



*CANAL DE PANAMÁ*

# Panama Canal: Expansion Status and Future Impact

“NUTC Business Advisory Council Meeting”

Evanston, IL - October 2015

Oscar Bazán

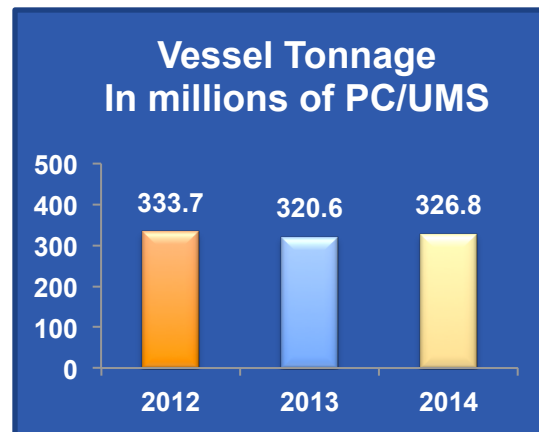
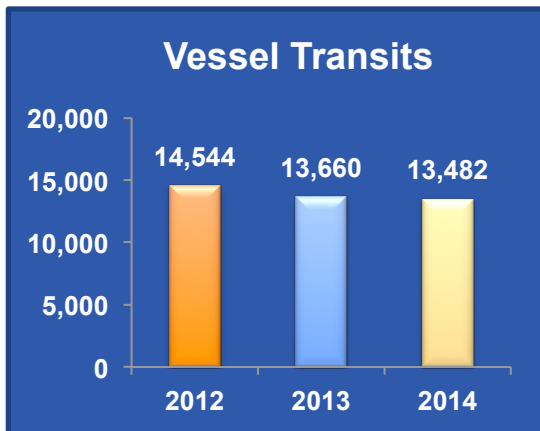
Executive Vice-President

Planning and Business Development

Panama Canal Authority

## Business Description

- The Panama Canal Authority, autonomous legal entity in charge of the operation, administration, management, preservation, maintenance, and modernization of the Canal
- Leading market position in the container liner segment with a 51% capacity deployed on the Northeast Asia to U.S. East coast route
- Stable business with diversified revenue streams:
  - Toll income, electric power sales, potable water sales and other marine services
- The Panama Canal is undergoing an Expansion program expected to significantly increase the Canal's capacity and strengthen its world-wide competitive position



<b>2014 Transit Revenues</b> (thousand of US dollars)	<b>\$2,323,931</b>
<b>2014 Other Revenues</b> (thousand of US dollars)	<b>\$305,220</b>
<b>2014 Total Revenues</b> (thousand of US dollars)	<b>\$2,629,151</b>
<b>Employees</b>	<b>10,016</b>

# Understanding the Operations of the Canal

- With an extension of 80km, the Panama Canal connects the Atlantic and Pacific oceans
- The Panama Canal uses systems of locks (compartments) that work as water lifts
- The ships are raised from the sea level to the level of Gatun Lake
- Ships then cross the channel through the continental divide and enter the set of locks that will take them to the sea level again

## A day in the Canal (Atlantic To Pacific Route)

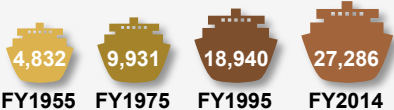
- 1 Atlantic locks which raise ships to the Gatun Level from the sea level or vice versa
- 2 Ships cross the canal through the Gatun Lake
- 3 Ships arrive to the exit locks to reach the sea level again
- 4 Ships exit the Canal



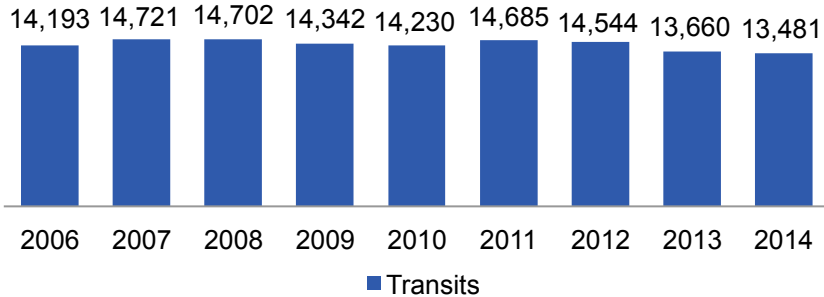
# Maritime Transit Operational Overview

## Vessel Evolution

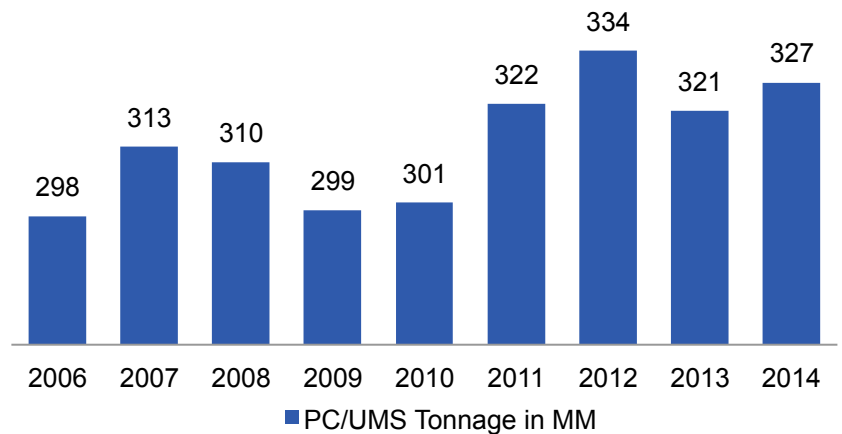
### Average Vessel Size (in PC/UMS)



