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ΠΤΥΧΙΑΚΗ ΕΡΓΑΣΙΑ

ΕΠΙΒΛΕΠΩΝ ΚΑΘΗΓΗΤΗΣ : ΞΕΝΙΤΙΔΟΥ ΕΛΛΗ

ΘΕΜΑ

“THE TEN MOST IMPORTANT PORTS IN THE WORLD”

**ΤΟΥ ΣΠΟΥΔΑΣΤΗ : ΤΡΙΑΝΤΑΦΥΛΛΙΔΗ ΓΡΗΓΟΡΙΟΥ
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CHAPTER 1 – INTRODUCTION

The main objective of the following dissertation is not to compare but to enlist together, ten of the most important ports worldwide depending on their own information, such as : level of commercial activity, shipping in tonnage movements, statistic researches from the recent-and not only-past with, sometimes, descriptive graphs, special features and characteristics both general and structural.

The Reader will notice a detailed but not inordinate presentation that relies on as many different topics as possible, used as a description compass for each and every port mentioned in the sequence, moreover photographic material is available as a closure to this Graduation Thesis.

CHAPTER 2 - PORT OF FELIXSTOWE, UNITED KINGDOM

The **Port of Felixstowe**, in Felixstowe, Suffolk is the United Kingdom's busiest container port, dealing with over 40% of Britain's containerized trade. In 2011, it was ranked as the 35th busiest container port in the world and Europe's sixth busiest. The port handled 3.74 million twenty-foot equivalent units (TEU) of traffic in 2011.

The port is operated by the Felixstowe Dock and Railway Company which was set up under an Act of Parliament, the Felixstowe Railway and Pier Act 1875 and so, is one of the few limited companies in the UK that do not have the word "Limited" in their name. Much of the land on which it sits is owned by Trinity College, Cambridge which in the 1930s bought some land near Felixstowe which included a dock which was too small to be included in the National Dock Labour Scheme.

In 1967, it set up Britain's first container terminal. The dock was developed into Britain's largest container port. In terms of freight volumes, Felixstowe is Britain's largest port handling 42% of Britain's container trade.

Felixstowe is owned by Hutchison Port Holdings (HPH) Group. The port has always been privately owned. In 1951, Gordon Parker, an agricultural merchant, bought the Felixstowe Dock & Railway Company, which at the time was handling only grain and coal. In 1976, Felixstowe was bought by European Ferries. In June 1991, P&O sold Felixstowe to Hutchison Whampoa of Hong Kong for £90m. In June 1994, Hutchison Whampoa's Hutchison International Port Holdings bought out Orient Overseas International's 25% stake in Felixstowe for £50m.

The port has its own Port of Felixstowe Police, fire, and ambulance services.

2.1_ DESCRIPTION

2.1.1_ TERMINALS

The port has two main container terminals, **Trinity** and **Landguard** as well as a RO-RO terminal.

There is a continuous quay of over 2.3 kilometers (1.4 mi), equipped with 29 ship-to-shore gantry cranes. The main navigation channel is dredged to 14.5 meters below chart datum, with a maximum depth of 15 meters alongside the quay. This allows Felixstowe to accommodate the world's latest generation of deep-draughted post-Panamax vessels. It will also most likely accommodate the much larger Maersk Triple E class, launched in 2013 and capable of carrying 18,000 TEUs.

2.1.2_TRANSPORT CONNECTIONS

The A14 connects the port to the English Midlands via the M6, the north via the M1 and M6 and A1 and via the A12 to London.

Each terminal has its own rail terminal which connects to the Felixstowe Branch Line.

2.2_CURRENT DEVELOPMENTS

2.2.1_FELIXSTOWE SOUTH

In 2008, work began on the construction and reconfiguration of Felixstowe South terminal creating 1,300 m of quay served by 13 new ship-to-shore gantry cranes. Work will be carried out in two stages with 750 m of sea wall complete by the end of 2010 and stage which is expected to open in 2014. This new terminal will have a clearance of 16 m and gantries suited for extra large box carriers.

2.2.2_FELIXSTOWE AND NUNEATON FREIGHT CAPACITY SCHEME

The railway track between Felixstowe and Nuneaton has been upgraded to allow for more freight trains by clearing the route to W10 loading gauge, allowing 'Hi-cube' shipping containers to be carried between the Port of Felixstowe and the West Coast Main Line at Nuneaton. The West Coast Main Line had previously been cleared to W10 and the route from Nuneaton to Birmingham was already cleared to W12.

This work will accommodate additional freight traffic as a result of 'Felixstowe South' expansion at the Port of Felixstowe. It will also allow the newer high-cube containers to be carried by train - and the percentage of these containers is expected to increase from 30% in 2007 to 50% in 2012. Network Rail completed the gauge enhancement from Ipswich to Peterborough in 2008. Work should be completed by 2014 at an estimated cost of £291 million.

2.2.3_COPDOCK ROUNDABOUT AND GENERAL TABLE

As part of the Felixstowe South development, Hutchinson Ports will provide financial support intended to increase capacity at the Copdock interchange (J55) between the A14 and the A12.



Location	
Country	United Kingdom
Location	Felixstowe
Coordinates	 51.9529°N 1.3095°E
Details	
Opened	1875
Operated by	Felixstowe Dock and Railway Company
Owned by	Hutchison Port Holdings
Type of harbor	Container port
Size	3,383 ha (8,360 acres)
Available berths	9
Employees	2,500 (2014)
Chief Executive Officer	Clemence Cheng
Statistics	
Vessel arrivals	3,000 sea ships
Annual containervolume	 3,7 million TEU
Website	www.portoffelixstowe.co.uk

CHAPTER 3 – PORT OF HAMBURG, GERMANY

The **Port of Hamburg** (German mostly: *Hamburger Hafen*) is a port in Hamburg, Germany, on the river Elbe. The harbour is located 110 kilometers from the mouth of the Elbe into the North Sea.

It is named Germany's "Gateway to the World" and is the largest port in Germany. In terms of TEU throughput, the port of Hamburg is the third-busiest port in Europe (after the ports of Rotterdam and Antwerp) and 15th-largest worldwide. In 2011, 9 million TEUs (20-foot standard container equivalents) were handled in Hamburg.

The harbour covers an area of 73.99 km² (64.80 km² usable), of which 43.31 km² (34.12 km²) are land areas. The location is naturally advantaged by a branching Elbe, creating an ideal place for a port complex with warehousing and transshipment facilities. The extensive free port enabled toll-free storing, but this was abandoned in 2013.

3.1 HISTORY

The port is almost as old as Hamburg itself. Founded on 7 May 1189 by Frederick I for its strategic location, it has been Central Europe's main port for centuries and enabled Hamburg to develop early into a leading city of trade with a rich and proud bourgeoisie.

During the age of the Hanseatic League from the 13th to 17th century, Hamburg was considered second only to the port and city of Lübeck in terms of its position as a central trading node for sea-borne trade.

During the second half of the 19th century, Hamburg became Central Europe's main hub for transatlantic passenger and freight travel, and from 1871 onward it was Germany's principal port of trade. In her time the Hamburg America Line was the largest shipping company in the world. The Free Port, established on 15 October 1888, enabled traders to ship and store goods without going through customs and further enhanced Hamburg's position in sea trade with neighbouring countries. The Moldauhafen has a similar arrangement, though related to the Czech Republic exclusively.

The *Speicherstadt*, one of Hamburg's architectural icons today, is a large wharf area of 350,000 m² floor area on the northern shore of the river, built in the 1880s as part of the free port and to cope with the growing quantity of goods stored in the port.

Hamburg shipyards lost fleets twice after WWI and WWII, and during the partition of Germany between 1945 and 1990, the Port of Hamburg lost much of its hinterland and consequently many of its trading connections. However, since German reunification, the fall of the Iron Curtain and European enlargement, Hamburg has made substantial ground as one of Europe's prime logistics centers and as one of the world's largest and busiest sea ports.

3.2_ACCESS

Deepening of the river Elbe for large vessels is controversial for ecological reasons. In part due to cooperation with Lower Saxony and Bremen to build a new container port (JadeWeserPort) in the deep waters of Jadebusen in Wilhelmshaven, Hamburg withdrew from this plan after a change of government in 2001.

3.3_TERMINALS (TABLE)

Port	Operator	Type	Berths	Quay length	Quay cranes	Area (Ha)	Capacity (kTEU)
EUROGATE Container Terminal Hamburg (CTH)	Eurogate	Containers	6	2,050 m	21	140	2,900
Container Terminal Altenwerder (CTA)	HHLA	Containers	4	1,400 m	26	110	> 3,000
Container Terminal Burchardkai (CTB)	HHLA	Containers	8	2,850 m	22	140	5,200
Container Terminal Tollerort (CTT)	HHLA	Containers	4	1,240 m	12	40	950
Buss Hansa Terminal		Multi-Purpose		840 m	9	30	
Buss Ross Terminal		Multi-Purpose		230 m	1		
Steinweg		bulk cargo		1,150 m	4		250
Buss Hansa Terminal		liquid		840 m			

		cargo					
Elbe Mineralölwerke	Royal Dutch Shell	liquid cargo					8/ship
Vopak Terminal Hamburg	Vopak	liquid cargo		840 m	9	720,000 cbm	5,000

3.4_CRUISE

Hamburg is a major cruise destination and one of Europe's largest ports of call for cruise passengers traveling the Atlantic, or the Norwegian and Baltic Seas. The port is also a major location for shipbuilder and shipyards, designing, building and reconditioning yachts and cruise liners. Hamburg has two passenger terminals for cruise ships: Hamburg Cruise Center HafenCity and Hamburg Cruise Center Altona, both capable of processing the world's largest cruise ships.



