Rancho Bernardo Inn, San Diego, CA *May 6, 2019*

Planning for Future Transportation Realties

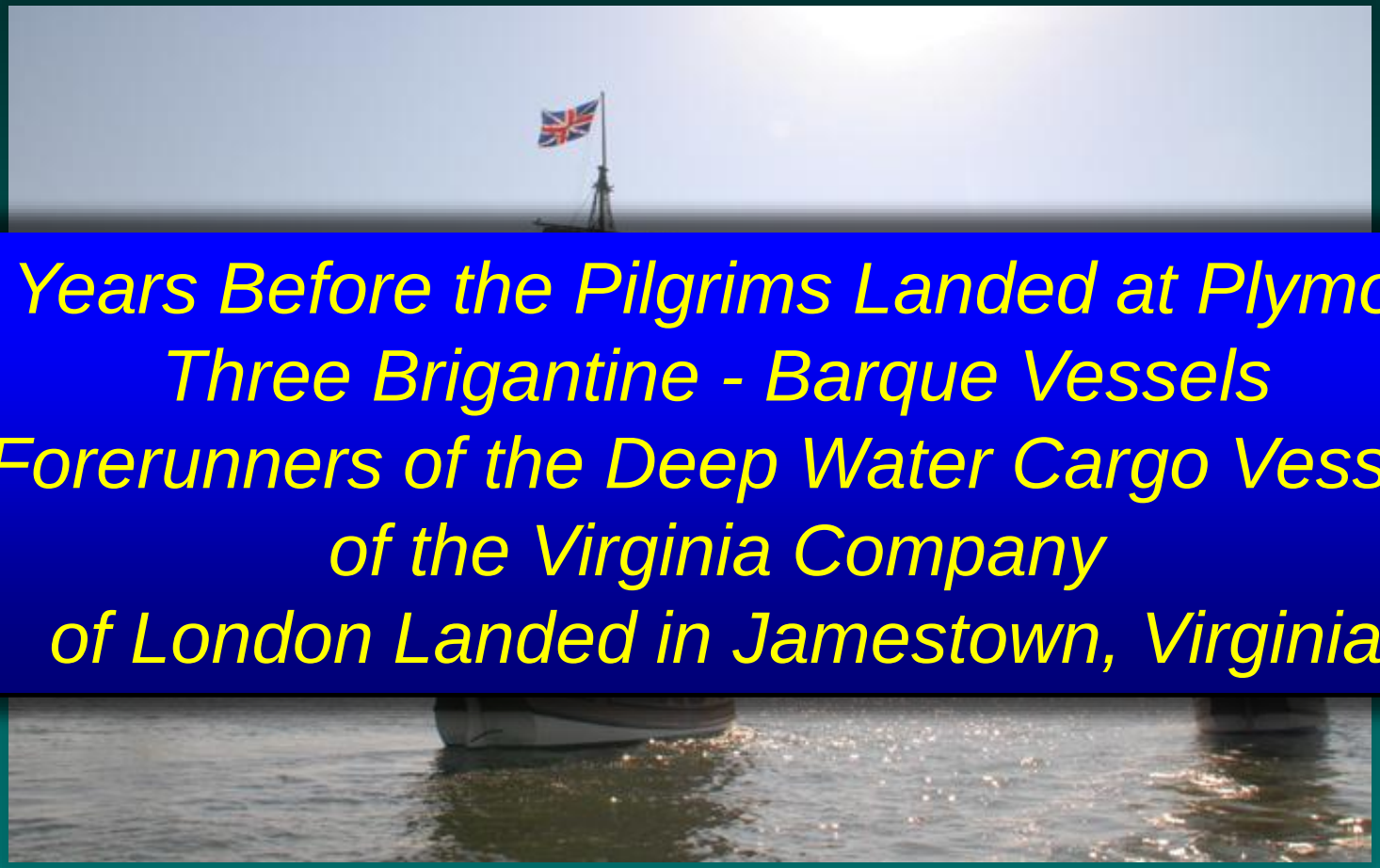
M. John Vickerman

VICKERMAN & ASSOCIATES, LLC

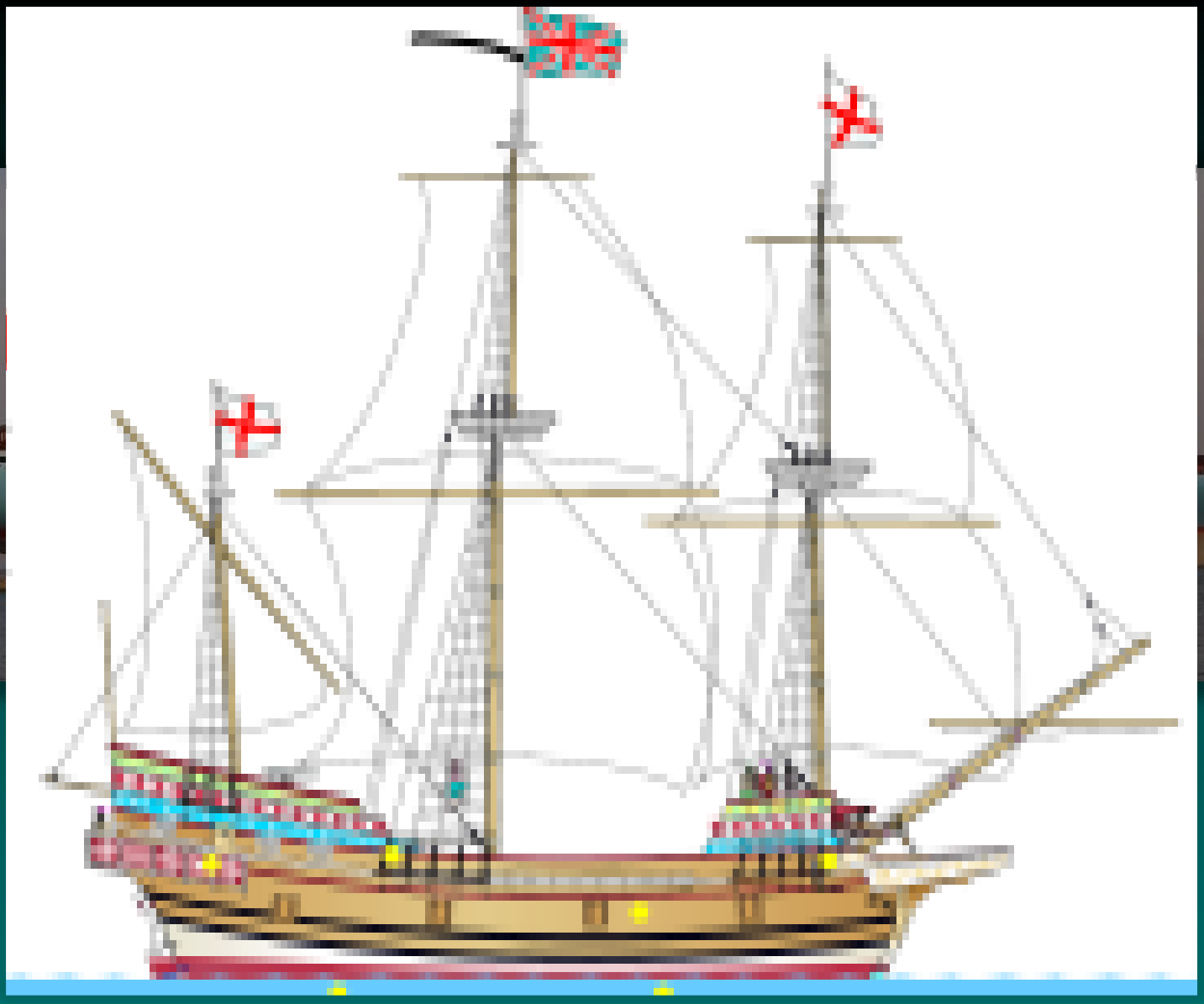
Williamsburg, Virginia

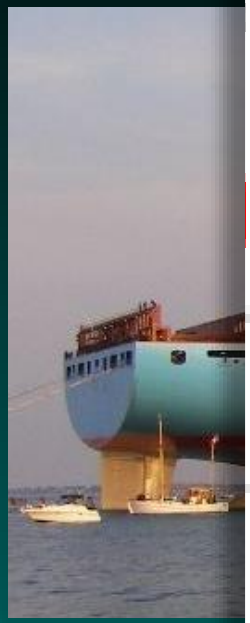
412 Years Ago: 1607

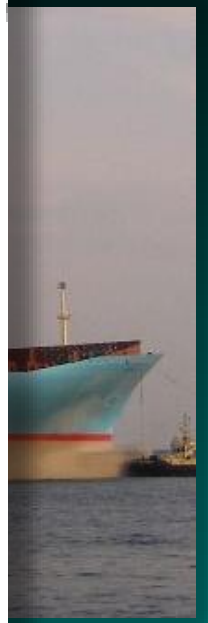
A Voyage of Three Vessels Created the First Permanent English Port in Jamestown, VA



13 Years Before the Pilgrims Landed at Plymouth,
Three Brigantine - Barque Vessels
(Forerunners of the Deep Water Cargo Vessel)
of the Virginia Company
of London Landed in Jamestown, Virginia







Godspeed Brigantine/Barque, Circa 1607
Deadweight Tonnage: 40 tons
LOA: 88 feet; Crew: 13, Passengers: 39

M/S EMMA MÆRSK

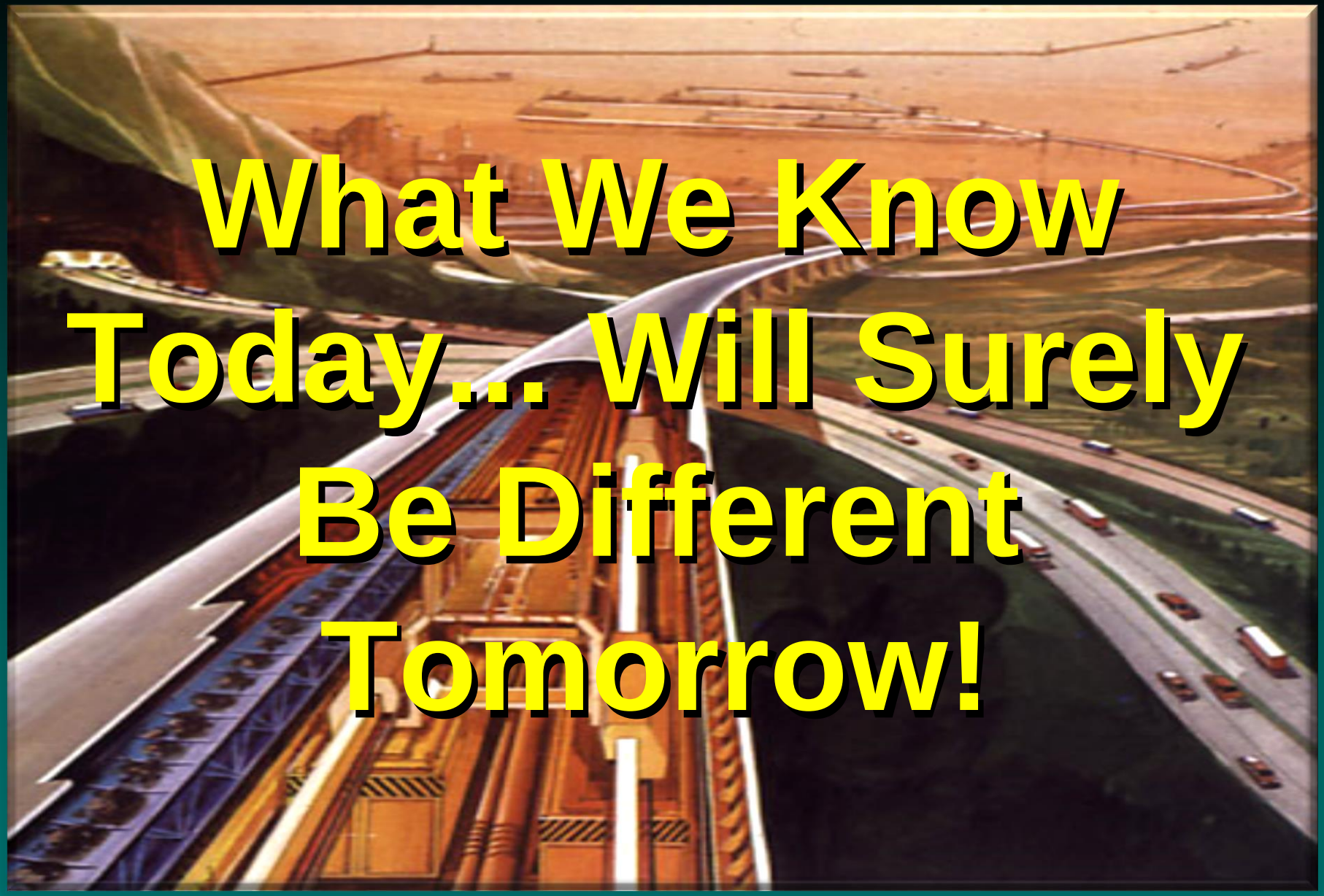
Circa 2013

Godspeed Brigantine/Barque, Circa 1607

Vessel Cargo Handling Circa 1955

Cargo Handling Circa 2010

US Navy Fast Frigate Circa 2045



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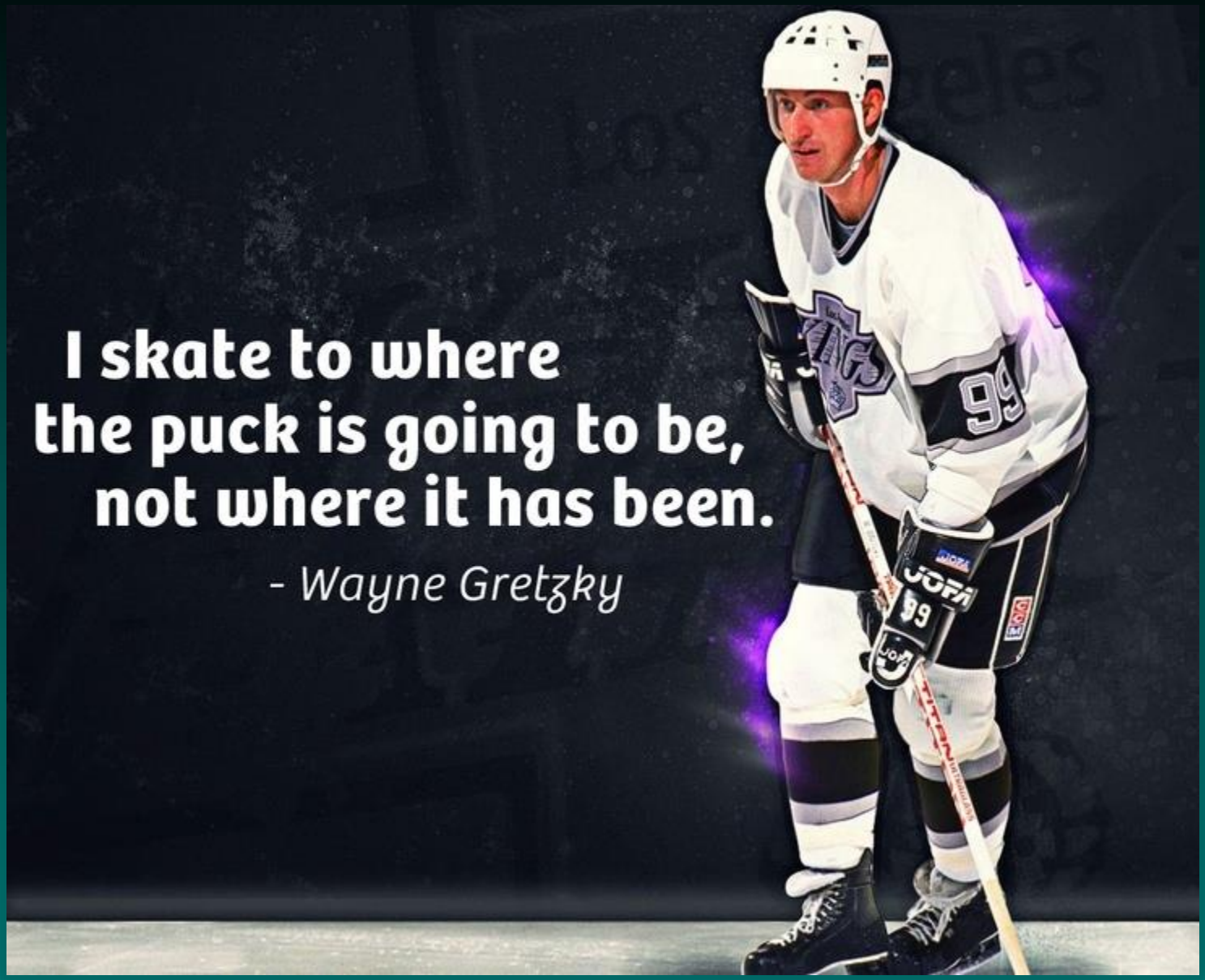

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Current Market Conditions Appear to be Improving for Marine Carriers

Expect the Global Maritime Trade Volume to Double by 2030…

Source: JOC.COM January 2018

VICKERMAN & ASSOCIATES, LLC

Three Mega Trade Trends to 2030

QinetiQ

Lloyd's Register

LIFE MATTERS

University of Strathclyde Glasgow

I. INCREASE IN GLOBAL POPULATION:

Global population is likely to be 8.5 billion by 2030, with 96% of growth coming from developing countries.

India will overtake China with the largest population.

Source: Global Marine Trends 2030 – QinetiQ – Lloyd's Register

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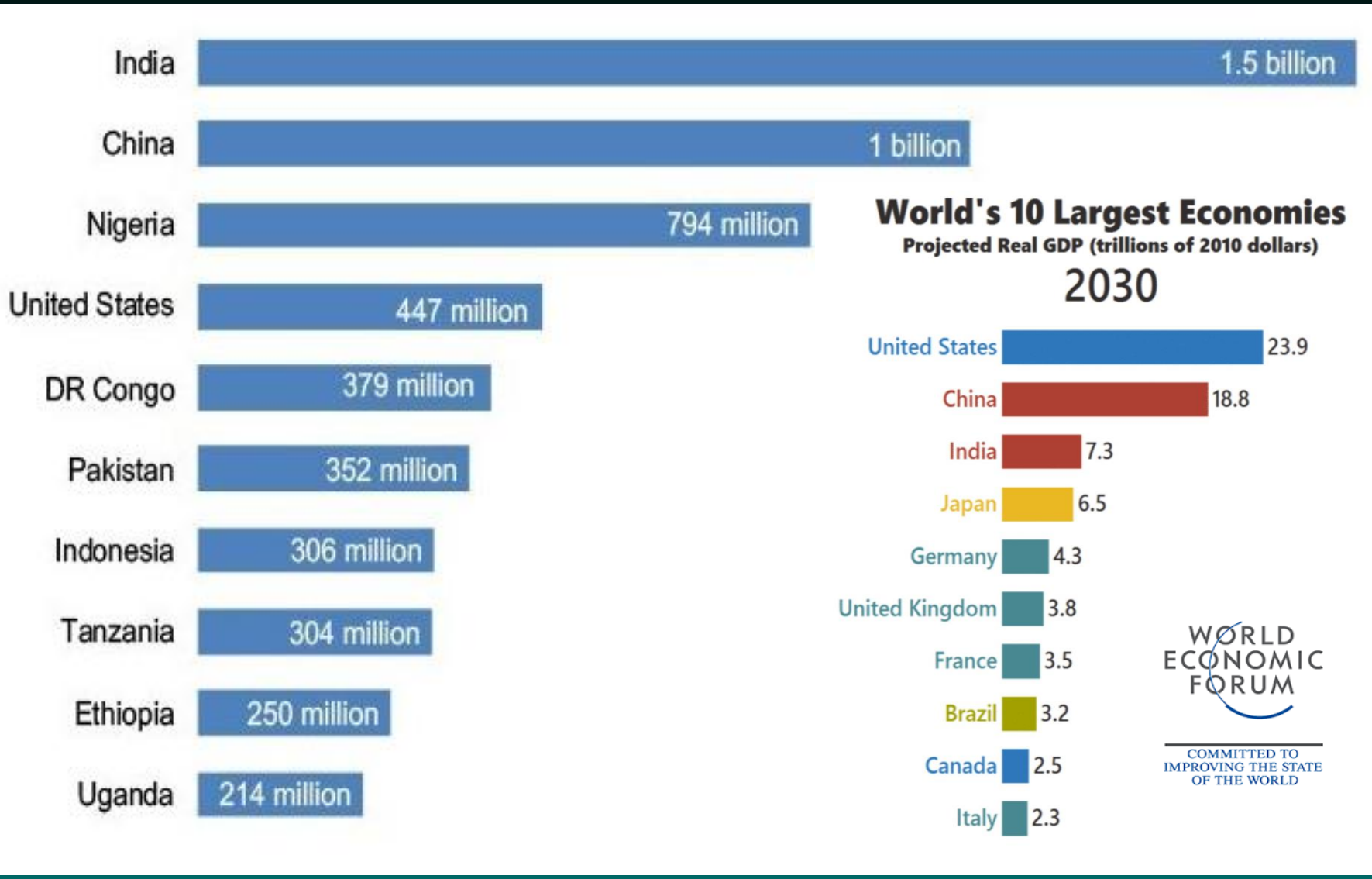
World's Largest Countries by Population in 2100



Source: UN Population Data

Three Mega Trade Trends to 2030:

QinetiQ
Lloyd's Register
LIFE MATTERS
University of Strathclyde Glasgow

II. GLOBAL GDP COULD GROW THREE TIMES WITHIN THE NEXT 20 YEARS

The countries with the largest growth in per capita GDP will be China, Vietnam, India and Indonesia.

Purchasing power in developing Asia will rise 8 times between 2010 and 2030.

Source: Global Marine Trends 2030 – QinetiQ – Lloyd's Register

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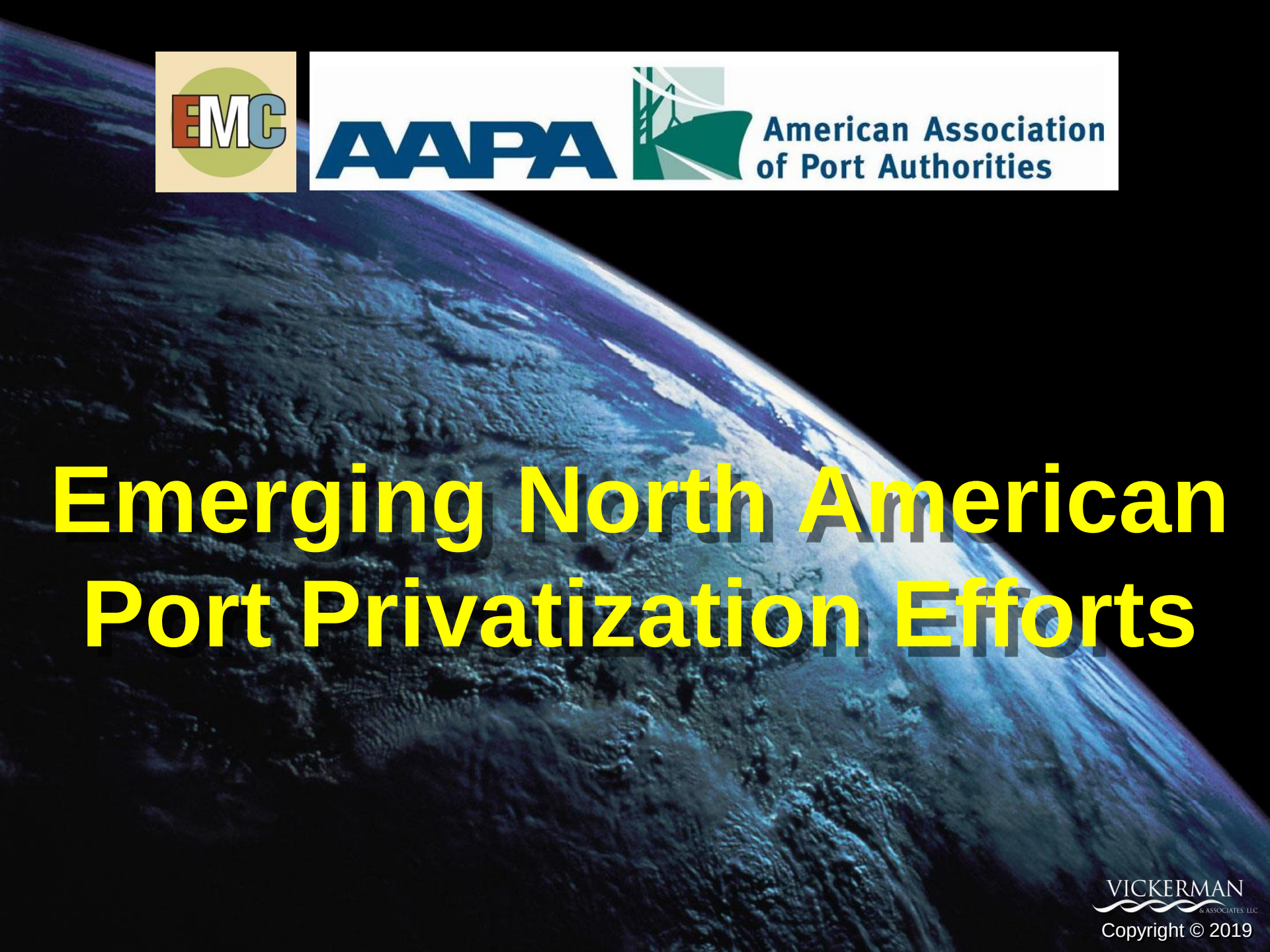
Three Mega Trade Trends to 2030:

III. 40% HIGHER ENERGY DEMAND IN 2030

China oil consumption could triple, overtaking the USA to become the largest oil consumer.

The USA will remain the biggest natural gas consumer, while China will see the largest growth in natural gas consumption.

Source: Global Marine Trends 2030 – QinetiQ – Lloyd's Register



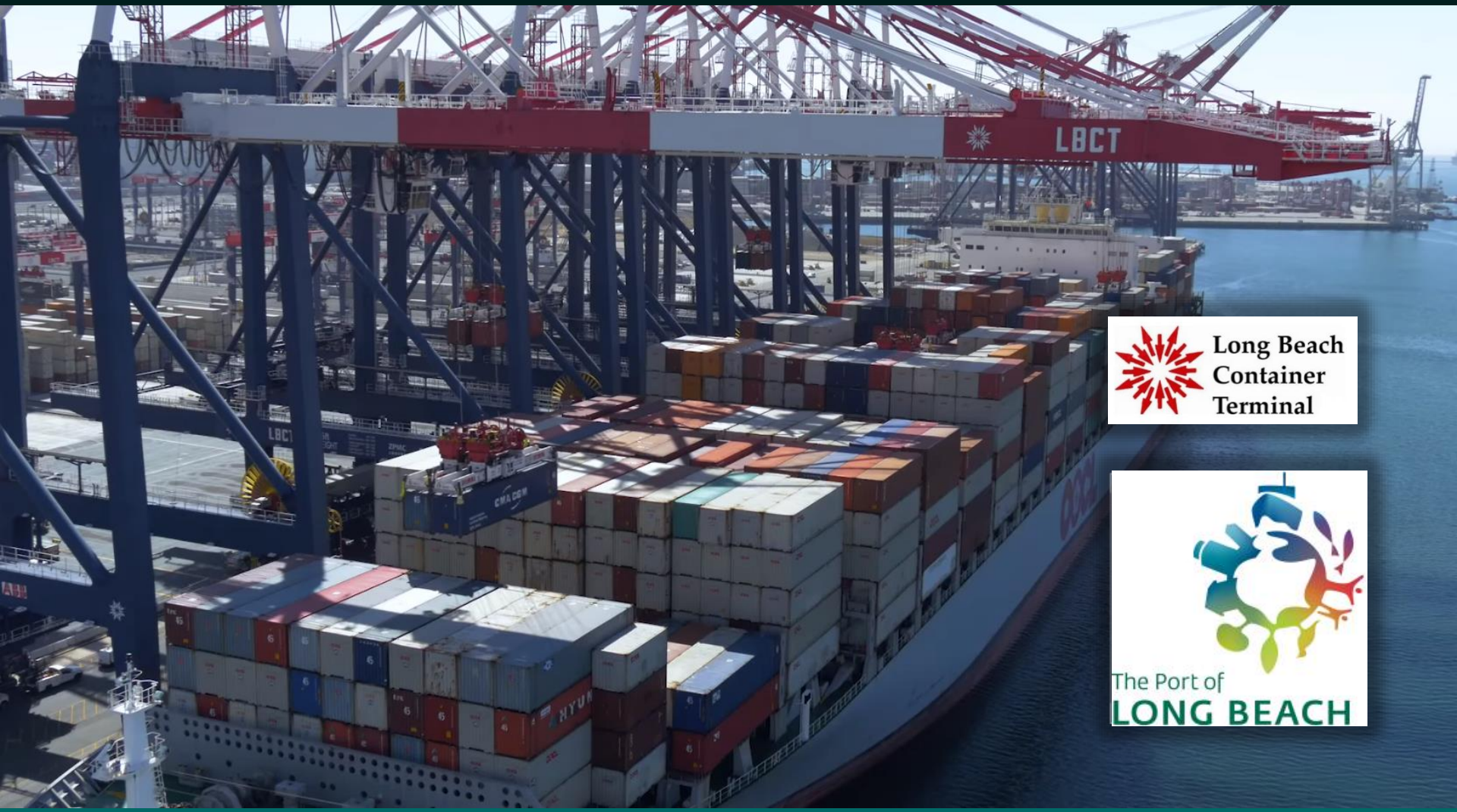
Emerging North American Port Privatization Efforts

VICKERMAN & ASSOCIATES, LLC

Comprehensive Update to the Current POLB Port Master Plan

Long Beach Container Terminal (LBCT)

Automated High Productivity STS Cranes



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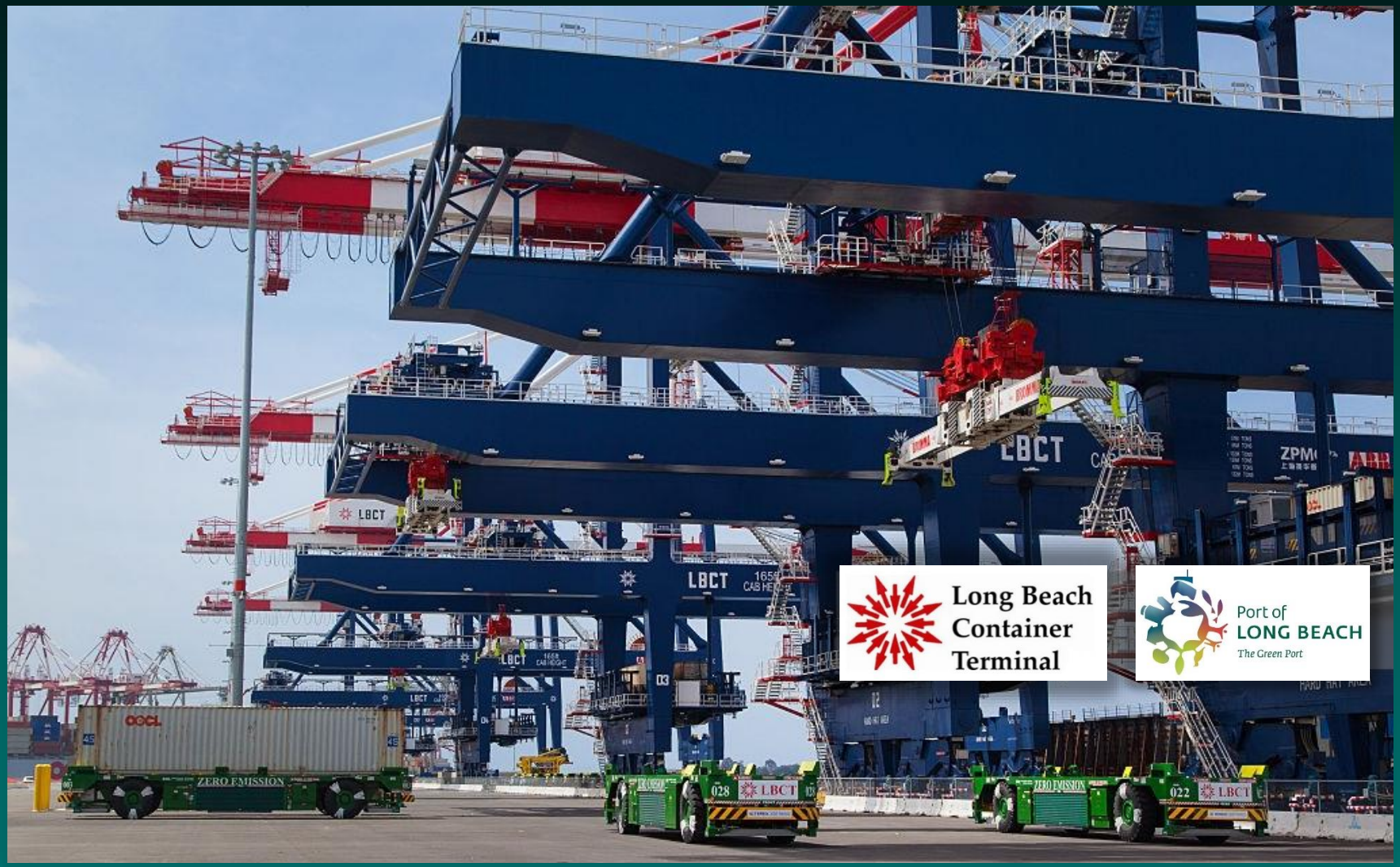
Long Beach Container Terminal (LBCT)

STS Cranes & Automated Guided Vehicles (AGVs)



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Long Beach Container Terminal (LBCT)

Automated High Productivity Intermodal Cranes

The Port of LONG BEACH

Long Beach Container Terminal

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Macquarie Infrastructure Partners (Australian Banking and Investment Group) has expanded its US footprint beyond the East Coast to the West Coast through the $1.78 billion purchase of Long Beach Container Terminal (LBCT) from Hong Kong's Orient Overseas (International) Limited (OOIL).

