



Best practices for improving coordination at Ports

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1. Port of Busan & Busan Port Authority

2. Main initiatives for the efficiency & coordination

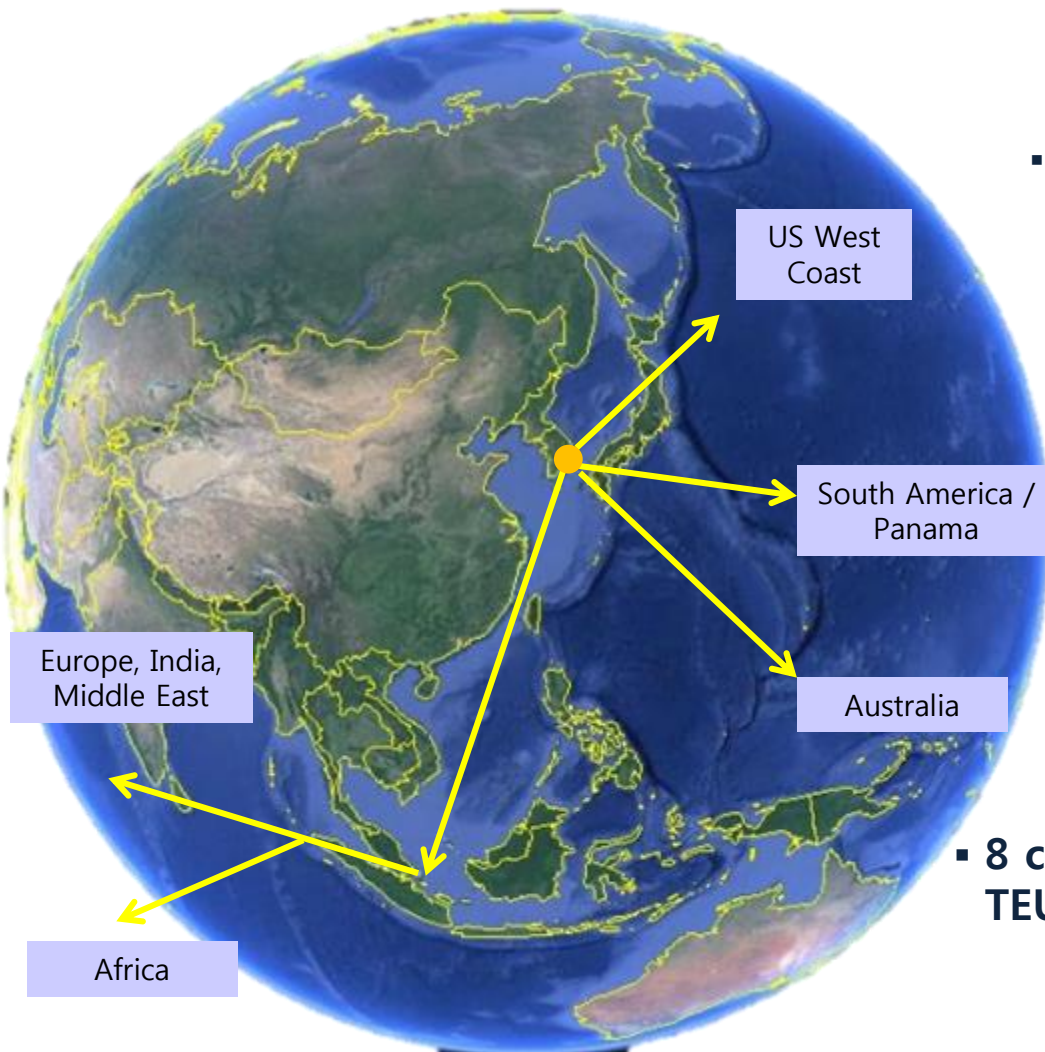
3. Achievement & Challenges

Port of Busan : Geographical location

- Strategically located between two countries, China and Japan
- Having 25% of world population, 20% of world GDP within 3 hours' flight distance



Port of Busan :Location & Connectivity



- In 2017, **56 container carriers** in total used Busan as **transshipment hub**