Panoramic view of Hamburg Harbour as seen from atop of Dockland Hamburg

3.5_CULTURE AND GENERAL TABLE

The Port of Hamburg is also one of Hamburg's largest attractions, both as a living, industrial and logistic center but also as a backdrop for modern culture and the ports history. Among these are various museum ships, musical theaters, bars, restaurants and hotels - and even a floating boat church.

The annual celebration of the harbour's birthday (*Hafengeburtstag*) during the first weekend of May is one of Hamburg's biggest public events. Visitors come from all

over Germany and Europe to experience the festivities. Tugboats perform "ballets", old galleons and new cruise ships are open for tours, and fireworks explode at night. Tour guides on boat tours in the harbour are called he lüchts (Low German for *he is lying*) after an often used call of dock workers when they overheard the stories told to tourists.

GENERAL TABLE

Location	
Country	Germany
Location	Hamburg
Details	
Opened	7 May 1189 by Frederick I
Operated by	Hamburg Port Authority Hamburger Hafen und Logistik AG (HHLA)
Owned by	Hamburg Port Authority
Type of harbor	Artificial
Land area	43.31 km ² (16.72 sq mi)
Size	73.99 km ² (28.57 sq mi)
Employees	10,000 (2004)
Statistics	
Vessel arrivals	▲ 10,106 (2011)
Annual cargo tonnage	▲ 132.2 million tonnes (2011)

Annual container volume	▲ 9 million TEU (2011)
Annual revenue	▲ €44.4 million (2004)
Main trades	basic pharmaceutical materials, coffee, spice, carpets, paper
Website	
www.hafen-hamburg.de	

CHAPTER 4 – PORT HEDLAND, WESTERN AUSTRALIA

Port Hedland is one of the largest iron ore loading ports in the world and the largest in Australia. In 2011 it had the largest bulk cargo throughput in Australia.

4.1 HISTORY

Named after Captain Hedland, the Master of a ship that anchored there in 1863, Port Hedland was first developed in order to service the needs of the local pastoral industry in East Pilbara. The first jetty was built in 1896, this was extended in 1908 after the discovery of gold in the Marble Bar area.

Until the 1930s the port was predominantly used to import goods and stores for the local industries and to export pearl, shell, wool, livestock, gold, tin and copper. With the end of WW2 the port began exporting significant amounts of manganese.

The 1960s saw the development of the port by the iron ore and salt industries. Goldsworthy Mining Ltd, a company later absorbed by BHP Billiton dredged an approach channel and turning basin for 65,000 DWT ships. Meanwhile the Leslie Salt Company, later Dampier Salt built a land backed wharf and facilities to aid salt exports and fuel imports.

Further dredging was performed after the Newman Mining Company, later BHP Billiton, chose Port Hedland as its export port. The new works allowed for ships up to 120,000 DWT.

Between the 1960s and today and extensive dredging and building has taken Port Hedland from a convenient anchorage to 15 berths capable of loading various ores and goods onto ships ranging from 25,000 DWT to 320,000 DWT.

In 2005/06 Port Hedland became the first Australian port to export in excess of 100 million tonnes per year. In 2010/11 the port exported a record 199 million tonnes making it the largest exporting port in Australia for bulk cargo.

4.2 ABOUT THE HARBOUR

4.2.1 PORT AUTHORITY

Port Hedland's harbour is managed by the Port Hedland Port Authority, a state government instrumentality. The Port Authority's headquarters, control tower and heliport are at Mangrove Point, just to the west of The Esplanade at the western end of Port Hedland. The tugboat pen, customs office and public jetty are at nearby Laurentius Point. The harbour's wharves are located on both sides of the harbour – Finucane Island to the west and Port Hedland to the east.

4.2.2 GEOGRAPHY

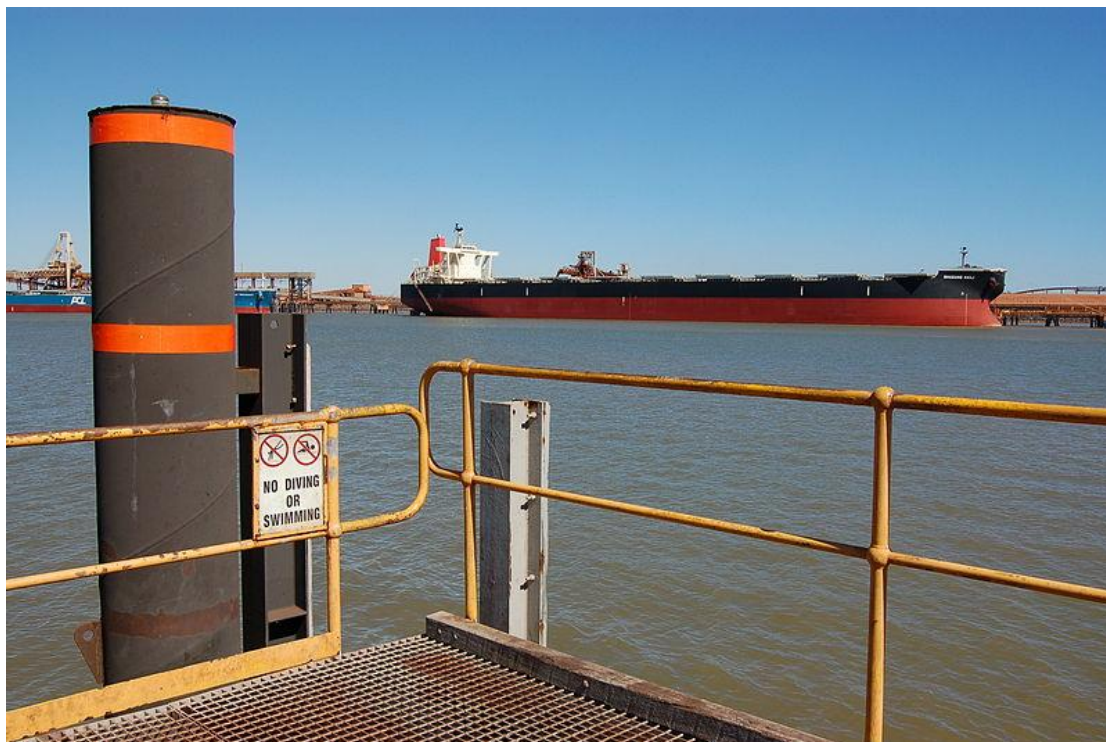
Access by oceangoing vessels into and out of the harbour is via a narrow curved channel. The following series of images depicts a 225 m (246.1 yd) long bulk carrier, *Darya Shanthi*, using the channel to enter the harbour. Visible in the foreground of each image is part of the harbour's system of mangroves.

4.3 PORT STATISTICS 2007-2012 (TABLE)

	2012	2011	2010	2009	2008	2007
Total cargo (tonnes)	246,672,060	199,002,079	178,625,449	159,390,660	130,707,208	111,809,432
<i>Imports</i>						
Sulphuric acid	10,003	6,011	–	73,577	69,649	145,336
Bitumen	–	–	–	3,185	1,284	3,825
Caustic soda	–	4,166	–	7,433	7,032	–
Ammonium nitrate	16,100	–	–	–	389	–
Cement	186,870	98,573	163,604	82,803	25,148	–


Fuel oils	1,216,04 4	988,990	822,794	713,226	619,957	527,256
General & containerised cargo	227,186	172,285	167,796	128,642	70,487	136,022
Total imports (tonnes)	1,656,203	1,270,025	1,154,194	1,008,866	793,946	812,439
<i>Exports</i>						
Iron ore	238,932, 735	192,548,683	173,957,507	153,895,882	125,267,292	106,616,567
Hot briquetted iron	–	–	–	–	–	–
Hot briquetted iron fines	–	–	44,576	324,389	321,702	–
Manganese	1,958,41 9	1,881,708	1,645,950	920,216	1,217,026	1,184,927
Chromite	411,647	173,236	143,421	180,128	209,792	219,337
Copper	433,904	461,383	479,545	423,050	417,075	249,824
Feldspar	–	–	–	–	–	–
Salt	3,197,20 3	2,623,412	1,165,401	2,609,954	2,409,527	2,669,441
Scrap	70,245	39,002	25,150	20,008	39,051	–
Livestock	–	–	7,817	5,825	7,951	6,335
General & containerised cargo	11,703	4,630	1,888	2,342	23,846	50,562
Total exports (tonnes)	245,015,856	197,732,054	177,471,255	158,381,794	129,913,262	110,996,993
<i>Shipping</i>						