Macquqrie has stakes in New Jersey's Maher Terminals at Port Elizabeth and Penn Terminals. Buying LBCT gives it major port assets on the US West and East coasts.

Source: JOC April 30, 2019


EMC
AAPA
American Association of Port Authorities
The Evolution of Today's Global Shipping Lanes
VICKERMAN & ASSOCIATES, LLC
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The Maritime Silk Road Replaced the Overland Silk Road as the Primary Trading Route Across Eurasia After the Tang Dynasties (618 to 907)

The Marine Silk Road was a Precursor to:

Today's modern supply chain logistics, distribution and shipping transportation networks

90% of Global Trade is Carried Out by Shipping

The Majority of Today's Ocean Trade is Conducted on the Marine Silk Road

The World's Primary Shipping Route:

The Marine Silk Road

VICKERMAN & ASSOCIATES, LLC

Maersk's Global Trading Routes Today

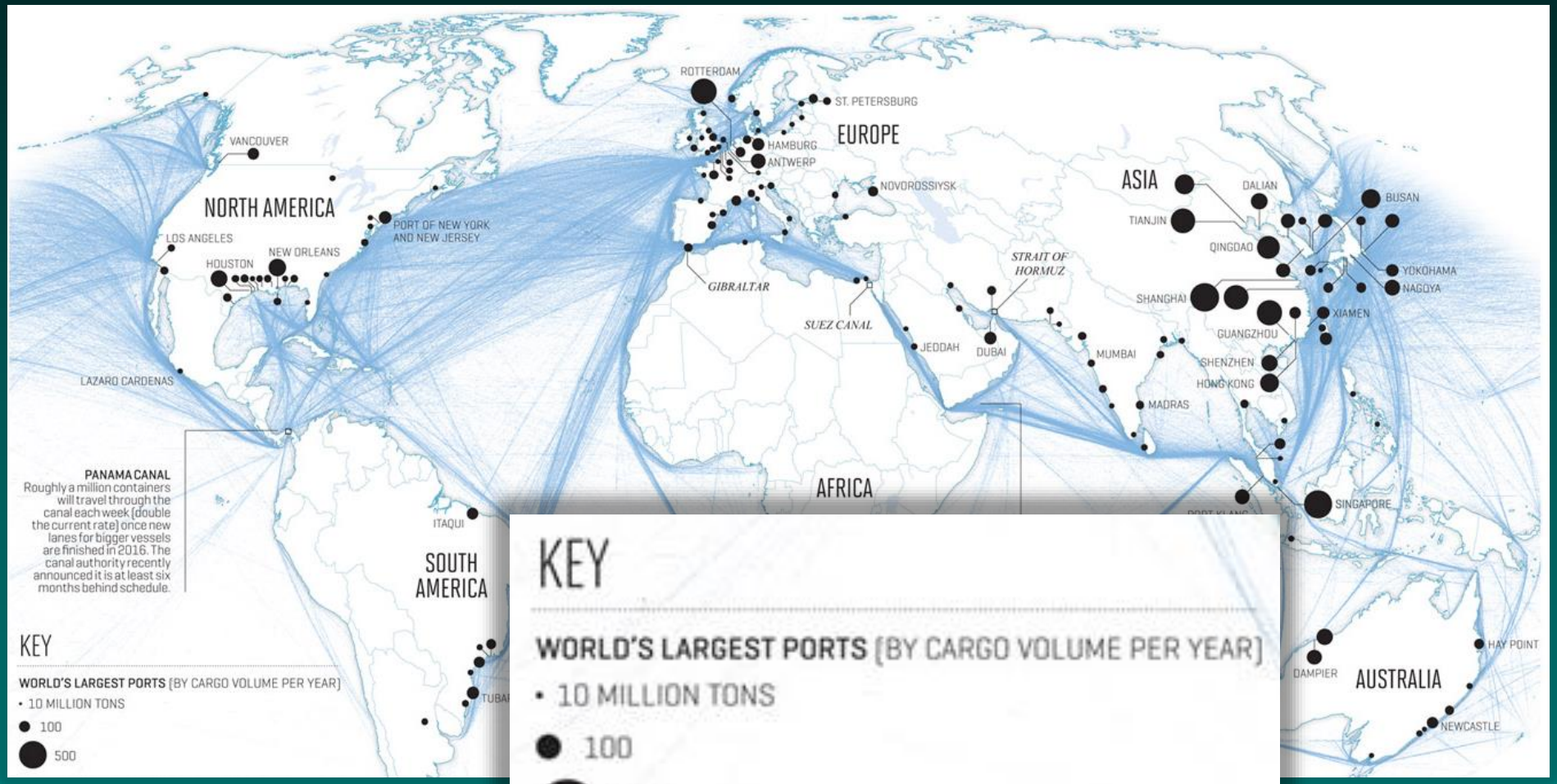
Lifting Global Trade.
APM TERMINALS

MAERSK GROUP

Indian Ocean Electric Blue Shipping Lane Trails From the Marine Silk Road

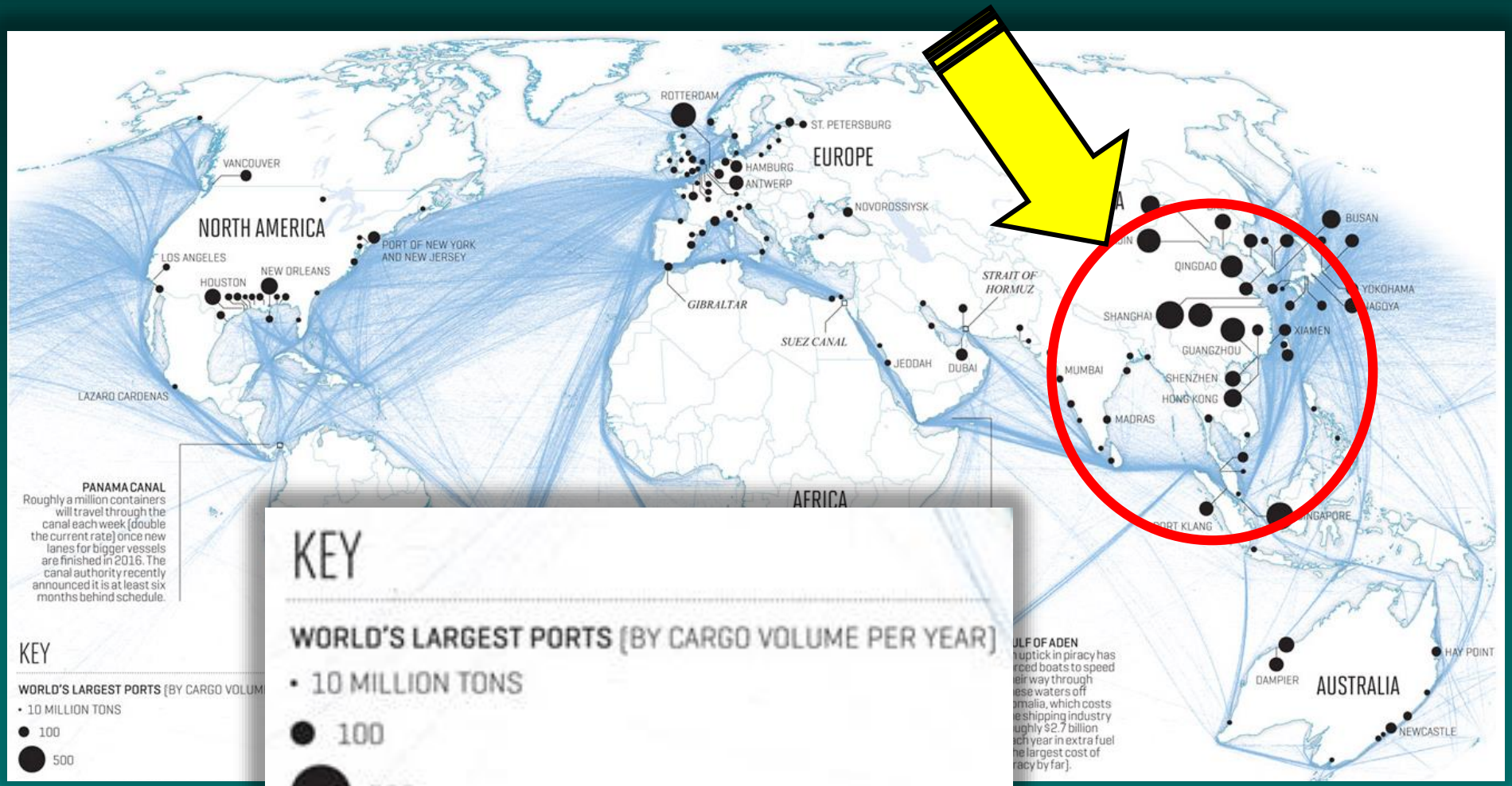
The World's Largest Ports Are Connected Via The Marine Silk Road

Where are the Biggest Ports?

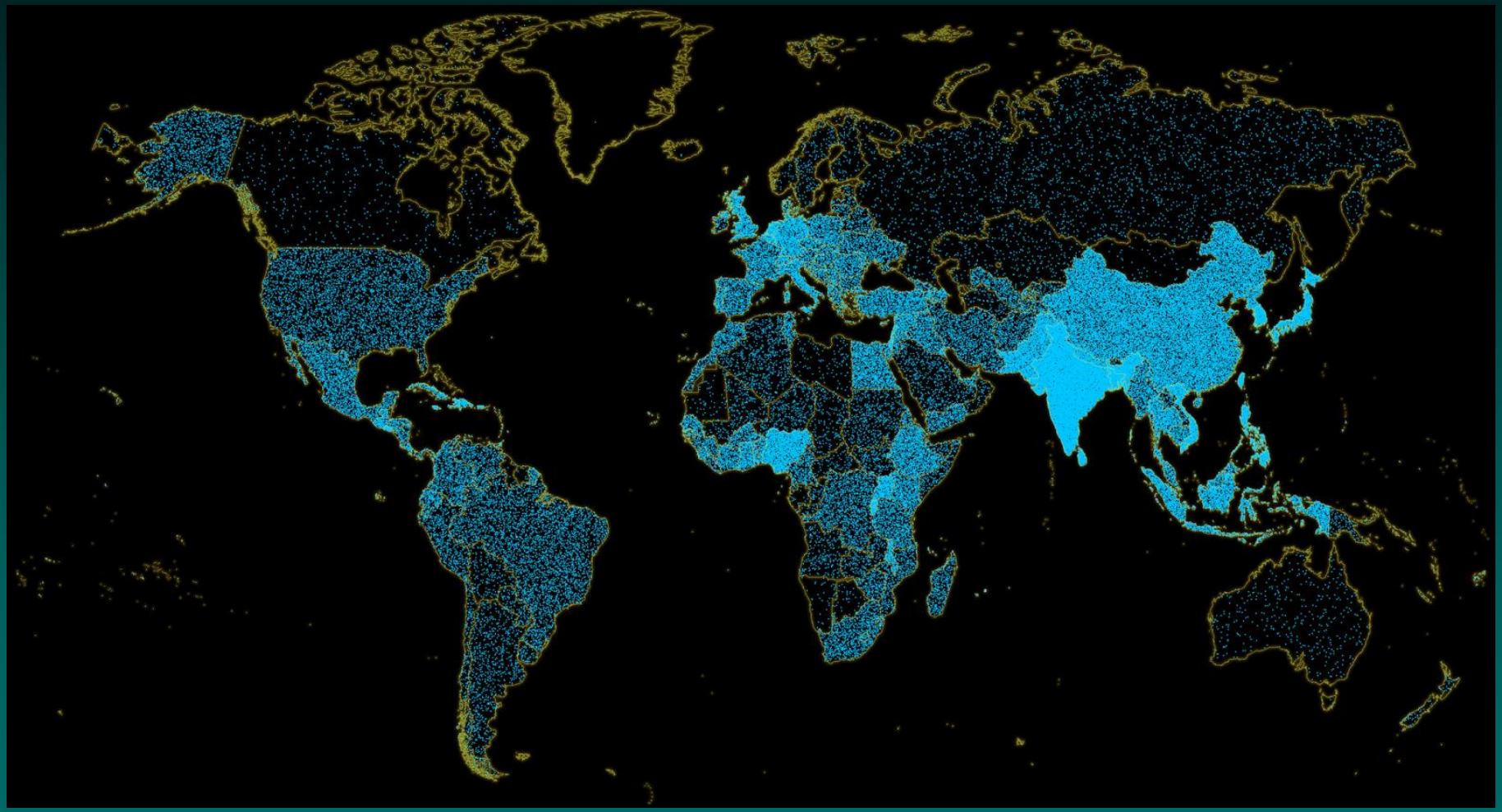


KEY
WORLD'S LARGEST PORTS (BY CARGO VOLUME PER YEAR)
• 10 MILLION TONS
100
500

The World's Largest Ports Are Connected Via The Maritime Silk Road



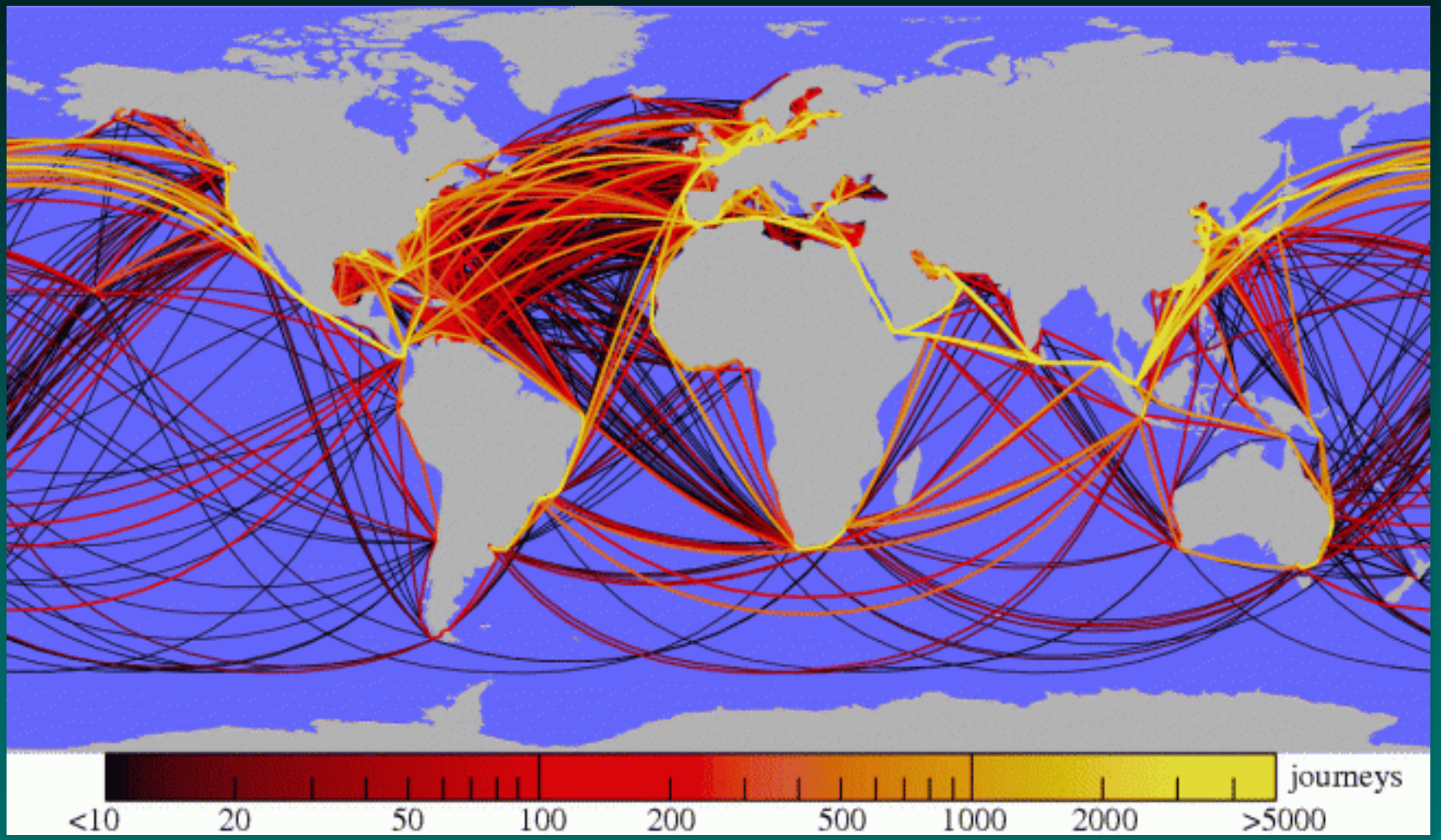
NASA's Population Density Imagery



A standard dot density map of population (each dot represents 50,000 people).

Global Shipping Routes Plotted by AIS GPS

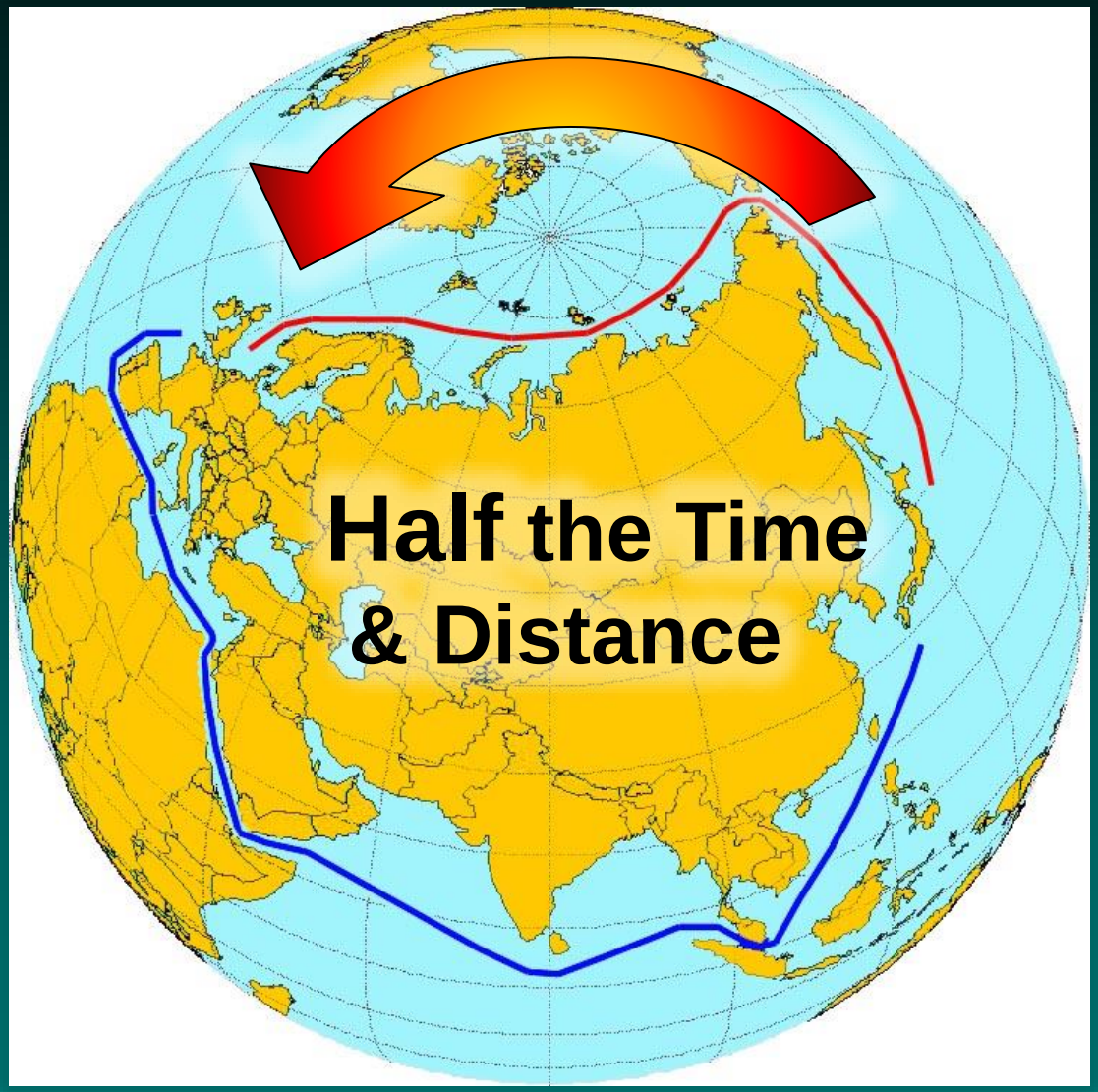
Today's Busiest Shipping Routes:
(1) Panama Canal, (2) Suez Canal, (3) Offshore China

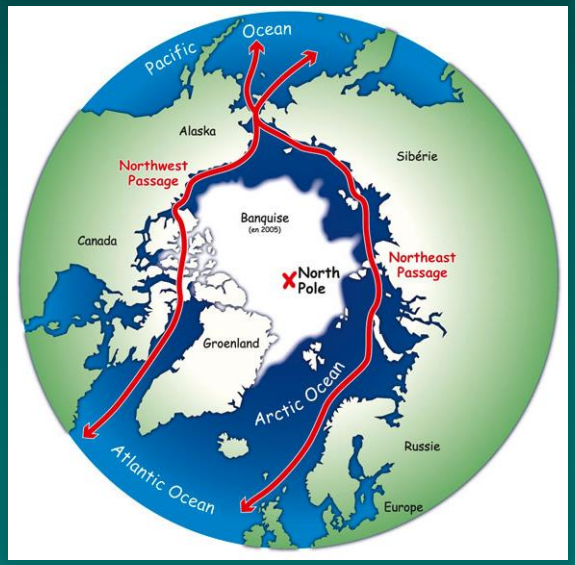


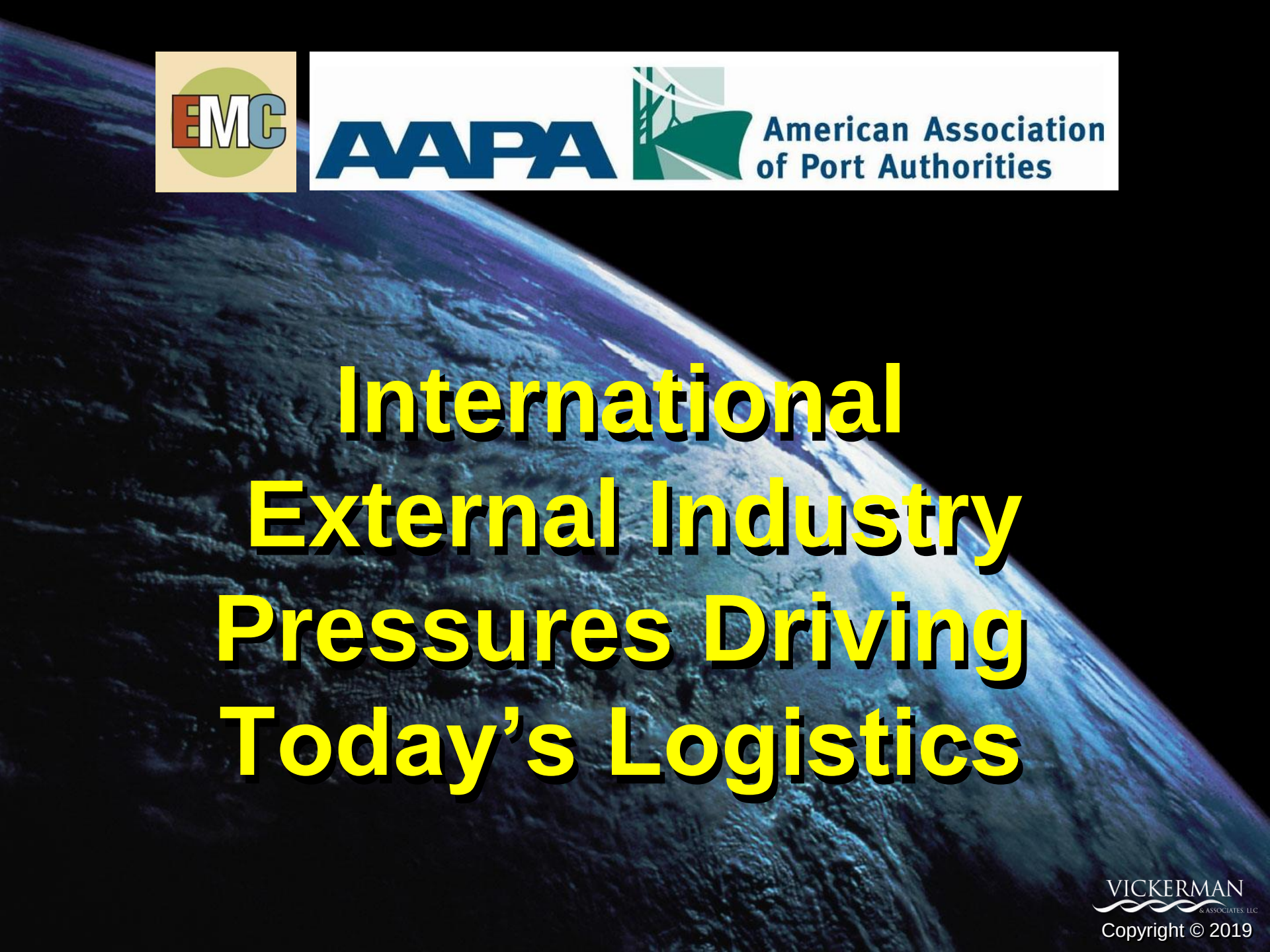
Source: Wired Science January 2010 Journal of the Royal Society: Interface

Shorter – Faster Arctic Ocean Route

2+ Months A Year Using Convoys







International External Industry Pressures Driving Today's Logistics

VICKERMAN & ASSOCIATES, LLC

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

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Expect the Global Maritime Trade Volume to Double by 2030

*"In the next 10-15 years **world trade is projected to grow significantly**. It is estimated that this growth will result in a **doubling of seaborne trade volumes** from 10 billion tons of cargo annually today to 20 billion tons of cargo around 2030".*

Source: Danish Maritime Forum, 24-28 October 2016

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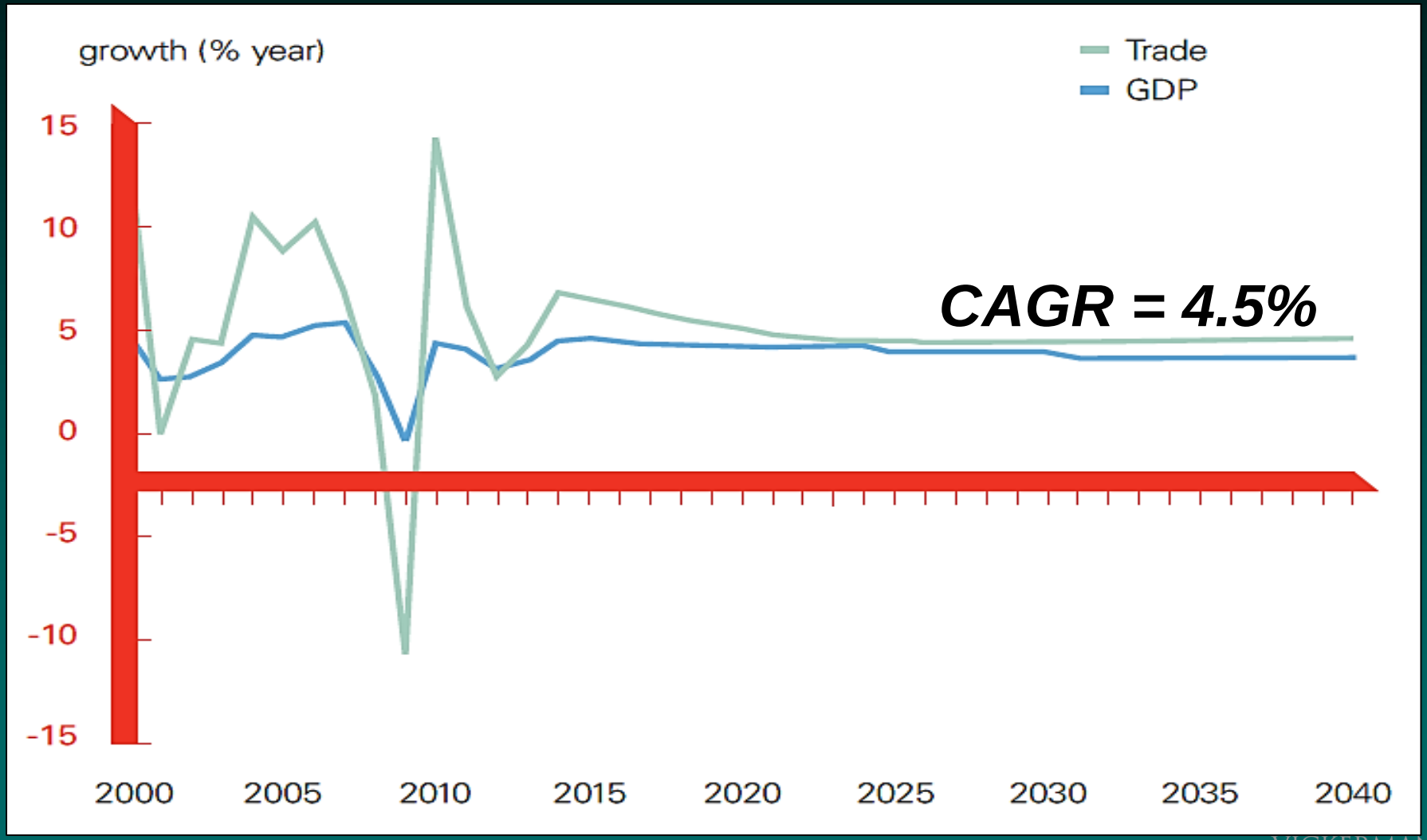
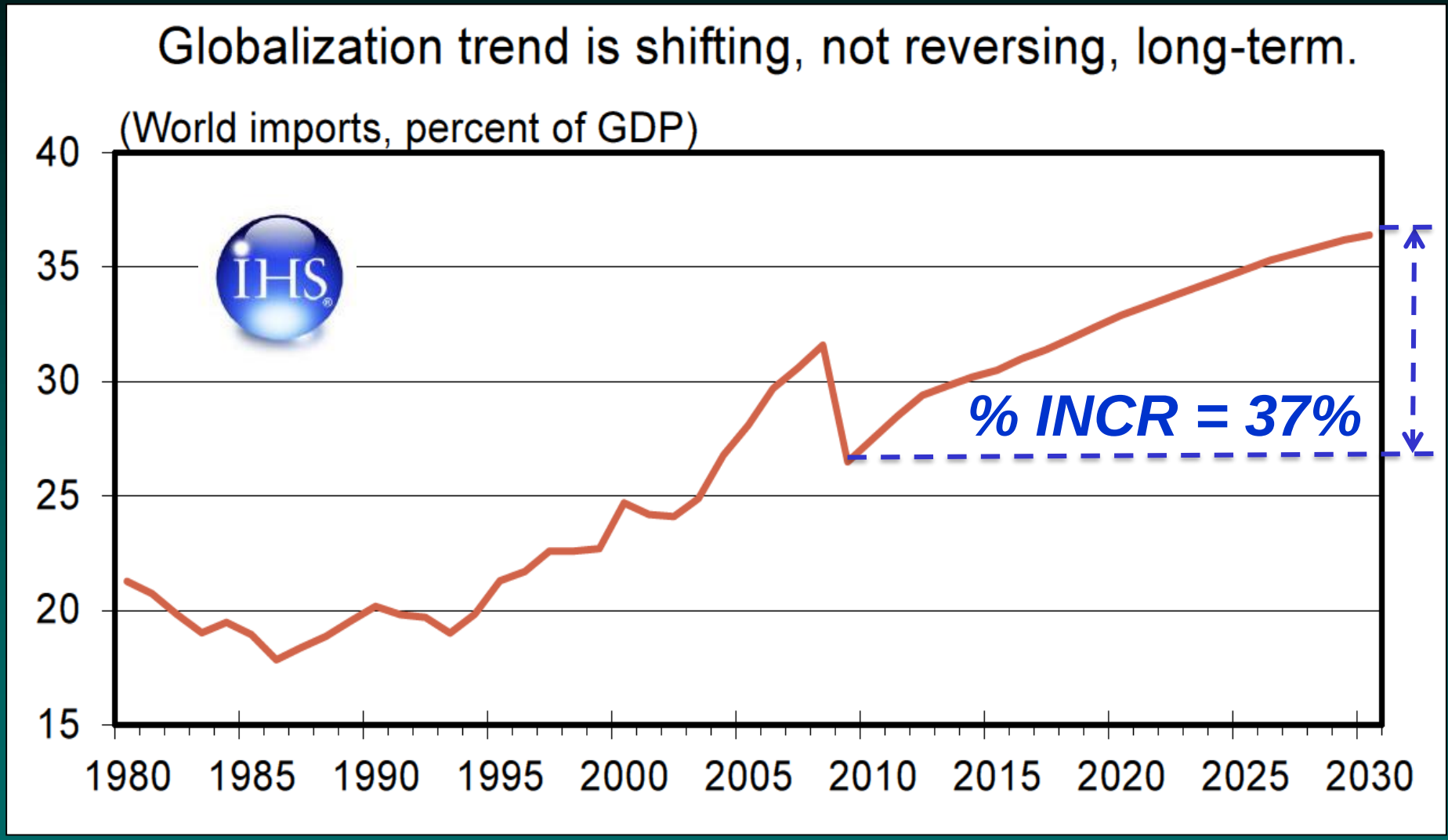
Growth in GDP and World Trade

