BMT Asia Pacific

Study on the Strategic Development Plan for Hong Kong Port 2030

Executive Summary

October 2014

Study on the Strategic Development Plan for Hong Kong Port 2030

Executive Summary

Prepared under the Management of:

Name: *Steve Roberts*
Position: *Senior Consultant*

Signature: 

Reviewed and Approved by:

Name: *Dr Simon Su*
Position: *Director*

Signature: 

Reference: R8830/10 Issue 6

Date: October 2014

BMT Asia Pacific Ltd. 5/F, FWD Financial Centre, 308 Des Voeux Road Central, Hong Kong
Tel: (852) 2815 2221 Fax: (852) 2815 3377

Contents

List of Figures

List of Tables

1 Introduction

1.1 Objective

This Executive Summary presents the findings of the consultancy "Study on the Strategic Development Plan for Hong Kong Port 2030". The Study's main focuses are to review the dynamic containerised cargo market in Hong Kong, recommend a development plan to enhance the competitiveness of Hong Kong Port (HKP) and facilitate its continued growth.

1.2 Present Competitive Environment of HKP

HKP acts as both a gateway port for South China cargo and as a transhipment hub. HKP's competitive strengths are:

- A geographic location that is attractive for transhipment
- High frequency of sailings and good connectivity
- Quality of service: reliability, security and low likelihood of damage to cargo
- Shorter lead time
- Freeport status, and
- Status as the only port along the China coast where foreign owned carriers can tranship China-related cargo.

However, HKP is not competitive in terms of cost (Terminal Handling Charge (THC) and inland transport cost by road for South China cargo), and there is diminishing distinction between HKP and competitors in terms of quality or capacity.

1.3 Outlook of HKP

Cargo Markets

South China cargo and international transhipment are two markets that HKP serves. The outlook for the following two types of cargo may be summarised as:

- **South China cargo:** Mixed – The growth of South China cargo base could benefit HKP, yet HKP is also facing increasing competition from other South China ports. Existing shipments for which HKP is competitive are likely to remain at HKP in the short to medium term.
- **International transhipment:** Mostly Positive – the international transhipment carried out at HKP is largely captive (due to current Mainland cabotage rules) or competitively served - else it would have been conducted elsewhere.

Future Trend

Anticipated future trends in the shipping industry relevant to Hong Kong include:

- Growth of the South China cargo base but a diminishing share of South China cargo routed via HKP,
- A greater amount of inland transport undertaken by river which is creating additional river-to-ocean transhipment throughput,
- An increase in transhipment within the global shipping industry,
- An increase in the amount and proportion of throughput at HKP accounted for by international transhipment,
- More frequent calls from 'mega vessels', and

- Handling of containerised cargo will continue to be concentrated at Kwai Tsing Container Terminals (KTCT).

In light of this current competitive environment and future outlook, the Study has sought to identify a viable and valuable development path for HKP, based on the strengths of the industry that has played such a pivotal role in Hong Kong's advancement.

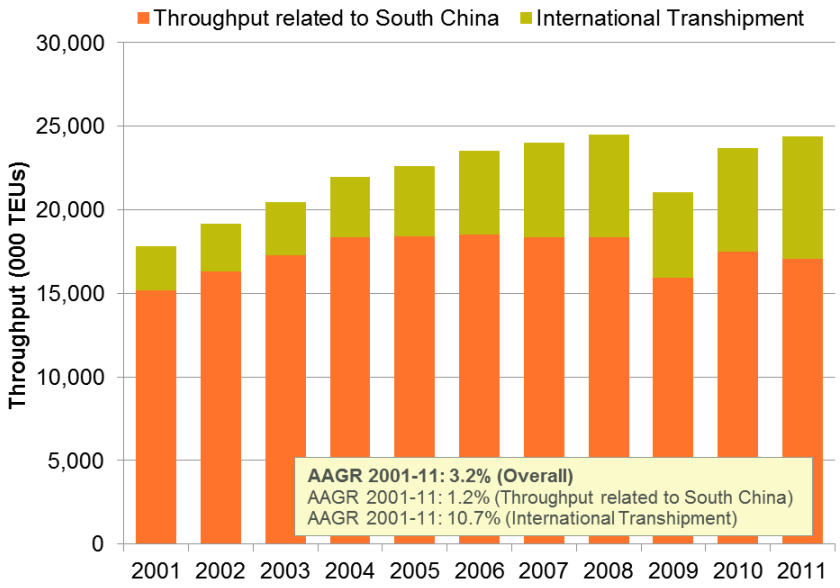
2 Demand and Supply of HKP

2.1 Demand

2.1.1 Markets

HKP serves two markets, cargo from South China and international transhipment. Historical growth trends are illustrated in Figure 2-1.