Gross registered tonnage	145,056,987	112,081,735	100,040,087	74,012,123	63,614,547	62,370,169
Deadweight tonnage	277,313,992	216,454,152	193,442,785	142,870,875	122,810,231	120,119,965
No. of vessels	1,843	1,474	1,303	1,027	888	925



4.4_GENERAL TABLE

Location	
Country	Australia

Location	Port Hedland, Western Australia
Coordinates	 20°19.0'S 118°34.5'E
Details	
Opened	1896
Operated by	Port Hedland Port Authority
Type of harbor	Seaport
Available berths	12(15)
Statistics	
Vessel arrivals	1,843 (2012)
Annual cargo tonnage	246,672,060 tonnes (2012)
Website	
Port Hedland Port Authority	

CHAPTER 5 – PORT OF JEBEL ALI, UNITED ARAB EMIRATES

Jebel Ali (Arabic: **علي ج بل**) (also sometime written "Mina Jabal Ali") is a deep port located in Jebel Ali Dubai, United Arab Emirates. Jebel Ali is the world's largest man-made harbour and the biggest port in the Middle East. Port Jebel Ali was constructed in the late 1970s to supplement the facilities at Port Rashid.

5.1_GEOGRAPHY

Jebel Ali port is located thirty-five kilometers southwest of Dubai, in the Persian Gulf.

5.2_HISTORY

Jebel Ali Port was constructed in the late 1970s and opened in 1979 to supplement the facilities at Port Rashid. The village of Jebel Ali was constructed for port workers, and it has a population of 300 people. Covering over 134 square kilometres (52 sq mi). It is home to over five thousand companies from 120 countries of the world .With 67 berths and a size of 134.68-square-kilometer (52.00 sq mi), Jebel Ali is the world's largest man-made harbour and the biggest port in the Middle East.

The port of Jebel Ali has become the port most frequently visited by ships of the United States Navy outside the United States. Due to the depth of the harbour and size of the port facilities, a *Nimitz*-class aircraft carrier and several ships of the accompanying battle group can be accommodated pierside. Due to the frequency of these port visits, semi-permanent liberty facilities (referred to by service personnel as "The Sandbox") have been erected adjacent to the carrier berth.

5.3_OPERATIONS

Port Jebel Ali encompass over one million square metres of container yard. It also contains space for medium- and long-term general cargo storage, including seven Dutch barns with a total of almost 19 thousand square metres and 12 covered sheds covering with 90.5 square metres. In addition, Port Jebel Ali also consists of 960 thousand square meters of open storage.

Port Jebel Ali is linked to Dubai's expressway system and to the Dubai International Airport Cargo Village. The Cargo Village facilities capable of handling cargoes, making four-hour transit from ship to aircraft possible. The DPA's commercial trucking service transport container and general cargo transport between Port Jebel Ali, Port Rashid, and the rest of UAE every day.

Jebel Ali port is one of DP World's flagship facilities and have been ranked as 9th in Top Container Port Worldwide having handled 7.62 million TEUs in 2005, which represents a 19% increase in throughput, over 2004. Jebel Ali Port was ranked 7th in the worlds largest ports in 2007. Jebel Ali port is managed by state-owned Dubai Ports World.

5.4_EXPANSION

The expansion of Jebel Ali port commenced in 2001, which is the master plan of the port. The project comprises 15 stages, which will be completed over the decade. The stage one was completed in 2007, which has increased the storage and handling capacity by 2.2 million TEUs and a Quay length of 1,200m.



The entire project includes 2.4 kilometres of new berths, the container yard behind the berths and the supporting infrastructure and buildings necessary for a fully functioning terminal. The new port will be on reclaimed land extending seaward from

the existing port and situated to the west of the Jumeirah Palm Island complex. The expansion of Jebel Ali port is expected to be complete in 2030, raising the total annual capacity to 55m TEUs.

The current plan will multiply the total capacity of Jebel Ali port by more than seven, making it the world's biggest container port, surpassing the ports of Shanghai and Singapore.

5.5_AWARDS AND GENERAL TABLE

On April 9, 2011 Jebel Ali Port has won the Golden Award for Best Seaport Overall from the Higher Committee for UAE Civil Seaports and Airports Security.

Location	
Country	UAE
Location	Dubai
Coordinates	 25.01126°N 55.06116°ECoordinates:  25.01126°N 55.06116°E
Details	
Opened	1979
Operated by	DP World
Available berths	67
Statistics	
Annual cargo tonnage	13.6 million TEU (2013)
Website	www.dpworld.ae/en/home.aspx

CHAPTER 6 – PORT OF SOUTH LOUISIANA, USA

The **Port of South Louisiana** is the largest volume shipping port in the Western Hemisphere and 9th largest in the world. It is one of the largest bulk cargo port in the world.

It extends 54 miles (87 km) along the Mississippi River between New Orleans, Louisiana and Baton Rouge, Louisiana, centering approximately at LaPlace, Louisiana, which serves as the Port's headquarters location.

This port is critical for grain shipments from the Midwest, handling some 60% of all raw grain exports.

6.1_GEOGRAPHY

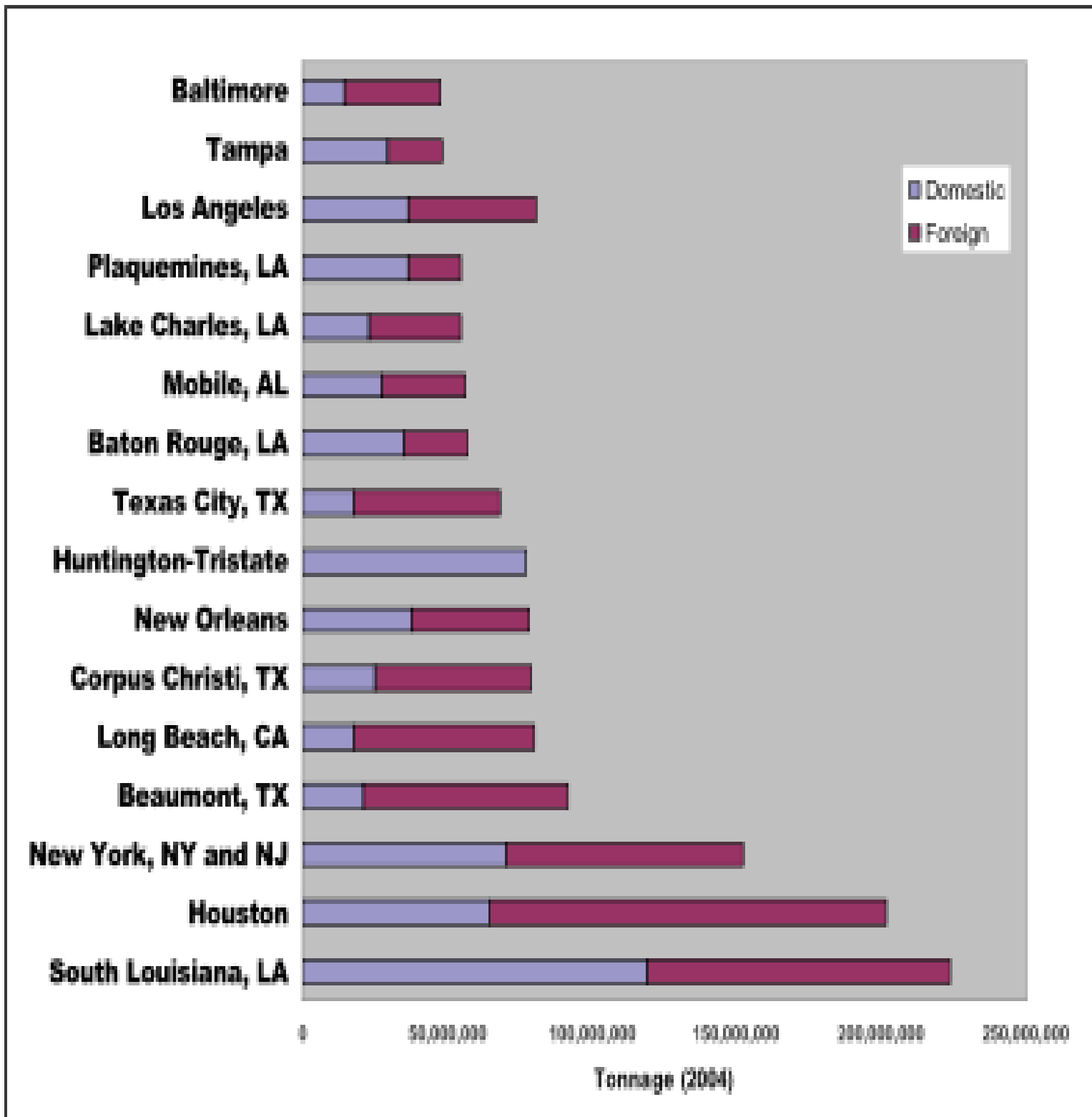
The ports of New Orleans, South Louisiana, and Baton Rouge cover 172 miles (277 km) on both banks of the Mississippi River. The Mississippi River-Gulf Outlet Canal (now closed by a rock dike built across the channel at Bayou La Loutre) extends 67 miles (108 km) from New Orleans to the Gulf, and the channel up the Mississippi River from New Orleans to Baton Rouge runs at a 48 foot (14.6 m) draft. Overall, the navigational depths range from 12 feet to 48 feet (3.6 - 14.6 m) along the river, channels, and side canals. After Hurricane Katrina, the National Oceanic and Atmospheric Administration Office of Coast Survey used boats with sonar and scanners to assess underwater damage to the ports. Port authorities used these surveys to make decisions about when to open or close the ports.