World trade will grow by 73% in the next 15 years. With merchandise trade volumes in 2025 hitting $43.6 trillion compared to today's $27.2 trillion



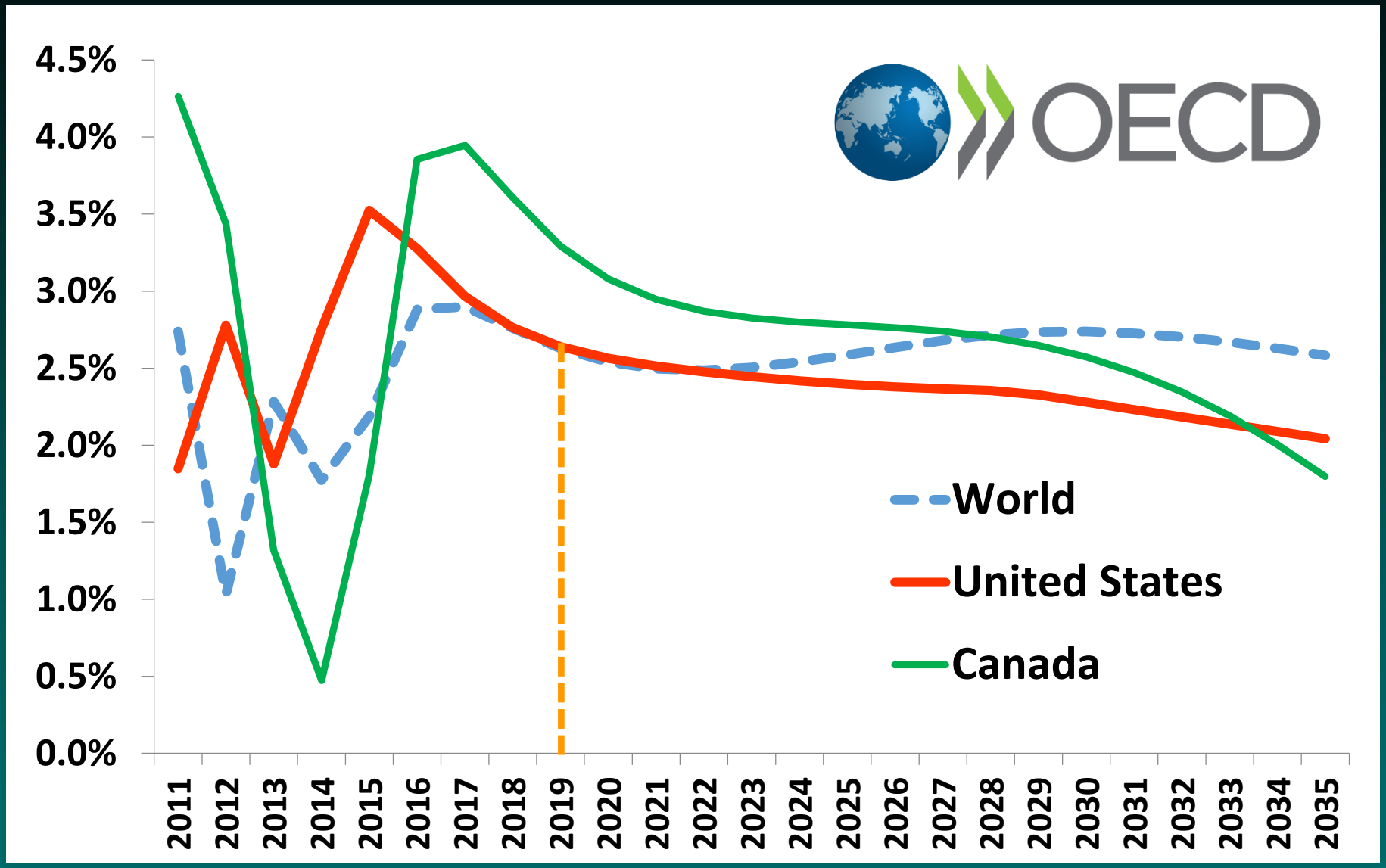
Source: Oxford Economics 2013

World Trade's Share of the Economy Grows Again



Source: IHS Global Insight – World Trade Service

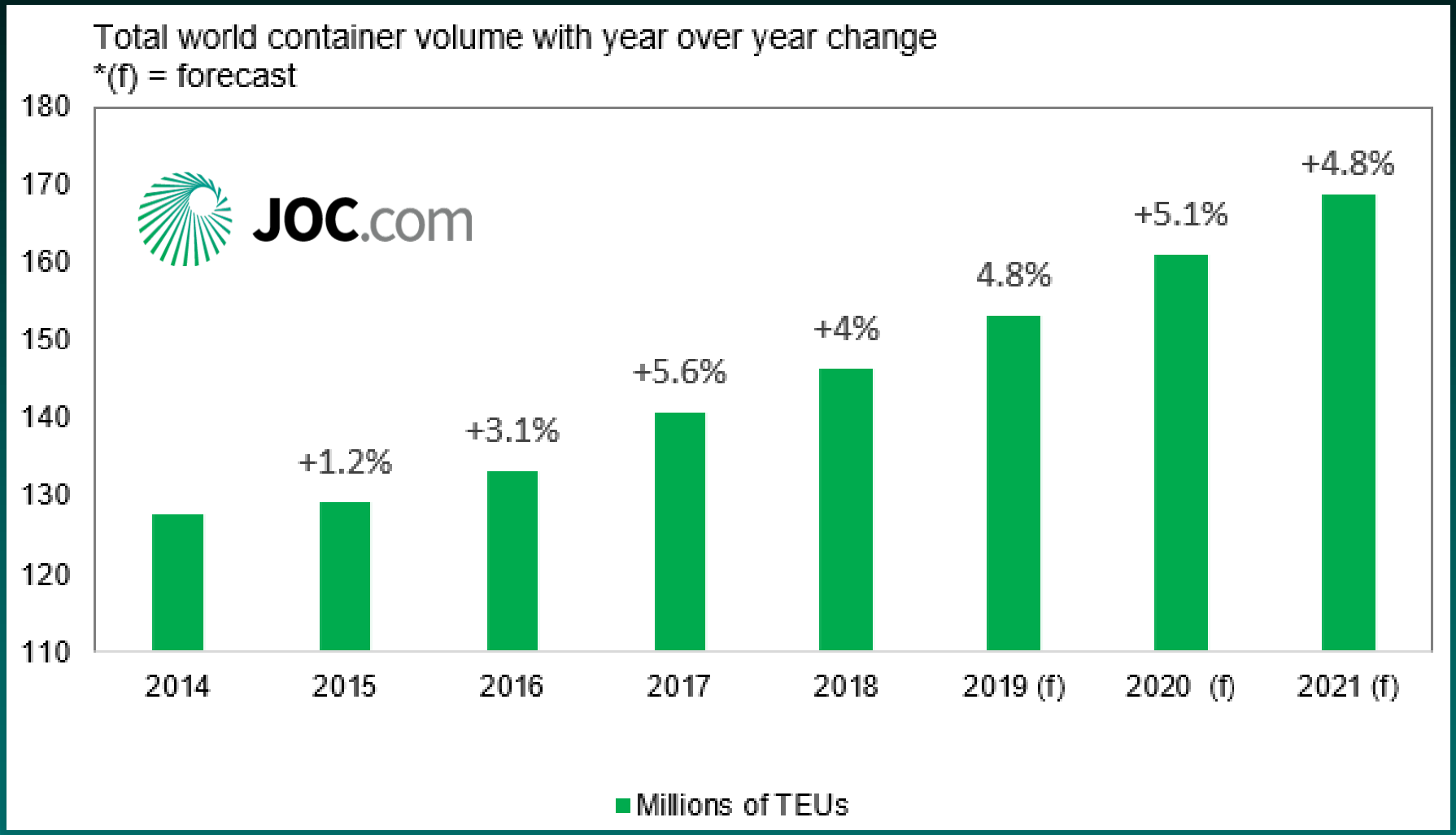
Long Term GDP Annual Growth Rates



Source: OECD Economic Forecast

Global Container Trade Growth Forecast

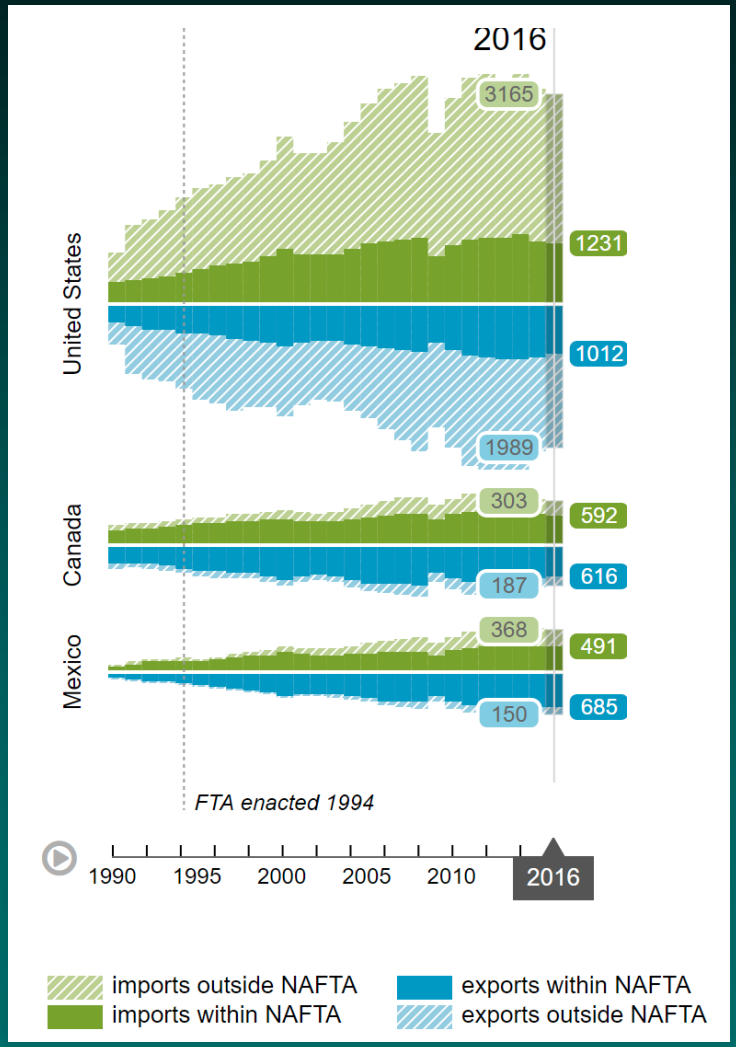
(Accelerating in 2019 and Beyond)

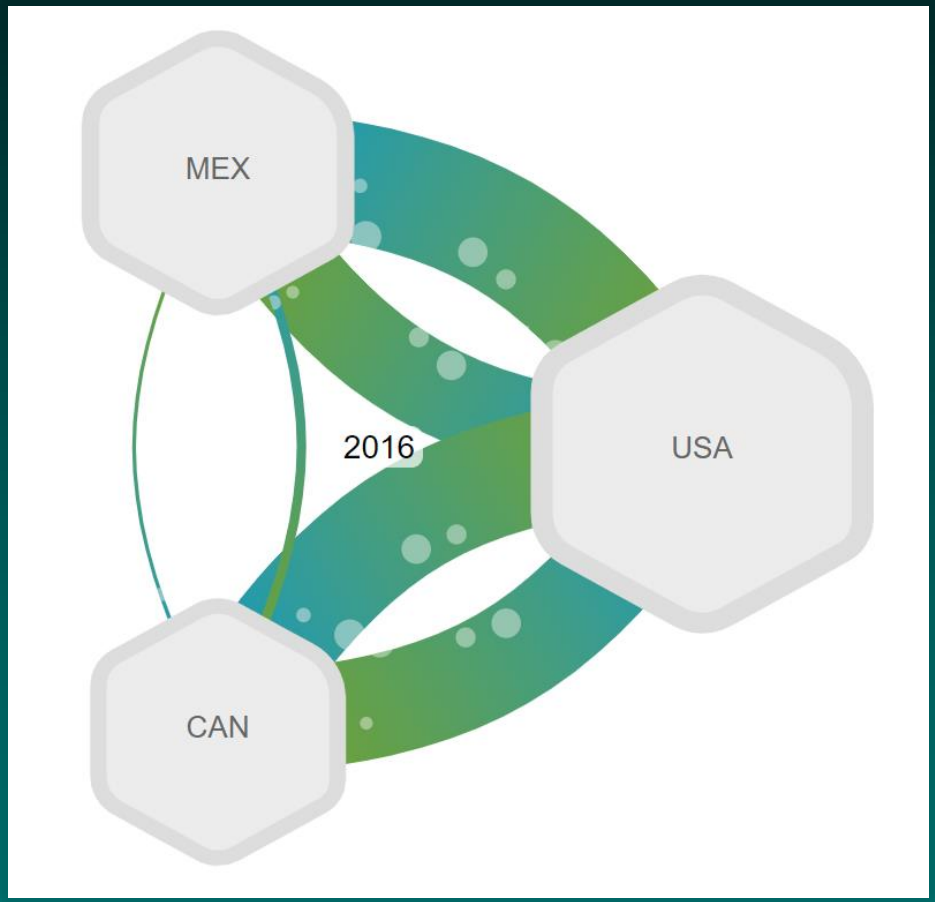


Source: 2019 HIS Markit –Trends in the World Economy and Trade report - JOC

NAFTA FTA Trade Volumes

(2016 Imports and Exports, in Billions of US Dollars)





Source: United Nations Comtrade Database – Data Visulaization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American Association of Port Authorities
What/Who Determines Today's Logistics Trade Flows?
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Who Owns & Controls Today's Cargo?

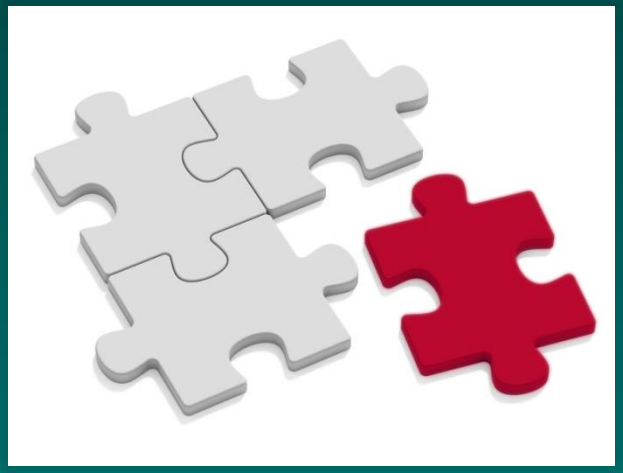
- The "***Shipper***" or "***Beneficial Cargo Owner***" *(BCO)*
- **BCO** = Importer of record, the entity that physically takes possession of cargo at destination and does not act as a third party in the movement of such goods
- The person or company who is usually the **supplier or owner of commodities shipped**.

Key Success Factor:

Cargo Will Flow "*Downhill*" to the

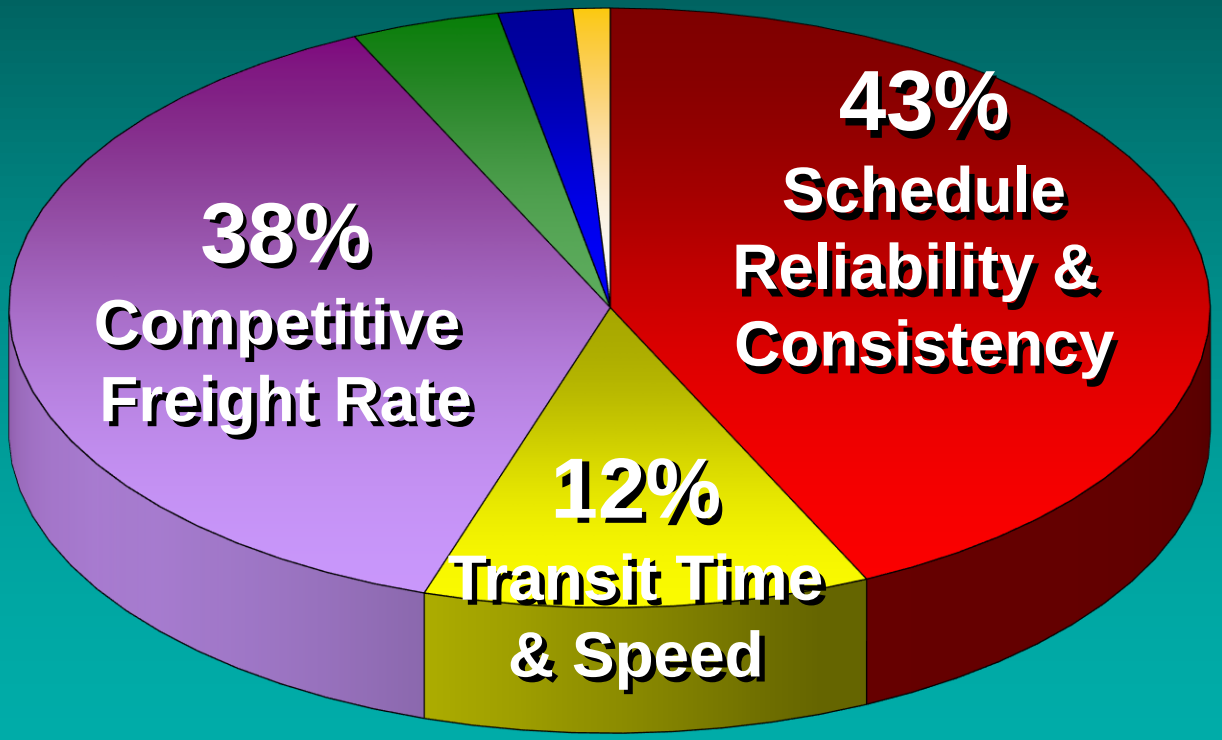
"*Lowest Cost - Best Service Levels*"

(Total Logistics Costs From Origin to Destination)



Above All Be MARKET DRIVEN

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."

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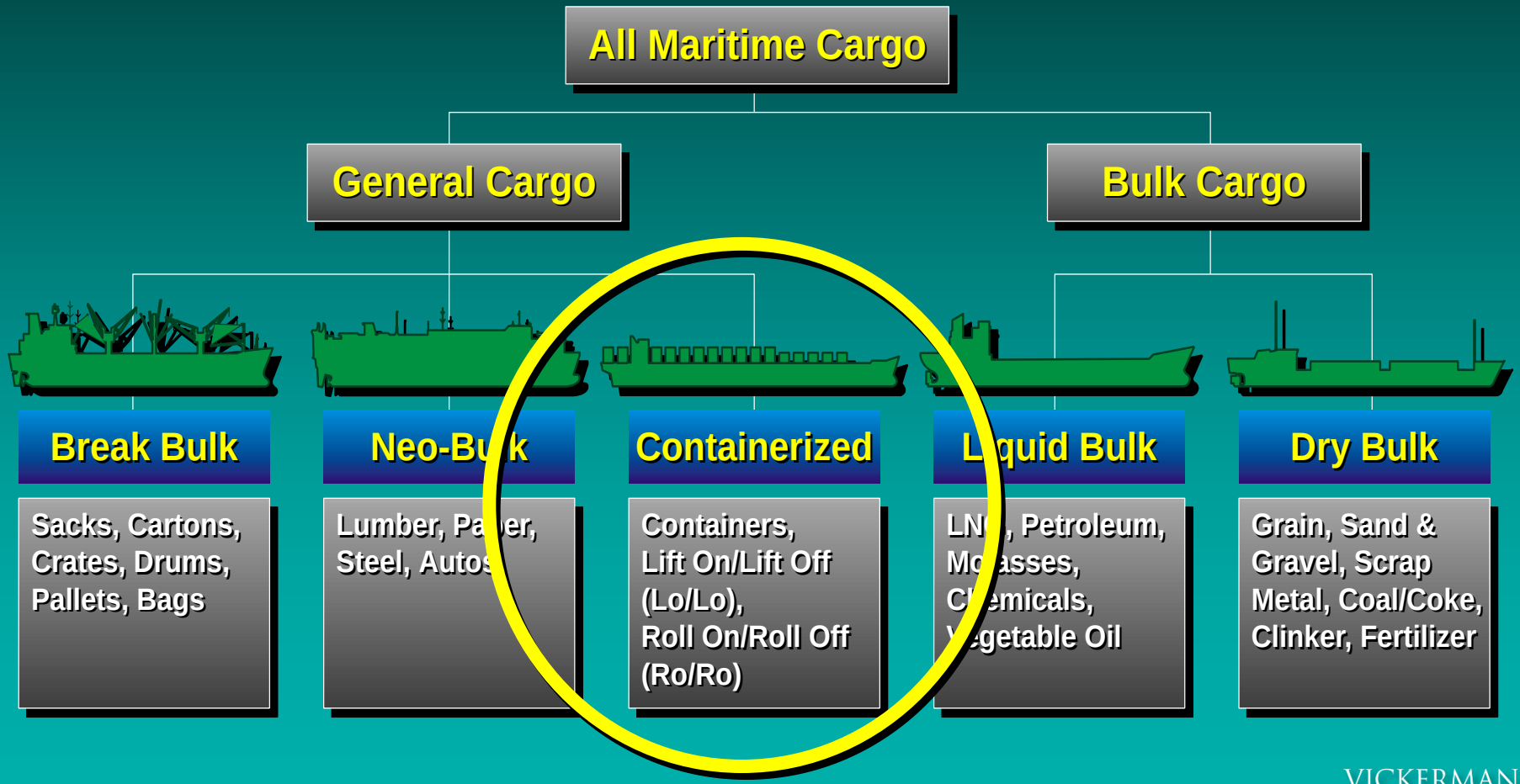
Functional Classification of Global Maritime Cargoes



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

8 ft. to 9.5 ft

20 ft

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How Much Can a Single Container Hold?

(Example 40 ft. Container)

					Example Value $
	=	1,890 Cases	@	$25.50/Case	=	$48,195
	=	315 20” TVs	@	$299/TV	=	$94,185
	=	10,000 Pairs	@	$30/pair	=	$300,000
	=	432,000 Packs	@	$4.00/Pack	=	$1,728,000

International Maritime Cargo Demand & Logistics Trends

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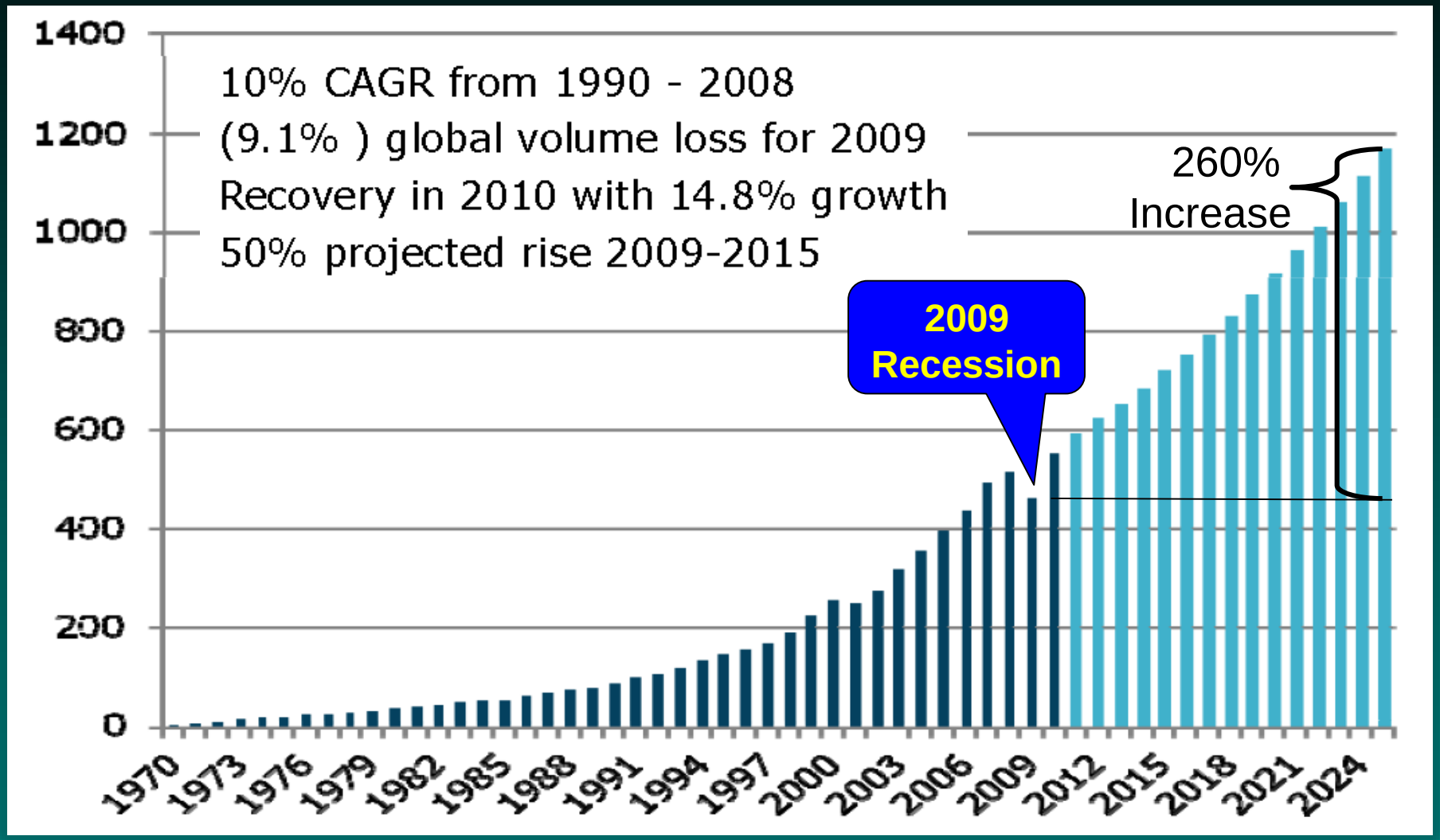
2025 World Container Port Market Demand

(Millions of TEUs)



Source: Drewry Shipping Consultants

Southeast Asian Manufacturing Centroid Shift

C Flow

U.S. Ir
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's $8.5 Billion Expansion Plan

(A New $4 Billion 45-mile-long parallel channel and Global Logistics Park)

3 Daily Convoys:

2 Northern Convoys
1 Southern Convoy

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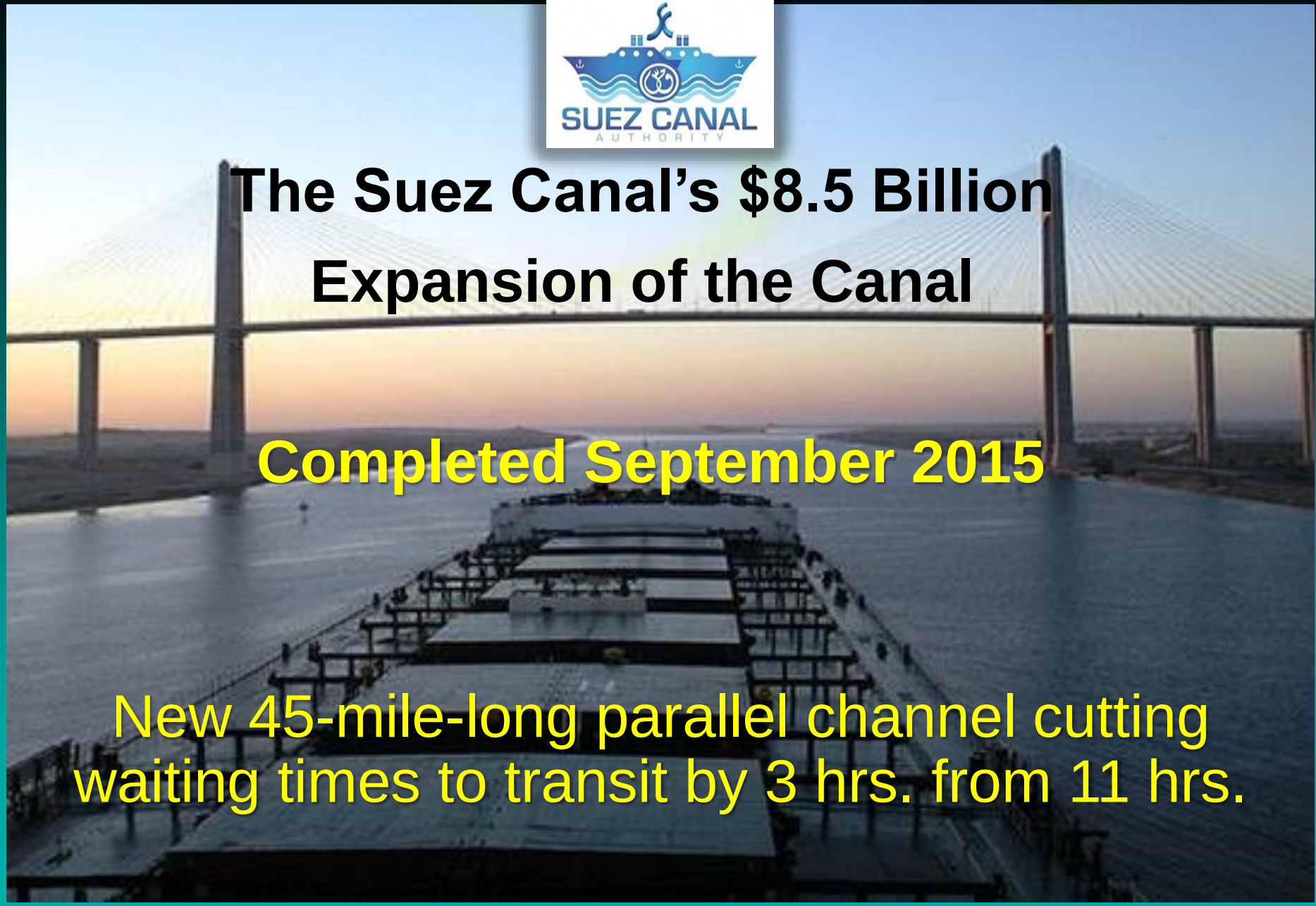

The Suez Canal's $8.5 Billion Expansion of the Canal

Completed September 2015

New 45-mile-long parallel channel cutting waiting times to transit by 3 hrs. from 11 hrs.

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Dredging 180 Million Cubic Meters (35-kilometers-long and 24-meters-deep) Shipping Route in Less than One Year

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& ASSOCIATES, LLC

Egyptian Jet Fighter Escort Selfie

(Taken with the New Expanded Suez Canal in the Background)

Source: Photo Courtesy of MIRASCO, August 2015

The Number of Ships Able to Navigate the Suez Canal Simultaneously Has Increased from 23 to 97, Thus Doubling the Suez Canal Capacity by 2023

The Continuing Asian Import Trade Challenge

VICKERMAN & ASSOCIATES, LLC

Container Transhipment World Records

Of the 10 busiest ports in the world, 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

China-US: Twin Engines of the World

2015 Population:
US: 325 million
China: 1,400 million
(1/5 World – 19%)

The number of Chinese children in elementary school is equivalent to the total US population.