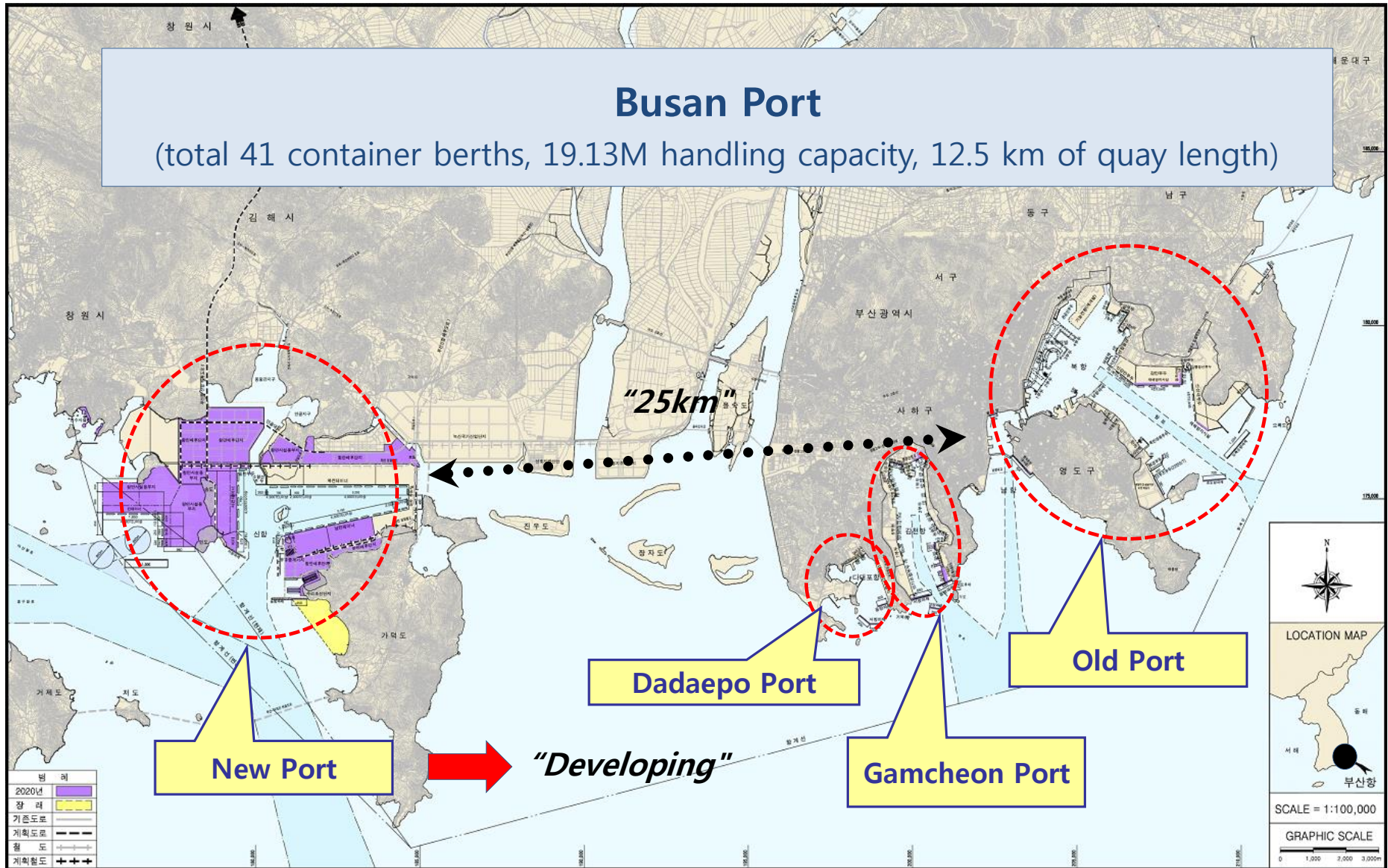
- **29 carriers** handled more than **10.000 TEU transshipment moves**