6.2_EXPORTS AND IMPORTS

These three ports are significant to the economy of the nation. The ports of South Louisiana, New Orleans, and Baton Rouge rank third, fourth, and fifteenth, respectively in total trade by port to all world ports. In terms of dollar value, total trade by port to all world ports, New Orleans, South Louisiana, and Baton Rouge, rank 12th, 16th, and 27th, respectively. About 6,000 vessels pass through the Port of New Orleans annually.

According to the North American Export Grain Association, as of August 2005, these three ports serve as a gateway for nearly 55 to 70 percent of all U.S. exported corn, soy, and wheat. Barges carry these grains from the Mississippi River to the ports for storage and export. Imports to these ports include steel, rubber, coffee, fruits, and vegetables.

6.3_SHIPPING IN TONNAGE (STATISTICS TABLE)



The Port of South Louisiana handles the largest amount of shipping, in tonnage, of all U.S. ports.

CHAPTER 7 – PORT OF HONG KONG, CHINA

The Port of Hong Kong, located by the South China Sea, is a deepwater seaport dominated by trade in containerized manufactured products, and to a lesser extent raw materials and passengers. A key factor in the economic development of Hong Kong, the natural shelter and deep waters of Victoria Harbour provide ideal conditions for berthing and the handling of all types of vessels. It is one of the busiest ports in the world, in the three categories of shipping movements, cargo handled and passengers carried.

7.1_ADMINISTRATION

Responsibility for administering the port is vested in the Director of Marine. The Port Operations Committee advises him on all matters affecting the efficient operations of the port, except those matters that are the responsibility of the Pilotage Advisory Committee and the Provisional Local Vessels Advisory Committee. The Hong Kong Port Development Council advises the Government on matters related to port planning and development and promoting Hong Kong as a regional hub port and a leading container port in the world. Meanwhile, the Hong Kong Maritime Industry Council advises the Government on measures to further develop Hong Kong's maritime industry and to promote Hong Kong's position as an international maritime centre. Both councils are chaired by the Secretary for Transport and Housing. The Marine Department is responsible for ensuring that conditions exist to enable ships to enter the port, work their cargoes and leave as quickly and as safely as possible. It is concerned with many aspects of safety standards for all classes and types of vessels, from the largest oil-carrying tankers to the smallest passenger-carrying sampans. It also maintains aids to navigation and mooring buoys for seagoing ships, manages three cross-boundary ferry terminals and administers eight public cargo working areas.

7.2_SHIPPING

Hong Kong is one of several hub ports serving the South-East and East Asia region, and is an economic gateway to mainland China. Hong Kong set a record in its container throughput in 2007 by handling 23.9 million TEUs (20-foot equivalent units of containers), maintaining its status as the largest container port serving southern China and one of the busiest ports in the world. Some 456,000 vessels arrived in and departed from Hong Kong during the year, carrying 243 million tonnes of cargo and about 25 million passengers. The average turnaround time for container vessels in

Hong Kong is about 10 hours. For conventional vessels working in mid-stream at buoys or anchorages, it is 42 and 52 hours respectively.

7.2.1_CONTAINER TRAFFIC

The port has been one of the busiest container ports in the world for many years, and at times the busiest. It was the world's busiest container port from 1987 to 1989, from 1992 to 1997, and from 1999 to 2004.

7.2.2_CONTAINER TERMINALS

There are currently nine container terminals situated at Kwai Chung, Stonecutters Island and Tsing Yi (the last one completed in 2004). Substantial container throughput is handled by the River Trade Terminal at Tuen Mun and by mid-stream.

7.2.3_KWAI TSING CONTAINER TERMINALS

The Kwai Tsing Container Terminals (Kwai Chung Container Terminals until Container Terminal 9 was opened on Tsing Yi), located in the north-western part of the harbour, has nine container terminals with 24 berths of about 8,500 meters of frontage. It covers a total terminal area of about 2.7 km² which includes container yards and container freight stations. The nine container terminals have a total handling capacity of over 18 million twenty-foot equivalent units (TEU).

These terminals are operated by five companies, namely:

- Modern Terminals Ltd. (MTL)
- Hongkong International Terminals Ltd. (HIT)
- COSCO Information & Technology (H.K.) Ltd. (COSCO)
- Dubai Port International Terminals Ltd. (DPI)
- Asia Container Terminals Ltd. (ACT)

The existing 8 terminals occupy 2.17 square kilometres of land, providing 18 berths and 6,592 metres deep water frontage. These terminals handle about 60% of total container traffic handled in Hong Kong.

Planning is underway for a potential Container Terminal 10 (CT10), with possible sites narrowed down to either southwest Tsing Yi or northwest Lantau, to the west of the airport.

CONTAINER TERMINALS

Terminal	Operator	Depth (m)	Berths	Quay length (m)	Quay cranes	Area (m²)	Capacity (kTEUs)
Terminal 1 (CT1)	MTL	14	1		4		
Terminal 2 (CT2)	MTL	14	1		5		
Terminal 3 (CT3)	DPI	14	1	305	6	167,000	>1,200
Terminal 4 (CT4)	HIT	12.5	3		8		
Terminal 5 (CT5)	MTL	14	1		4		
Terminal 6 (CT6)	HIT	12.5– 15.5	3		11		
Terminal 8 East (CT8E)	HIT/COSCO	15.5	2	640	9	300,000	1,800
Terminal 8 West (CT8W)	ACT	15.5	2	740	8	285,000	>2,000

Terminal 9 North	HIT	15.5	2	700	9	190,000	>2,600 (N&S)
Terminal 9 South (CT9S)	MTL	15.5	4	1,240	13	490,000	

7.2.4_RIVER TRADE TERMINAL AT TUEN MUN

The River Trade Terminal at Tuen Mun involves the consolidation of containers, break bulk and bulk cargo shipped between the Hong Kong port and ports in the Pearl River Delta. The terminal is located near Pillar Point in Tuen Mun, New Territories, and is operated by River Trade Terminal Company Ltd. The 65-hectare terminal, completed in November 1999, has about 3,000 metres of quay, according to Hong Kong Port Development Council data.

7.2.5_MID-STREAM

Mid-stream operation involves loading and unloading containers to and from ships while at sea, with barges or dumb steel lighters performing the transfer, and then distributing or landing the containers to piers nearby. Due to high handling fees at the container terminals, Hong Kong has become the only place in the world with at-sea loading and unloading operations.

Currently, there are 11 different yard sites solely for mid-stream operations, occupying a total land area of 27.5 hectares and waterfrontage of 3,197 metres.

7.3_FERRY SERVICES

The Hong Kong-Macau Ferry Terminal between Central and Sheung Wan and the China Ferry Terminal in Tsim Sha Tsui provide centralised ferry services to Macau and 24 ports on mainland China. About 100 vessels, mostly high-speed passenger craft such as jetfoils, catamarans and hoverferries, operate from these terminals. In 2001, over 17 million passengers passed through the terminals, comprising approximately 11.2 million passenger trips to/from Macau and 6.5 million passenger trips to/from mainland ports.

7.4_GOVERNMENT FLEET

There are over 600 vessels of different types and sizes in the government fleet. About 152 vessels are major mechanised vessels serving under 16 government departments such as the Marine Police, Customs and Excise, and Fire Services. Some user departments operate and man their purpose-built vessels. The Marine Department itself controls about 100 vessels, including patrol launches, personnel carriers, pontoons, self-propelled barges and specialized vessels such as hydrographic survey launches and explosive carriers. These vessels provide support to the department's own port operations or serve other departments which do not have their own fleet. The Government Dockyard is responsible for the design, procurement and maintenance of all vessels owned by the Government. It occupies a site of 980,000 m² on Stonecutters Island and has an 83,000 m² protected water basin as an operational base for vessels operated by the Marine Department. The dockyard has a ship-lift system and three ship-hoists capable of dry-docking vessels of up to 750 tonnes. An on-line computerised information system is employed to co-ordinate the maintenance activities and support services to maximise maintenance efficiency and vessel availability.