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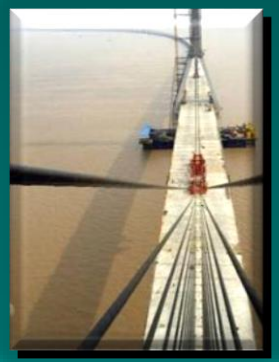
Shanghai International Shipping Center

Yangshan Deep Port & Logistics Park



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Shanghai International Shipping Center

Yangshan Deep Port - 20 Mile Bridge Access

Shanghai Yangshan Deep-Water Harbour

Yangshan Deep Port – 54 Berths East China Sea

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Shanghai International Shipping Center

Yangshan Deep Port & Logistics Park

Shanghai Port Set a 2011 Record by Handling over 30 million TEUs


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Emerging New Economic Global Trade Drivers
(BRIC → ASEAN 2020) + India
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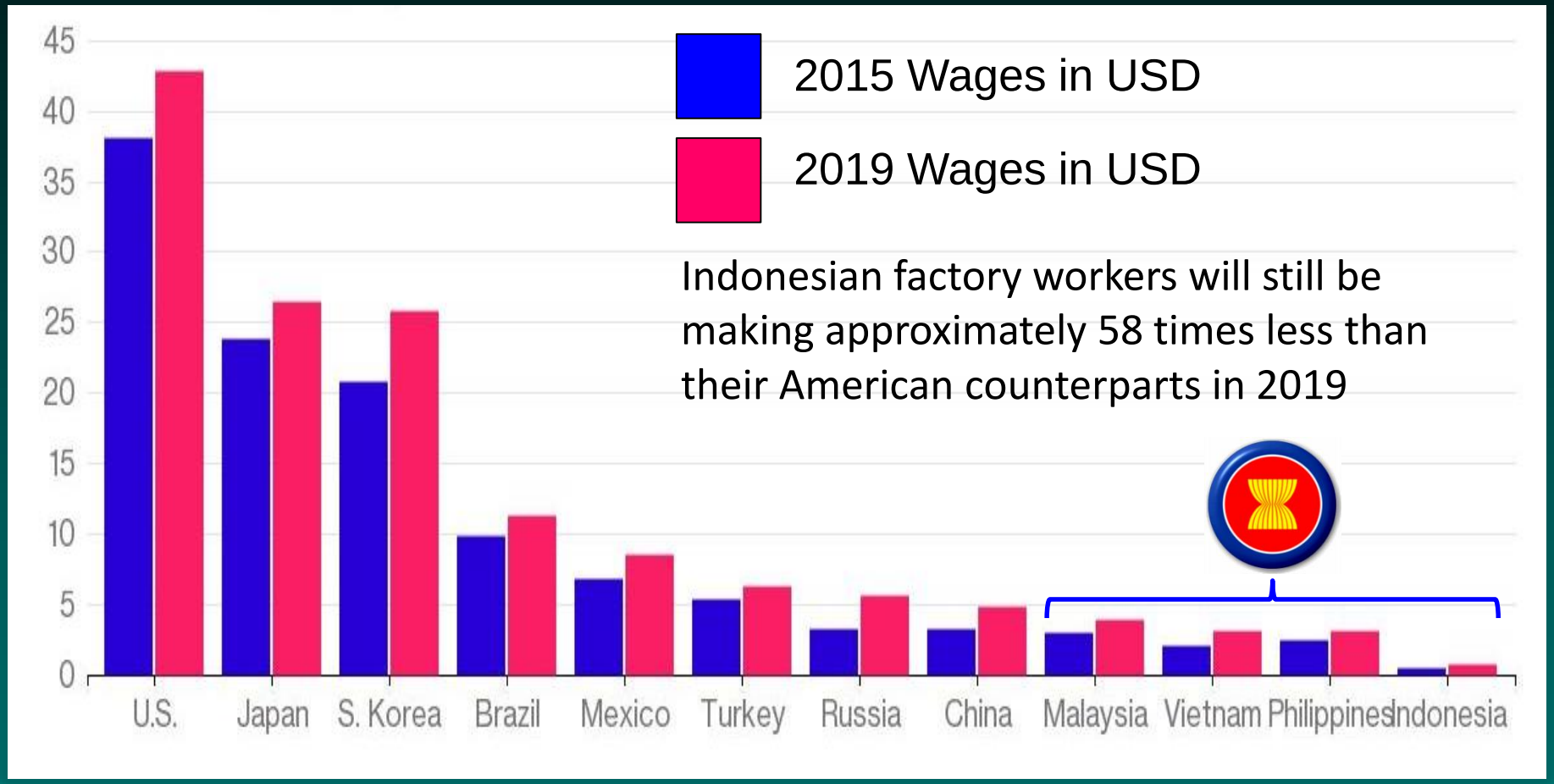
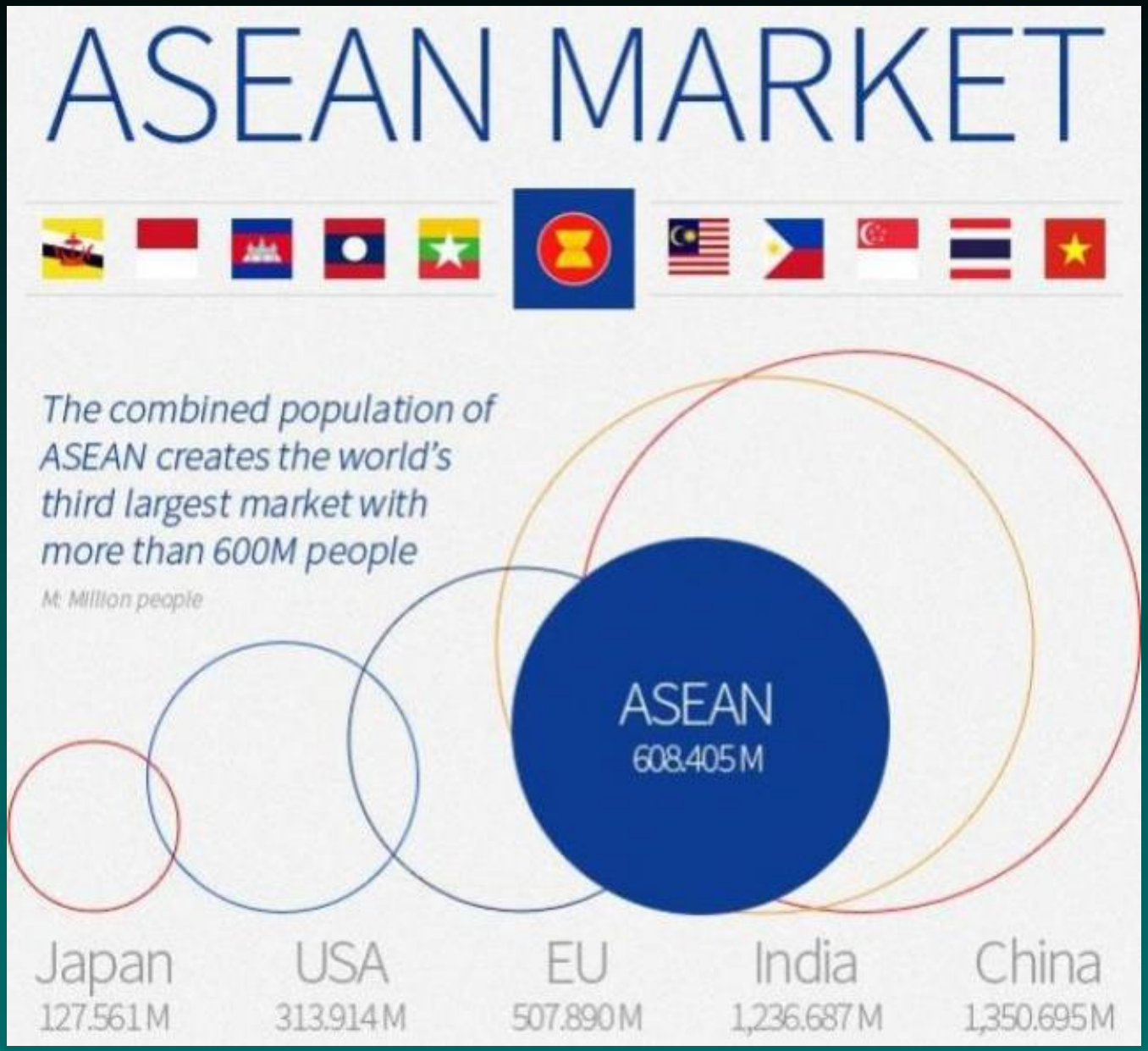
Global Manufacturing Hourly Wage Rates



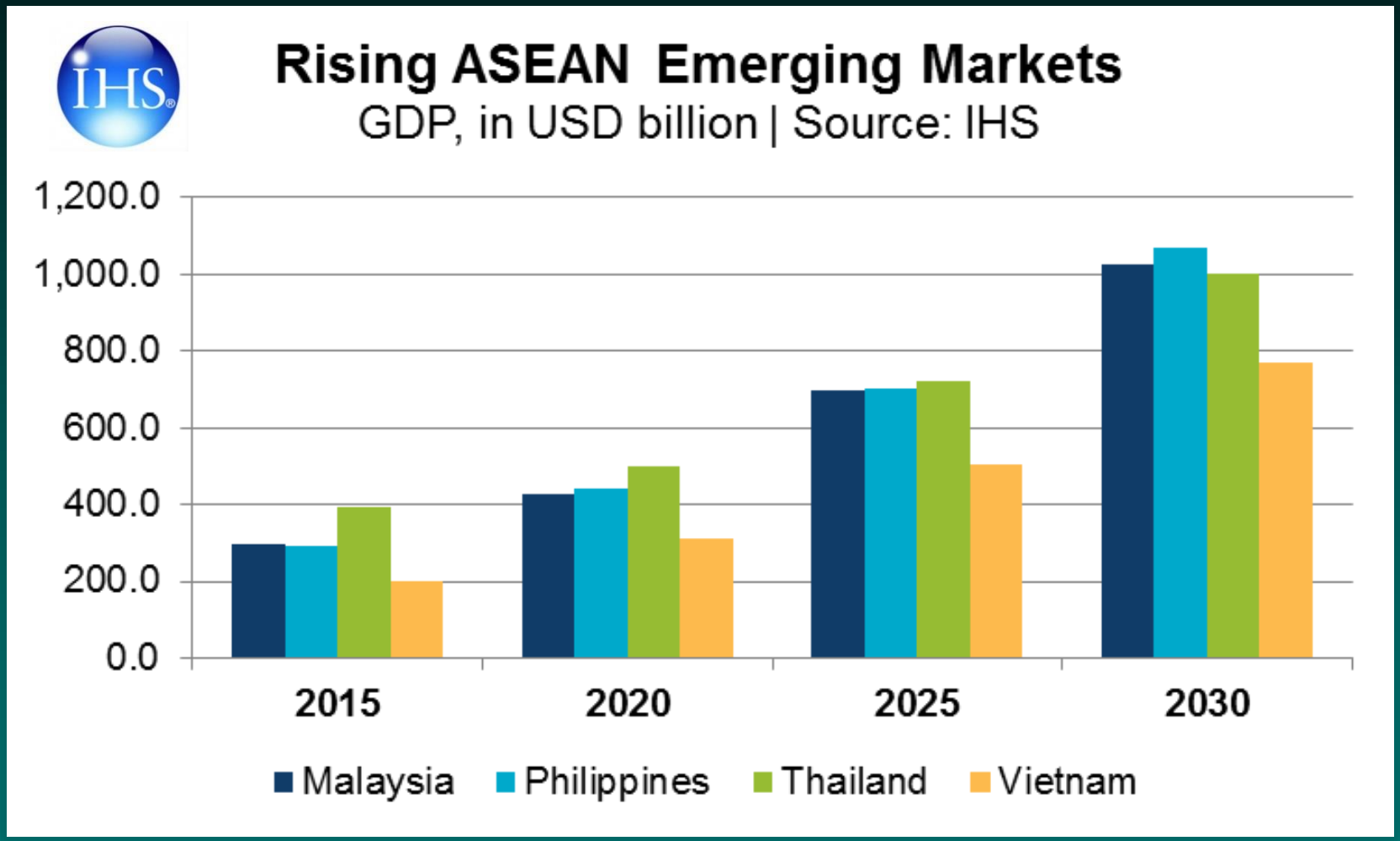
Source: 2015 Economist Intelligence Unit Bloomberg



Source: 2012 World Bank Data

Rising ASEAN Emerging Markets

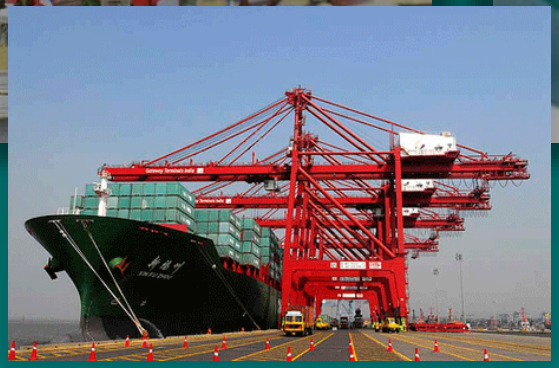
(GDP in Billions of USD)



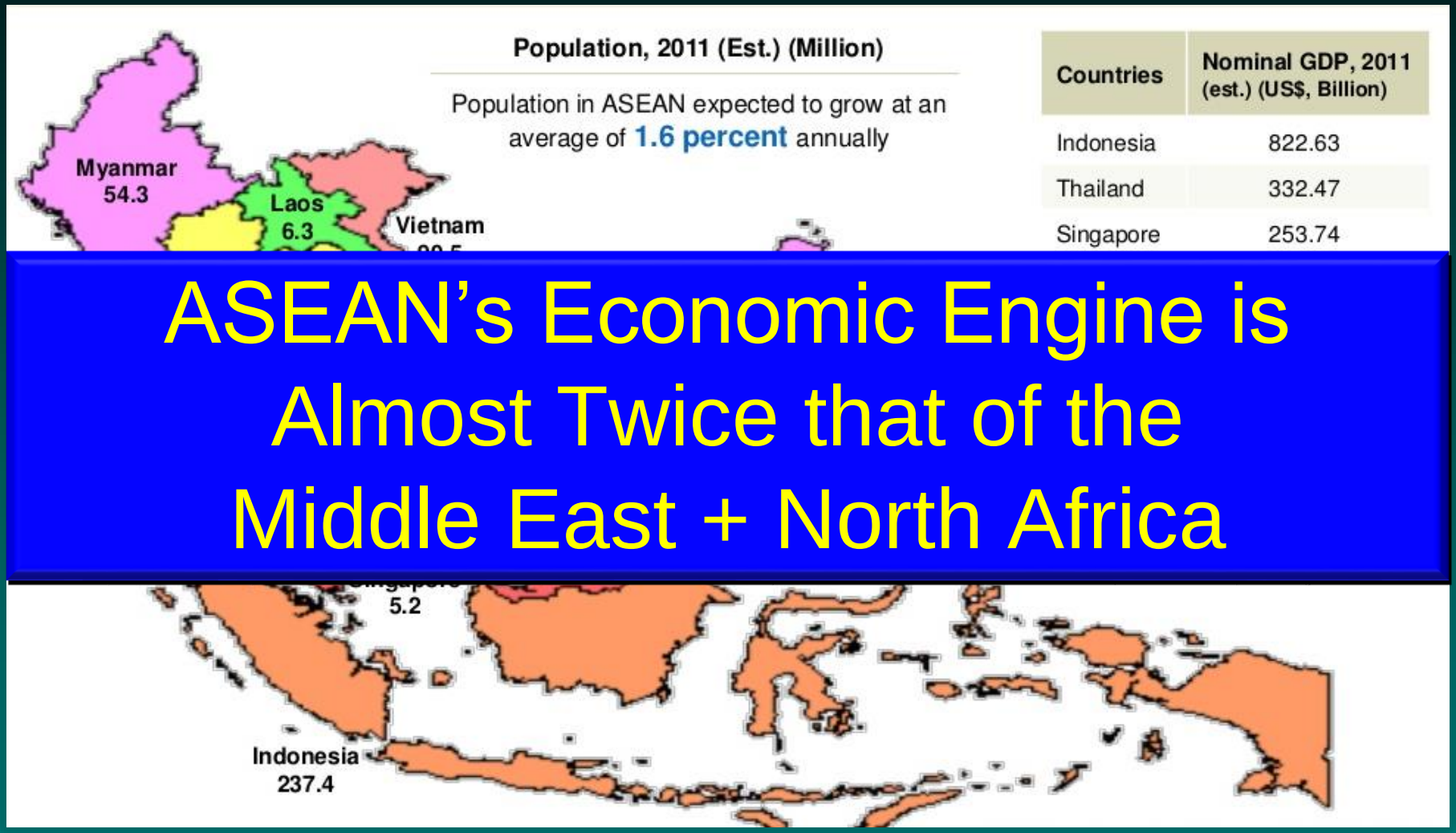
Source: HIS Global Insight

Association of Southeast Asia Nations (ASEAN)
2020 ASEAN CONNECTIVITY

47 New Seaports Will Be Built Across ASEAN



ASEAN Has a Population of more than 600 million People and a GDP of over US $2.1 Trillion

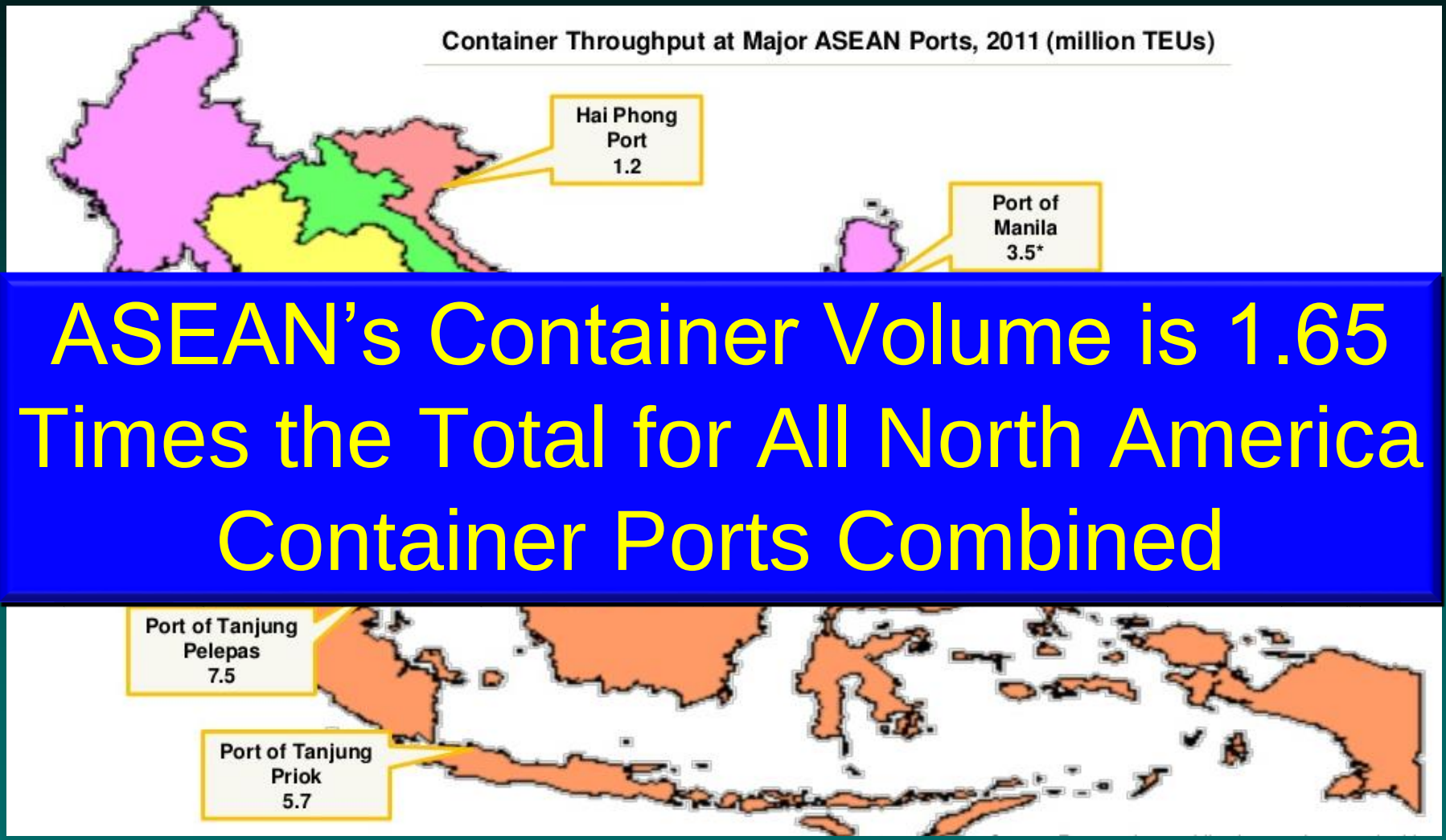


Countries	Nominal GDP, 2011 (est.) (US$, Billion)
Indonesia	822.63
Thailand	332.47
Singapore	253.74

ASEAN's Economic Engine is Almost Twice that of the Middle East + North Africa

Source: ASEAN.org, International Monetary Fund, World Bank, Frost & Sullivan

Nine ASEAN Ports Handled More Than 66.3 million TEUs (80% of all ASEAN Cargo)



ASEAN's Container Volume is 1.65 Times the Total for All North America Container Ports Combined

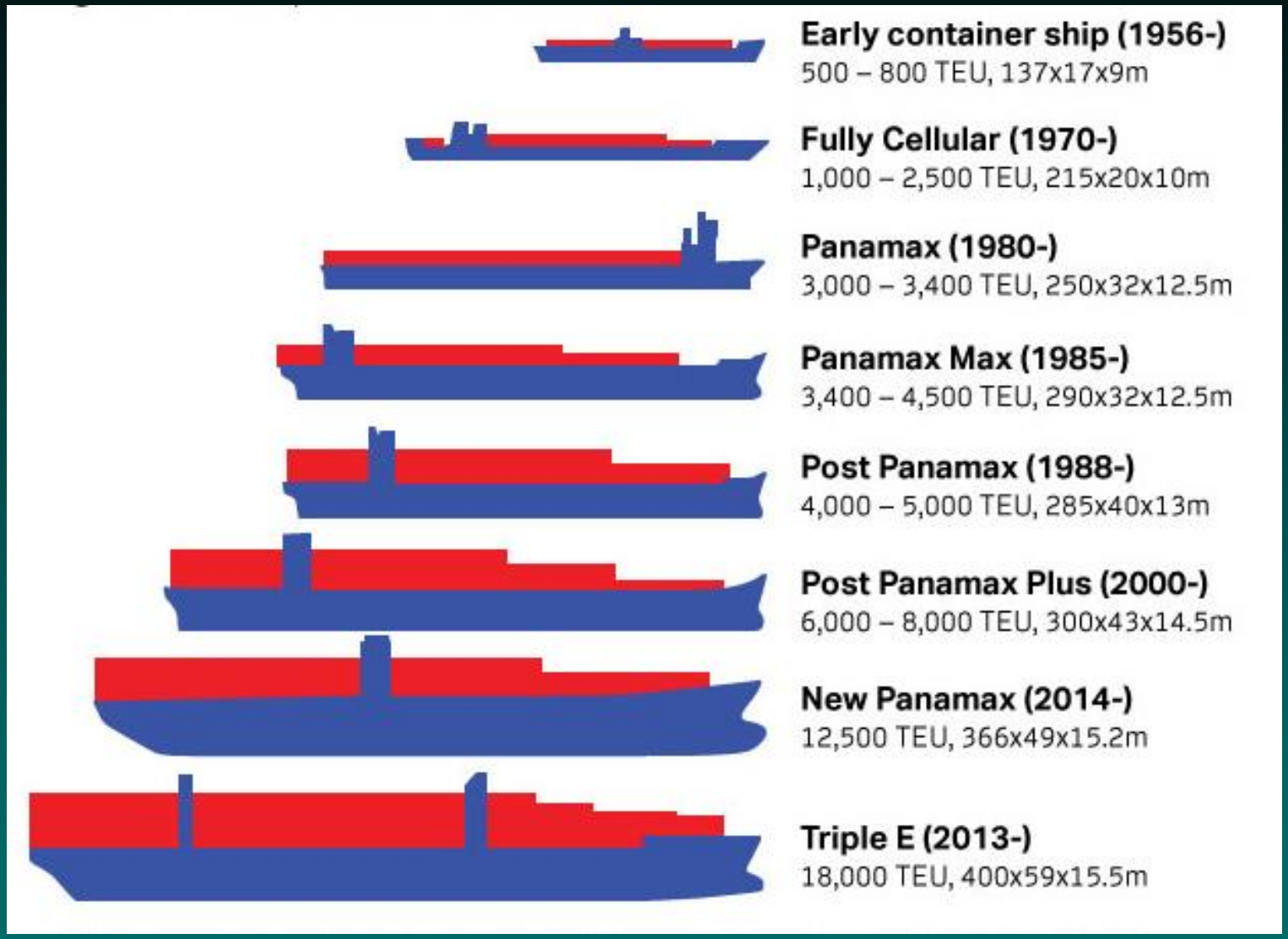
Source: ASEAN.org, Frost & Sullivan

The Arrival of Mega Container Ships in North America

(The Advent of Ultra Large Container Vessels (ULCV) – Megamax MGX 24 Vessel)

VICKERMAN & ASSOCIATES, LLC

Evolution of the Modern Container Vessel



Source: FORWARD Florida Media, March 2014 – Adapted with permission from the Geography of Transport Systems, Jean-Paul Rodrigue

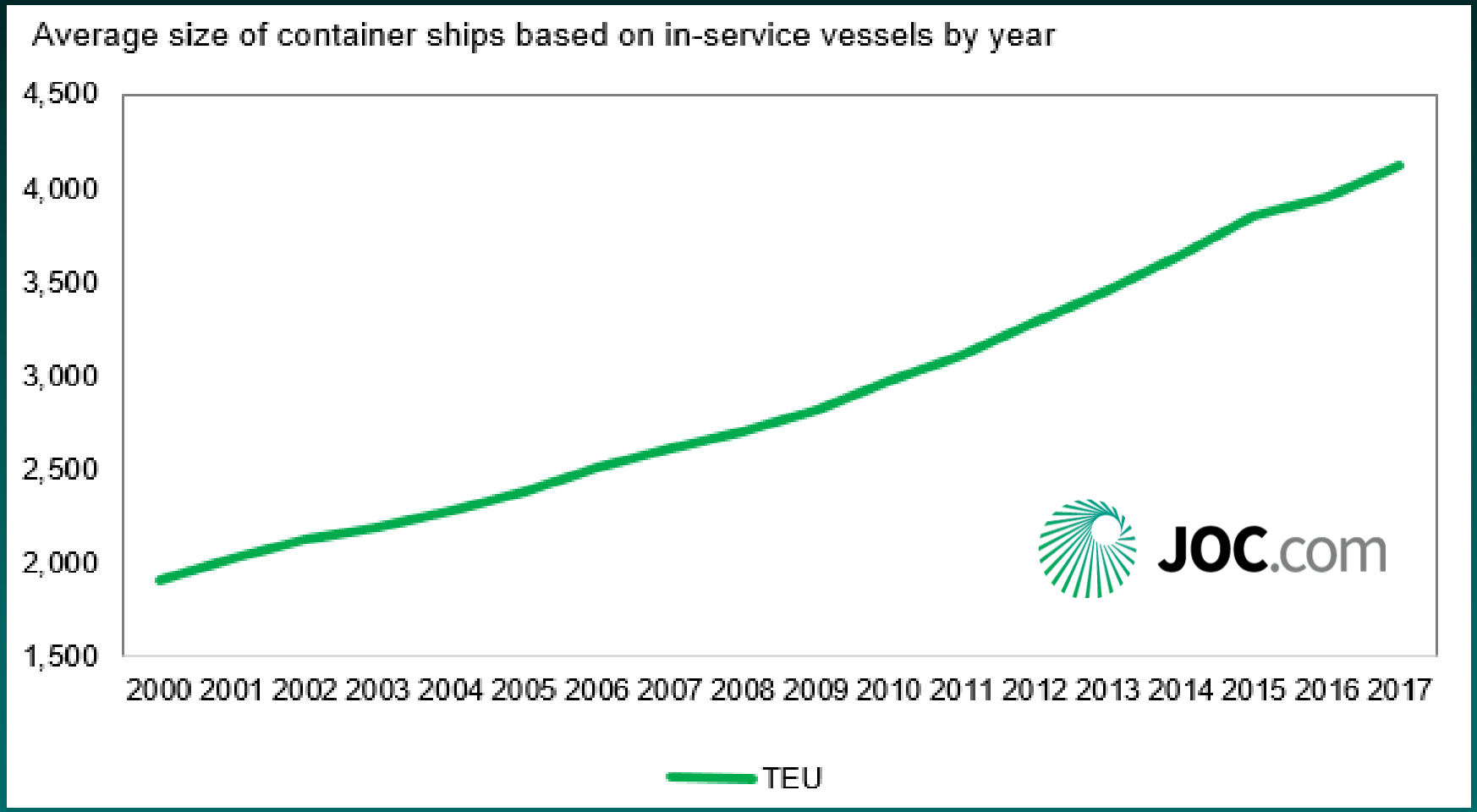
US East Coast Port vessel sizes from Asia have been increasing since the opening of the expanded Panama Canal in June 2016

The maximum vessel size has increased from 10,700 TEU to 14,400 TEU, and the share of the Asia-East Coast carried by 12,000- to 15,000-TEU vessels has increased from 9.6% to 14.8% in the third quarter of 2018,

VICKERMAN & ASSOCIATES, LLC

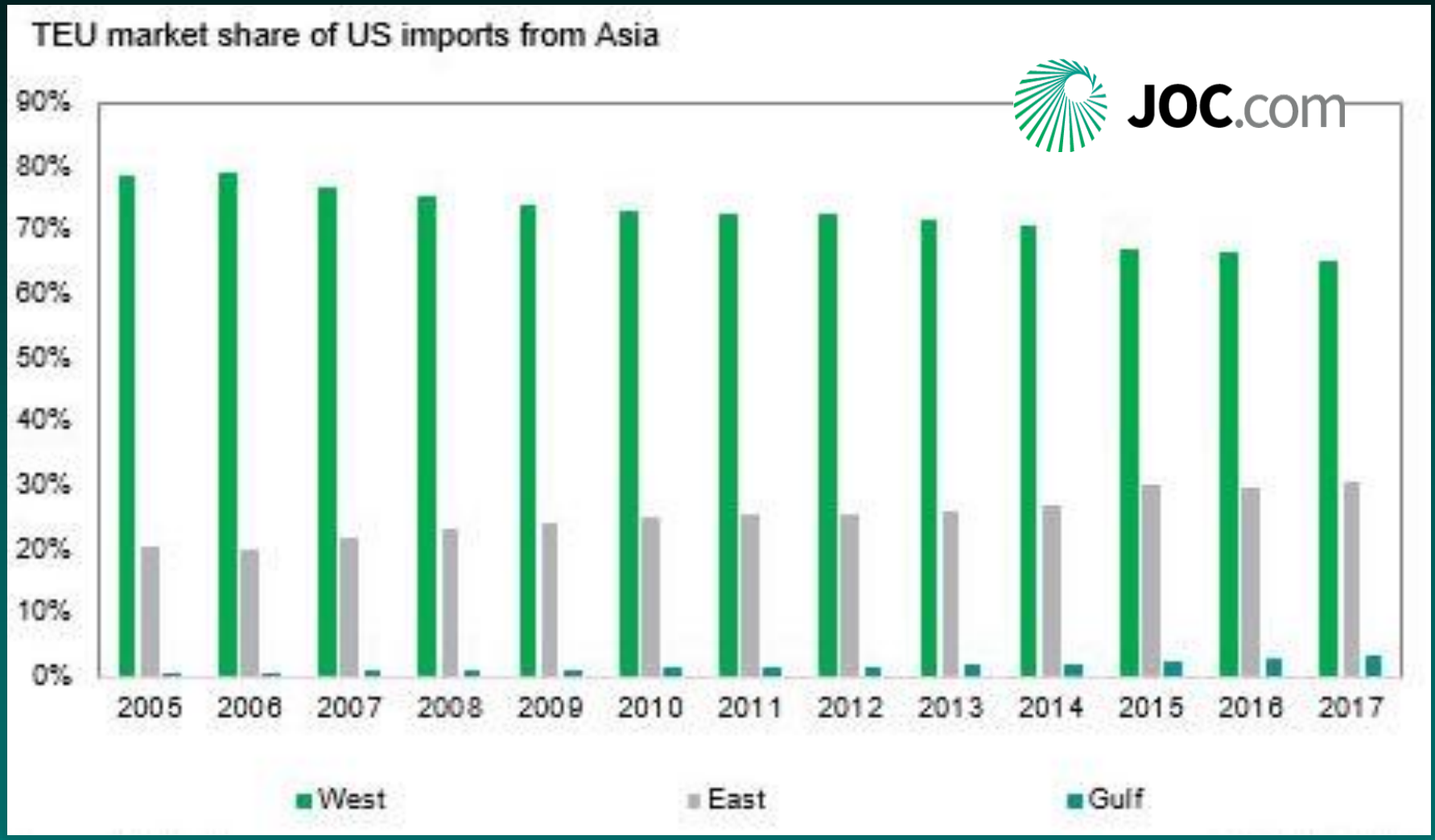
Average Container Ship Size Climbs

As expected, the average size of ships
in the global fleet continued to grow substantially