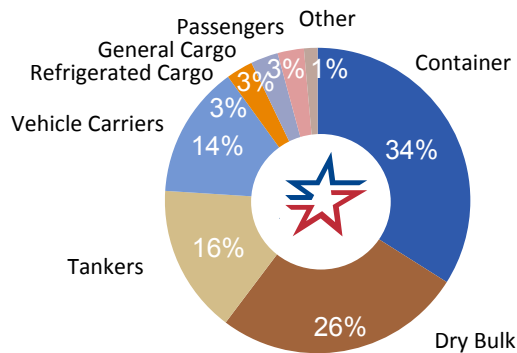
Avg. '06-'14:  
14,284



## Volume Evolution

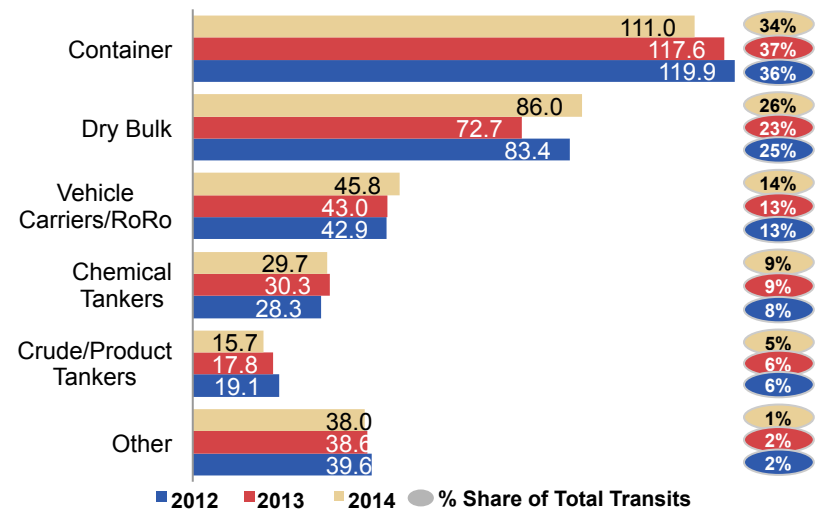


## Volume Breakdown 2014



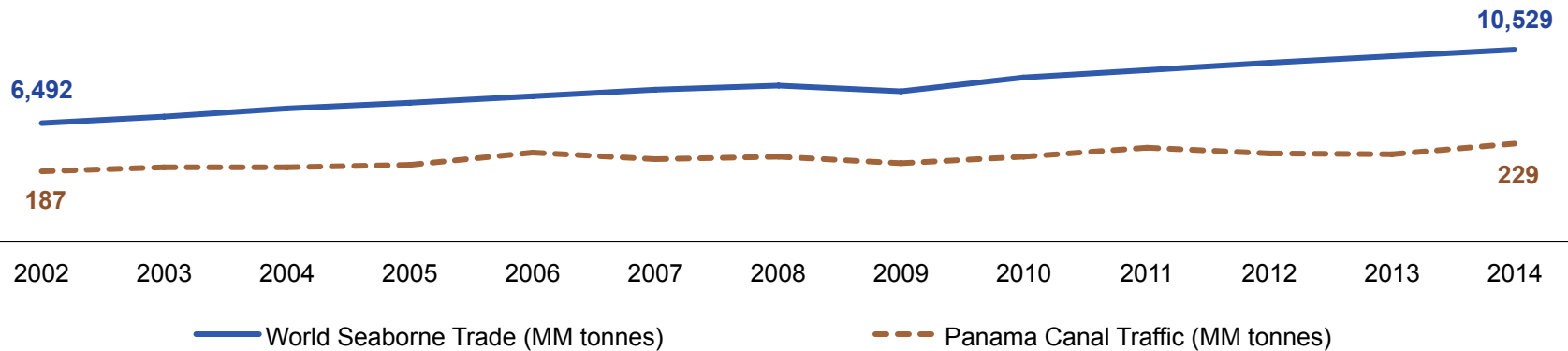
327 PC/UMS MM Tons

## 2012-2014 Transits by Market Segment

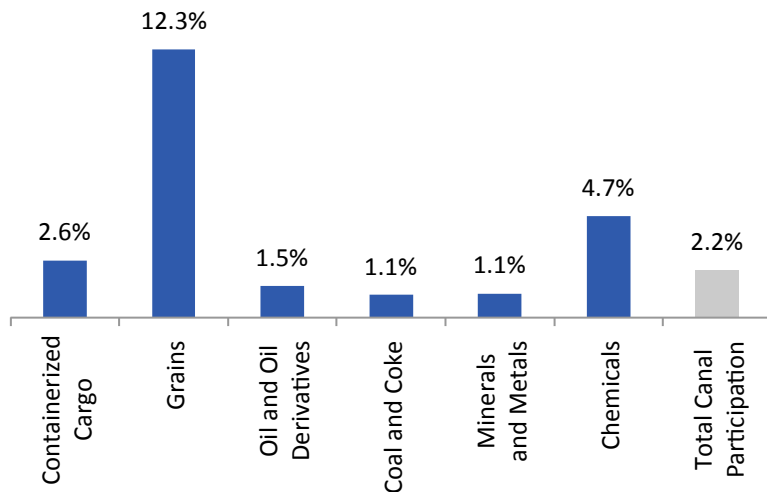


# A Key Facilitator of Transcontinental Seaborne Trade

The Panama Canal's relevance to the global economy is evidenced by the strong correlation of its vessel traffic with global seaborne trade



## Worldwide Cargo Market Share<sup>(1)</sup>



## Relevance of the Canal to Selected Countries<sup>(1)</sup>

USERS	FY 2013*	FY 2014*
United States	136.5	154.1
China	46.4	51.5
Chile	29.0	29.5
Japan	20.0	21.7
Colombia	17.5	19.2
South Korea	16.8	19.1

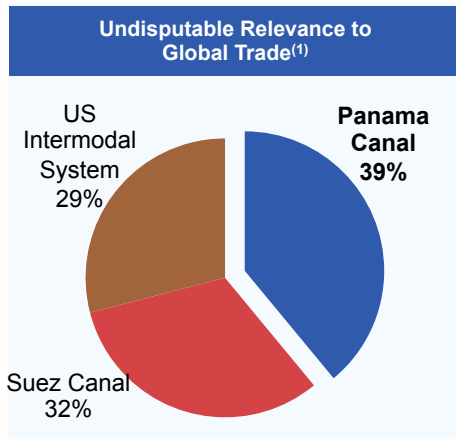
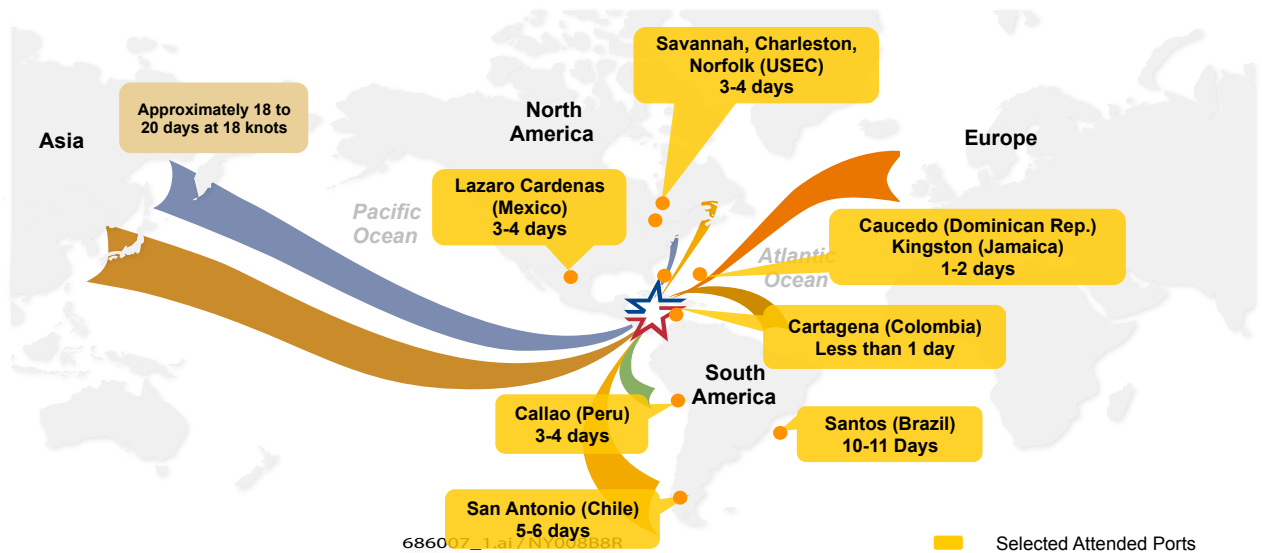
Millions of Long tons - Trade Through the Canal

The Canal is a key asset for the region's competitiveness

# Critical Cornerstone of Global Maritime Transportation

- ✓ Serves 144 maritime routes and 1,700 ports in 160 countries
- ✓ Privileged location with the most economical and time saving option between the Americas, Asia and Europe
- ✓ The right to limit the access to the Canal grants pricing advantages without distorting demand

## Unique Position in the World Maritime Trade



			Route <sup>(2)</sup>		Savings	
Market Segment	From	To	Panama	Suez	Miles	Days:
Containership (roundtrip)	NE Asia	US East Coast	22,000 nm	26,600 nm	4,600 nm	14
Vehicle Carrier	NE Asia	US East Coast	10,859 nm	14,490 nm	3,631 nm	8
LNG <sup>(3)</sup>	US Gulf	Japan	9,623 nm	14,117 nm	4,494 nm	10
Market Segment	From	To	Panama	Cape of Good Hope	Miles:	Days:
Dry Bulk	US Gulf	Dalian, China	10,069 nm	15,353 nm	5,284 nm	16