7.5_DRYDOCKS AND SLIPWAYS

The port has extensive facilities for repairing, maintaining, drydocking and slipping of all types of vessels. Two floating drydocks are located off the west coast of Tsing Yi Island and two northeast of Lantau Island. The largest is capable of docking vessels up to 150,000 metric tons deadweight (DWT). There is also a large number of smaller shipyards, which carry out repairs to vessels and build specialised craft, including sophisticated patrol craft and pleasure vessels for overseas markets.

7.6_PORT FACILITIES AND SERVICES

7.6.1_MOORINGS AND ANCHORAGES

The Marine Department operates and maintains 58 mooring buoys for seagoing vessels. Of these 31 are suitable for ships up to 183 metres in length and 27 for ships up to 137 metres. There are 44 special typhoon mooring buoys to which ships can remain secured during typhoons. This improves efficiency and reduces operational costs of vessels through elimination of unnecessary movements. In addition to the three Immigration and Quarantine Anchorages designated for visiting vessels to complete port formalities, there are eight dangerous goods and eight general-purpose anchorages providing temporary berthing spaces for vessels.

The areas and water depths of the anchorages are diversified to accommodate different sizes and draughts of ships calling at Hong Kong. There are over 460 modern marine aids to navigation throughout Hong Kong waters to guide mariners to and from their berths.

7.6.2_NAVIGATION SAFETY

All fairway buoys are lit and fitted with radar reflectors. Traffic Separation Schemes operate in the East Lamma Channel and Tathong Channel. The Marine Department's VHF radio network provides comprehensive marine communication coverage throughout the harbour and its approaches. The department has direct communication links with other maritime authorities and users world-wide. Locally, the department's Maritime Rescue Co-ordination Centre (MRCC) maintains direct contact with emergency response services, which include the Government Flying Service, Marine Police and Fire Services. MRCC provides 24-hour maritime distress alert monitoring and co-ordinates all maritime search and rescue operations within the Hong Kong search and rescue region in the South China Sea.

A comprehensive vessel traffic service is provided by the department's Vessel Traffic Centre (VTC), with radar surveillance and tracking capabilities as well as a fully integrated data handling sub-system, covers 95% of Hong Kong waters used by seagoing vessels and ferries. The VTC offers advice on the activities of other vessels and gives navigational information to mariners through a sectorised VHF network. This ensures the safety standard and traffic efficiency of the port. An upgraded vessel tracking system, which can track 4,000 moving vessels plus 1,000 stationary targets in real time, has been in operation since early 2002. It provides the latest technology such as AIS, ECDIS, CCTV, new VHF-direction finders and modern communications systems to further improve navigation safety and operation efficiency. Marine Department patrol launches maintain a watch on shipping, traffic separation schemes, fairways, navigational channels, typhoon shelter and cargo-working areas. They provide on-scene support to the VTC, and are in continuous radio contact with the VTC and local marine traffic control stations located at Ma Wan and Kwai Chung Container Port. The VTC is thus able to promptly initiate and co-ordinate actions required to facilitate safe navigation in the port.

The Hydrographic Office of the Marine Department surveys Hong Kong waters and produces nautical charts to facilitate safe navigation within the port. It functions with reference to the standards laid down by the International Hydrographic Organization (IHO). Notices to Mariners are promulgated fortnightly to update bilingual nautical charts. A Differential Global Positioning System correction signal is

broadcast continuously on 289 kHz to assist mariners using GPS navigation to position-fix their vessels more accurately. Tidal height predictions and real-time tidal information are provided on the department's website. Pilotage is compulsory for ships of 3,000 gross tonnes and above and gas carriers of any tonnage. Quarantine and immigration facilities are available on a 24 hour basis. Advance immigration clearance and radio pratique may be obtained by certain vessels on application.

7.6.3_DANGEROUS GOODS

Dangerous goods are moved in the waters of Hong Kong strictly in accordance with the International Maritime Dangerous Goods Code. Their movements must be recorded in Marine Department's Dangerous Goods Information System. Fire-fighting vessels operated by the Fire Services Department are kept in a state of readiness at all times. The Marine Department's pollution control vessels are on 24-hour standby to deal with oil spills.

7.6.4_OTHER WORKING FACILITIES

To facilitate transfer of cargo between vessels and the shore, and cargo to and from Pearl River ports, the Marine Department provides and manages 7,756 metres of public cargo-working sea frontage in various parts of Hong Kong. Bulk handling facilities for coal and oil are provided at the power generating stations at Tap Shek Kok in Castle Peak and at Po Lo Tsui on Lamma Island.

7.7_HONG KONG SHIPPING REGISTER

Hong Kong is a major centre of ship ownership and management. Ships owned or managed in Hong Kong amount to 34 million gross tonnes. Hong Kong has been recognised by the international shipping sector as a first-rate ship registration centre, where registration of ships is entirely voluntary. At the end of 2001, 653 ships were registered in Hong Kong, with a total gross tonnage of 13.7 million tonnes – a 32 per cent growth over the previous year. The Hong Kong Shipping Register operates independently in its maritime policy and administration. The HKSAR Government issues related certificates under its own legislation in the name of 'Hong Kong, China'. As a quality shipping register, Hong Kong adopts all major international conventions promulgated by the International Maritime Organization (IMO). As an associate member of the IMO, the Government ensures that ships registered in Hong

Kong are maintained to the highest international safety and marine environmental protection standards.

A Flag State Quality Control (FSQC) System was introduced in 1999 to monitor the performance of authorised classification societies and to maintain the quality of ships on the Hong Kong shipping register. Any Hong Kong-registered ship whose quality standard is found to be declining or which is detained by a port state for serious deficiencies will be subject to FSQC inspections by Marine Department surveyors. The department regulates the safety standards of all locally licensed vessels, currently numbering over 10,000. Marine Department surveyors also carry out surveys of new vessels being built abroad for licensing in Hong Kong. Examinations are held regularly for the issuance of both foreign-going and river-trade certificates of competency for masters, deck officers and engineers. In addition, local certificates of competency are issued to coxswains and engineers of locally licensed vessels, which operate within the waters of Hong Kong. An inspection and advice service is provided to promote safe working practices in ship-repairing, ship-breaking, cargo-handling on ships and safety afloat.

7.8_SEAFARERS

Hong Kong is a centre for employment of seafarers. 1,200 Hong Kong officers and ratings serve on board more than 420 seagoing ships of 12 different maritime nations. The mercantile marine office registers seafarers, regulates their employment on board ships of all flags and supervises the employment and discharge of seafarers on Hong Kong ships and foreign ships not represented in Hong Kong by a consulate office.

CHAPTER 8 – PORT OF TANJUNG PELEPAS, MALAYSIA

The **Port of Tanjung Pelepas** (abbreviation: **PTP**, UN/LOCODE: MYTPP 01°21'58.85"N 103°32'54.12"E) is a port for container ships located on the eastern mouth of the Pulai River in south-western Johor, Malaysia, and is part of the APM Terminals Global Terminal Network, which holds a minority share in the joint venture. Receiving its maiden vessel on 10 October 1999 on a three-month trial operation, it set a world record as the fastest growing port with 1 million twenty-foot equivalent units (TEU) of containers handled after 571 days of operations. The good performance sealed the port's fate, and it was officially launched by then Prime Minister of Malaysia, Tun Dr. Mahathir Mohamad, on 13 March 2000.

8.1_GROWTH

The port continues to register spectacular growth. At the end of 1999, the terminal handled 20,696 twenty-foot equivalent units (TEU), which rose to 423,710 TEU in 2000, 2.05 million TEU in 2001, and 2.67 million TEU in 2002, and 3.48 million TEU in 2003 outstripping Port Klang and thereby establishing itself as Malaysia's largest port. In 2004, it registered a 15.3% increase to 4,020,421 TEU, and came in as the world's 16th busiest container port. In 2005, PTP handled 4.2 million TEU, and 2006 an estimated 4.6 million TEU. In 2007, PTP handles a further 5.5 million TEU, a growth of 14.5 percent compared to 2006. In 2008 PTP handled 5.6 million TEU and PTP closed 2009 with a container throughput of 6.02 million TEUs which was 7.5% higher than 2008. For year 2010, the port handled 6.5 million TEU a total growth of 8% from 2009 and in 2011, PTP handled 7.5 million TEU with a growth of 15% from 2010. In 2012, PTP's container throughput rose from 7.5 million to 7.7 million TEU with a growth of 2.4%.

Year	TEU million
1999	0.02
2000	0.42
2001	2.05
2002	2.67
2003	3.48
2004	4.02
2005	4.20
2006	4.60
2007	4.50
2008	5.60
2009	6.02
2010	6.50

2011	7.50
2012	7.70

This accelerated growth hinges on the port's proximity to the busy sea lanes on which the Port of Singapore derived its growth and sustainability for nearly two centuries. Positioning itself as a choice alternative to Singapore's terminals, it highlights its proximity to the Tuas Second Link which leads to Singapore. Sustained growth after 2000 was also largely possible as Maersk Sealand, the world's largest container ship operator, took a 30% equity stake in the port's holding company, Seaport Terminal in a deal concluded on 17 August 2000, effectively shifting all of Maersk's operations to the new port from the Singaporean port by the end of that year. Maersk was once the largest operator in Singapore, and the shift represented a 10% drop in business there.