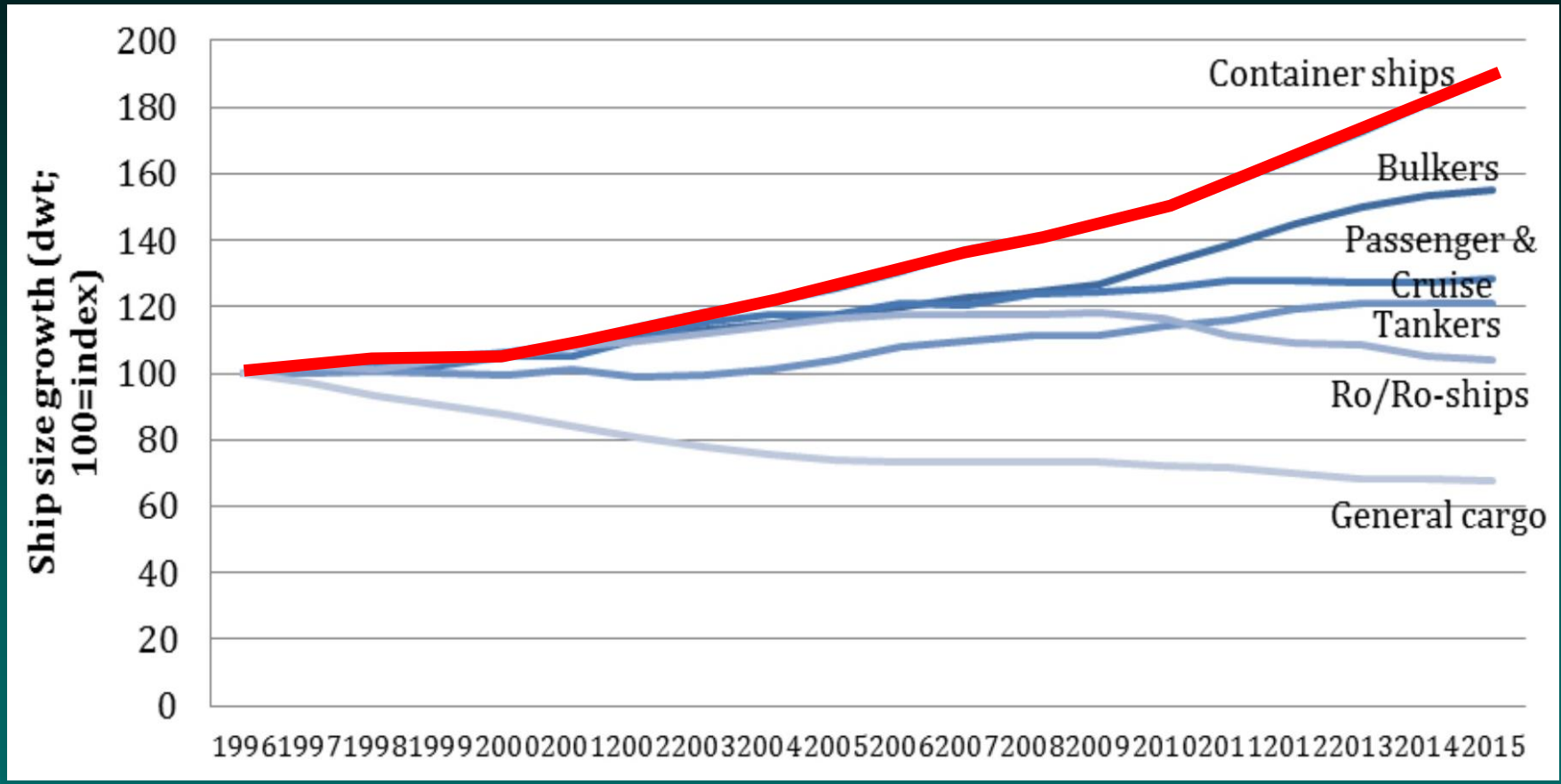
Source: 2019 HIS Markit –Trends in the World Economy and Trade report - JOC

US East and Gulf Coast Ports Make Significant Asian Import Market Share Gains



Source: 2019 HIS Markit –Trends in the World Economy and Trade report - JOC

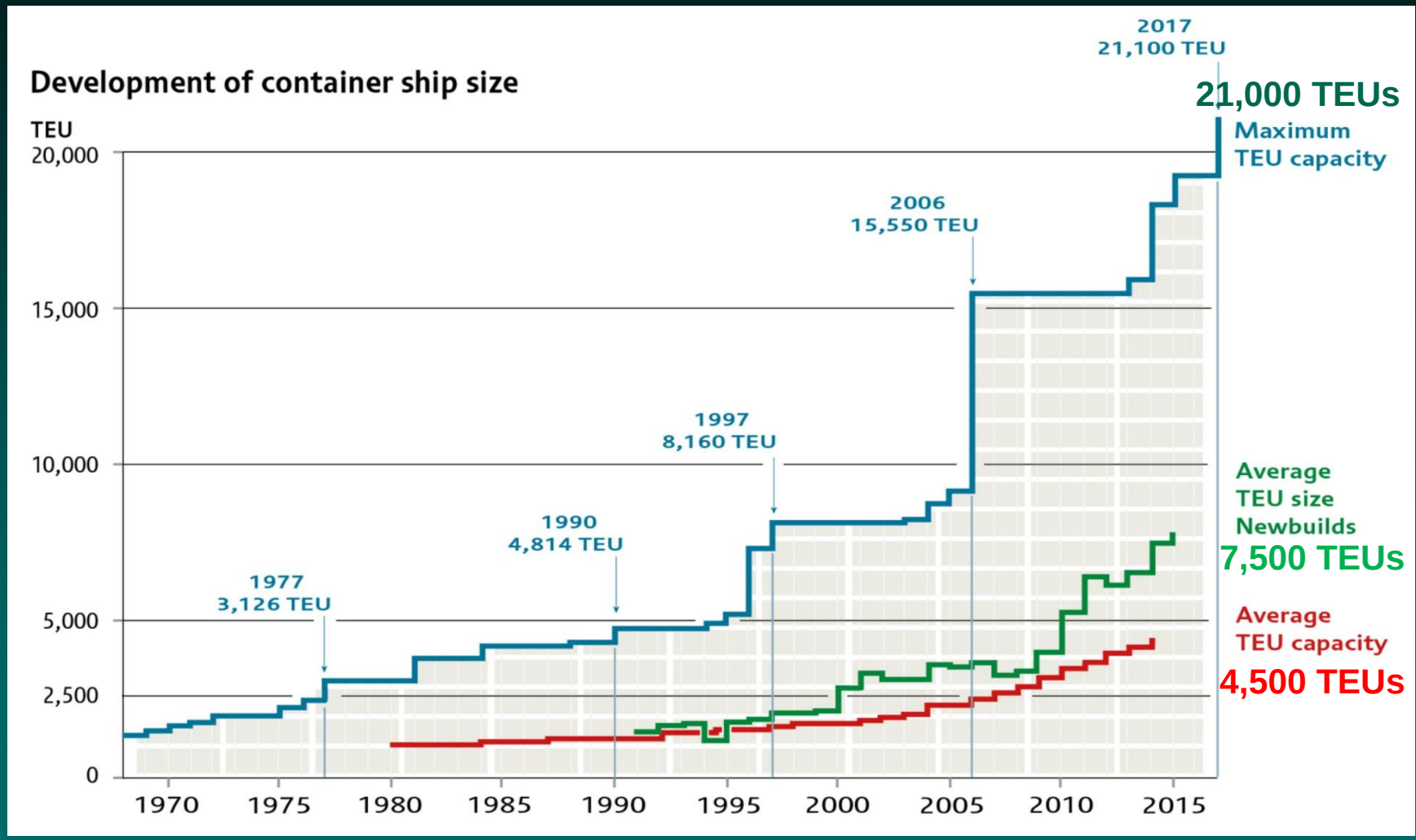
OECD Relative Global Vessel Size Growth Index for Various Ship Types



Size of container ships has been growing at a faster pace than all other ship types.

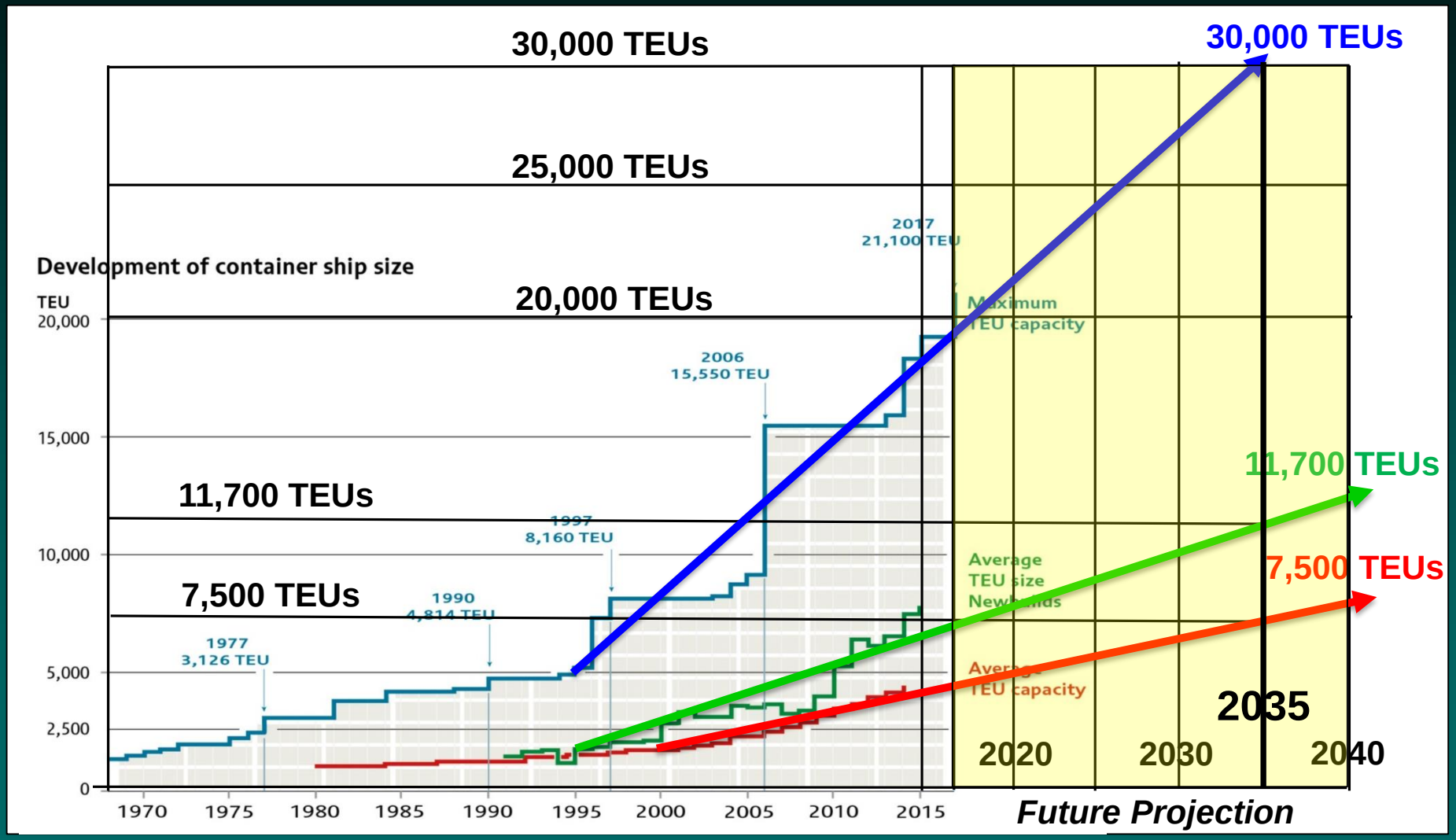
Source: Clarkson Services – OECD/ITF 2015 Project: Impact of Mega Ships

OECD Historical Development of Container Vessel Size (1970 to 2017)



Source: Clarkson Services – OECD/ITF 2015 Project: Impact of Mega Ships

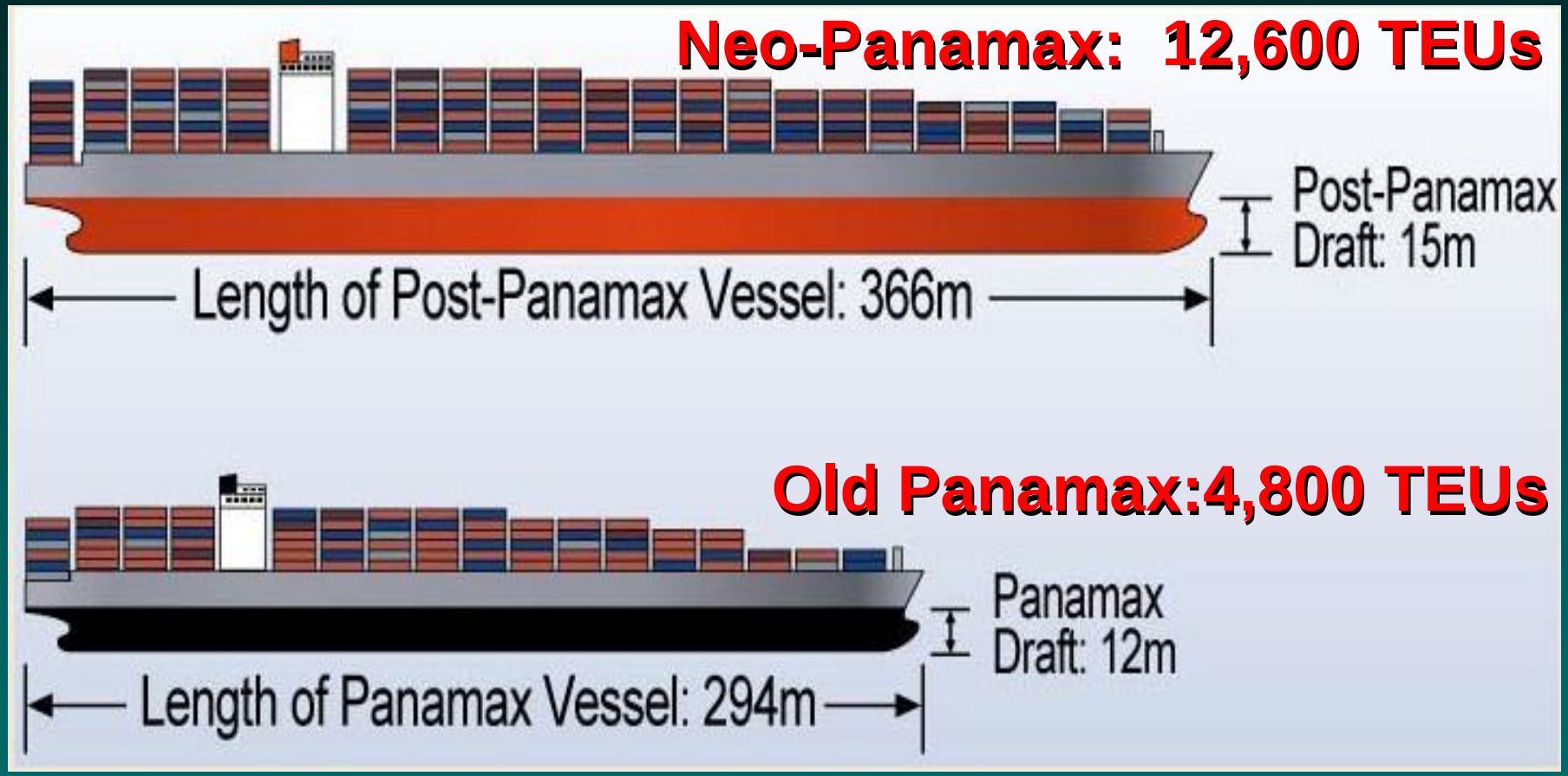
Future Development "Extrapolated" OECD Container Vessel Size (2015 to 2035)



Source: Clarkson Services – OECD/ITF 2015 Project: Impact of Mega Ships

The Autoridad Del Canal de Panama

Panama Canal Third Lane Expansion Capabilities



Source: ACP Expansion Project, Circle of Blue January 27, 2015

Largest NEO-PANAMAX Containership to Transit the New Panama Canal – August 2017

(OCEAN Alliance's weekly South Atlantic Express (SAX) service)

CMA CGM's THEODORE ROOSEVELT:

TEU Allowance: **14,855 TEUs**

Vessel LOA: 365.9 meters **(1,200.66 ft.)**

Vessel Beam: 48.2 meters **(158.31 ft.)**

Vessel Max. Draft: 16 meters **(52.49 ft.)**

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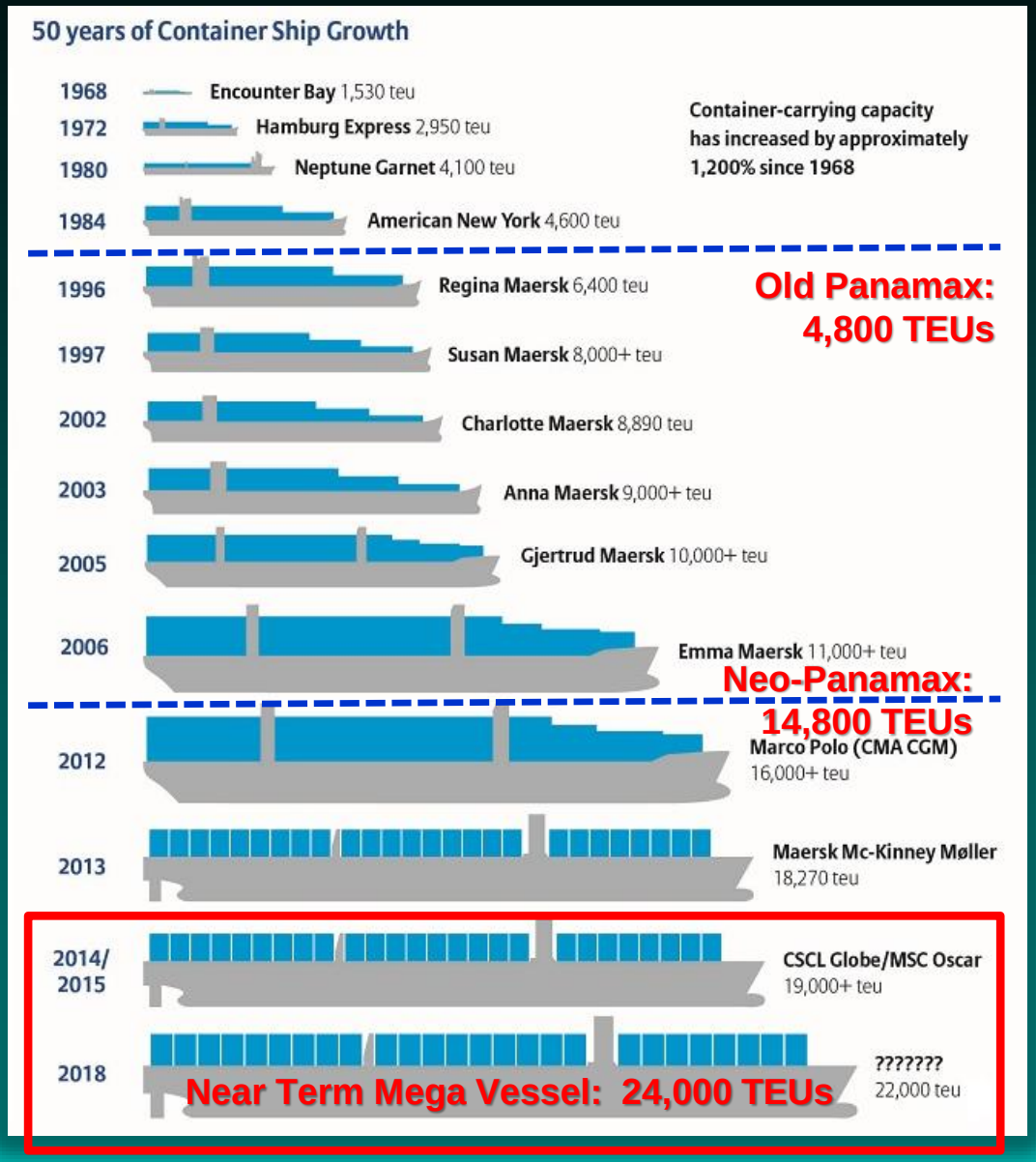
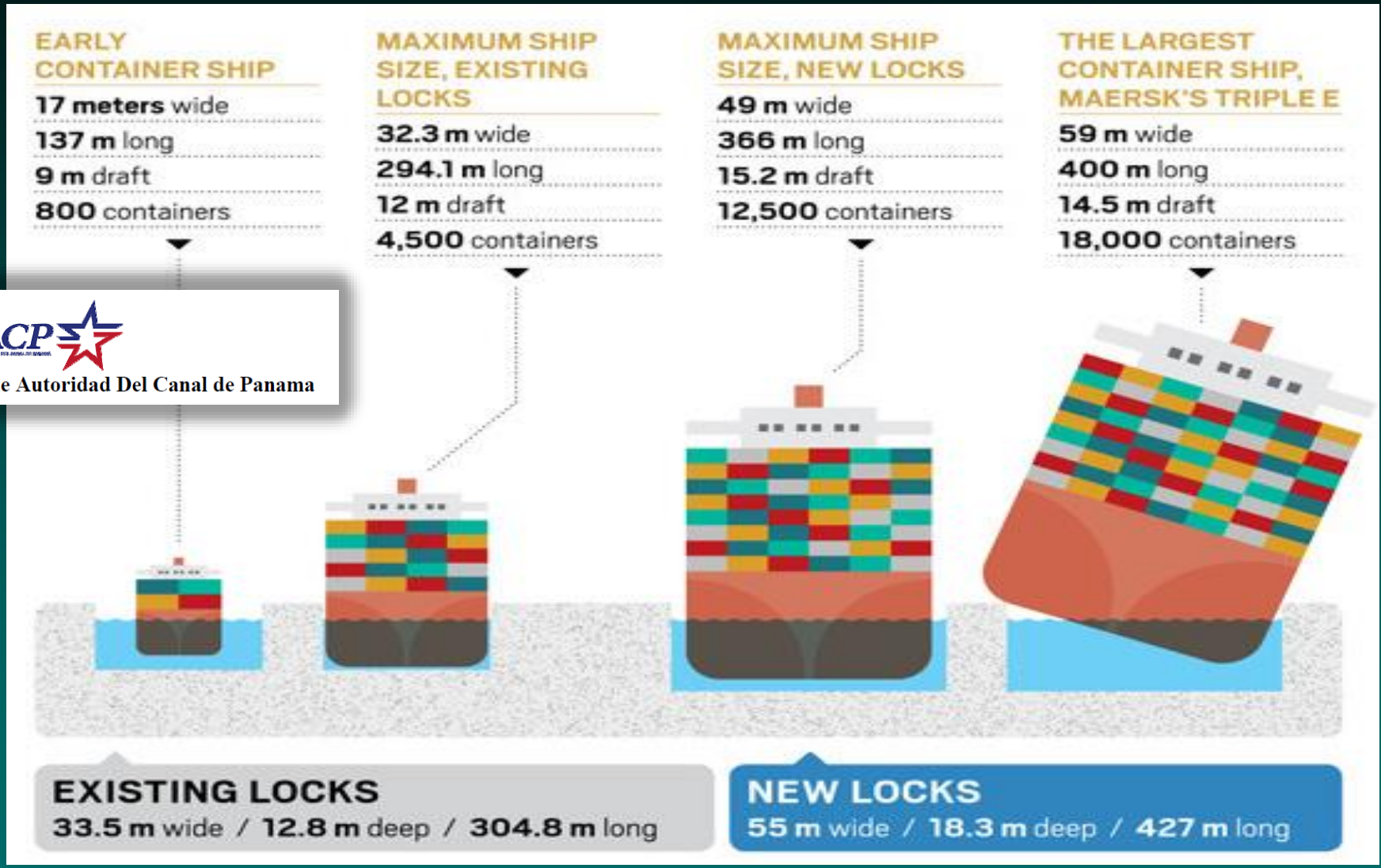
50 Years of Container Vessel Evolutionary Growth



Source: Allianz Global Corporate & Specialty - Data: Container-Transportation.com

The Recent Mega Container Vessels are Too Large for the New Panama Canal Third Lane Expansion



Source: A.P. Moeller-Maersk, Panama Canal Authority

May 8, 2017 Largest Container Vessel to Call at the Port of Virginia

COSCO Development Container Ship – 13, 092 TEUs

Containership COSCO DEVELOPMENT at 1,200 feet long and 158 feet wide, It is 100-plus feet longer that the U.S. Navy's newest aircraft carrier the Gerald R. Ford

VICKERMAN & ASSOCIATES, LLC

The Biggest Ship Ever in San Francisco Bay

CMA CGM Benjamin Franklin

1,300 ft. LOA , 177 ft. beam, 18,000 TEUs

Source: CMA CGM, The SF Chronicle

VICKERMAN & ASSOCIATES, LLC

The Biggest Ship Ever in San Francisco Bay

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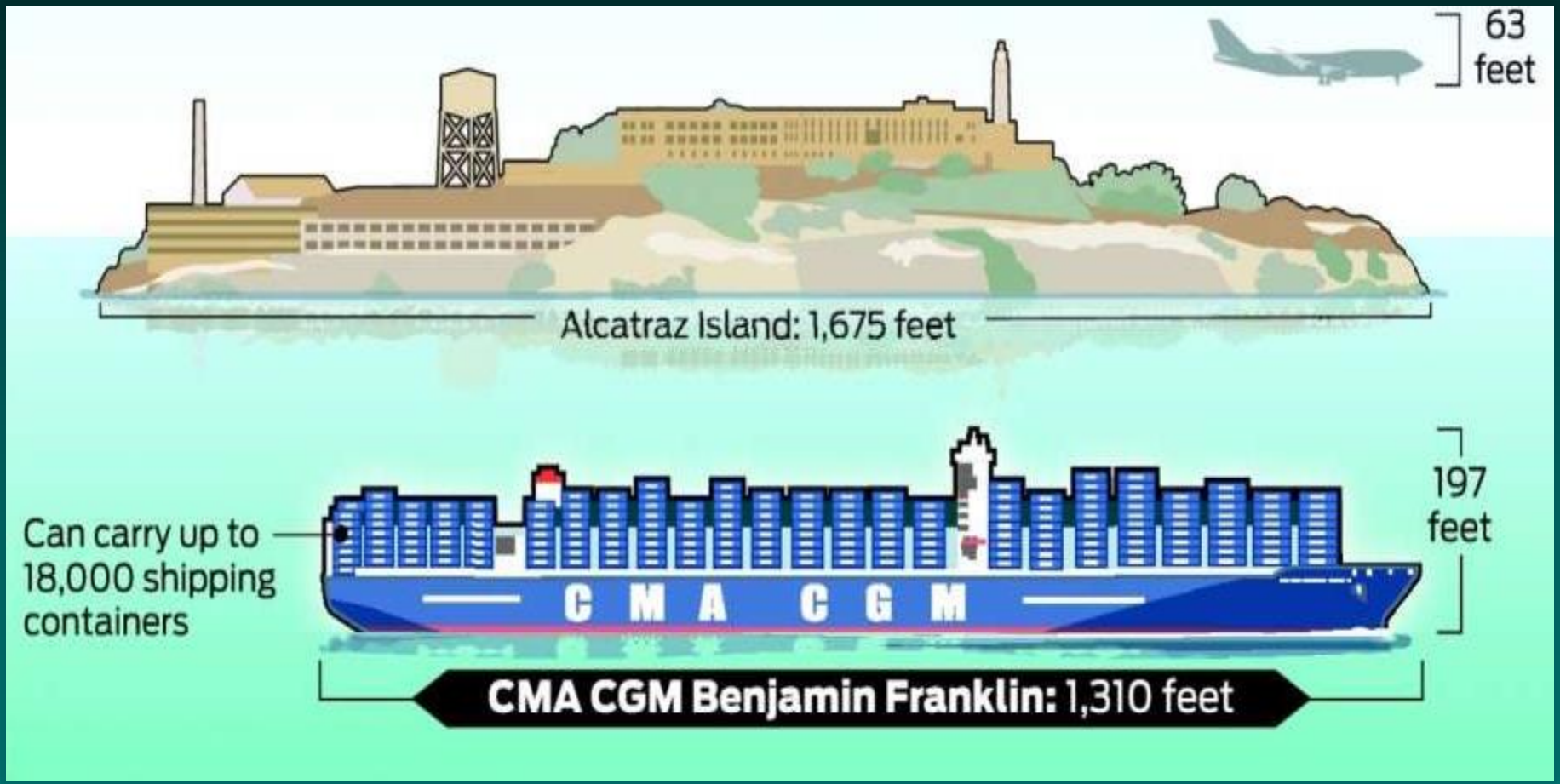
1,300 ft. LOA , 177 ft. beam, 18,000 TEUs



Source: CMA CGM, The SF Chronicle

Largest Container Vessel to Call in North America:

(December 26, 2015 APMT POLA - CMA CGM Benjamin Franklin
1,300 ft. LOA and 177 ft. beam, 18,000 TEUs)

The massive Benjamin Franklin was turned in 56 hours of operations, averaging 29.1 lifts per crane, per hour, averaging total 200 container moves against the vessel each hour, for a total of 11,200 lifts..

VICKERMAN & ASSOCIATES, LLC

South Korea's Samsung Heavy Industries:

OOCL Mega Ships 21,100 TEU to be delivered November 2017

Six ordered at 21,100 TEU, total cost of US $950 million.
The contract also includes options for six additional units.

VICKERMAN & ASSOCIATES, LLC

CMA CGM Orders 9 New 22,000-TEU Vessels

CMA CGM Group's US$1.5 billion order for nine LNG Powered 22,000-TEUs container ships for delivery from the end of 2019.

Asia-Europe trade may be set for 24,000 TEU ships from 2019

Source: American Shipper - Lloyd's List

Hyundai Heavy Industries (HHI) Confirms Orders of "*Megamax*" Boxships to Daewoo Shipbuilding & Samsung Heavy Industries For TWELVE 23,000 TEU Container Ships

(Delivery in the second quarter of 2020)

- The twelve 23,000 TEU vessels will be deployed in the Asia-North Europe trade.
- All the "*ECO FRIENDLY*" new vessels will be sequentially delivered in the right time to prepare for the 2020 environmental regulations.