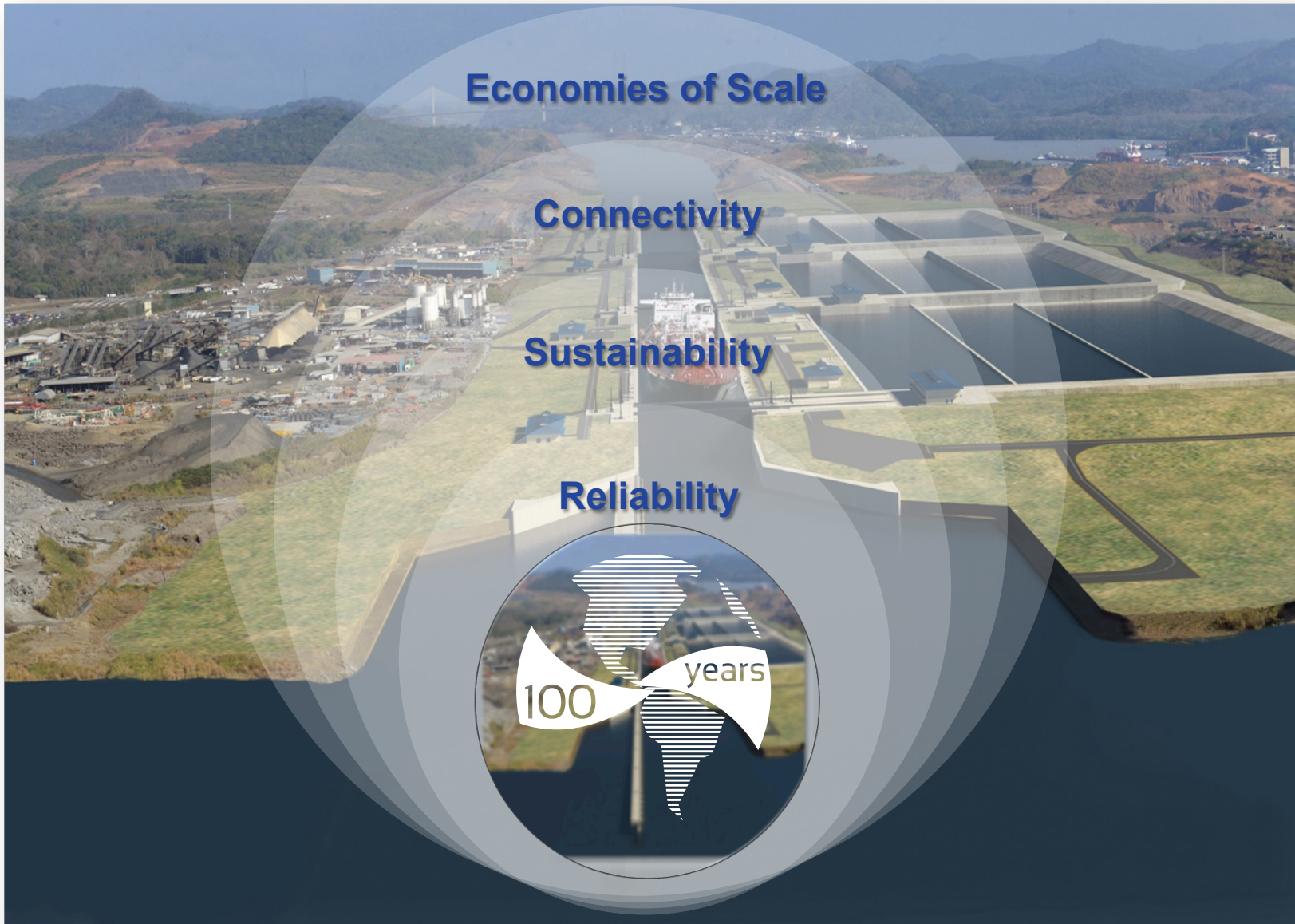
Source: ACP

(1) Container cargo market share on the Northeast Asia to U.S. East coast route

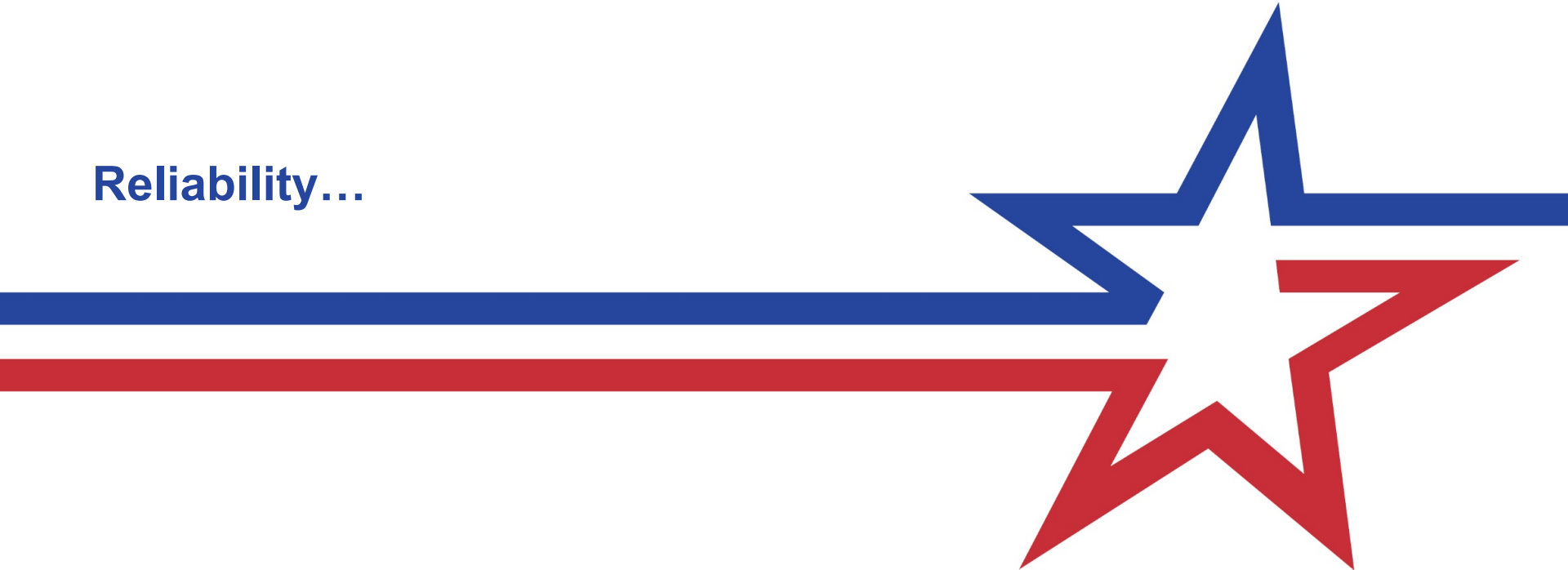
(2) nm = Nautical Miles

(3) Expected savings after the Canal's Expansion

# The Panama Canal Service Package...



**Reliability...**





# Operational Reliability Since the Canal's Opening



*Safe and secure - Opens 24 hours a day, 7 days a week, 365 days a year*

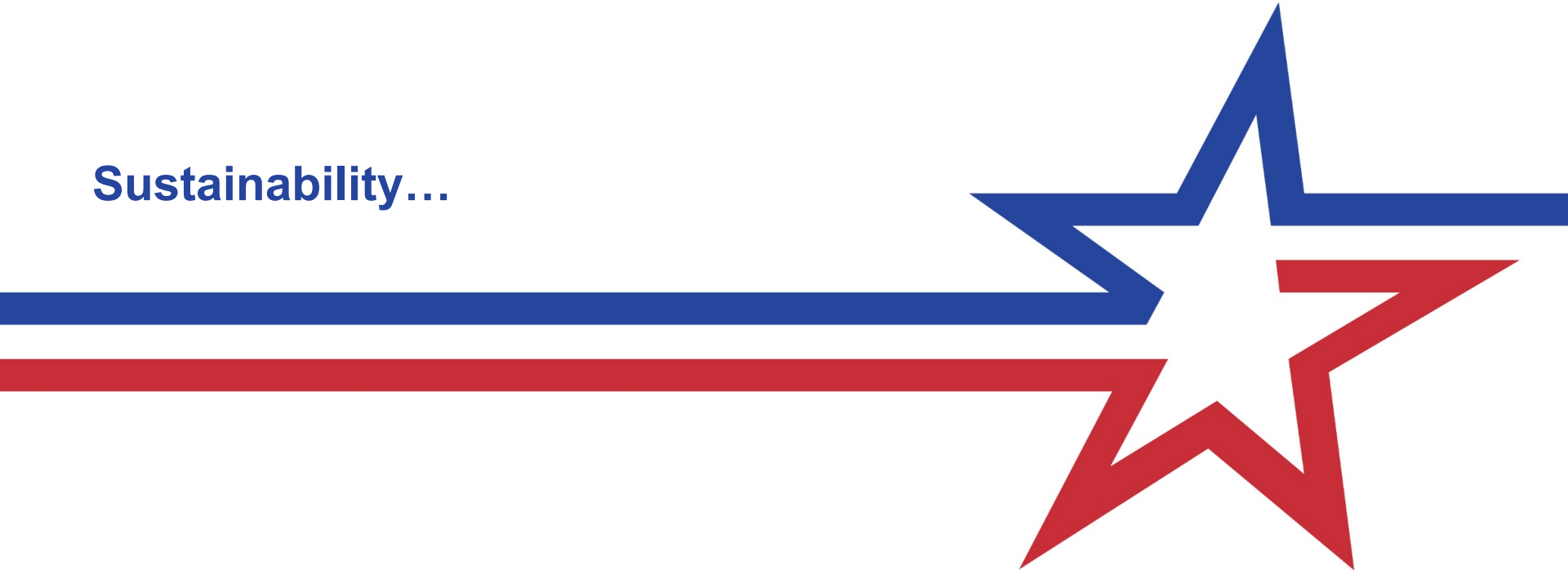
**Solid Experience**

- ✓ Over 100 years of operations
- ✓ The canal has stopped operations only 17 hours in total since 1,999 (year in which ACP assumed control of the Canal)
- ✓ Maintenance is executed without interrupting or slowing down operations
- ✓ Customer satisfaction of ~99% in 2014<sup>(1)</sup>
- ✓ Predictability: Published tariffs and fixed transit date with reservation
- ✓ Sufficient to attend large traffic volumes with 7,379 Panamax type vessels transited in 2014, exceeding previous record of 7,241 in 2012

PCNT Tonnage in MM <sup>(2)</sup>			PC/UMS Tonnage in MM							
1915	1959	1974	1999	2002	2005	2007	2009	2011	2012	2014
4	53	138	228	235	279	313	299	322	334	327