In 2002, Evergreen Marine Corporation, then the world's second largest shipping company after Maersk, also shifted its operations to PTP from Singapore. This event raised alarm bells in the Singaporean port, with widespread speculation in the shipping community that Evergreen's endorsement of PTP demonstrated that Maersk's move may not be an isolated one. Other lines have since also started direct services at PTP.

In 2012, the port announced that it will expand its quay by the addition of two berths worth MYR1.4 billion with a total of 14 berths. The length of the quay will increase by 0.7 km to the existing 4.32 km making it a 5.0 km long linear quay. It is expected that the two berths will be fully operational in the first quarter of 2014. The expansion project will increase the handling capacity to 10.4 million TEUs.[5]

8.2_FACILITIES

The current port offers 14 berths totaling 5km of linear wharf length, and a 1.2 million square meters container yard which contains around 200,000 TEU in storage space, 38,000 ground slot and 4,000 reefer points.

The berths are serviced by 44 Super Post-Panamax quay cranes, 11 of which have a 22 rows outreach and dual hoist 40' pick, 30 with 22 rows outreach and twin 20' lift. The total capacity of the port today is over 8.4 million TEU per year with 148 rubber tyred gantry cranes and 390 Prime Movers operates around the container facility.[6]

Besides being connected directly to the main Malaysian expressways, the port is also linked to rail access which extends into Southern Thailand with a 4 track rail terminal. A 14 lanes gate terminal and 6 lanes FTZ (Free Trade Zone) ensure a smooth turnaround time for import and export containers. The port development area consists of 2,000 acres for the port terminal and 1,500 acres for the free trade zone. The port has a naturally deep harbor with a draft of 15 – 19 metres, and its turning basin of 720 metres allows for ships of any size to turn easily.

The entire master plan of the port envisages over 95 berths with 150 million TEU terminal handling capacity making it the only port in South East Asia with long term potential to handle increasingly growing container traffic. The berths are expected to extend from the mouth of the Pulai River to Malaysia-Singapore Second Link.

CHAPTER 9 – PORT OF ROTTERDAM, NETHERLANDS

The **Port of Rotterdam** is the largest port in Europe, located in the city of Rotterdam, Netherlands. From 1962 until 2002 it was the world's busiest port, now overtaken by first Singapore and then Shanghai. In 2011, Rotterdam was the world's eleventh-largest container port in terms of twenty-foot equivalent units (TEU) handled (2009: tenth; 2008: ninth, 2006: sixth). In 2012 Rotterdam was the world's sixth-largest port in terms of annual cargo tonnage.

Covering 105 square kilometres (41 sq mi), the port of Rotterdam now stretches over a distance of 40 kilometres (25 mi). It consists of the city centre's historic harbor area, including Delfshaven; the Maashaven/Rijnhaven/Feijenoordcomplex; the harbours around Nieuw-Mathenesse; Waalhaven; Vondelingenplaat; Eemhaven; Botlek; Europoort, situated along the Calandkanaal, Nieuwe Waterweg and Scheur (the latter two being continuations of the Nieuwe Maas); and the reclaimed Maasvlakte area, which projects into the North Sea.

Rotterdam consists of five distinct port areas and three distribution parks that facilitate the needs of a hinterland with 40,000,000 consumers.

9.1 HISTORY

The port of Rotterdam has a long history, stretching back into the 14th-century. As the city of Rotterdam has developed from a small town into a major harbour city, the port has expanded. In earlier centuries, docks were built on the banks of the Nieuwe Maas river. In the 19th century, connections between Rotterdam and the North Sea were poor, with a large estuary/delta area with many small waterways between them. Ships had to sail around the island of Voorne-Putten to go out to sea. This could take several days or even weeks.

9.1.1 NIEUWE WATERWEG

In the first half of the 20th century the port activities moved from the centre westward towards the North Sea. To improve the connection to the North Sea, the *Nieuwe*

Waterweg ("New Waterway"), a large canal, was designed to connect the Rhine and Meuse rivers to the sea. The *Nieuwe Waterweg* was designed to be partly dug, then to further deepen the canal bed by the natural flow of the water. Ultimately however, the last part had to be dug by manual labour also. Nevertheless, Rotterdam from then on had a direct connection between the sea and harbour areas with sufficient depth. The *Nieuwe Waterweg* has since been deepened several times. The *Nieuwe Waterweg* was ready in 1872 and all sorts of industrial activity formed on the banks of this canal.

9.1.2_EUROPOORT AND MAASVLAKTE EXTENSIONS

Over the years the port was further developed seaward by building new docks and harbour-basins. Rotterdam's harbour territory has been enlarged by the construction of the *Europoort* (gate to Europe) complex along the mouth of the *Nieuwe Waterweg*. In the 1970s the port was extended into the sea at the south side of the mouth of the *Nieuwe Waterweg* by completion of the *Maasvlakte* (Meuse-plain) which was built in the North Sea near Hoek van Holland.

In the past five years the industrialised skyline has been changed by the addition of large numbers of wind turbines taking advantage of the exposed coastal conditions. The construction of a second *Maasvlakte* received initial political approval in 2004, but was stopped by the Raad van State (the Dutch Council of State, which advises the government and parliament on legislation and governance) in 2005, because the plans did not take enough account of environmental issues. On 10 October 2006, however, approval was acquired to start construction in 2008, aiming for the first ship to anchor in 2013.

9.2_CHARACTERISTICS

Most important for the port of Rotterdam are the petrochemical industry and general cargo transshipment handlings. The harbour functions as an important transit point for transport of bulk and other goods between the European continent and other parts of the world. From Rotterdam goods are transported by ship, river barge, train or road. Since 2000 the *Betuweroute*, a fast cargo railway from Rotterdam to Germany, has been under construction. The Dutch part of this railway opened in 2007. Large oil refineries are located west of the city. The river Maas and Rhine also provide excellent access to the hinterland.

9.2.1_24 METER DRAFT

The EECV-quay of the port has a draft of 24 metres (78 feet) making it, along with the Terminal of Ponta da Madeira in Brazil, one of only two available mooring locations for the largest bulk cargo ship in the world, the iron ore bulk carrier MS *Berge Stahl* when it is fully loaded. The ship's draft of 23 meters (75 feet) leaves only 1 metre (3 feet) of under keel clearance, therefore it can only dock in a restricted tidal window. Such ships must travel in the Eurogeul.

9.2.2_ROBOTIC CONTAINER OPERATIONS

Much of the container loading and stacking in the port is handled by autonomous robotic cranes and computer controlled chariots. The ECT pioneered the development of terminal automation. At the Delta terminal, the chariots—or automated guided vehicles (AGV)—are unmanned and each carry one container. The chariots navigate their own way around the terminal with the help of a magnetic grid built into the terminal tarmac. Once a container is loaded onto an AGV, it is identified by infra-red "eyes" and delivered to its designated place within the terminal. This terminal is also named "the ghost terminal".

Unmanned Automated Stacking Cranes (ASC) take containers to/from the AGVs and store them in the stacking yard. The newer Euromax terminal implements an evolution of this design that eliminates the use of Straddle Carriers for the land-side operations.






9.3_ADMINISTRATION

The port is operated by the Port of Rotterdam Authority, originally a municipal body of the municipality of Rotterdam, but since 1 January 2004, a government corporation jointly owned by the municipality of Rotterdam and the Dutch State.

9.4_FLOOD BARRIERS AND GENERAL TABLE

The port of Rotterdam and its surrounding area is susceptible to a storm surge from the North Sea. In the Delta Works flood protection plan various options have been considered for protecting Rotterdam. Finally a unique design was built, the Maeslantkering. This flood barrier consists of two huge doors that normally rest in

a dry dock besides the Nieuwe Waterweg. When a flood of 3 metres (9.8 ft) above NAP (mean sealevel) is predicted the gates are floated into positions, like caissons, and sunk in place. When the waterlevel recedes enough to open the gates, they are floated back into their docks. Another barrier, the Hartelkering, is situated in the Hartelkanaal.

Location	
Country	<u>Netherlands</u>
Location	<u>Rotterdam</u>
Coordinates	 51.8850°N 4.2867°E
Details	
Opened	14th century
Size of harbor	5,257 ha (12,990 acres)
Land area	5,299 ha (13,090 acres)
Size	10,556 ha (26,080 acres)
Employees	1,207 (2008)
Chief Executive Officer	Hans Smits
Statistics	
Vessel arrivals	 36,315 sea ships (2008)
Annual cargo tonnage	 441.5 million <u>tonnes</u> (2012)
Annual containervolume	 11.87 million <u>TEU</u> (2011)
Annual revenue	 € 525 million (2008)

Net income

▲ € 151 million (2008)

CHAPTER 10 – PORT OF SINGAPORE, SINGAPORE

The **Port of Singapore** refers to the collective facilities and terminals that conduct maritime trade handling functions in Singapore's harbours and which handle Singapore's shipping. Currently the world's second-busiest port in terms of total shipping tonnage, it also transships a fifth of the world's shipping containers, half of the world's annual supply of crude oil, and is the world's busiest transshipment port. It was also the busiest port in terms of total cargo tonnage handled until 2005, when it was surpassed by the Port of Shanghai. Thousands of ships drop anchor in the harbour, connecting the port to over 600 other ports in 123 countries and spread over six continents.