Source: Maritime Executive Septemnber 2018

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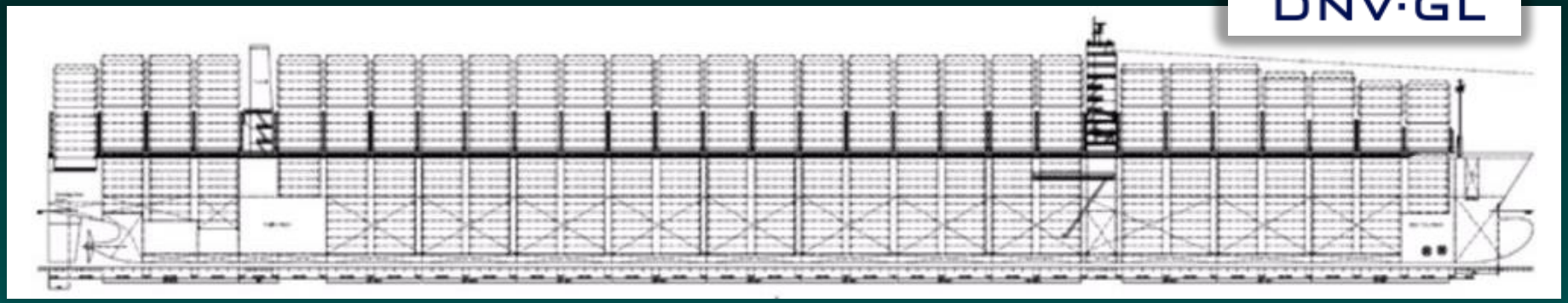
Next Generation: *Suezmax 26,000 TEUs*

26 Bays, 25 Rows - Ultra Large Container Ships (ULCS)



With a Beam of 25 rows & Length of 26 bays
(LOA: 430 meters – 1,411 feet)
the ULCS capacity could reach **26,300 TEU.**

***Port of Antwerp**: New Terminals in Europe are using 26,000 TEU design vessels*

Source: DNV GL in-house methodology - “Concept Design Assessment”

Ultra Large Container Vessels (ULCV): Megamax-24 Era

(Post Neo-Panamax Comparative Vessel Characteristics)

ALPHALINER

***Alphaliner*: Megamax - 24**

MGX-24 Vessel

Length: 24 Container Bay
Breath: 24 Deck Rows
Height: 24 Container Tiers
In Hold: 12 container Tiers

Mega Container Vessel	Alphaliner Designation	TEU Capacity	Length ft.	Beam ft.	Loaded Draft ft.	Explanatory Notes
ACP "Neo-Panamax"	-	12,600	1,200	160.7	49.90	ACP Neo-Panamax Data
MAX Neo-Panamax	-	14,500	1,201	158.31	52.49	CMA CGM's T. Roosevelt
Post Neo-Panamax	**MGX-20**	**20,000**	**1,312**	**192.49**	**52.49**	**Design Vessel LNG**
Post Neo-Panamax	**MGX-22**	22,000	1,315*	193.57	52.49	CMA CGM 22,000 Option to go to 24 Rows
Post Neo-Panamax	**MGX-24**	24,000	1,319	201.44	52.49	
Post Neo-Panamax	**MGX-26**	26,000	1,411	209.31*	52.49	ULCV Suezmax 26,000 TEUs

* Calculated Value/Derived Value

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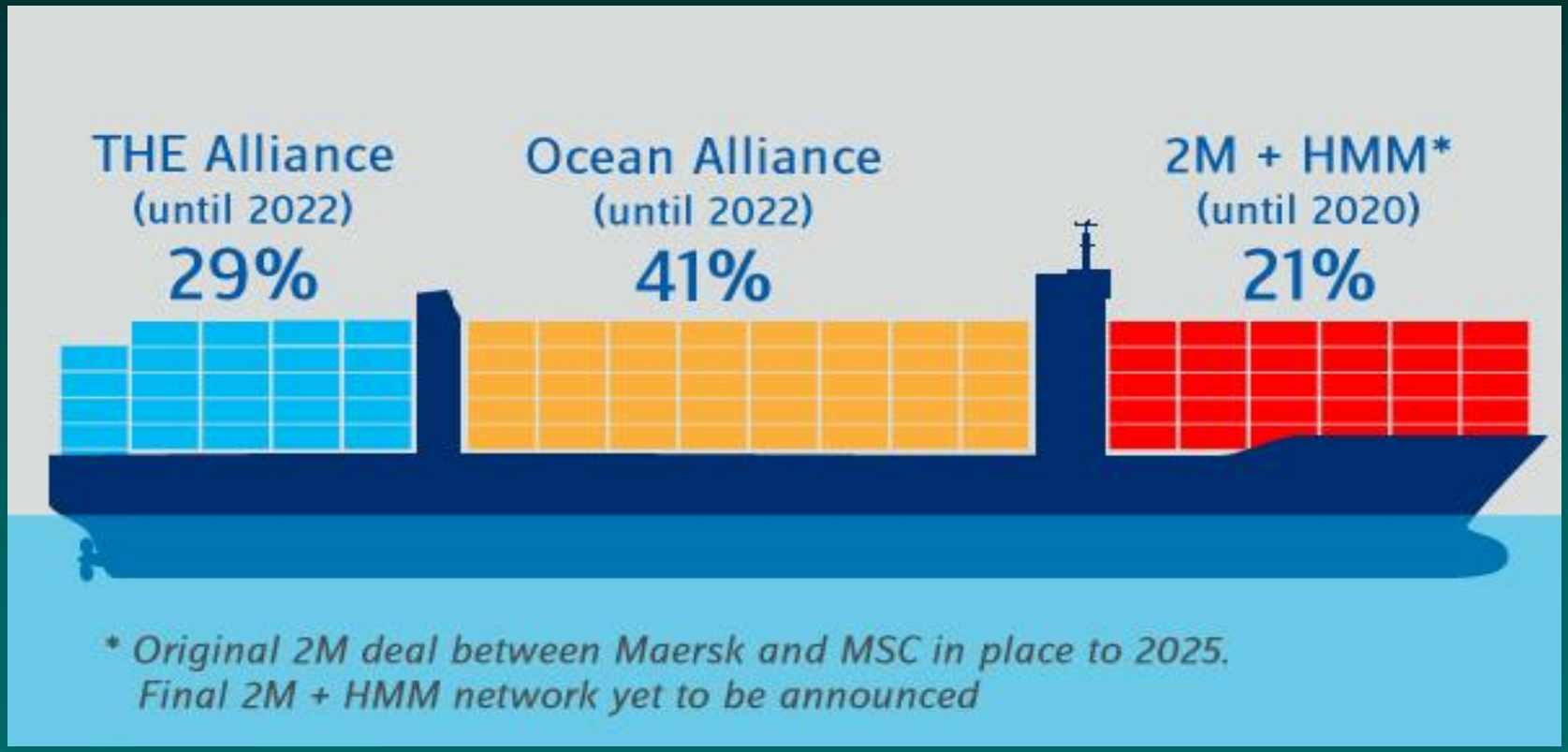
Vessel Sharing Alliances Were Restructured Late April 2017

(Ocean Alliance to Dominate the Overall Trans-Pacific Trade)

US ports will face unprecedented operational challenges.

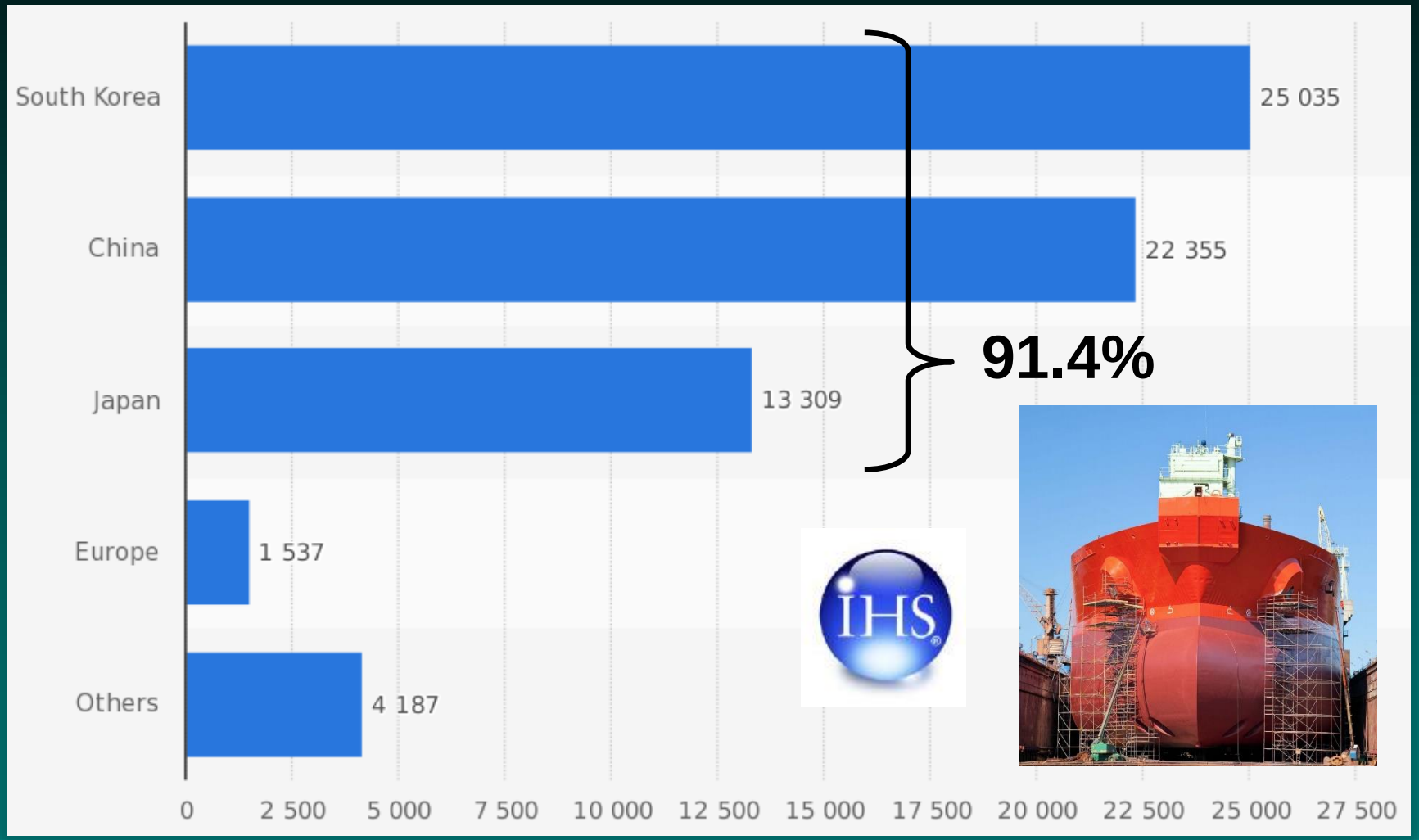


Three alliances will control 91 % of the US trade volume

Source: Alphaliner – JOC - IHS Maritime & Trade

Largest Shipbuilding Nations in 2016

(Gross Tonnage, in 1,000s)



Source: IHS, Shipbuilders' Association of Japan, Statista 2018

A 20,000 TEU Mega-Container Vessel Can Produce High Intermodal Rail Volumes For One Weekly Vessel Call)

26.8 Double Stacked Trains

Assuming a 75% Intermodal Rail Split

26.8 Double Stacked Trains

Breakthrough in Terminal Automation & Remote Control of STS Cranes

VICKERMAN & ASSOCIATES, LLC

Today's Crane Operator View – STS Crane

VICKERMAN & ASSOCIATES, LLC

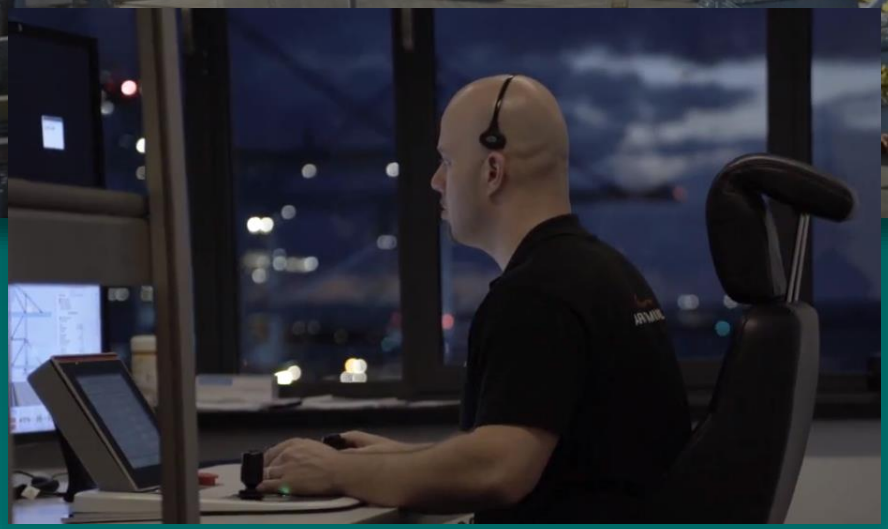
Moving Crane Operations Away from the Terminal: DP World Terminal 4 Jebel Ali Dubai (UAE)

(13 ship to shore (STS) cranes and 35 automatic stacking cranes (ASC) – By Late 2018 Port Volume will be 22.1 million TEUs > Top 3 US Ports Combined

All STS and Stacking Cranes at Terminal 4 Jebel Ali will be operated from a control room located away from the of the terminal.

VICKERMAN & ASSOCIATES, LLC

Port of Rotterdam – Maasvlakte II

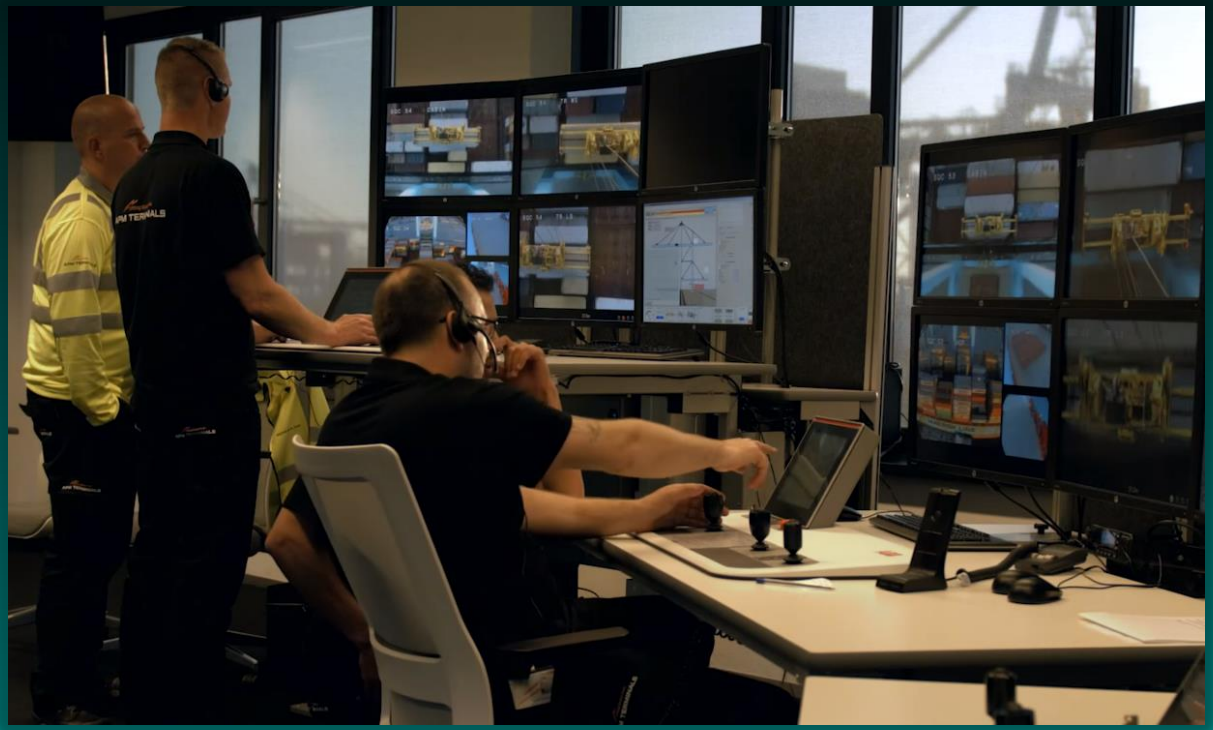


Port of Rotterdam
PROJECTORGANISATIE
MAASVLAKTE 2

VICKERMAN
& ASSOCIATES, LLC

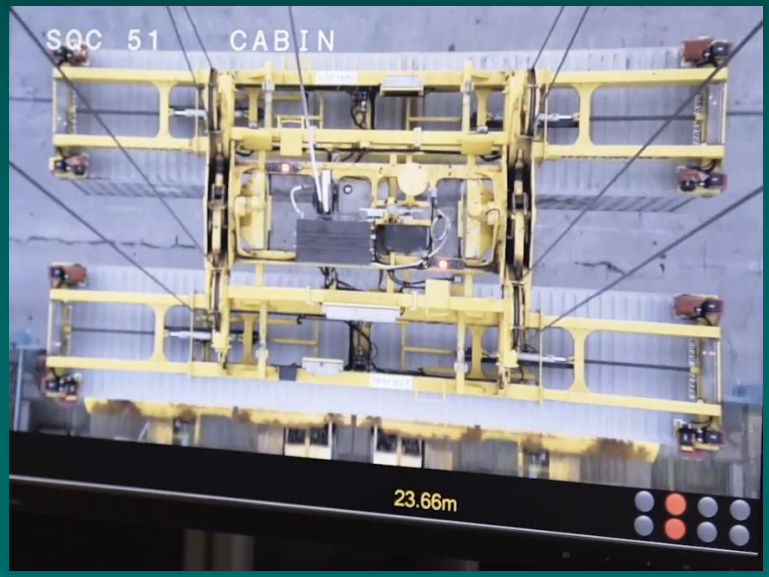
Port of Rotterdam – Maasvlakte II

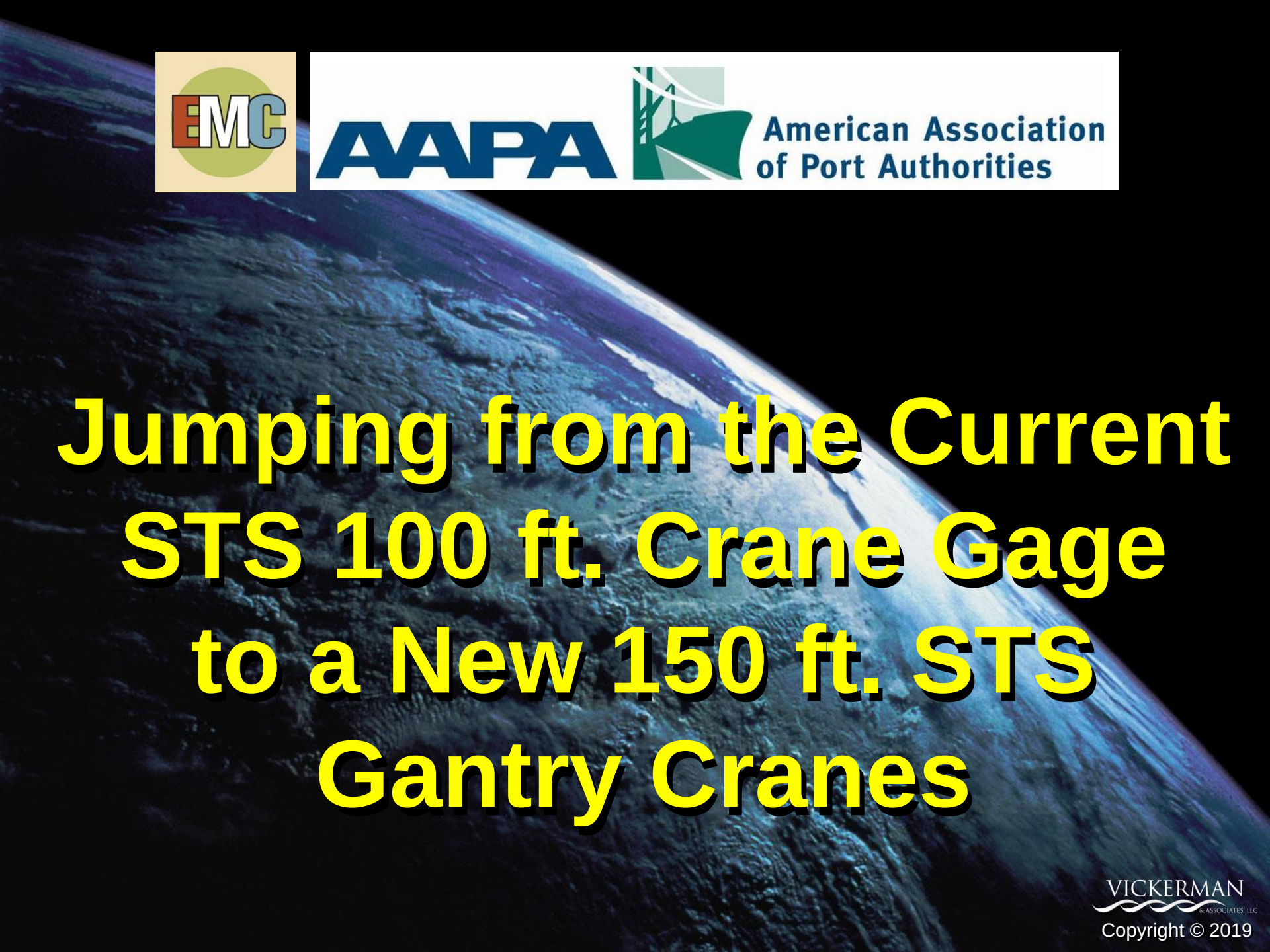
Remote Ship to Shore (STS) Crane Operators



Port of Rotterdam – Maasvlakte II

Remote Ship to Shore (STS) Crane Operators

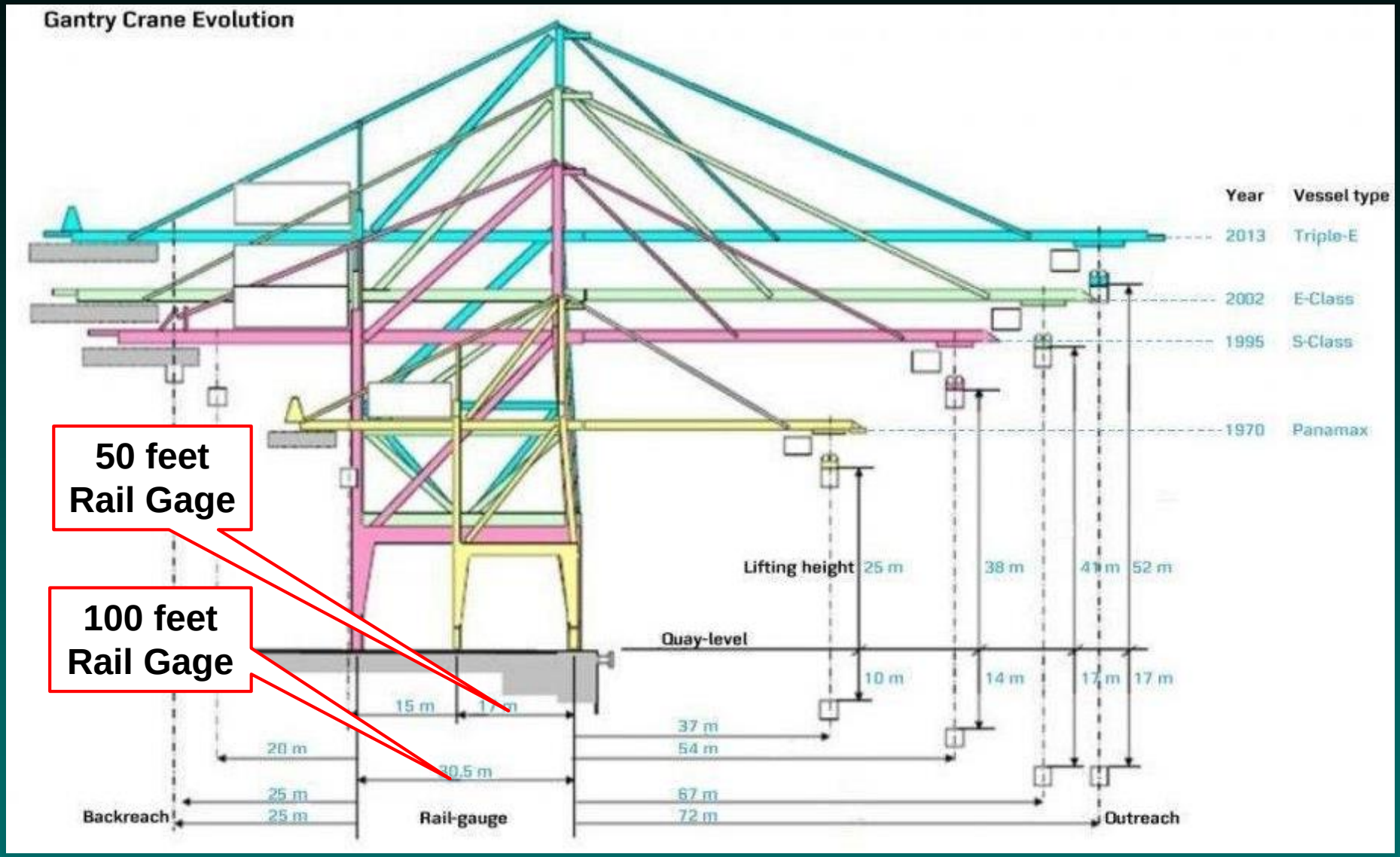




Jumping from the Current STS 100 ft. Crane Gage to a New 150 ft. STS Gantry Cranes

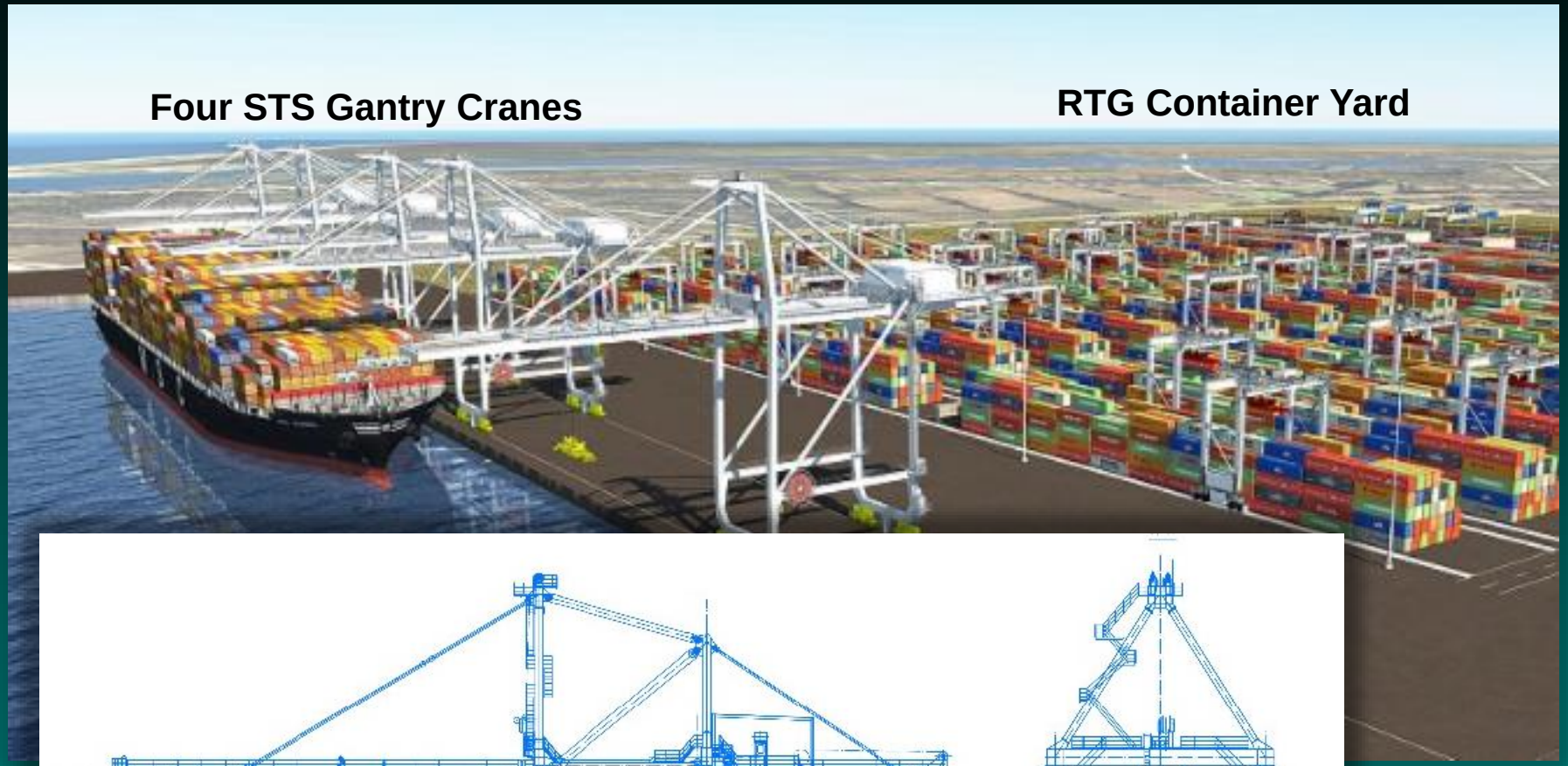
VICKERMAN & ASSOCIATES, LLC

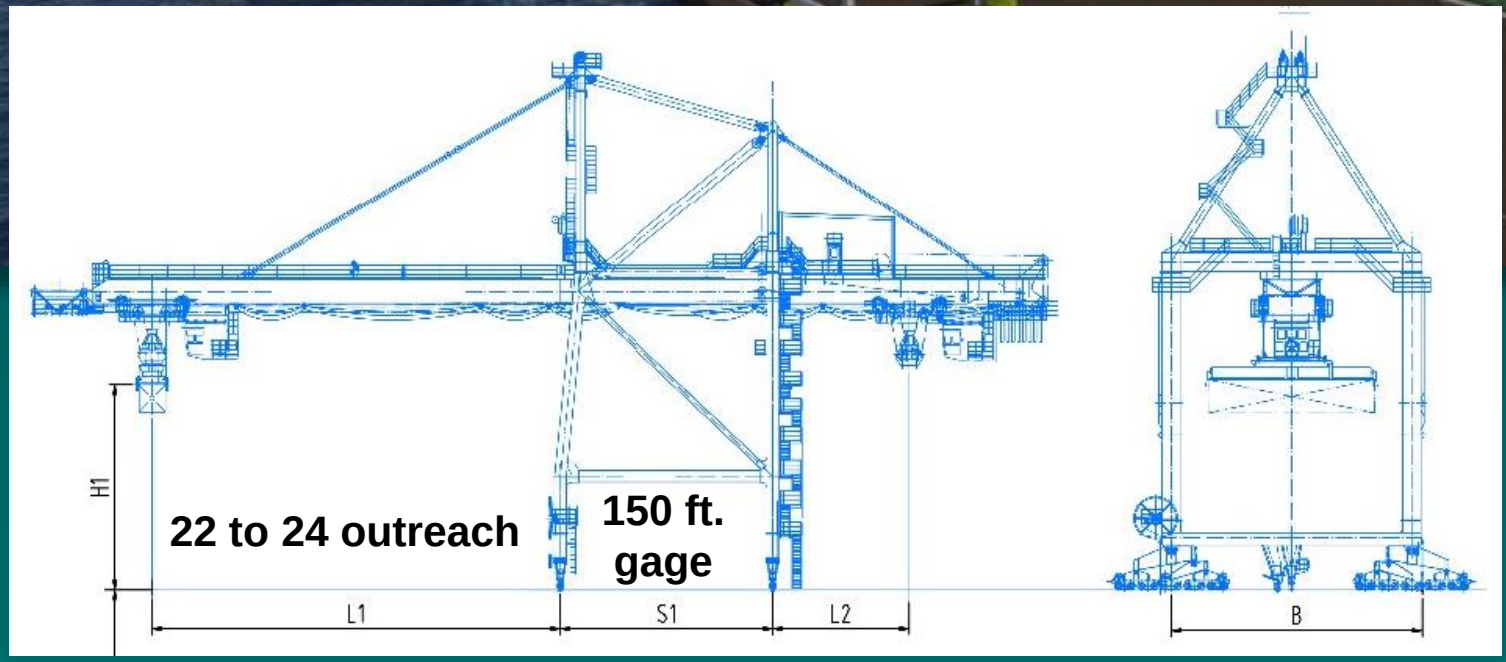
Today's STS Wharf Gantry Crane Evolution



APM Terminals released the following graphic today showing how container cranes have evolved in size over the years.