*Steady transit levels through decades*

**Sustainability...**



## Dredging



## Bridge over Atlantic side



## Launches



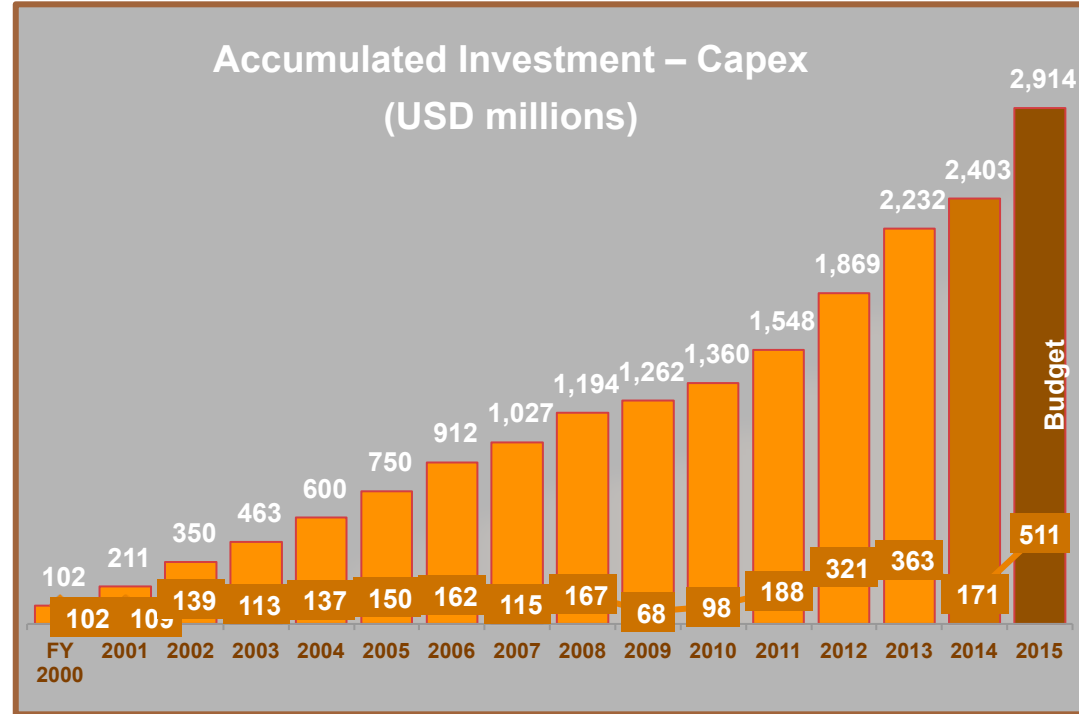
## Ground dams



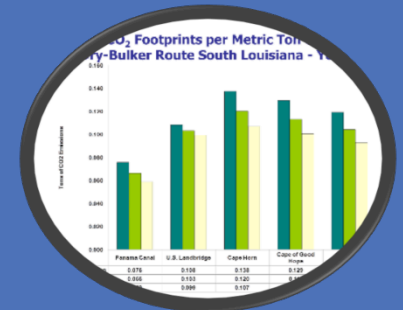
## Fuel Pipeline and Tank Farm



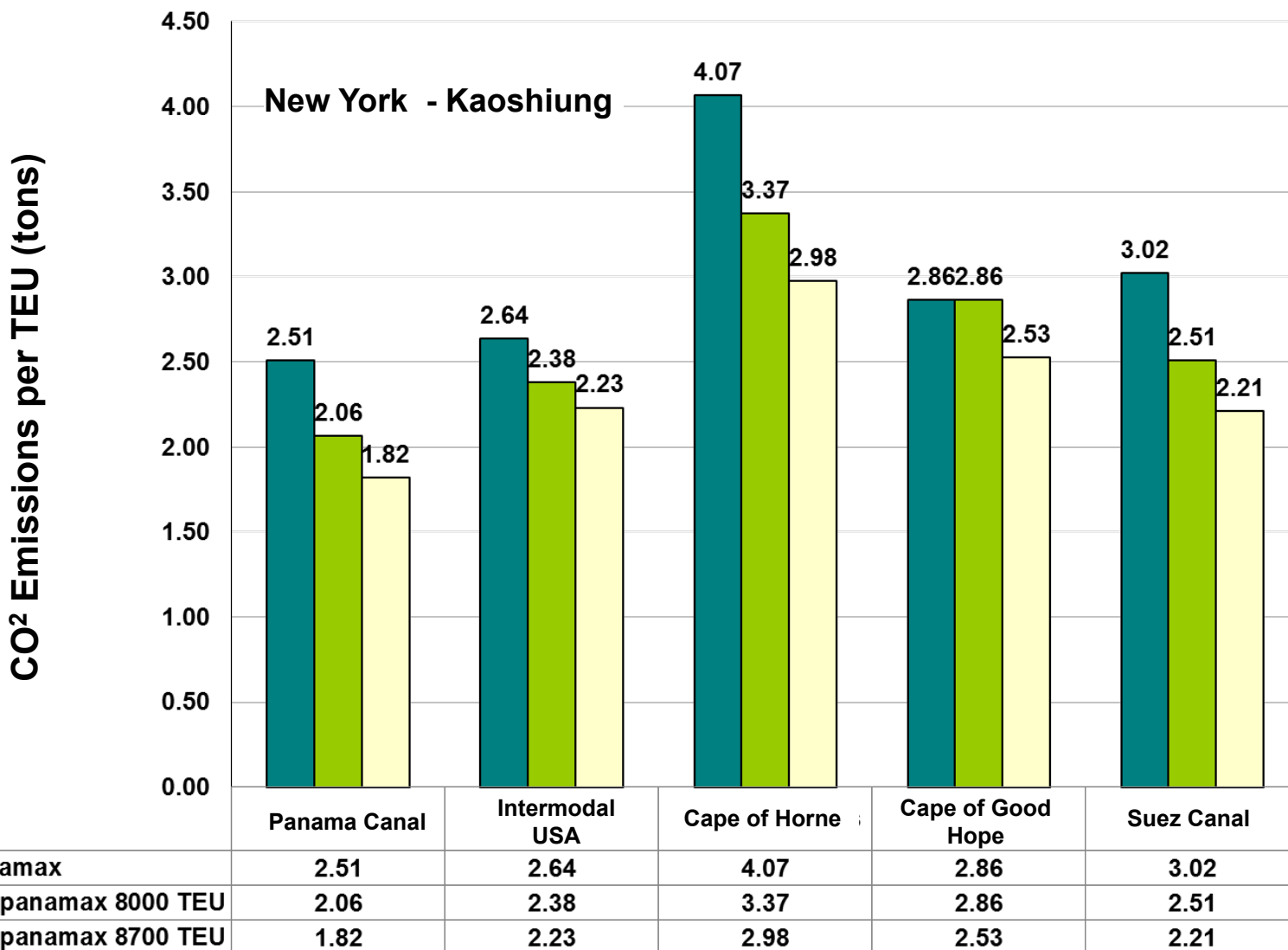
## Tugboats



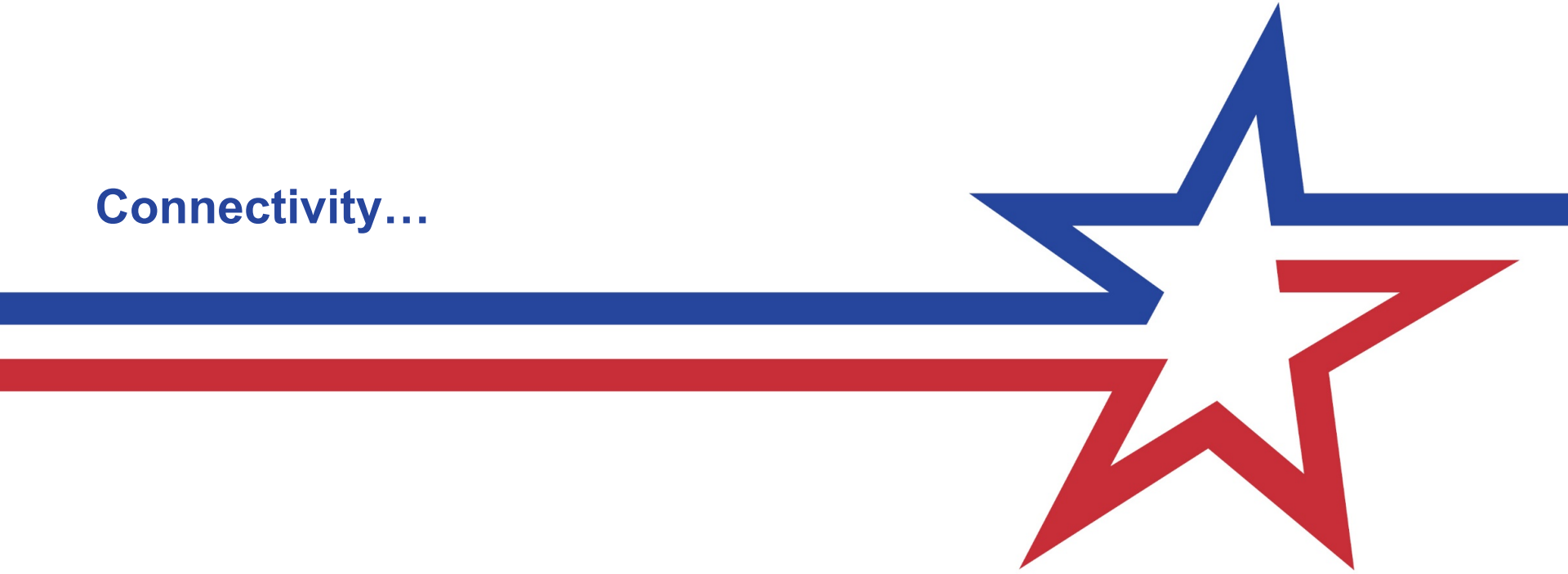
- The CO<sub>2</sub> emission reduction in the planet as a result of the Panama Canal route
- The actions taken by ACP: Environmental management in operations and Canal Watershed sustainability programs
- Become carbon neutral