- **19 carriers** handled more than **100.000 TEU transshipment moves**

- **8 carriers** handled more than **½ million TEU transshipment moves**

Port of Busan

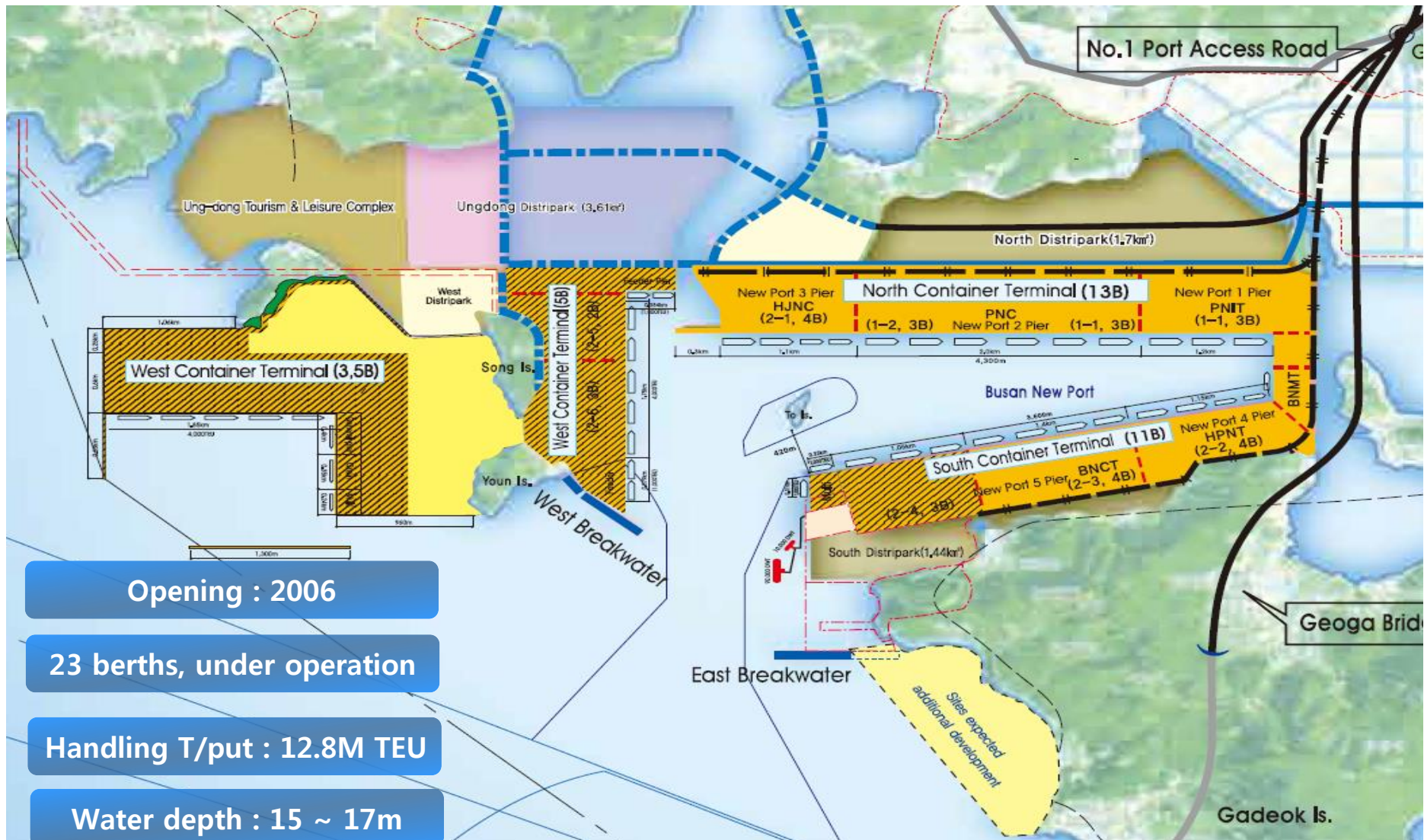
Busan Port
(total 41 container berths, 19.13M handling capacity, 12.5 km of quay length)