150 ft. Gage Semi-Automated STS Gantry Cranes





Wide Gage STS Container Terminal 3 Jebel Ali Dubai (UAE)

(STS Gantry Crane Gage = 42 m = 137.8 ft)

STS Crane Operations from Remote Control Room

Encoder Systems for modern automated STS container cranes reduce costs and increases safety

VICKERMAN & ASSOCIATES, LLC

Moving Crane Operations Away from the Terminal: DP World Terminal 4 Jebel Ali Dubai (UAE)

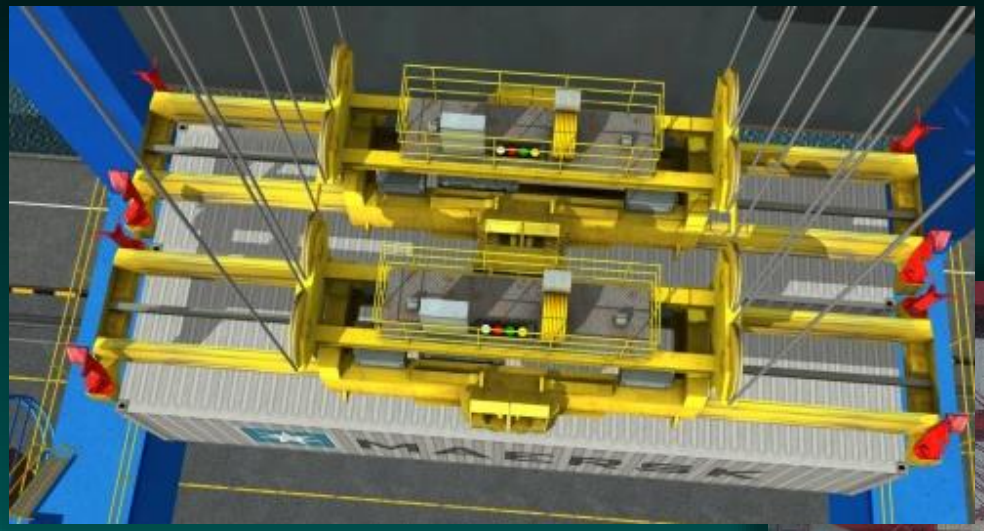
(13 ship to shore (STS) cranes and 35 automatic stacking cranes (ASC) – By Late 2018 Port Volume will be 22.1 million TEUs > Top 3 US Ports Combined

All STS and Stacking Cranes at Terminal 4 Jebel Ali will be operated from a control room located away from the of the terminal.

VICKERMAN & ASSOCIATES, LLC

Semi-Automated STS Gantry Cranes Operations

Spreader capability to lift tandem, triple, quad & 6 pack loads



The US Midwest & The Mississippi River Are the New Intermodal Freight Battle Ground

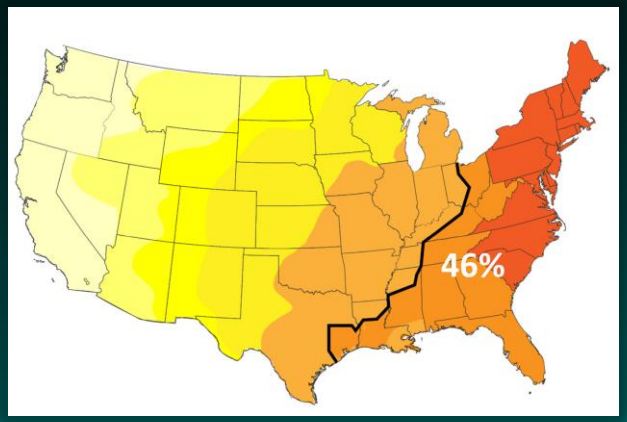
VICKERMAN & ASSOCIATES, LLC

New State of Marine & Intermodal Competition

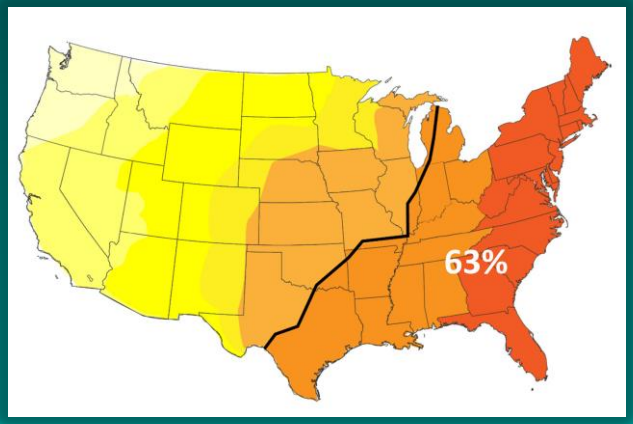
Source: NW Seaport Alliance Strategic Business Plan, May 6, 2015

US Market Penetration Via Panama Canal Expansion

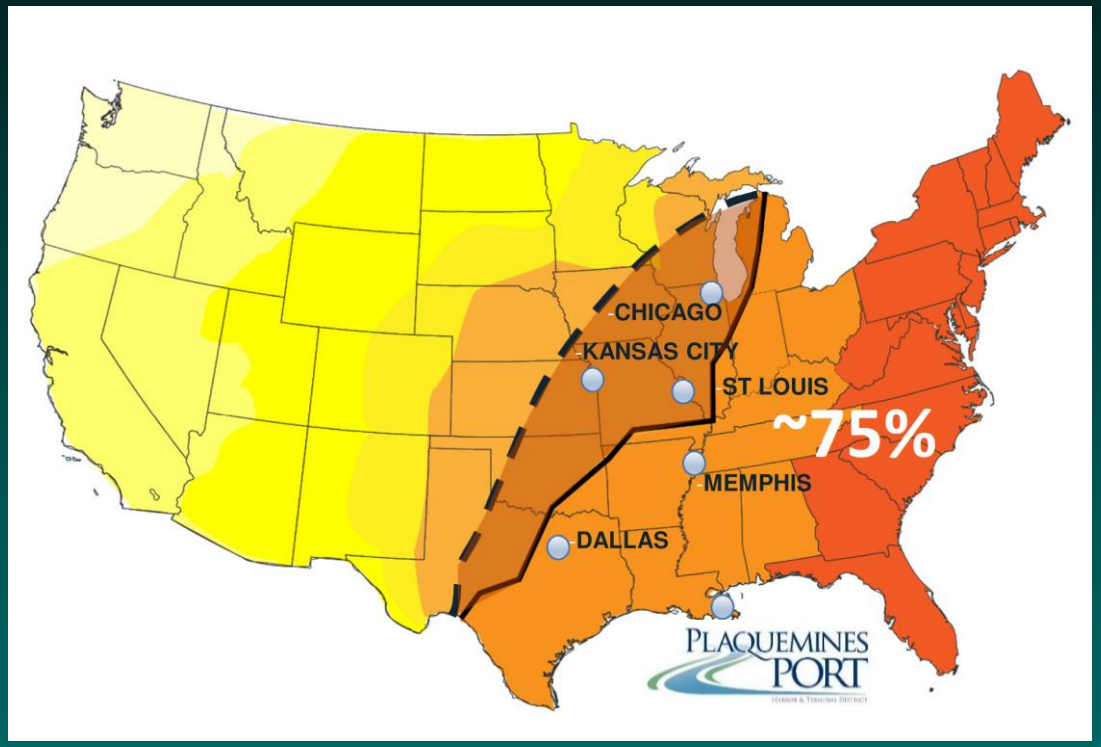
(Economies of Scale)



46 % Penetration, Before 2016
Via All Water, 4,500 TEU Vessels



63 % Penetration, After 2016
Via All Water, 8,000 TEU Vessels



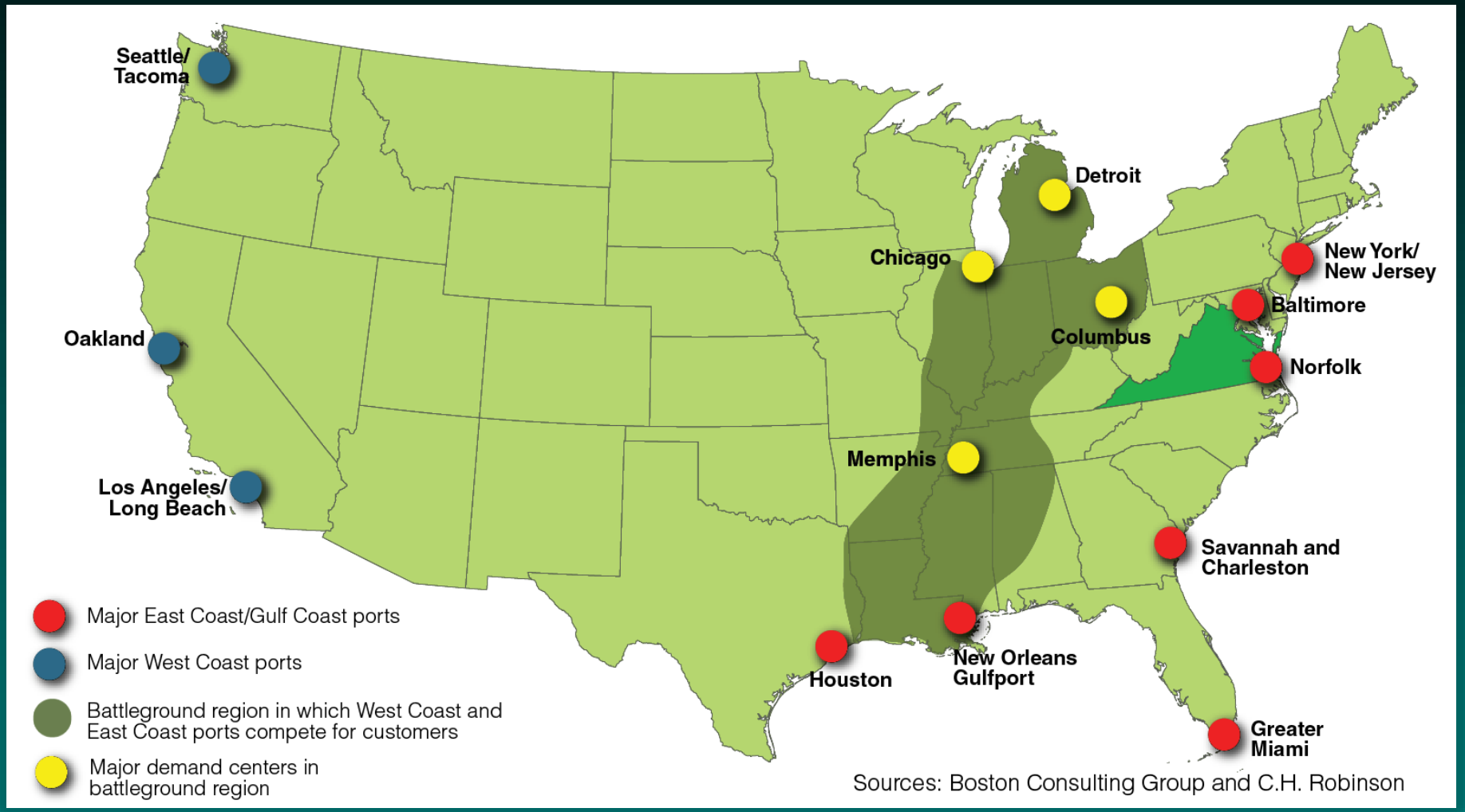
75 % Penetration, 2018 & Beyond
Via All Water & Pendulum Service
14,500 TEU Vessels

Source: Potential Effects of the Panama Canal Expansion on the Texas Transportation System

VICKERMAN & ASSOCIATES, LLC

New Container Port Battleground Region

(Representing 15% of the US GDP)



Source: Boston Consulting Group & C. H. Robinson

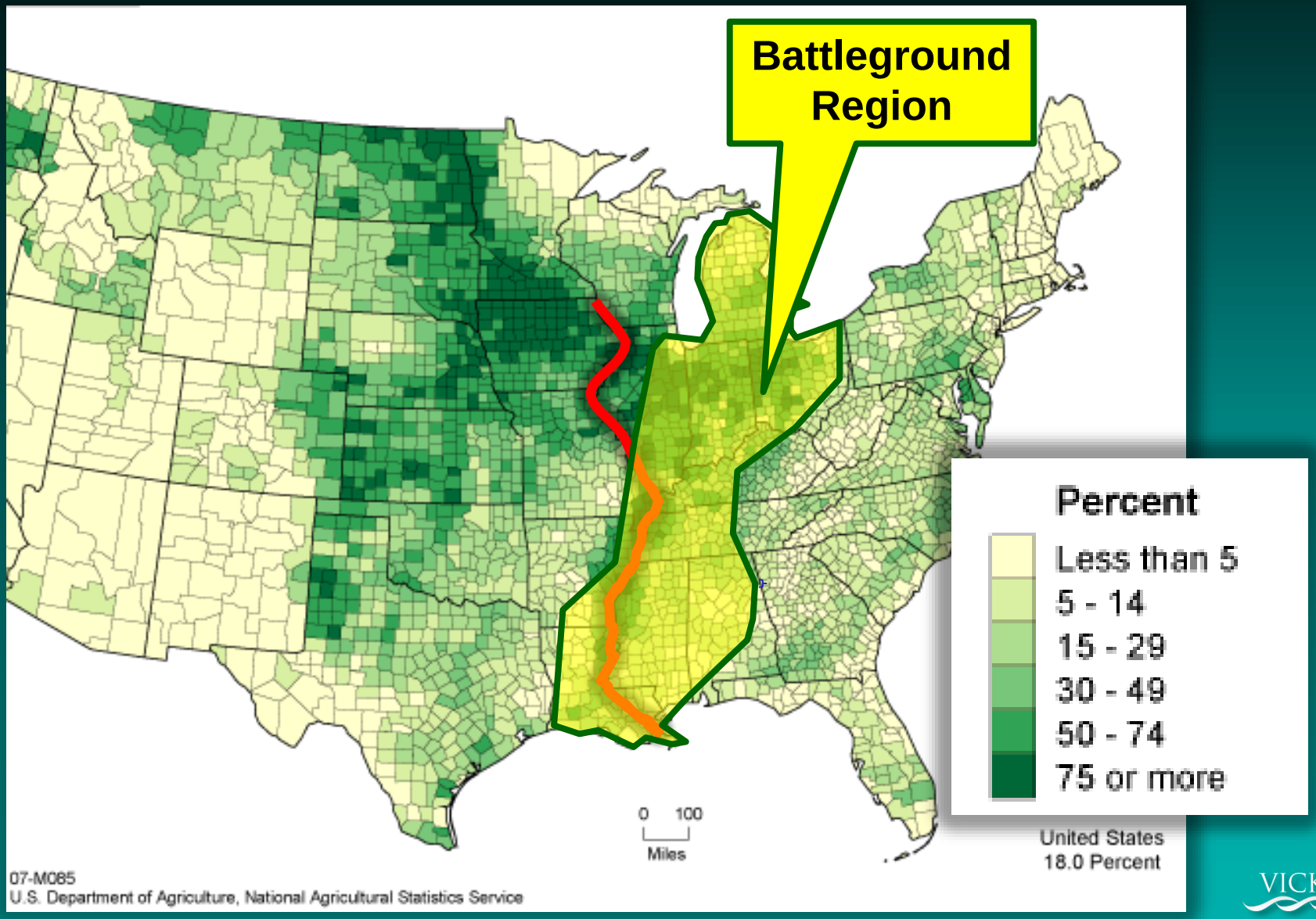
New Container Port Battleground Region

(Representing 15% of the US GDP)

Source: USDC Bureau of Economic Analysis – Boston Consulting Group Analysis

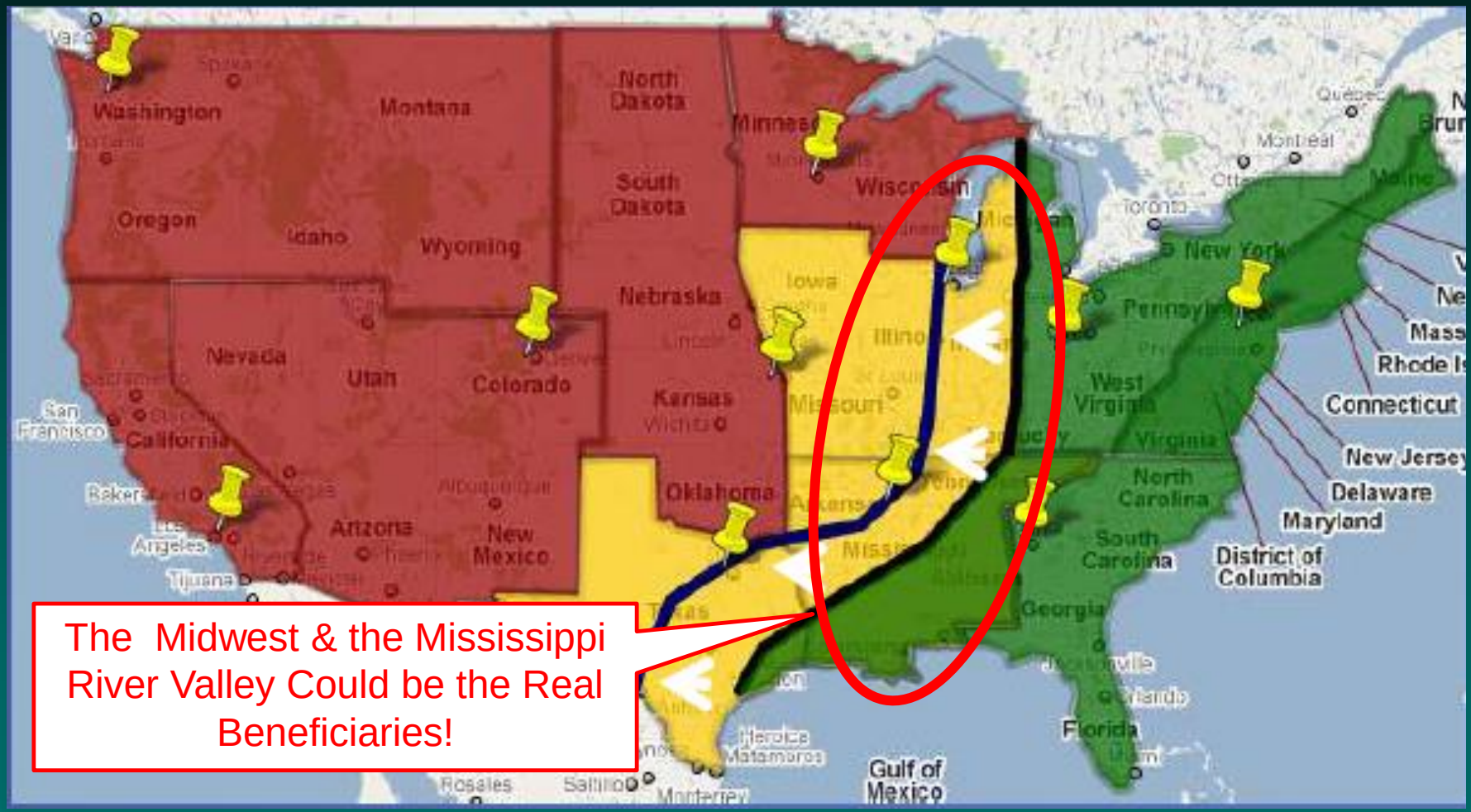
North American Cropland Intensity

(Acres of Cropland as a percent of Land Area)



Dramatic US Market Penetration after 2017

Panama Canal <u>Economies of Scale</u> with permit deeper market penetration into the US



Source: ACP Expansion Project – Rodolfo Sabonge AAPA January 24, 2013

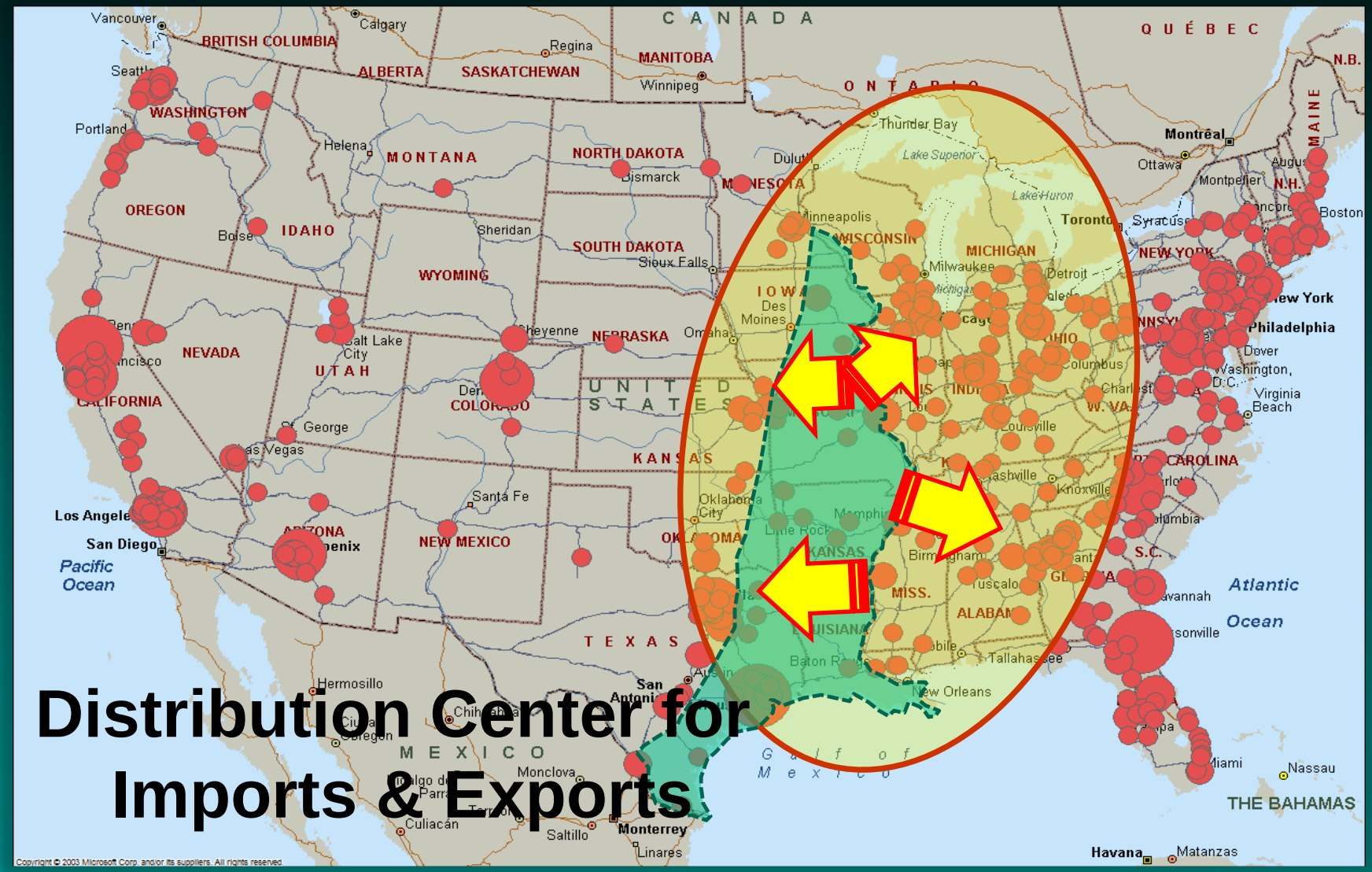
Dramatic US Market Penetration Is Coming

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

The Panama Canal will prove to be a strong contender for Asian trade serving not only the US East Coast, but ALL of the Gulf and the Most of the Midwest by 2020

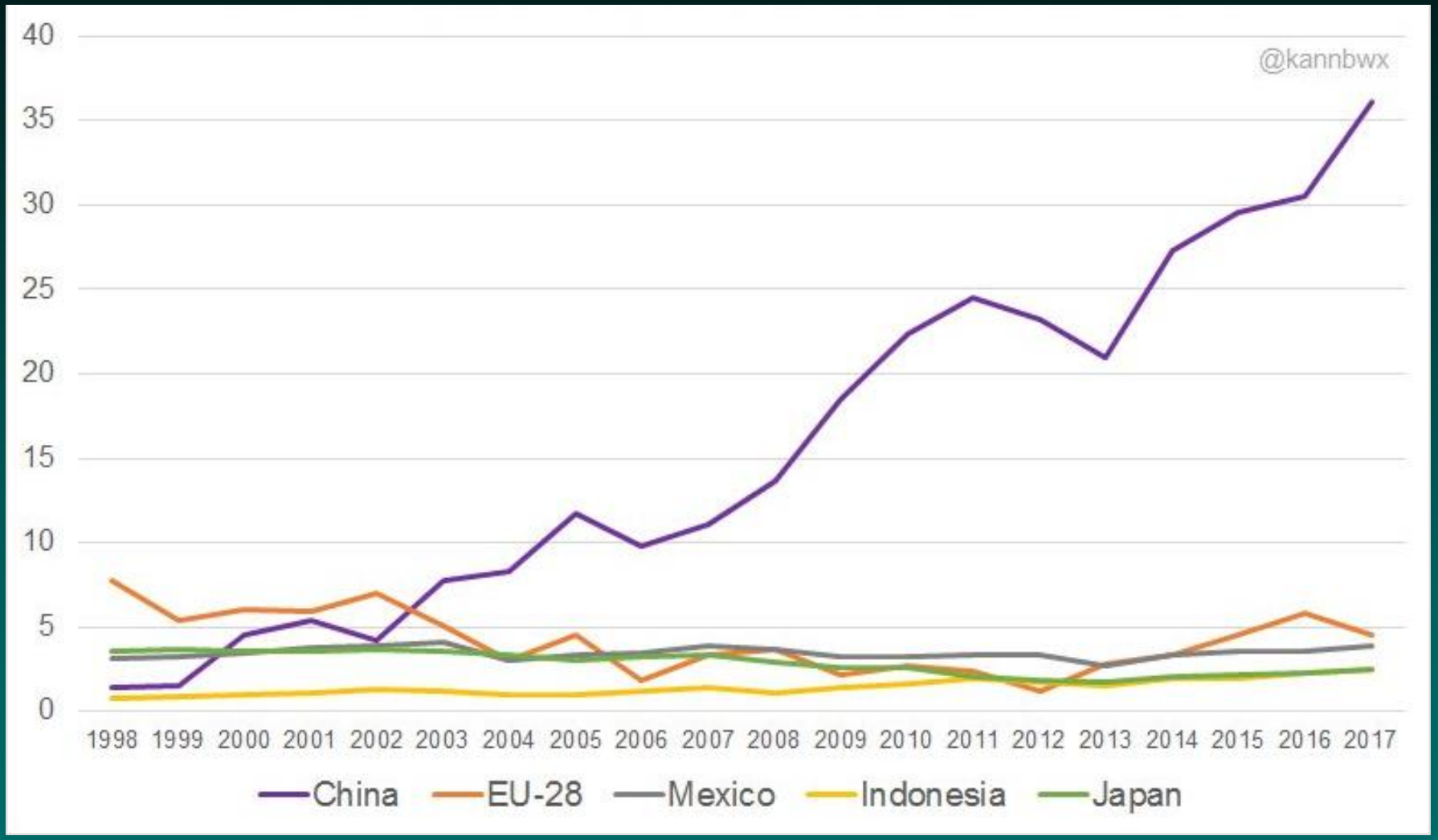
Source: Potential Effects of the Panama Canal Expansion on the Texas Transportation System, Texas DOT, Cambridge Systematics

2017 - 2020 Regional Competitive Inland Port & Distribution Center MS River Region



US Soy Exports – Top 5 Destinations

(Millions of Tons)



Source: Karen Braun@kannbwx - Global Agriculture Columnist at Thomson Reuters

VICKERMAN & ASSOCIATES, LLC

Top 10 Destinations for US Soybean Exports: 2015 - 2017

NOPA
NATIONAL OILSEED PROCESSORS ASSOCIATION

Soybeans (all countries) – Jan – Dec 2017

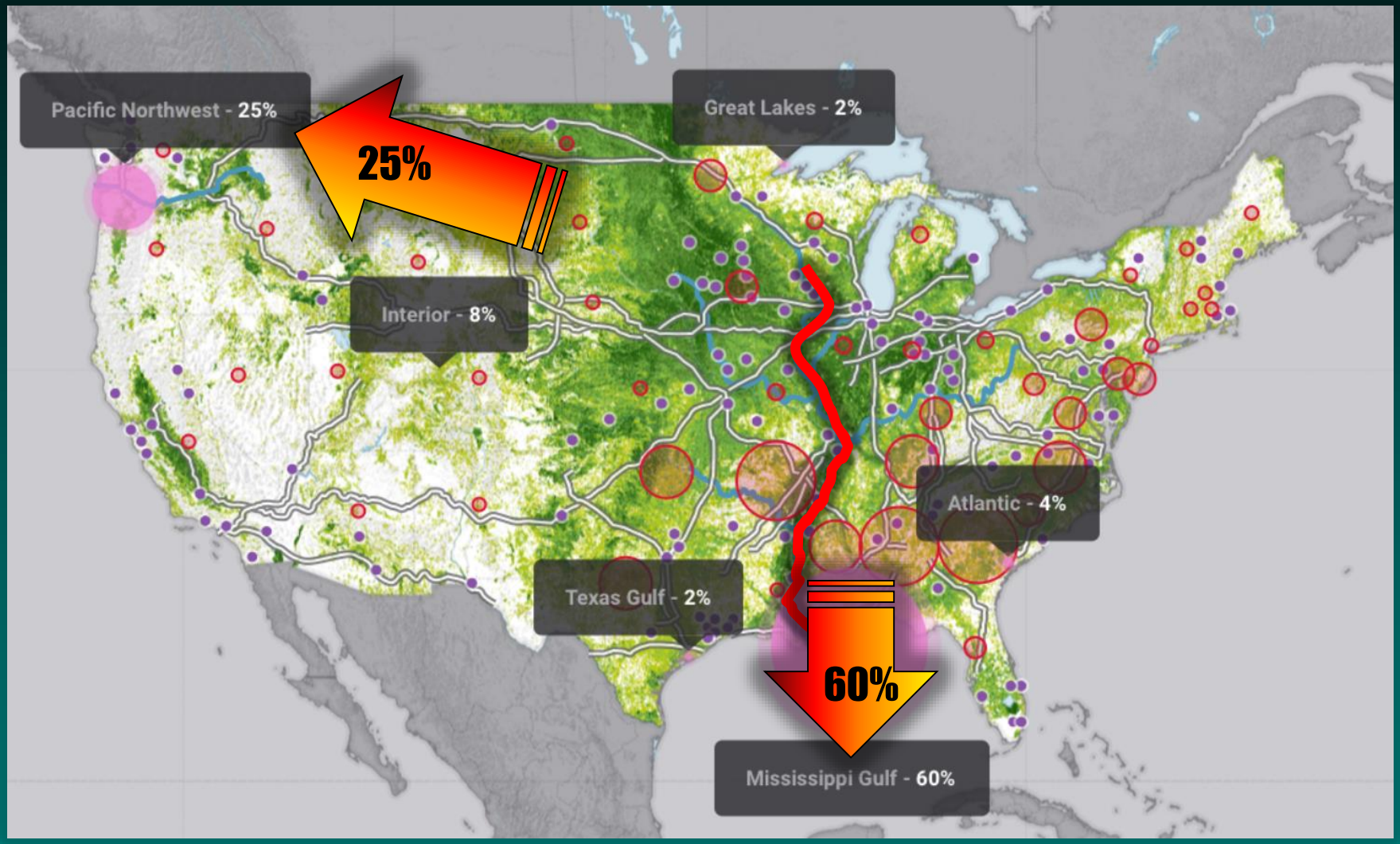
EXPORT MARKETS	2017 RANK	VALUE	QUANTITY (METRIC TONS)
China	1	$12,355,952	31,996,679
Mexico	2	$1,586,418	3,914,594
Netherlands	3	$1,102,659	2,882,304
Japan	4	$975,733	2,299,341
Indonesia	5	$922,138	2,396,149
Taiwan	6	$588,188	1,449,916
Thailand	7	$466,670	1,196,195
Pakistan	8	$428,344	1,143,986
Bangladesh	9	$385,050	1,046,891
Egypt	10	$364,491	1,010,074
TOTAL EXPORT TOP TEN		**$19,175,643**	**49,336,129**
TOTAL EXPORT (ALL COUNTRIES)		**$21,582,206**	**55,542,883**

Source: USDA – Foreign Agricultural Service 3-10-2015

VICKERMAN & ASSOCIATES, LLC

US Soybean Destinations (2016)

(Primary International Export Percentages)



Source: IIASA-IFPRI, USDA AMS, Gro Intelligence

China will be hard-pressed to find another country that can produce as large a volume of soybeans as American farmers. Brazil and Mexico are two other sources for soybeans, but they can't match the U.S. in capacity.

Historical Rules Are Changing on the Lower Mississippi River

VICKERMAN & ASSOCIATES, LLC

Mississippi River Deepening: Southwest Pass to Baton Rouge

(50 to 55 foot depths are possible in the Future)

Mississippi River Ship Channel

Gulf to Baton Rouge, LA - General Reevaluation Report

Table D-32 Project Results

	48 Foot River Depth	50 Foot River Depth
Average Annual Benefits	$105,900,000	$147,810,000
Average Annual Costs	$103,520,000	$138,700,000
Net Benefits	$2,380,000	$9,110,000
BCR	1.02	1.07

Project authorized to 55 feet - full channel. Smaller but positive BCR at 55 feet depth.

VICKERMAN & ASSOCIATES, LLC

Mississippi River Deepening: Southwest Pass to Baton Rouge

(50 to 55 foot depths are possible in the Future)

The USACE in August 2018 signed the final economic justification report needed for the project.

"Two Phases in which 64 miles of the 254-mile portion from Baton Rouge to the Gulf of Mexico will need to be dredged.

Phase 1: Deepening the first 30 miles from Plaquemines to Venice – Two years to complete.

Phase 2: Deepening the 36-mile portion from Belmont Crossing to Baton Rouge – Two years to complete.