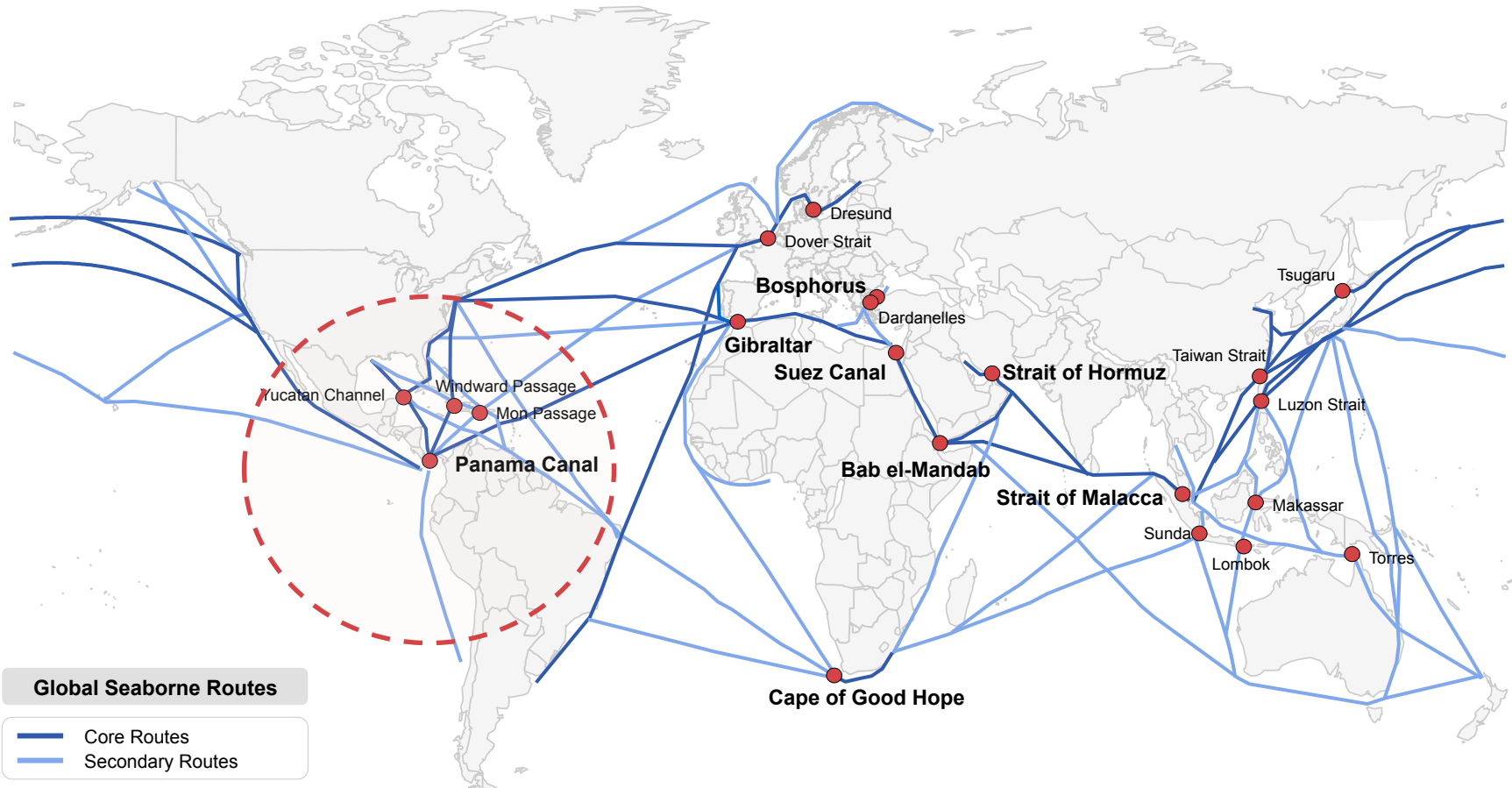
# CO<sub>2</sub> Emission's for Container Vessels Asia – USEC



**Connectivity...**



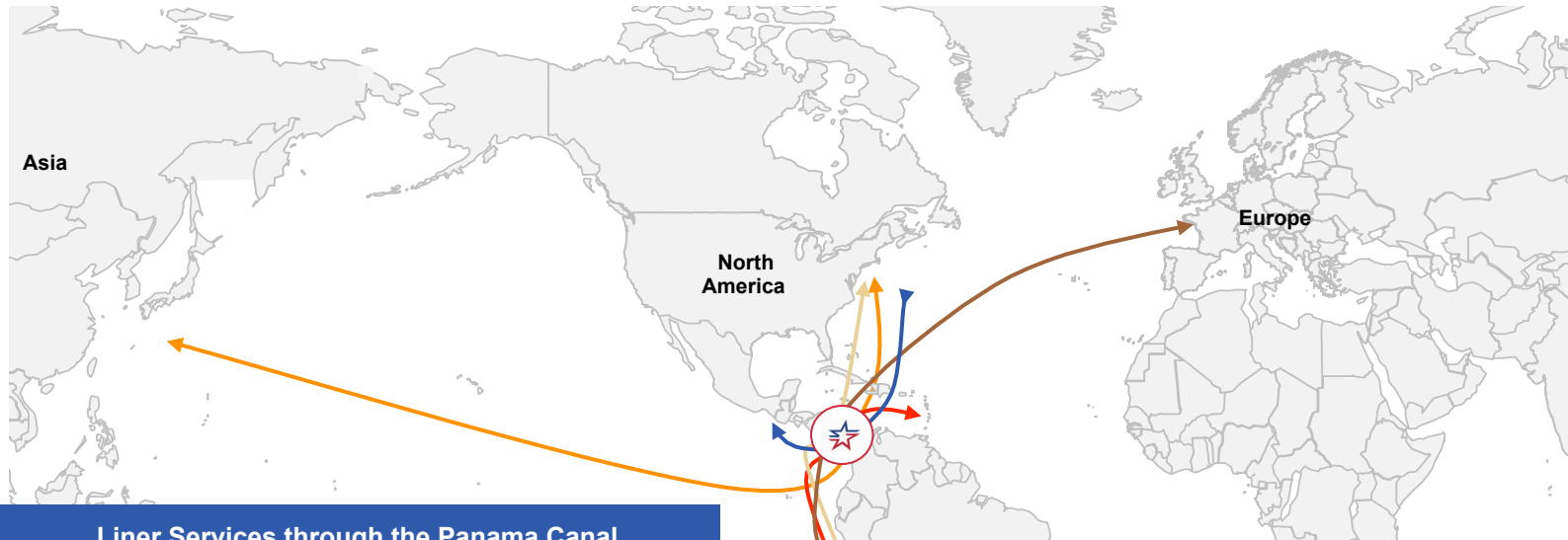
# Global Maritime Trade Routes Overview



*The Panama Canal is a cornerstone of the Western Hemisphere's maritime trade and a prime asset in the Americas*

# The Panama Canal's Key Routes

The Panama Canal's strategic position renders it a crucial role in the Western Hemisphere's seaborne trade dynamics. More than 225MM tons made their way through its waters in 2014<sup>(1)</sup>



### Liner Services through the Panama Canal

Commercial Route	No. of services	Annual capacity	Average vessel size
Asia - USEC / Gulf	14	3,303,521	4,549
WCSEA - Europe	7	1,213,667	3,556
WCSEA - ECUS	2	438,919	4,245
Pendulum	2	481,406	4,629
WCUS - Europe	3	660,381	4,288
Asia - Caribbean	1	242,805	4,669
Australia - Europe	1	55,085	2,421
Australia - ECUS	1	178,142	3,426
WCSEA - Caribbean	2	134,560	1,282
<b>Total</b>	<b>33</b>	<b>6,708,486</b>	<b>4,186</b>

### Feeder Liner Services at Panamanian Container Terminals

Feeder Services Atlantic	25	2,456,006	2,490
Feeder Services Pacific	14	3,106,958	6,314
<b>Total</b>	<b>39</b>	<b>5,562,964</b>	

### Panama Canal Routes (Long tons MM)

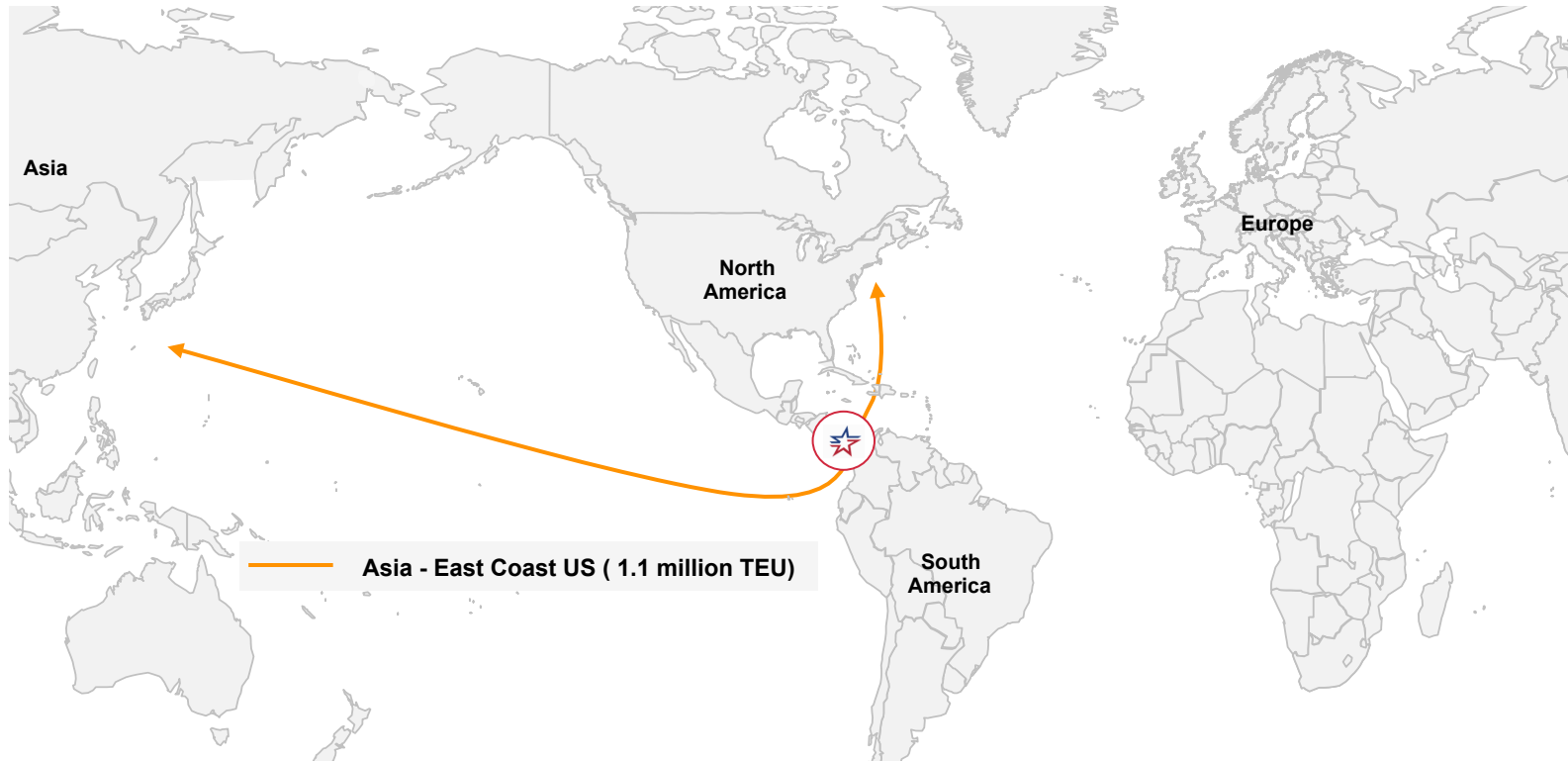
- Asia - East Coast US ( 86.2M)
- West Coast South America – East Coast US (33.4M)
- West Coast South America - Europe (12.6M)
- West Coast Central America – East Coast US (12.0M)
- South America Intercoastal (10.9M)