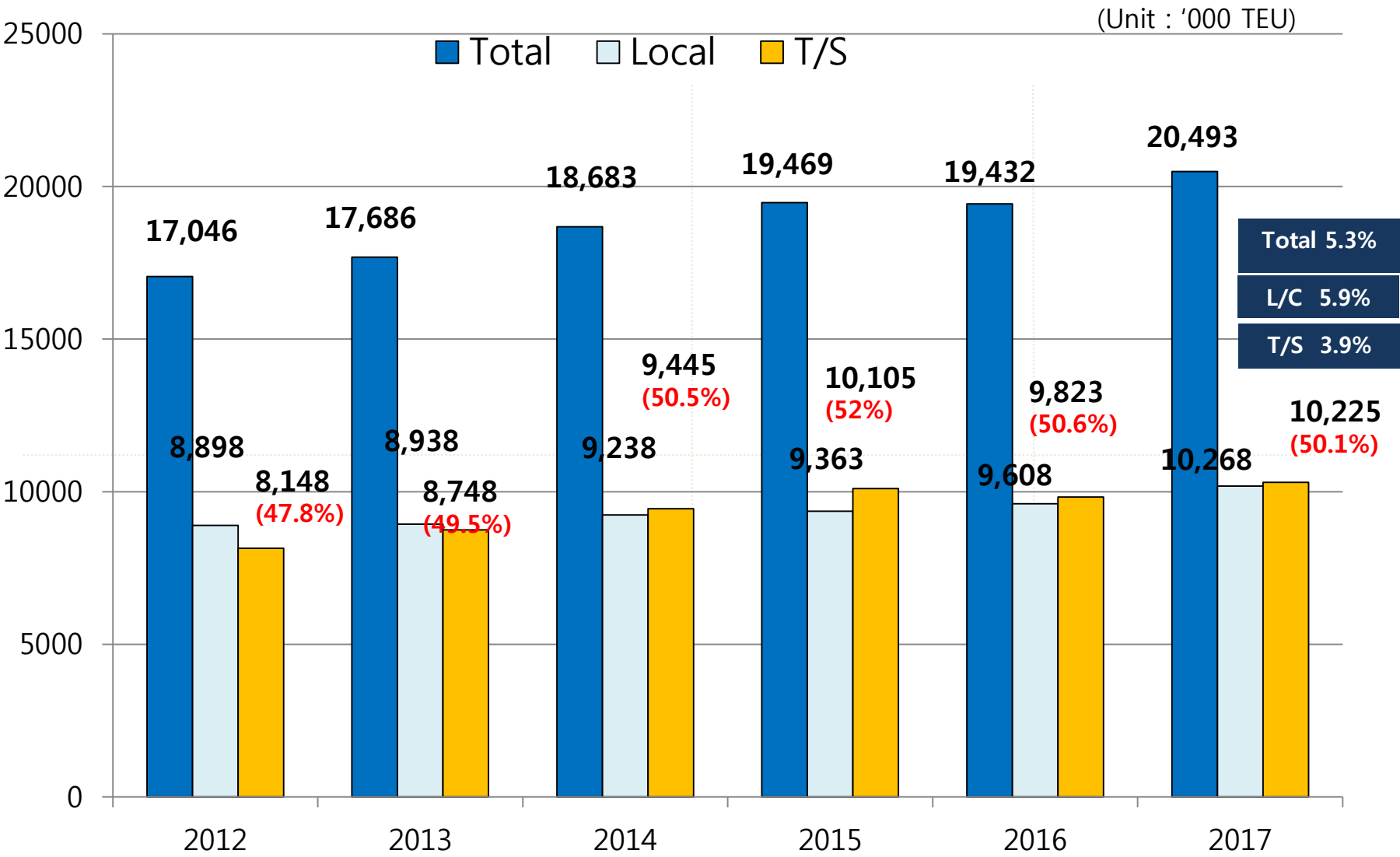
Busan Old Port



Busan New Port



Busan Port t/put



Busan Port t/put by country

- Top three nations(CHN, USA, JPN) account for 55% of total volume

- 47.2% of L/C cargo, 61.1% of T/S cargo

(Unit : TEU, %)

Country	2016			2017			Growth rate(%)		
	TTL	Gateway	T/S	TTL	Gateway	T/S	TTL	Gateway	T/S
CHINA	4,904,803	1,857,156	3,047,647	5,101,802	1,991,425	3,110,377	4.02	7.23	2.06
US	2,834,482	1,341,152	1,493,330	2,987,284	1,461,611	1,525,673	5.39	8.98	2.17
JAPAN	2,811,006	1,340,600	1,470,406	2,938,105	1,346,642	1,591,463	4.52	0.45	8.23
CANADA	520,963	193,610	327,353	689,108	238,469	450,639	32.28	23.17	37.66
VIETNAM	545,213	341,375	203,838	600,522	381,962	218,560	10.14	11.89	7.22
MEXICO	541,286	310,540	230,746	541,686	311,014	230,672	0.07	0.15	-0.03
RUSSIA	370,477	154,976	215,501	470,078	192,015	278,063	26.88	23.9	29.03
THAILANDS	346,998	161,369	185,629	411,203	181,988	229,215	18.5	12.78	23.48
INDIA	382,138	267,920	114,218	387,669	277,569	110,100	1.45	3.6	-3.61
INDONESIA	344,457	170,881	173,576	359,036	172,954	186,082	4.23	1.21	7.2

Busan Port : Transshipment hub port

(Unit : ,000 TEU, %)

No.	Port	t/put(2016)	T/S Volume	T/S Shares
1	Singapore	30,904	26,268	85.0
2	Busan	19,373	9,797	50.6
3	Port Kelang	13,167	9,064	68.6
4	Tanjung Palepas	8,029	7,545	94.0
5	Jabel Ali(Dubai)	14,772	7,238	49.0
6	Hong Kong	19,813	5,060	30.7