The other portions of the river don't need to be dredged because they are already at least 50 feet deep"

Source: Sean Duffy, Big River Coalition, told BlueWater Reporting in December 2018

VICKERMAN & ASSOCIATES, LLC

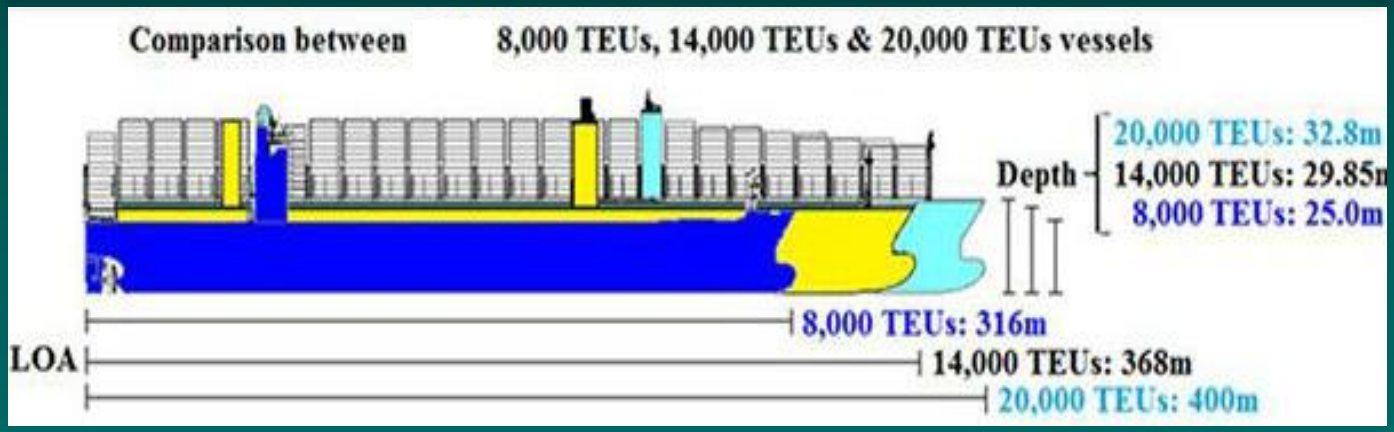
Can Mega Container Vessels Physically Call in the Lower Mississippi River Region?

VICKERMAN & ASSOCIATES, LLC

Historically the Largest Container Vessel to Call in the Lower Mississippi River was 8,000 TEUs with a Controlling Vessel Draft at 45 ft. (Eff. 47 ft)

Containership Size by Vessel Generation

Vessel Class	Capacity (TEU)	Containers Across	Draft (feet)	Beam (feet)	Length Overall (feet)	Air Draft (feet)
Panamax	4,000	15	40	106	965	117
Post-Panamax	7,000	17	49	144	1,100	138
Super Post-Panamax	9,000	19	50	158	1,200	159
Neo Panamax	13,000	20	50	160	1,200	164
Megaship	18,000	23	52	193	1,300	187



With Controlling Depths at 50 ft. - 53 ft. The Largest Current Container Vessels Could Reach 18,000 to 20,000 TEUs in the Lower Mississippi River

VICKERMAN & ASSOCIATES, LLC

Maersk's Triple E Container Ship

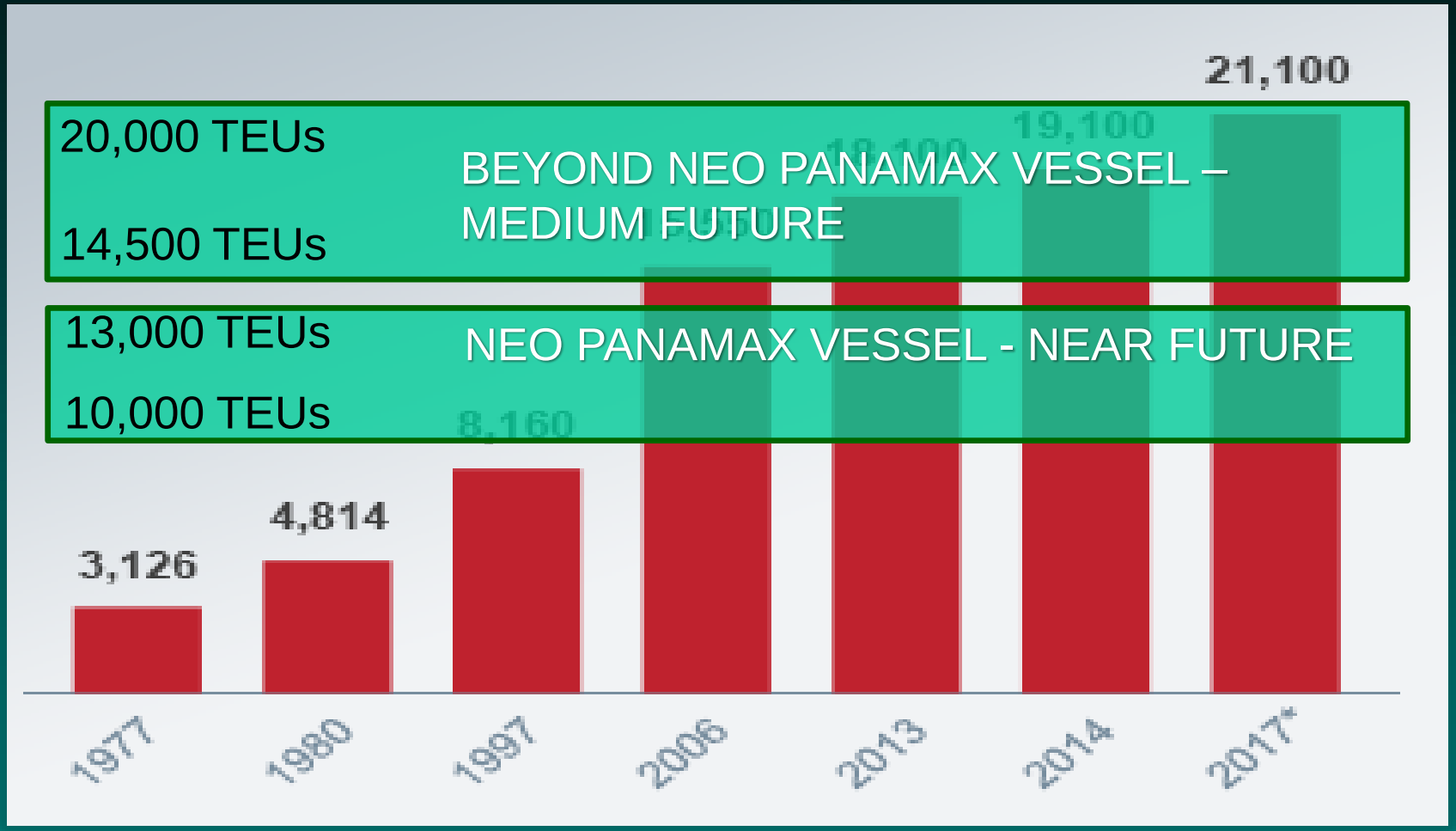
1.5 times the Size of the NEW Panama Canal Wide Body Shallow Draft 18,000 TEU Vessel

(Same Design Draft of the 8,000 TEU Susan Maersk)

(Design Draft of 14.5 Meters = 47.57 feet)

VICKERMAN & ASSOCIATES, LLC

The World's Largest Container Ships On the Mississippi River



Mississippi River Container Vessel Size

Source: OECD/ITF

VICKERMAN & ASSOCIATES, LLC

It Is Not Inconceivable that by 2025 the Lower Mississippi Design Vessel May Well be a 14,500 to 20,000 TEU Container Ship

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Emerging New Inland Waterway Vessel Technology & Up River Terminals

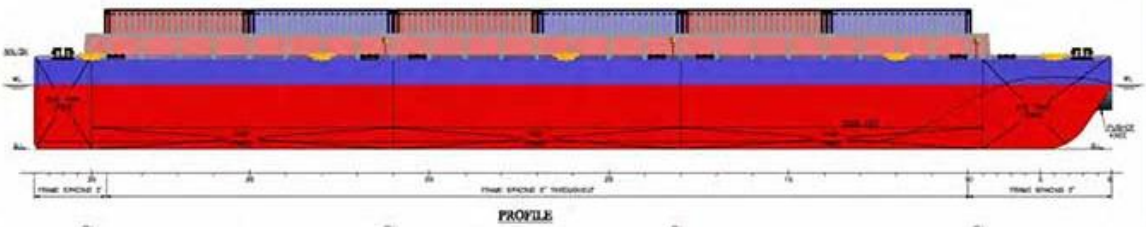
VICKERMAN & ASSOCIATES, LLC

“Deck” Barge Loaded with Containers

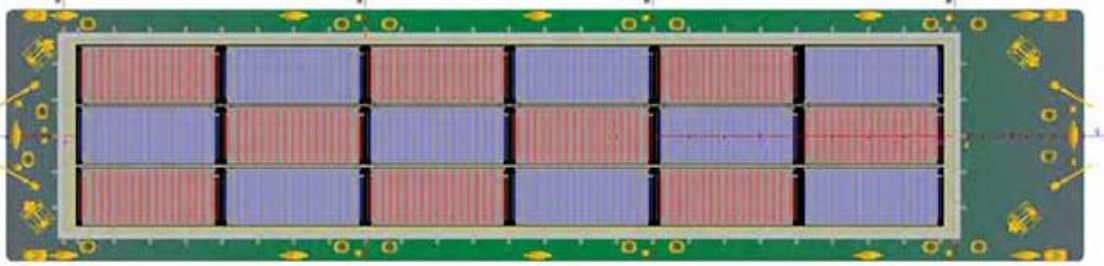
“Hopper” Barge Loaded with Containers

Source: USDOT Maritime Administration MARAD

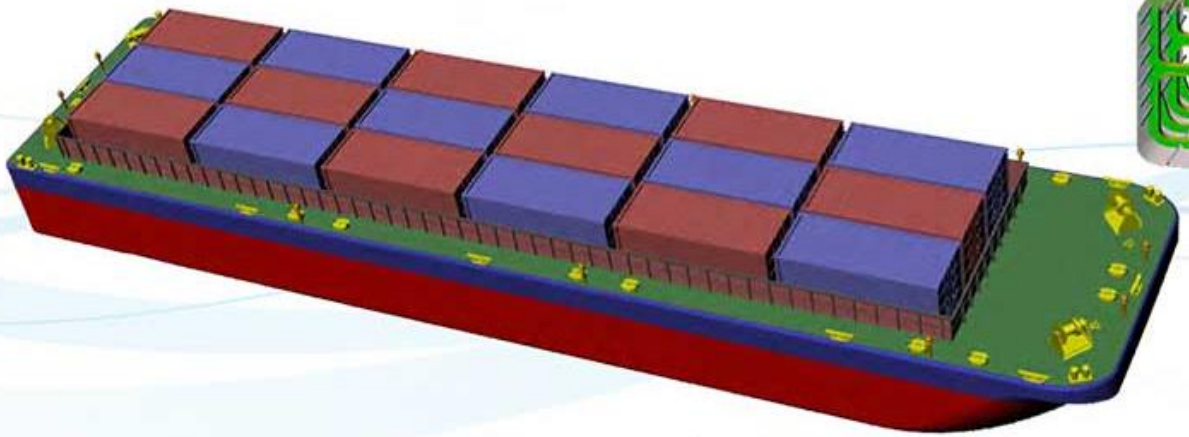
Customary Container on Barge (COB)



PROFILE



MAIN DECK PLAN



Length OA	:	150'-0"
Breadth Mld	:	35'-0"
Depth Mld	:	12'-6"
Draft	:	9'-0"
Type of Vessel	:	Double Skin Hold-Container Barge
No. of Containers	:	36 TEU
Max. Stack Weight	:	40T
Deadweight	:	2450 kip

Features

- Container stowage on-deck
- Highly fuel efficient transportation
- Ballast tanks optimized for Even keel loading/unloading

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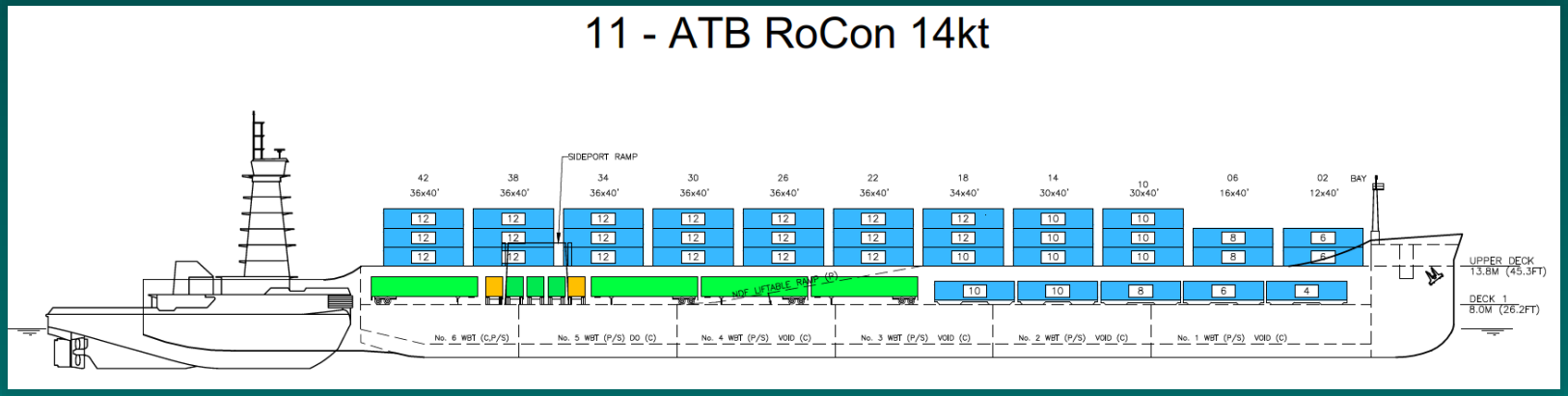
Virginia Port Authority SSS Route to Richmond, VA

Proposed Domestic AMH/Short Sea Container Services

Proposed New England Marine Highway Project's articulated tug barge short sea container service connecting New York City and Portland, Maine - 900 TEUs



Proposed MARAD ATB Ro/Con – HEC Design - 886 TEUs, Design Draft 14.1 ft. – 14 Knots

VICKERMAN & ASSOCIATES, LLC

Short Sea Shipping Expertise Today: European Common Market

Short Sea LNG Bunker Vessel

AMSbarge Containerkraanschip

(Port of Rotterdam)

Port of Hamburg Port Feeder Barge Concept

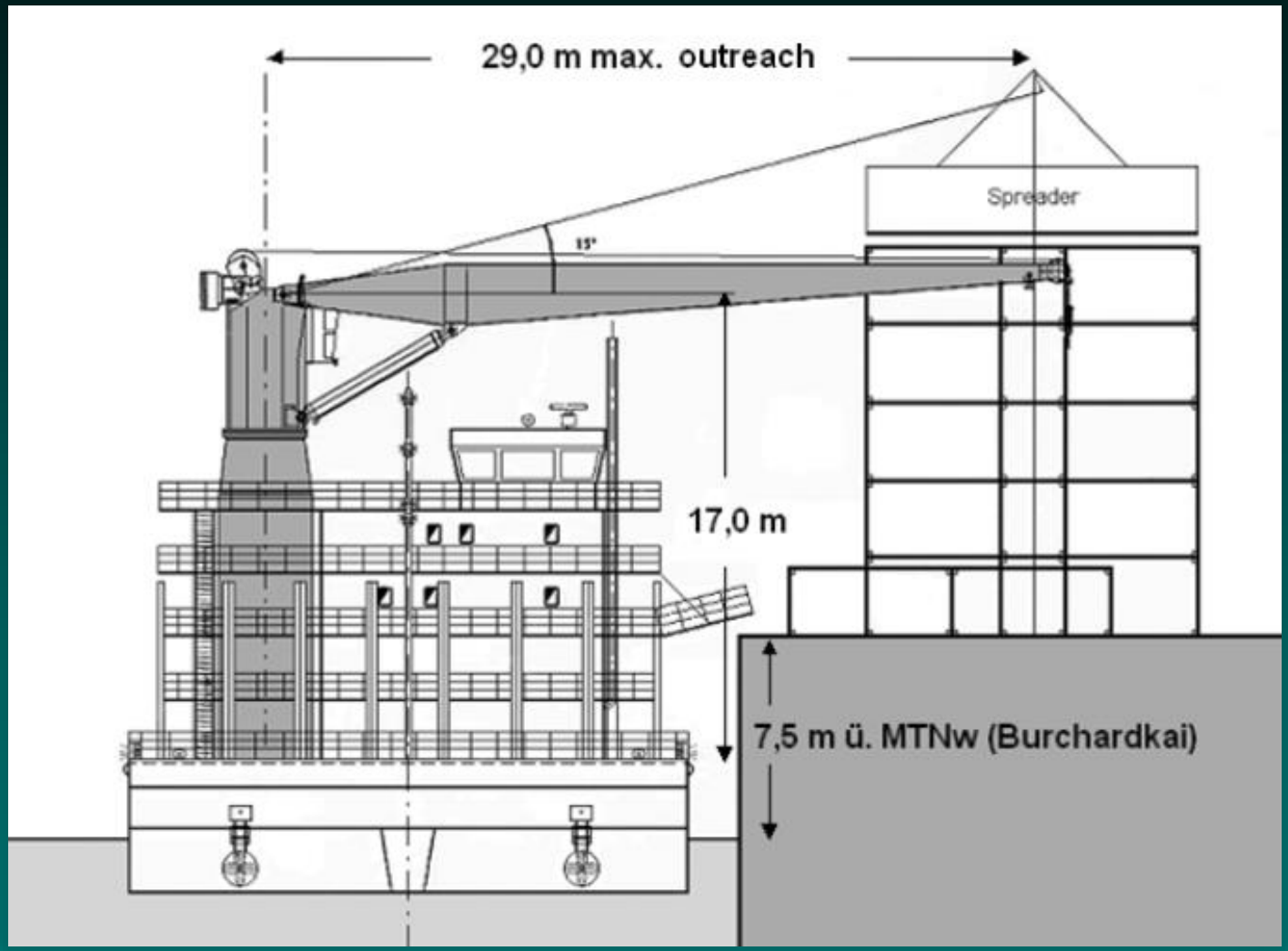
(168 TEU Capacity)

Port Feeder Barge Gmbh Port of Hamburg

Port Feeder Barge Gmbh
Port of Hamburg

PORT FEEDER BARGE GmbH
Managing Director:
Dr.-Ing. Ulrich Malchow

Shipboard Crane Outreach



Port Feeder Barge Gmbh Port of Hamburg

Yara Birkeland Autonomous Electric Container Vessel Operations

The all-electric container vessel Yara Birkeland (the joint project of Yara and technology company Kongsberg)

The Yara Birkeland will be the world's first fully electric and autonomous container ship. At 70m with a 100-150 TEU capacity, it will travel with remote pilotage by 2019 and **fully autonomous by 2020.**

Yara Birkeland Autonomous

Zero Emission – No Ballast Vessel

Yara Birkeland Autonomous

Zero Emission – No Ballast Vessel

North Sea Container Line (NCL),the Norwegian Feeder and Short Sea Carrier, has Introduced a New Concept for Coastwise and Inland Waterway Shipping…

VICKERMAN & ASSOCIATES, LLC

American Patriot Holdings (APH) Prototype Inland Container Vessel

A "*State of the Art*" Hull Design to Ensure Optimal Speed in All River Conditions Utilizing LNG as Main Propulsion Fuel

VICKERMAN & ASSOCIATES, LLC

American Patriot Holdings (APH) Prototype Inland Container Vessel

A "*State of the Art*" Hull Design to Ensure Optimal Speed in All River Conditions Utilizing LNG as Main Propulsion Fuel coupled with the Patented Z-Wake Bow Design.

VICKERMAN & ASSOCIATES, LLC

American Patriot Container Transport, LLC. (APCT) General Vessel Fleet Characteristics

LOA Feet	Beam Feet	TEU Capacity	Scantling Vessel Drafts
595	100	1696	10.0 ft.
772	100	2392	10.0 ft.
952	100	2960	10.0 ft.
1042	100	3244	10.0 ft.

VICKERMAN & ASSOCIATES, LLC

American Patriot Container Transport, LLC.
Hybrid 600 ft Lock Vessel Characteristics

LOA Feet	Beam Feet	TEU Capacity	Scantling Vessel Drafts
595	**100**	**937** - 4 Tier	**10.0 ft.**
595	**100**	**1,190** - 5 Tier	**10.0 ft.**
595	**100**	**1,443** - 6 Tier	**10.0 ft.**
595	**100**	**1,696** - 7 Tier	**10.0 ft.**
Speed: 18 mph, Fuel: LNG			
Vessel Range: 2000 miles			

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Inland Waterway Vessel Transfer to Ocean Container Transport

1824 TEUs to 3244 TEUs

Commercially Viable?

200 - 900 TEUs

Cargo Quantity Viability?

REPORT CARD for America's INFRASTRUCTURE

ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

AMERICA'S GPA:

D+

ASCE 2017 Report Card for America's Infrastructure

ESTIMATED INVESTMENT NEEDED BY 2020:

$4.6 TRILLION

Cost to Improve

Ports: C+

Inland Waterways: D

Roads: D

Failure to Act: It Costs Each US Family $3,400 per year

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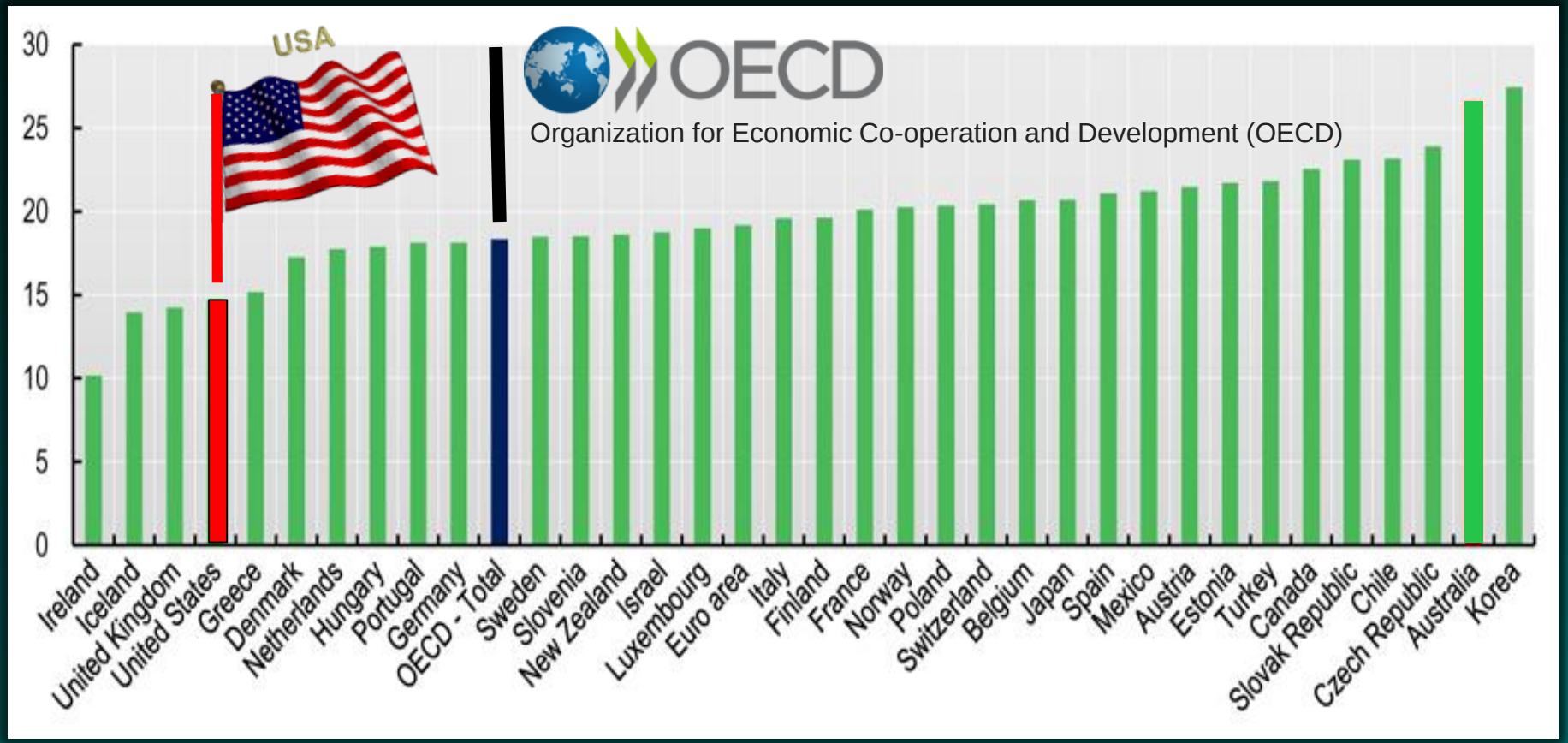
International Gross Fixed Capital Formation as a Percent of GDP

(*US is 32nd in the World - Below OECD Nations*)



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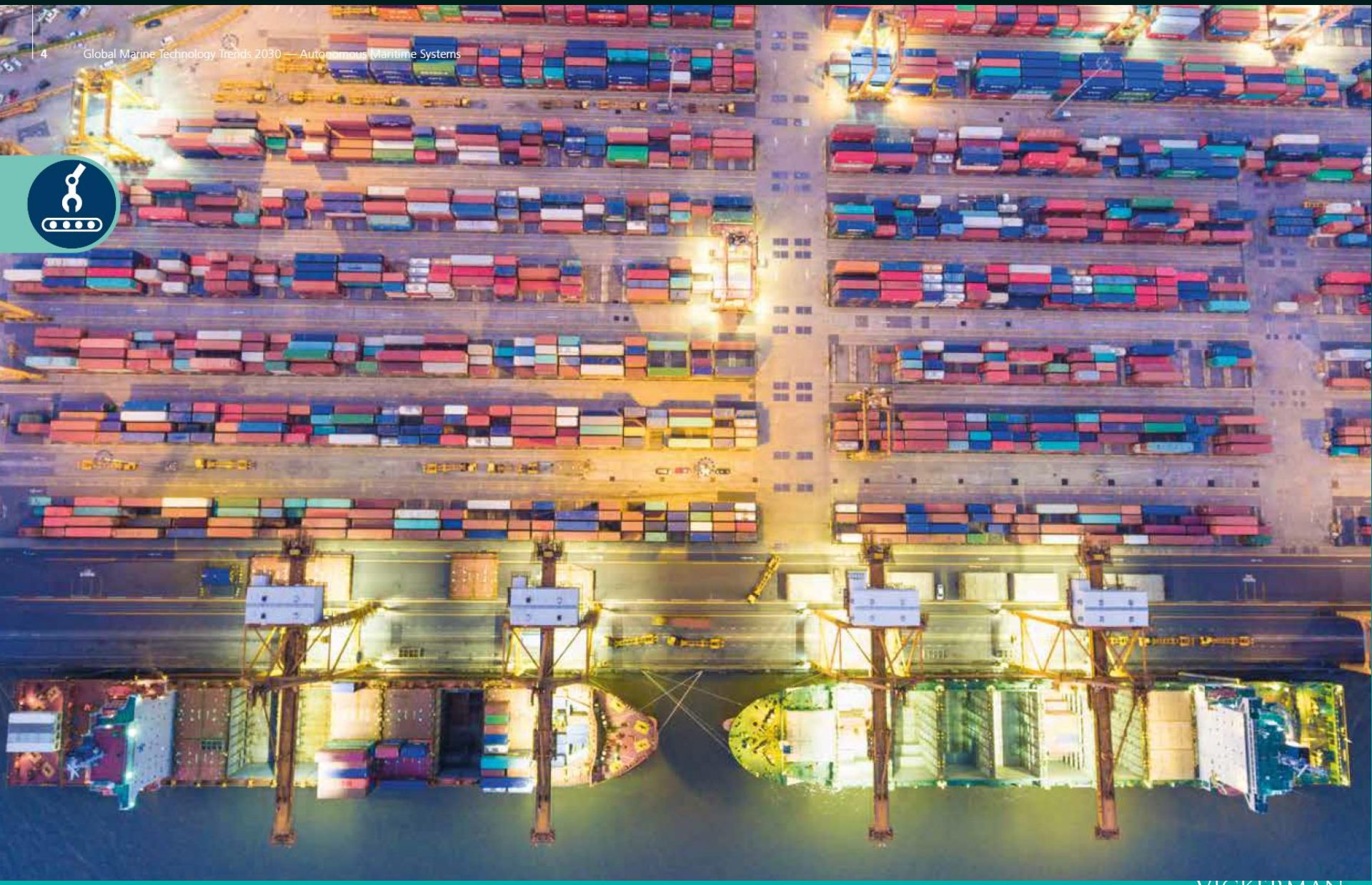
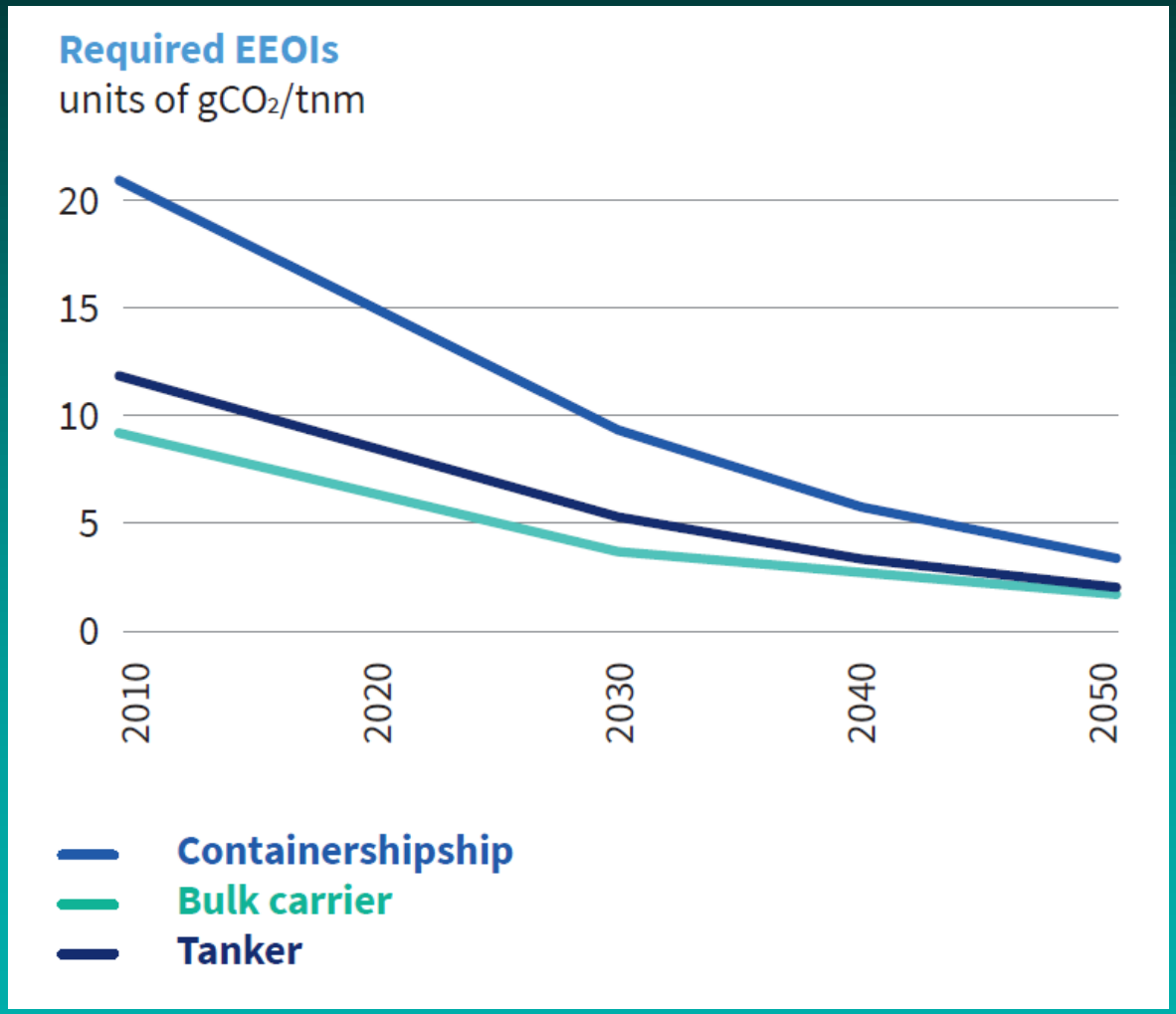


Lloyd's Register | UMAS



Source: Lloyd's Register Group Limited and UMAS 2017