Source: ACP  
(1) Long tons



# Hanjin Shipping Service Network through the Panama Canal

- Panama Canal Customers' Ranking for Container Vessels - Position No. 9
- Provides 5 weekly services through the Panama Canal - AWE-1, AWE-2, AWE-3, NUE3 & GME (Asia – USEC)



Service through the Panama Canal	Vessels deployed	Vessel size range	Average vessel size	Yearly Capacity
AWE1	9	4,024 – 4,545	4,283	222,699
AWE2	10	4,250 – 5,050	4,517	234,884
AWE3	10	4,014 – 4,738	4,422	229,918
NUE3	9	4,024 – 5,500	4,364	226,928
GME	9	4,250 – 4,300	4,263	221,664
Service that do transshipment in Panamanian Ports				
ASPA /ACSA5	12	6,350 – 9,326	7,667	398,662

**Economies of Scale ....  
Canal Expansion Program**



# Expansion Program at a Glance

## Atlantic Entrance Deepening & Widening



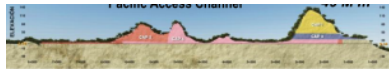
- Dredging of Canal's entrance in the Atlantic Ocean

## Gatun Lake Navigation Channel Widening & Deepening and Deepening of the Culebra Cut

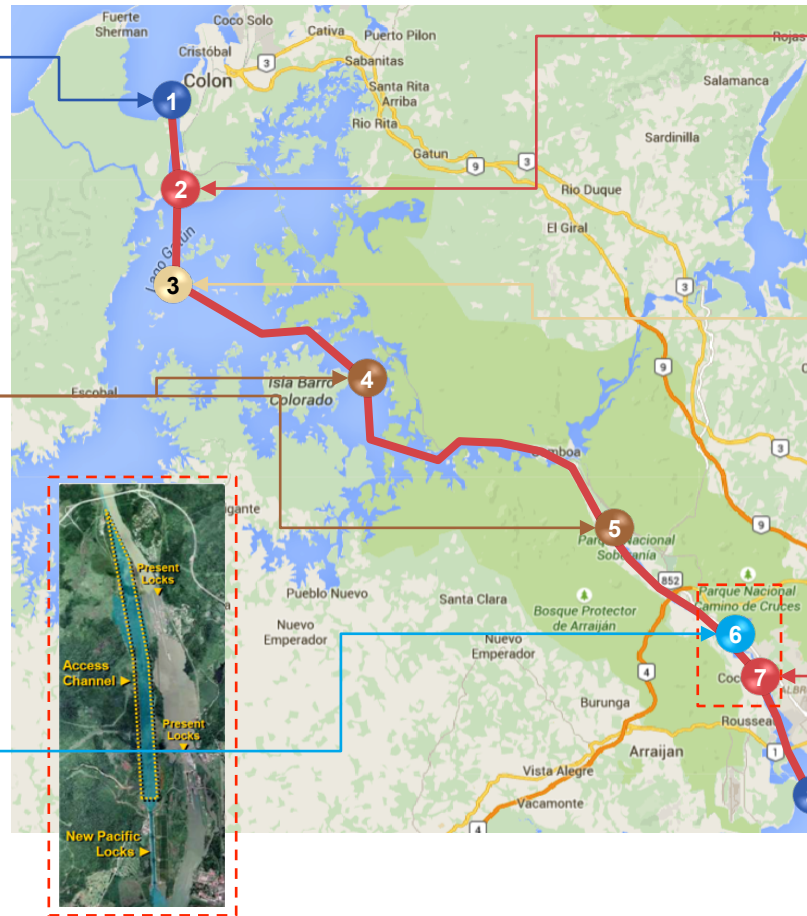


- Removal of sub aquatic material to deepen & widening of the navigation channel in the Gatun Lake and the Culebra Cut

## Pacific Access Channel



- A new access channel north of the new locks on the Pacific side
- Executed in four phases (PACs 1 to 4), entails the excavation of ~50 MMcu.m of material along a 6.1 km span



## Atlantic Side Post-Panamax Locks



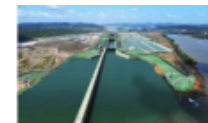
- Features 3 chambers, 9 water-saving basins, a lateral filling and emptying system, and 16 rolling gates

## Increase of Gatun Lake's Maximum Operational Level



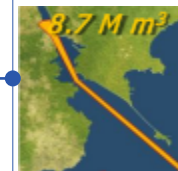
- Enables raising Gatun Lake's maximum operating level by 45 cm to improve the Canal's water supply and draft dependability

## Pacific Side Post-Panamax Locks



- Features 3 chambers, 9 water-saving basins, a lateral filling and emptying system, and 16 rolling gates

## Pacific Entrance Deepening and Widening

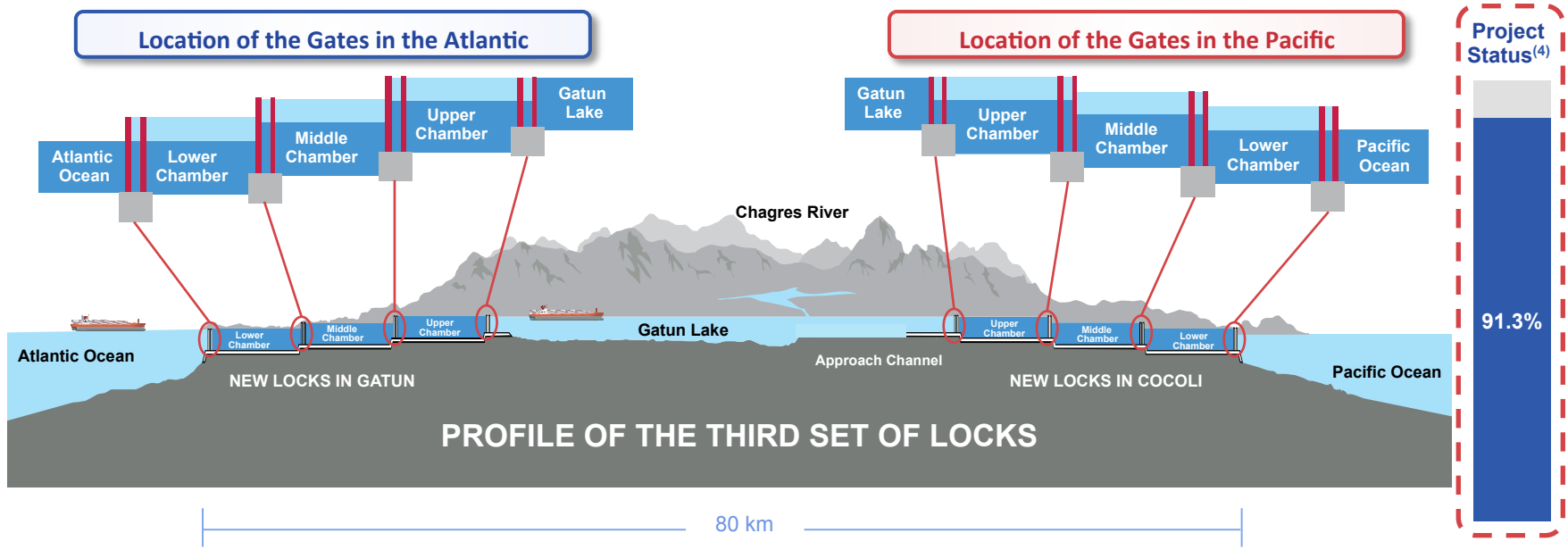


- Deepening the Pacific entrance to 15.5 m below mean low water level and widening it to 225 m