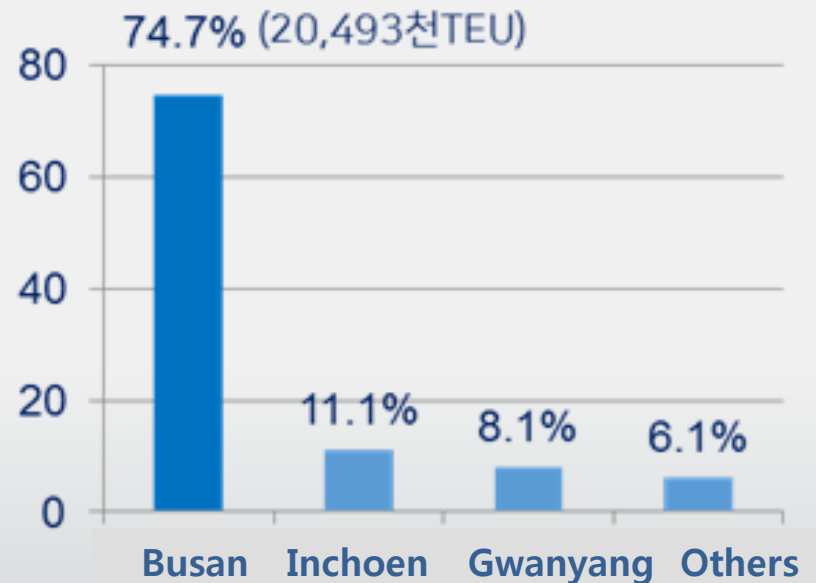
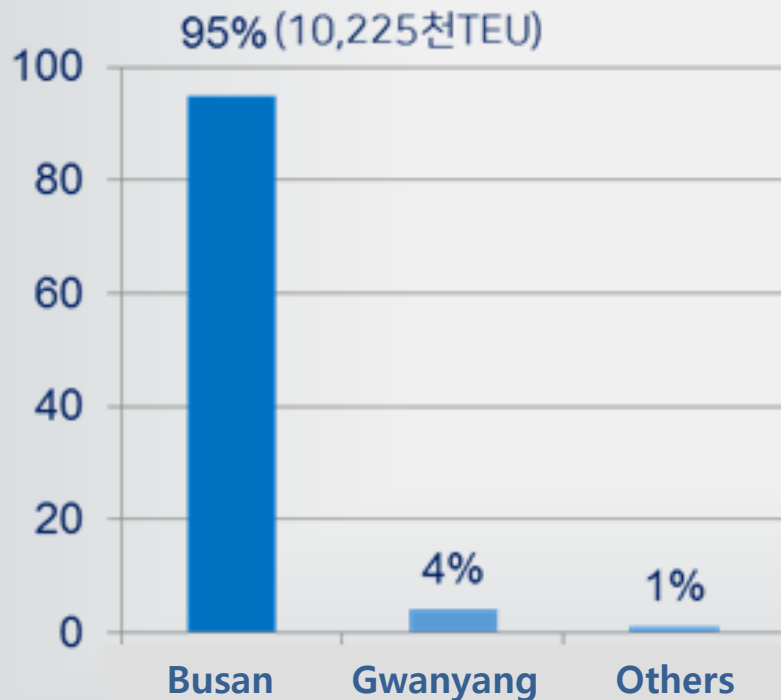
* Source : Drewry, Container port review & forecast(2017/2018)

** Hong Kong, converted mid-stream cargo from T/S to gateway cargo

Port of Busan

Korea's No.1 container port

- 75% of Korea's total cargo(27.42M teu)
- 95% of Korea's total T/S



Busan Port Authority

Busan Port Authority

- Established in Jan, 2004 as a state-owned company under the Port Authority Law
- As a landlord, main income comes from terminal lease fees (44%), port dues(30%), and others(26%)
- Makes efforts to diversify the business portfolio