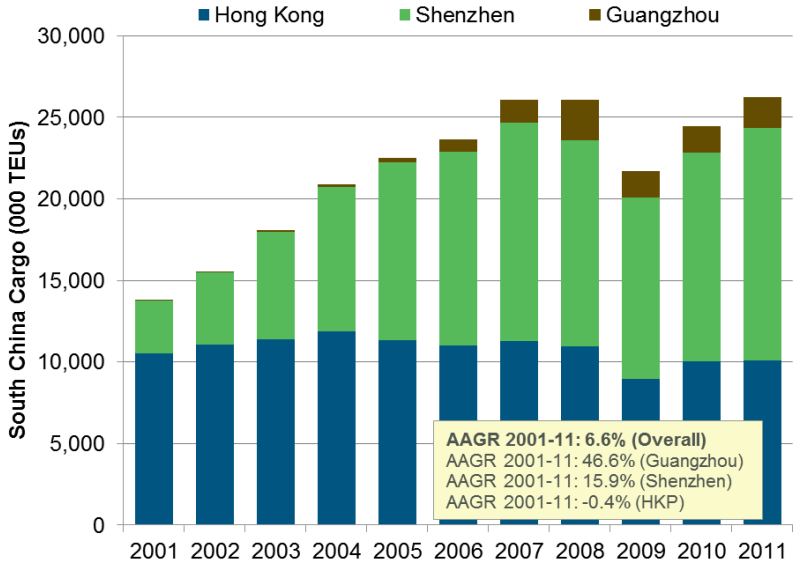
Figure 2-1 Total Container Throughput via HKP



Source: Transport and Housing Bureau

Figure 2-2 shows that the amount of South China cargo via HKP (counting the actual number of Twenty-Foot Equivalent Units (TEUs) shipped, not port throughput) has been relatively static for the past decade, in comparison with neighbouring ports.

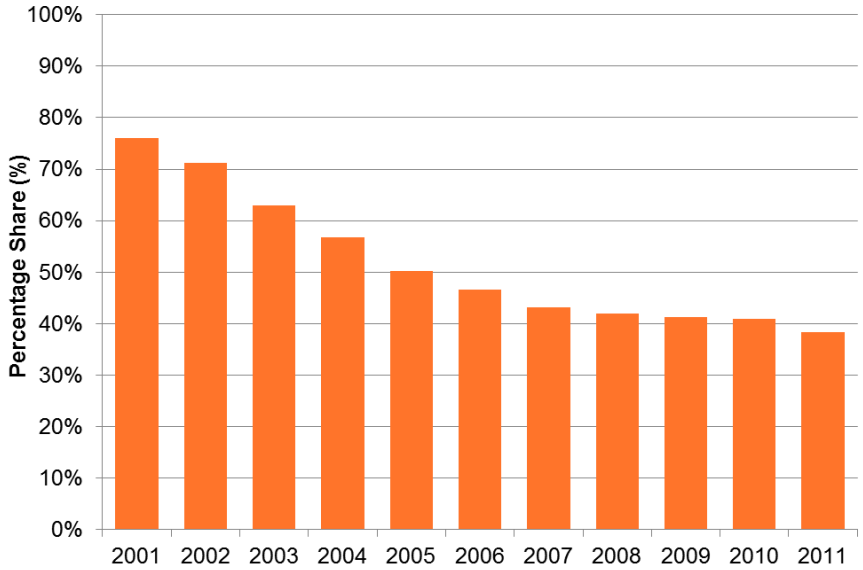
Figure 2-2 South China Cargo Handled at Hong Kong Port, Shenzhen Port and Guangzhou Port



Source: Transport and Housing Bureau

As a result of competition from other South China ports, HKP's market share for South China cargo has declined, but the rate of decline is diminishing (Figure 2-3). However, throughput related to South China is no longer the main driver of growth in HKP's throughput (Figure 2-1).

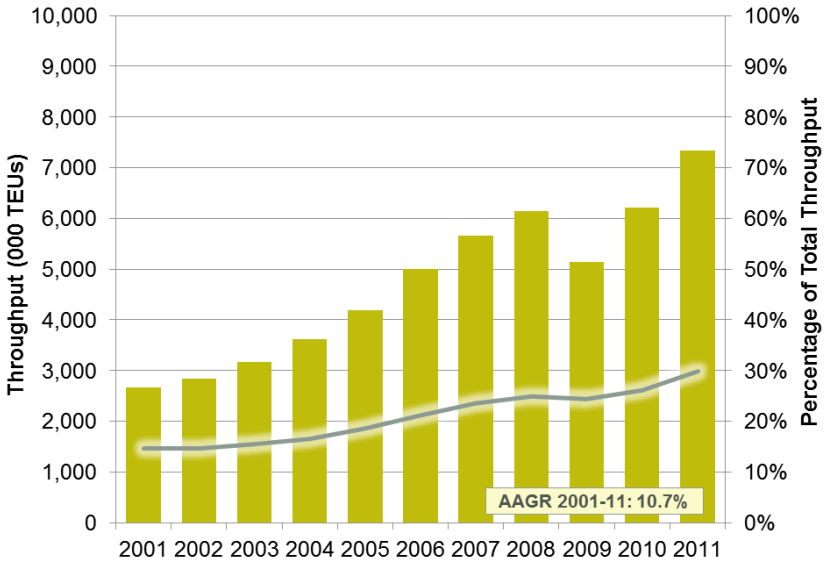
Figure 2-3 HKP's Share of the South China Cargo Base