The Port of Singapore is not a mere economic boon, but an economic necessity because Singapore is lacking in land and natural resources. The Port is critical for importing natural resources, and then later re-exporting them after they have been refined and shaped in some manner, for example wafer fabrication or oil refining to generate revenue. Only then can the service industries such as hospitality services typical of a port of call, for example, restocking a ship's food and water supplies, take their role. The Straits of Johor are currently impassable to any ship as the Johor-Singapore Causeway links Singapore to Malaysia.

10.1 HISTORY

10.1.1 BEFORE 1819

In the late 13th century, a settlement known as Singapore was established on the north bank of the Singapore River around what was called the Old Harbour. It was the only port in the southern part of the Strait of Malacca and serviced ships and traders in the region, competing with other ports along the coast of the Malacca Strait such as Jambi, Kota Cina, Lambri, Semudra, Palembang, South Kedah and Tamiang. The port had two functions. First, it made available products that were in demand by international markets; according to the *Daoyu Zhiliu (Brief Annals of Foreign Islands)*, 1349) by Chinese trader Wang Dayuan (born 1311, fl. 1328–1339), these included top-quality hornbill casques, lakawood and cotton. Although these goods were also available from other Southeast Asian ports, those from Singapore were unique in terms of their quality. Secondly, Singapore acted as a gateway into the

regional and international economic system for its immediate region. South Johor and the Riau Archipelago supplied products to Singapore for export elsewhere, while Singapore was the main source of foreign products to the region. Archaeological artefacts such as ceramics and glassware found in the Riau Archipelago evidence this. In addition, cotton was transshipped from Java or India through Singapore.

By the 15th century, Singapore had declined as an international trading port due to the ascendance of the Malacca Sultanate, such trade continued on the island. A map of Singapore by Portuguese mathematician Manuel Godinho d'Eredia showed the location of the office of a *shabandar*, the Malay official responsible for international trade, and shards of 15th-century Siam ceramics and late 16th - or early 17th-century Chinese blue and white porcelain have been found at the Singapore and Kallang Rivers. Singapore also provided other regional ports with local products demanded by international markets. For instance, blackwood (a generic term used by Europeans to refer to rosewood) was exported from Singapore to Malacca, and was in turn purchased by Chinese traders and shipped to China for furniture-making. In the early 17th century, Singapore's main settlement and its port were destroyed by a punitive force from Aceh. After this, there was no significant settlement or port at Singapore until 1819 when Sir Stamford Raffles, excited by the deep and sheltered waters in Keppel Harbour, established for Britain a new settlement and international port on the island.

10.1.2_1819-1963

Keen to attract Asian and European traders to the new port, Raffles directed that land along the banks of the Singapore River, particularly the south bank, be reclaimed where necessary and allocated to Chinese and English country traders to encourage them to establish a stake in the port-settlement. Chinese traders, because of their frequent commercial interactions with Southeast Asian traders throughout the year, set up their trading houses along the lower reaches of the river, while English country traders, who depended on the annual arrival of trade from India, set up warehouses along the upper reaches. The port relied on three main networks of trade that existed in Southeast Asia at that time: the Chinese network, which linked Southeast Asia with the southern Chinese ports of Fujian and Guangdong; the Southeast Asian network, which linked the islands of the Indonesian archipelago; and the European and Indian Ocean network, which linked Singapore to the markets of Europe and the Indian Ocean littoral. These networks were complementary, and positioned Singapore as the transshipment point of regional and international trade. By the 1830s, Singapore had overtaken Batavia (now Jakarta) as the centre of the Chinese junk trade, and also become the centre of English country trade, in Southeast Asia. This was because Southeast Asian traders preferred the free port of Singapore to other major regional ports which had cumbersome restrictions. Singapore had also supplanted Tanjung Pinang as the export gateway for the gambier and pepper industry of the Riau–Lingga

Archipelago by the 1830s, and South Johor by the 1840s. It had also become the centre of the Teochew trade in marine produce and rice.

As the volume of its maritime trade increased in the 19th century, Singapore became a key port of call for sailing and steam vessels in their passage along Asian sea routes. From the 1840s, Singapore became an important coaling station for steam shipping networks that were beginning to form. Towards the late 19th century, Singapore became a staple port servicing the geographical hinterland of the Malay Peninsula. Following the institution of the British Forward Movement, Singapore became the administrative capital of British Malaya. Roads and railways were developed to transport primary materials such as crude oil, rubber and tin from the Malay Peninsula to Singapore to be processed into staple products, and then shipped to Britain and other international markets. During the colonial period, this was the most important role of the port of Singapore.

10.1.3_SINCE 1963

Singapore ceased to be part of the British Empire when it merged with Malaysia in 1963. Singapore lost its hinterland and was no longer the administrative or economic capital of the Malay Peninsula. The processing in Singapore of raw materials extracted in the Peninsula was drastically reduced due to the absence of a common market between Singapore and the Peninsular states.

Since Singapore's full independence in 1965, it has had to compete with other ports in the region to attract shipping and trade at its port. It has done so by developing an export-oriented economy based on value-added manufacturing. It obtains raw or partially manufactured products from regional and global markets and exports value-added products back to these markets through market access agreements such as World Trade Organization directives and free trade agreements.

By the 1980s, maritime trading activity had ceased in the vicinity of the Singapore River except in the form of passenger transport, as other terminals and harbours took over this role. Keppel Harbour is now home to three container terminals. Other terminals were built in Jurong and Pasir Panjang as well as in Sembawang in the north. Today, the port operations in Singapore are handled by two players: PSA International (formerly the Port of Singapore Authority) and Jurong Port, which collectively operate six container terminals and three general-purpose terminals around Singapore.

In the 1990s the Port became more well-known and overtook Yokohama, and eventually became the busiest port in terms of shipping tonnage

10.2_OPERATIONS

The port is the world's busiest port in terms of shipping tonnage handled, with 1.15 billion gross tons (GT) handled in 2005. In terms of cargo tonnage, Singapore is behind Shanghai with 423 million freight tons handled. The port retains its position as the world's busiest hub for transshipment traffic in 2005, and is also the world's biggest bunkering hub, with 25 million tonnes sold in the same year.

Singapore is ranked first globally in 2005 in terms of containerized traffic, with 23.2 million Twenty-foot equivalent units (TEUs) handled. High growth in containerised traffic has seen the port overtaking Hong Kong since the first quarter of 2005, and has led the race ever since, with an estimated 19,335 TEUs handled in the year up to October, compared to 18,640 TEUs handled in Hong Kong in the same period. A rise in regional traffic consolidating the port's position in Southeast Asia, and increases in transshipment traffic using the strategic East Asia-Europe route via Singapore helped the port to emerge tops at the end of the year, a title it had not held since overtaking Hong Kong once in 1998.

Singapore port played vital role in emerging economy.

10.3_OPERATORS

PSA Singapore's container facilities are as follows:

- Container berths: 52
- Quay length: 15,500 m
- Area: 600 hectares
- Max draft: 16 m
- Quay cranes: 190
- Designed capacity: 35,000 kTEU

PSA Singapore has 13 berths which are part of the Pasir Panjang Container Terminal's Phase Two which are due for completion by 2009. Phase Three and Four will add another 16 berths and are expected to be completed by 2013.

Jurong Port's facilities are as follows:

- Berths: 23
- Berth length: 4,545 m
- Maximum vessel draft: 16 m
- Maximum vessel size: 150,000 metric tons deadweight (DWT)
- Area: 1.2 km² Free Trade Zone, 320,000 m² non-Free Trade Zone

- Warehouse facilities: 280,000 m²

PSA Singapore also has a 40-year contract to operate the tax-free Gwadar Port on the southwestern coast of Pakistan. Gwadar started operation in March 2008, with 3 multi-purpose berths, a 602 meter quay, and 12.5 meter depth. Another 9 berths are under construction, with a 20 meter depth.