Construction of Busan
New Port

Old port
redevelopment

Distripark
development



1. Port of Busan Port & Busan Port Authority

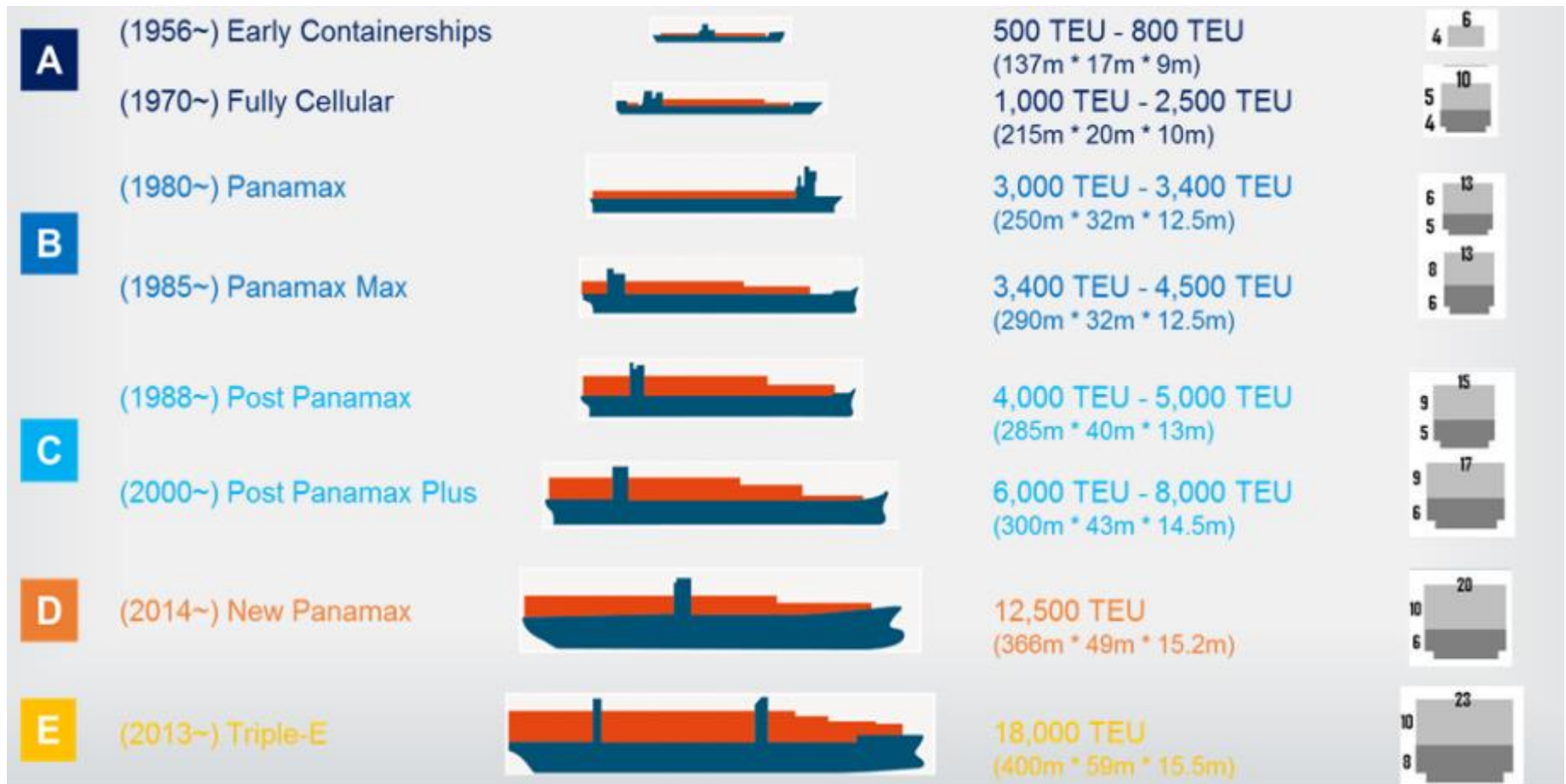
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3. Achievement & Challenges

Current environment the port industry

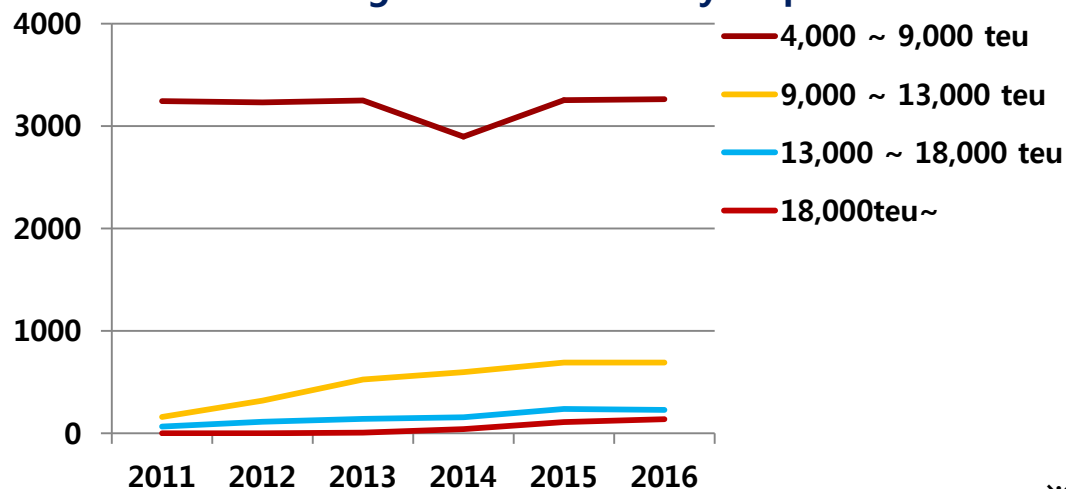
Advent of mega vessel

- Economies of scale, facilitating the consolidation among carriers
- More than 62 vessels of 18,000TEU, employed into the market in 2-3 years