# Expansion Program at a Glance

	Pre-Expansion	Post-Expansion
Max Vessel Capacity	Panamax (294m length)	Post-Panamax (366m length)
Capacity	4,400 TEU's	13,000 - 14,000 TEU's
Canal Water Time <sup>(1)</sup>	31.5 h	24.0 h
Container Cargo Market Share <sup>(2)</sup>	39%	50% <sup>(3)</sup>

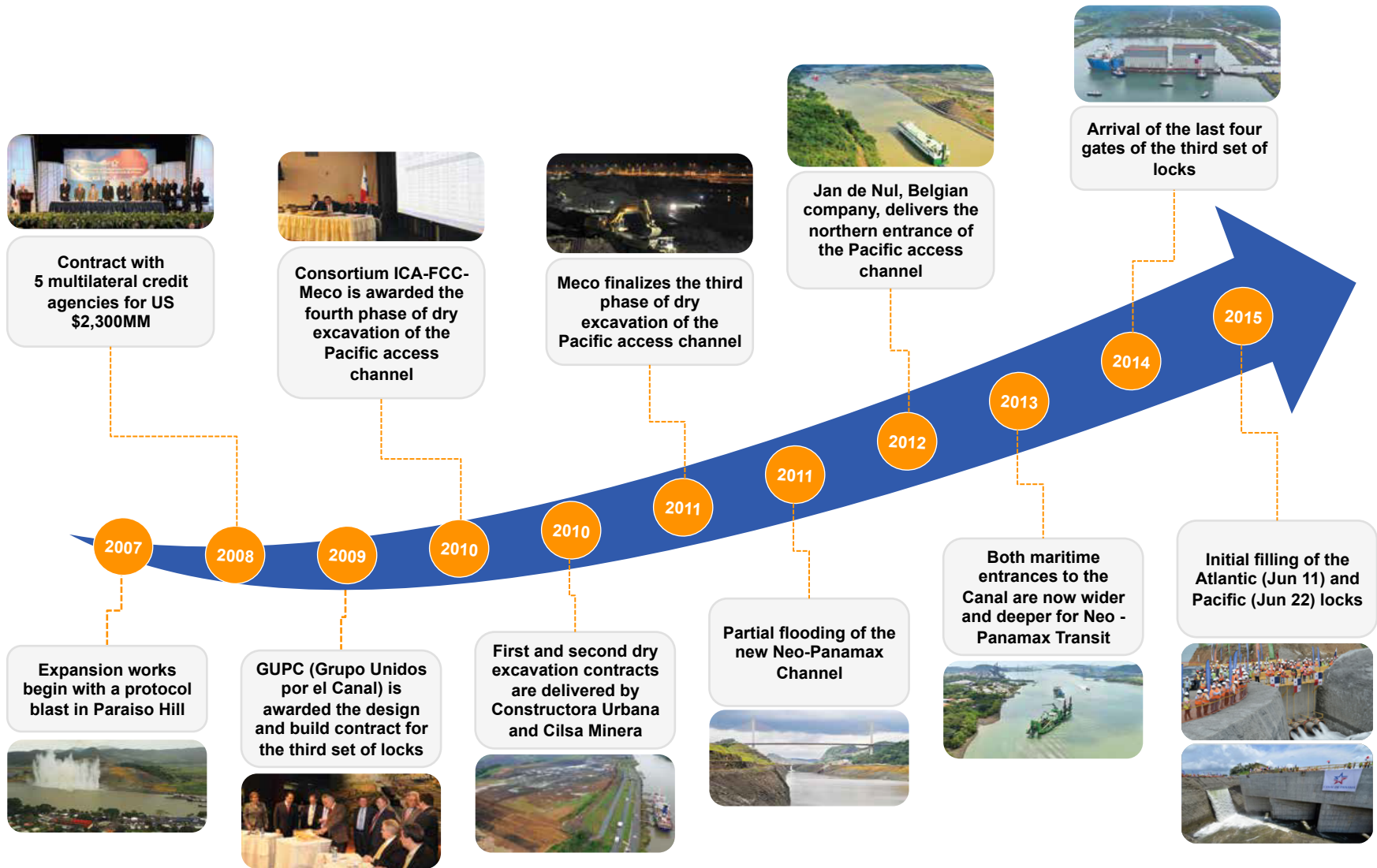
The Expansion will create a new lane of traffic along the Canal through a new set of locks, doubling the waterway's



The locks work as steps for ships to navigate above sea level (lakes level)

20 Source: ACP  
 (1) As of September 30, 2014  
 (2) Container cargo market share on the Northeast Asia to U.S. East coast route in 2013  
 (3) ACP preliminary estimation  
 (4) As of June 30, 2015

# Key Milestones of the Canal's Expansion



# The New Locks

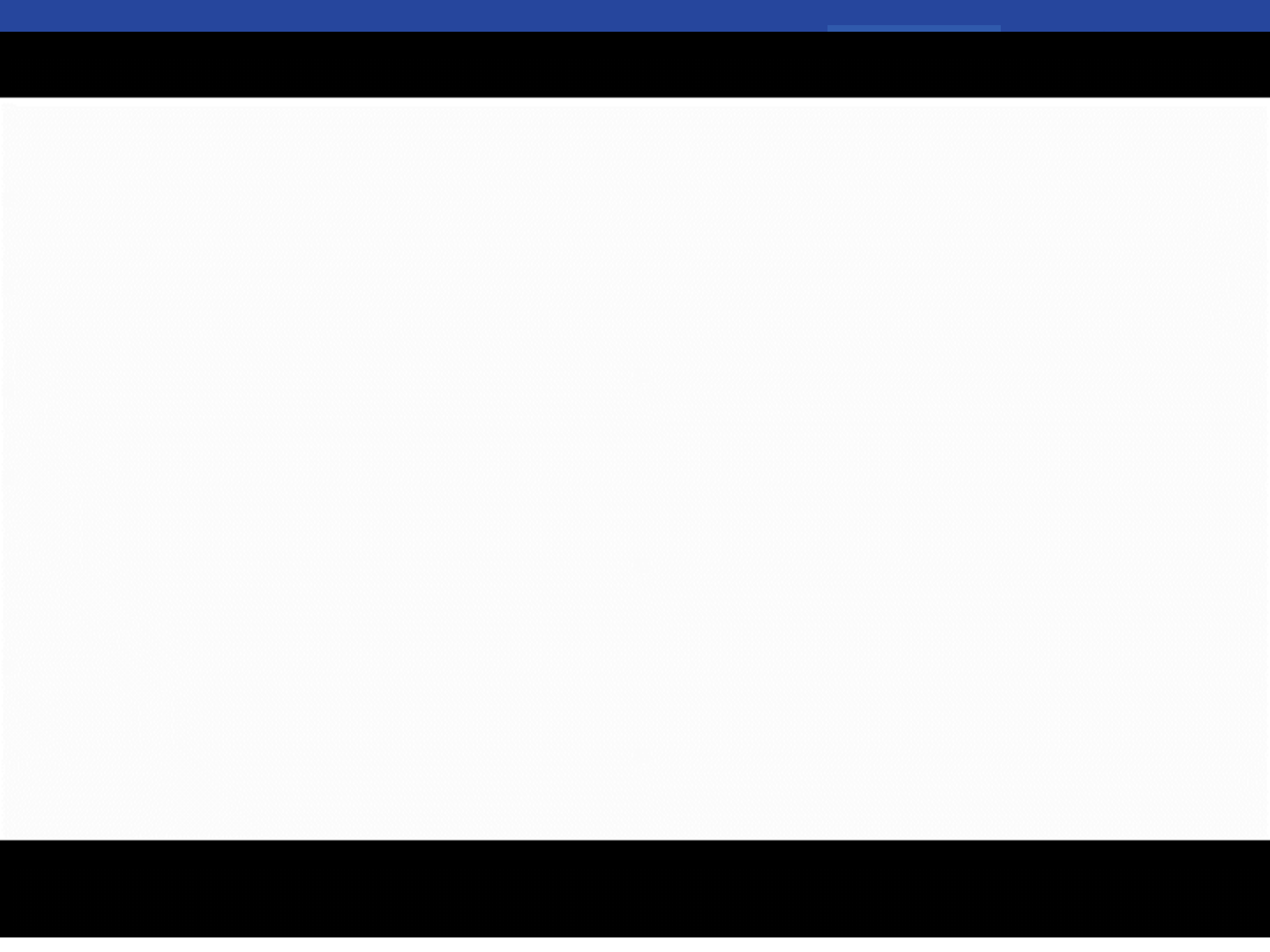


## Atlantic Locks



## Pacific Locks





# Panama Canal Expansion Milestone: Filling of the Atlantic Locks Complex





# Panama Canal Expansion Moves Ahead with Filling of New Pacific Locks



The intricate filling process will make use of powerful electric and diesel pumps, designed specifically for the job. The electric pumps are expected to provide 30,000 gallons of water per minute each, while an added network of 13 diesel pumps will work to pump 7,000 gallons of water per minute each, filling the lower chamber at a rate of nine inches per hour.

The filling and subsequent testing of the new Pacific locks is expected to take approximately 90 days to complete.