10.4_TERMINALS

Port	Operator	Type	Berths	Quay length	Quay cranes	Area (Ha)	Capacity (kTEU)
<u>Brani</u> (BT)	PSA	Container	9	2,629	29	79	
<u>Cosco-PSA</u> (CPT)	<u>Cosco/PSA</u>	Container	2	720 m		22.8	>1,000
<u>Jurong</u>	JTC	Multi-Purpose	23	4,547		152	
<u>Keppel</u> (KT)	PSA	Container	14	3,220	37	96	
<u>Pasir Panjang</u> (PPT) Phase 1	PSA	Container	6	1,885	19	71	
<u>Pasir Panjang</u> (PPT) Phase 2A	PSA	Container	4	1,700	19	63	>4,000
<u>Pasir Panjang</u> (PPT) Phase 2B	PSA	Container	4 (1 under construction)	1,246	16	56	2,800

<u>Pasir Panjang</u> (PT)	PSA	Container	7 (under constructn)				5,600
<u>Pasir Panjang</u> (PPT) Phase 2D	PSA	Container	5 (under construction)				
<u>Pasir Panjang</u> (PPT) Phase 3	PSA	Container					
<u>Pasir Panjang</u> (PPT) Phase 4	PSA	Container					
<u>Pasir Panjang Wharves</u>	PSA	General					
<u>Sembawang</u>	PSA	General					
<u>Tanjong Pagar</u> (TPT)	PSA	Container	8	2,320	27	80	

10.5_CRUISE BUSINESS

Port of Singapore also has a terminal for cruise ships. Such cruise lines that home port there include Princess Cruises, Royal Caribbean, Holland America Line, and more. Princess will have the place as largest deployment by a premium cruise line when it deploys *Sapphire Princess* on three- to eleven- day roundtrip cruises to Asia. More than 40,000 passengers will be sailing on those cruises from November 2014 to February 2015. Stationing the ship in port will bring \$50 million under contribution while Princess responds to a growing interest for Singapore-based cruises.

10.6_IN POPULAR CULTURE


- The port was documented in a *MegaStructures* program of the National Geographic Channel
- The Keppel Terminal of the port was featured in a Strike Force mission in *Call of Duty: Black Ops II*.(videogame)

10.7 _GENERAL TABLE



Ships lying at anchor outside the Port of Singapore

Facility information

Location	<u>Singapore</u>
Coordinates	 1.264°N 103.840°E
Constructed	1819
Annual <u>TEU</u>	32.2 million (2013) ^[1]

Shipping information

Number of berths:	67
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Road information

Street access

Ayer Rajah Expressway

CHAPTER 11 – PORT OF SHANGHAI, CHINA

The **Port of Shanghai** (Chinese: 上海港; pinyin: *Shànghǎi gǎng*), located in the vicinity of Shanghai, comprises a deep-sea port and a river port.

In 2010, Shanghai port overtook the Port of Singapore to become the world's busiest container port. Shanghai's port handled 29.05 million TEUs, whereas Singapore port was a half million TEU's behind.

In 2012, Shanghai port set a historic record by handling over 32 million TEUs.

11.1_GEOGRAPHY

The Port of Shanghai faces the East China Sea to the east, and Hangzhou Bay to the south. It includes the confluences of the Yangtze River, Huangpu River (which enters the Yangtze River), and Qiantang River.

11.2_ADMINISTRATION

The Port of Shanghai is managed by Shanghai International Port which superseded the Shanghai Port Authority in 2003. Shanghai International Port Company Limited is a public listed company, of which the Shanghai Municipal Government owns 44.23 percent of the outstanding shares.

11.3_HISTORY

During the Ming Dynasty, what is now the city of Shanghai was a part of Jiangsu Province (with a small part in Zhejiang Province). While Shanghai had become a county seat in the Yuan Dynasty, it remained relatively a small town.

Its location at the mouth of the Yangtze led to its development as coastal trade developed during the reign of the Qianlong emperor in the Qing Dynasty. Gradually, the port of Shanghai surpassed the port of Ningbo and the port of Guangzhou to become the largest port of China at the time.

In 1842, Shanghai became a treaty port, thus developing into an international commercial city. By the early 20th century, it was the largest city in the Far East, and the largest port in the Far East.

In 1949, with the Communist takeover in Shanghai, overseas trade was cut dramatically. The economic policy of the People's Republic had a crippling effect on Shanghai's infrastructure and capital development.



Donghai Bridge

In 1991, the central government allowed Shanghai to initiate economic reform. Since then, the port of Shanghai has developed at an increasing pace. By 2005, the Yangshan deep water port was built on the Yangshan islands, a group of islands in Hangzhou Bay, linked to Shanghai by the Donghai Bridge. This development allowed the port to overcome shallow water conditions in its current location, and to rival another deep-water port, the nearby Ningbo-Zhoushan port.

11.4_HARBOUR ZONES

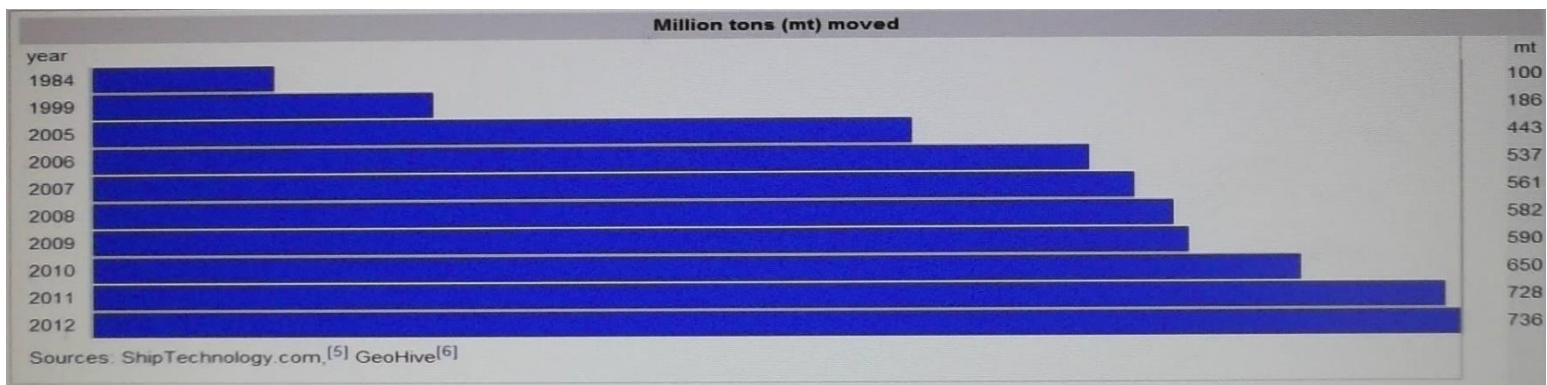
The port of Shanghai includes 3 major working zones:

- Yangshan deep water port
- Huangpu River
- Yangtze River

11.5_ECONOMY

The Port of Shanghai is a critically important transport hub for the Yangtze River region and the most important gateway for foreign trade. It serves the Yangtze economically developed hinterland of Anhui, Jiangsu, Zhejiang and Henan provinces with its dense population, strong industrial base and developed agricultural sector.

11.6_DATA TABLE



11.7_GENERAL TABLE

Location	
Country	<u>People's Republic of China</u>
Location	<u>Shanghai</u>
<u>Coordinates</u>	 30.626539°N 122.064958°E
Details	
Opened	1842 (As treaty port)
Operated by	<u>Shanghai International Port Company</u> <u>Ltd.</u>
Owned by	Public
Type of harbor	Deep-water seaport/Riverport
Statistics	
Annual cargo tonnage	736 million (2012)
Annual <u>containervolume</u>	32.529 million <u>TEU</u> (2012)
Website	http://www.portshanghai.com.cn

CHAPTER 12 – EXPOSURE OF PHOTOGRAPHIC MATERIAL

12.1_PORT OF SHANGHAI, CHINA



12.2_PORT OF SINGAPORE, SINGAPORE



12.3_PORT OF ROTTERDAM, NETHERLANDS



12.4_PORT OF TANJUNG PELEPAS, MALAYSIA



12.5_PORT OF HONG KONG, CHINA



12.6_PORT OF LOUISIANA, USA



12.7_PORT OF JEBEL ALI, UNITED ARAB EMIRATES



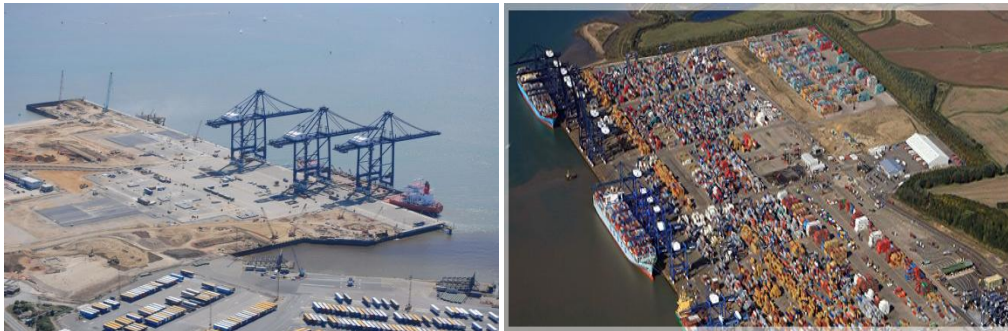
12.8_PORT HEDLAND, WESTERN AUSTRALIA



12.9_PORT OF HAMBURG, GERMANY



12.10_PORT OF FELIXSTOWE, UNITED KINGDOM



SOURCE 1 : www.google.com

SOURCE 2 : www.supplychaindigital.com/top_ten/top-10-global-ports

SOURCE 3 : en.wikipedia.org