Large vessels' calling at Busan Port

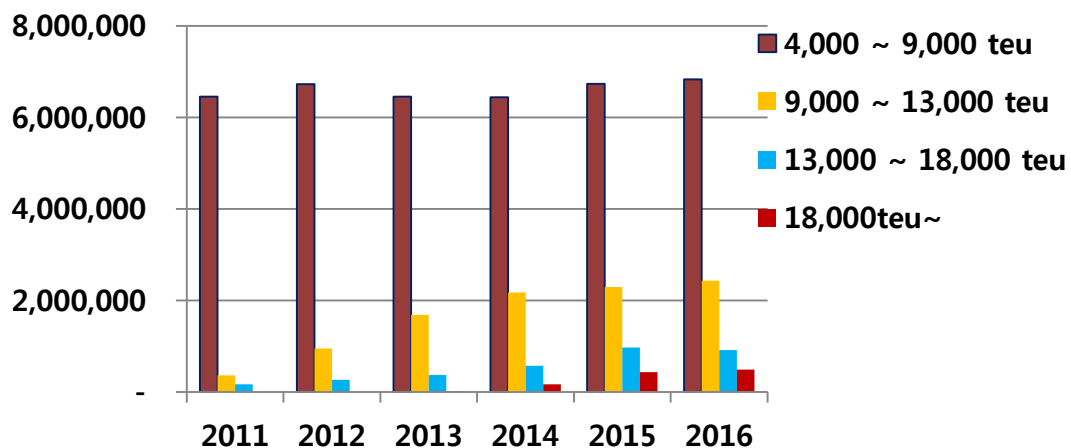
<A number of callings at Busan Port by ship size >



Year	4,000~ 9,000 teu	9,000~ 13,000 teu	13,000~ 18,000 teu	18,000 teu~
'11	3,245	159	66	-
'12	3,230	318	114	-
'13	3,250	526	141	7
'14	2,896	596	156	41
'15	3,254	690	238	108
'16	3,263	692	227	137

※ Assumption : Port MIS data(GT) converted to TEU

<A CNTR volume handled in Busan Port by ship size >



Year	4,000~ 9,000 teu	9,000~ 13,000 teu	13,000~ 18,000 teu	18,000teu ~
'11	6,455,955	360,671	164,635	-
'12	6,727,617	949,095	263,873	-
'13	6,458,203	1,682,134	372,709	21,000
'14	6,440,472	2,177,038	573,015	168,946
'15	6,736,583	2,294,439	971,404	432,589
'16	6,830,242	2,430,821	918,059	486,794

※ Assumption : Port MIS data(GT) converted to TEU

Continuous investment

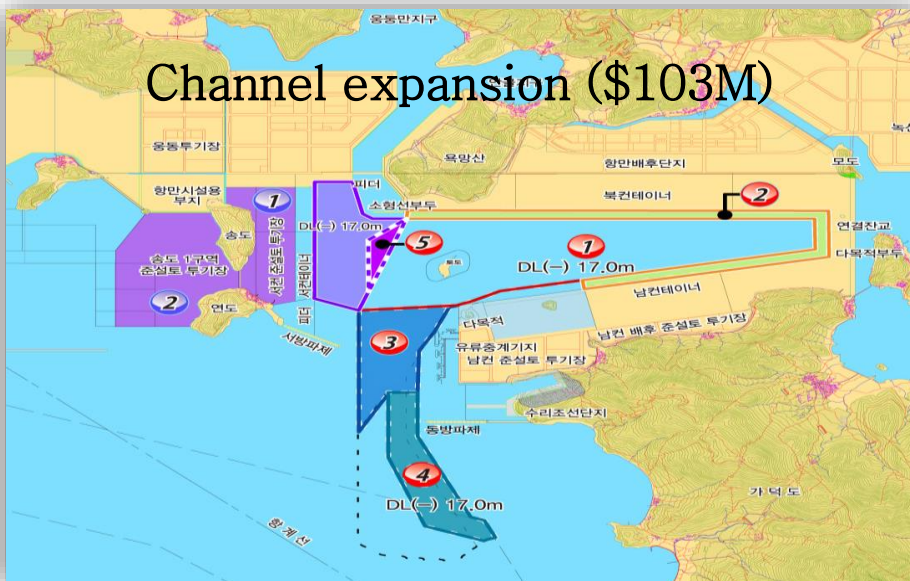
West Terminal
(DL(-20M))