June 22, 2015

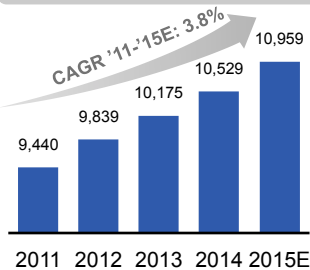
# Successful tests of the gate operation in the Atlantic Side

**June 23, 2015**

**The gates have buoyancy tanks that allow them to weigh 15% of their actual weight inside the water-filled new locks.**

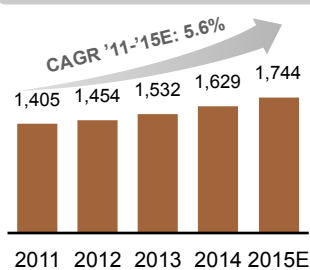


## Seaborne Trade (Mt)



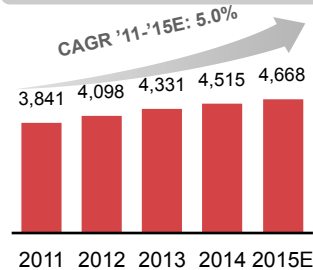
- Alliances, mergers and vessel sharing agreements will dominate the global maritime market pursuing a more competitive status
- Raising oversupply will lead to more market consolidation impacting negatively on the deployed capacity and cargo volume
- Positive impact from the 2015 U.S. west coast port labor negotiations, resulting in cargo diversion through the Panama Canal

## Container Trade (Mt)



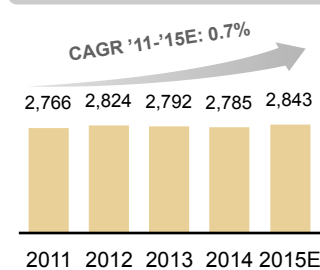
- A major part of Panama Canal tolls comes from this segment
- World demand for containerized cargo will continue its increasing trend at an average growth of 5%
- Containerized cargo volumes for U.S. will keep its positive trend, with a sustained recovery of 3.4%
- Delivery of Neo and Post-panamax vessels will continue putting pressure on vessel deployment in favor of the Panama Canal by increasing its average vessel size

## Dry Bulk Trades (Mt)



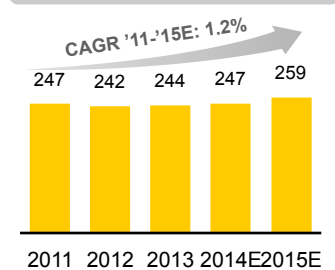
- With the Canal's Expansion, moderate growth of thermal coal & metallurgical coal movements are expected due to economies of scale
- Good grain harvest outlook for the U.S. and the development of port terminals in Northern Brazil may stimulate a grain route through the Panama Canal to Asia
- Ballast transits levels are expected to remain low given the current downward freight market
- China's slow growth will impact seaborne trade of raw materials

## Oil Trades (Mt)



- The U.S. is expected to continue exporting condensed ultralight oil to Asia, increasing transits through the Panama Canal
- With the Expansion, oil flows from Colombia and Venezuela to Asia will be in Neopanamax vessels
- Increased demand in Europe, decreases shipments of petroleum products from the Panama Canal
- Crude exports from Ecuador to the Gulf of Mexico stimulates shipments through the Panama Canal
- Competitive LPG prices from the U.S. will impact positively flows through the Panama Canal into Asia

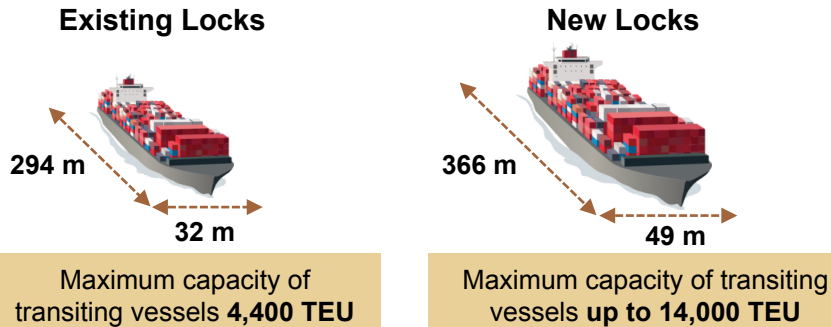
## LNG Trades (Mt)



- Shale Gas revolution has turned the U.S. into a net exporter of LNG
- Main flows expected to come from the Gulf of Mexico to Asia via the Panama Canal

# The Expansion will Significantly Enhance the Canal's Global Competitive Position

## Relevant Vessel Capacity Increase



## Operational Optimization with Economies of Scale



Economies of scale - Efficiencies in the supply chain – Connectivity

Higher capacity to strengthen ACP's market position

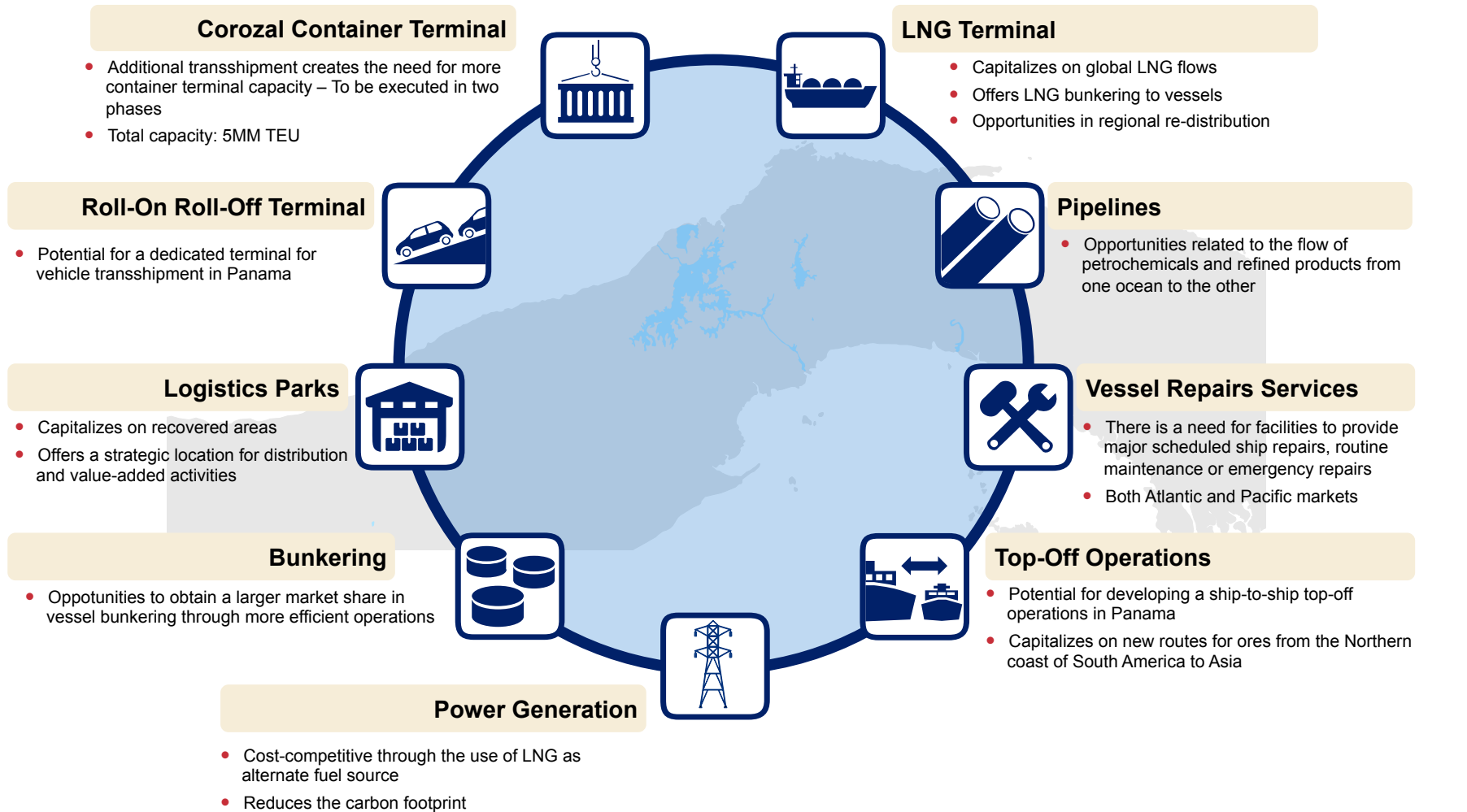
## Increasing Market Participation Persuading New Players to Consider the Panama Canal Route

- The Expansion will increase attended vessels from 294 to 366 mts
- Transported capacity increase from 4,400 TEU to 14,000 TEU
- Increase Canal's cargo market share to ~50% in one of the main seaborne routes<sup>(1)</sup>
- Just-in-time; Reservation System

Container Vessels	Dry Bulk	Liquid Bulk	LNG/LPG
<p><b>Up to 14,000 TEU new volumes from:</b></p> <ul style="list-style-type: none"> <li>● Latin America</li> <li>● Recover market from: West Coast United States</li> <li>● Suez Canal</li> </ul>	<p><b>Up to 170,000 DWT</b></p> <ul style="list-style-type: none"> <li>● Coal from Colombia</li> <li>● Metalurgical coal from Vancouver</li> <li>● Iron Ore from Brazil in Minicapesize (85,000-120,000 DWT)</li> </ul>	<p><b>Up to 150,000 DWT</b></p> <ul style="list-style-type: none"> <li>● Tankers</li> <li>● Petroleum Products</li> </ul>	<p><b>LNG Up to 177,000m<sup>3</sup> and VLGC</b></p>

# Panama Canal's Diversification Strategy





**Thank you!**