Removal of “To” Island (\$309M)



Channel expansion (\$103M)



<Port perspective>

- Huge investment for port construction (dredging, quay wall, etc.)
- Equipment, yard investment
- Social cost(traffic..)
- Environment issue

Global Port Community Cooperation

To share the current challenges and difficulties of each port

▪ Chain Port

- Busan, LA, Singapore, Shenzhen, Antwerp, Felixstowe, Hamburg, etc

▪ PAR(Port Authority Round Table) : 18 Ports and Countries/State

- Busan, Rotterdam, Long Beach, Houston, NY/NJ, Hamburg, Antwerp, Singapore, Tokyo, Shanghai, Ningbo, Guangzhou, Port Kelang, others

▪ IAPH(International Association of Ports and Harbors)

- 180 ports in 90 countries
- Largest Global Port Alliance(NGO)
- Established in 1955

Initiative for GHG Emission reduction

Busan Port GHG Emission

** Researched by the internal research team of BPA*

Emission from Vessel

	GHG Emission / annual / ton					
	CO2	NOx	NH ₃	SOx	PM	VOC
Arrival & Departure	55	737	-	738	25	-
During dockage	1,177	17,692	-	15,446	441	-
Total	55	737	-	16,184	25	-

Emission from equipment

		GHG Emission / annual / ton					
		CO2	SOx	NOx	PM ₁₀	PM _{2.5}	VOC
Equipment	Container terminal	775	1,314	3,580	274	257	323
	General piers	24	43	117	9	8	11
Total		799	1,357	3,697	283	265	334
Road Trailer		710	1,253	3,410	260	242	309
Total		1,509	2,610	7,107	543	507	643

Initiatives for GHG Emission reduction

AMP

- SOx emitted from vessels accounts for more than 60% of the total in Busan.
- Required to take measures with providing AMP during the vessels' dockage.

LNG

- LNG, alternative energy for the vessels.
- In response of it, it requires to review and study how to provide LNG bunkering facilities.

Port equipment

- As of now, only 40% of equipment has been transferred into eco-friendly power system.
- More investment and detailed studies are required.

Port of Busan, on the process of implementation, is needed to get more support and coordination from the ports from the world

Port Digitalization

Digitalization

- To proactively react to the digitalization of port and shipping industries
- To support the port users by adopting the digitalization at port

Combining and sharing data with port users(carriers, shippers, terminal operators, logistics companies), imperative to secure the port's competitiveness

➤ Digital transformation strategy

- **Building the logistics service platform by sharing integrated data**
 - Platform like Data Factory for integrating and sharing data from different systems
 - re-establishment of data code system
 - Developing a platform for sharing the port's all logistics sources
 - Platform conducting logistics deal process on Block chain
 - secure transparency and security of electronic transaction

Port Call Optimization



- Global standardization of port information
- To optimize vessel and port operations and do away with the inefficiencies.

- Use of different standards and identifiers for locations port to port
- Shipping is using up to 700 different ports, impossible to connect to so many standards
- Data is often collected through 3rd parties, not through the information owner. So data becomes corrupt with lack transparency
- Less efficient communication



- The definition covered are broadly divided into three sectors
 - (1) those used during a vessel's call such as berth and depth
 - (2) the minimum general terms a port should provide on itself
 - (3) those covering events recorded during the vessel's call at the port (the arrival, departure time>

PCO Project



Development plan

- Agree on business process of port calls
- Agree on minimum scope of data
- Agree on functional definitions
- Use of functional definitions by industry
- Agree on data model and formats
- Use of data model and formats by industry
- Agree on ISO label
- Use of ISO label by industry
- Local roll out by industry
- Global roll out by industry

International Taskforce Port Call Optimization

<p>Shipping</p>  <p>MAERSK, Shell, MSC, Inchcape Shipping Services, Vopak, CMA CGM</p>	<p>Endorsers</p>  <p>Lloyd's List Intelligence, BIMCO, IALA, UK P&I CLUB, etc.</p>
<p>Standards</p>  <p>United Kingdom Hydrographic Office, GS1</p>	<p>Ports</p>  <p>Port of Rotterdam, MPA Singapore, Algeciras Port, BPA, etc.</p>

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Achievement & challenges

Achievement

Port community

Digitalization & GHG

PCO Projects (BP)

Challenges

Port, under presented

PA, as Landlord

Strong commitment

“Needs to get the cross industries involved in all the initiatives for better coordination at ports”



Thanks

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