Source: Transport and Housing Bureau

In contrast, international transhipment has become an increasingly significant component of throughput at HKP, recording an average annual growth rate of 10.7% (2001-2011) (Figure 2-4) - significantly greater than that of throughput related to South China.

Figure 2-4 International Transhipment Throughput at HKP



Source: Transport and Housing Bureau

The growth of international transhipment at HKP is driven by:

- Growth in world trade,
- More common use of transhipment as the mode of operation in container shipping, and
- Efforts by HKP terminal operators to attract international transhipment throughput in view of HKP's competitive advantages.

2.2 Supply

2.2.1 Existing Port Capacity

Principal port developments in the Pearl River Delta (PRD) include:

- Shenzhen Port, comprising the Western Shenzhen ports (Chiwan, Shekou and Dachan Bay; with a combined total of 25 berths), and Yantian which has 16 berths for ocean-going vessels and has achieved high levels of operational efficiency.
- Guangzhou Port including the expansion at Nansha. The original Guangzhou port has older, more limited facilities, particularly for container handling. The new container terminal at Nansha is built to modern standards and has space for further expansion.
- Others: Humen and Zhuhai. Humen is a four-berth terminal in Dongguan, opened with two berths in 2008 it has recently been expanded. Zhuhai has four container berths.

The ports share overlapping hinterlands and compete for the same South China cargo.

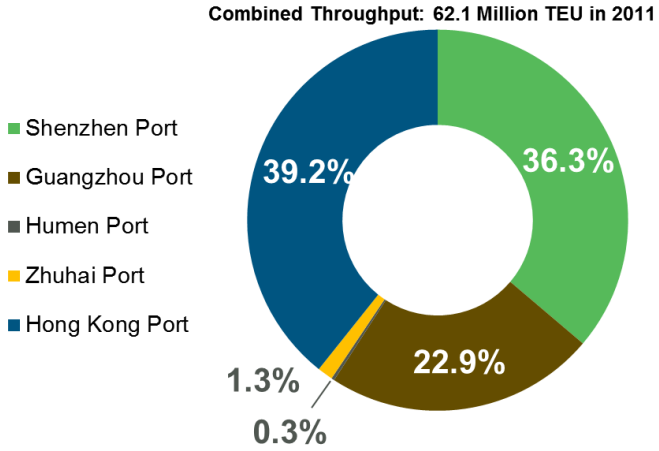
A boom in the port sector saw the number of berths suitable for ocean-going container vessels in the PRD grow by 141% from 2001-2011.

Figure 2-5 Container Ports in the PRD

Source: BMT

The distribution of container throughput and berths for ocean vessels among the major South China ports is shown below.

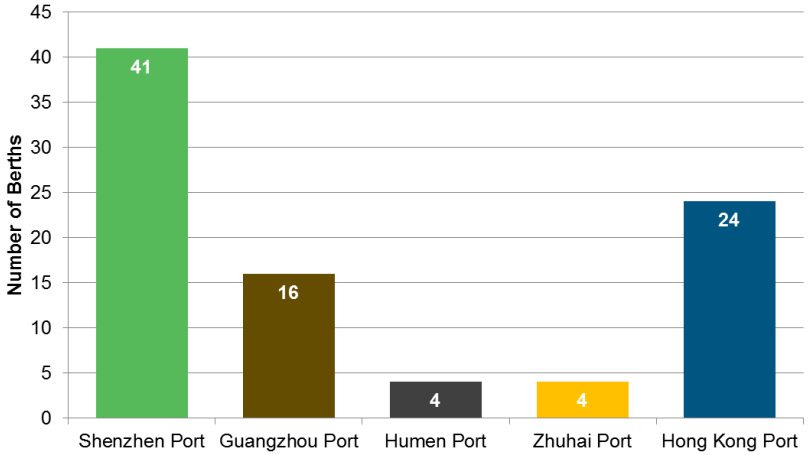
Figure 2-6 Distribution of Container Throughput among the Major South China Ports; 2011



Source: Various, compiled by BMT

Terminal operators are now more cautious about investing in additional capacity, and it is unlikely that all the additional 45 ocean vessel berths (for which plans have been made) will be added to the existing 89.

Figure 2-7 Distribution of Number of Berths for Ocean Vessels among the Major South China Ports; 2011



Source: Various, compiled by BMT

3 Competitiveness of Hong Kong Port

3.1 Introduction

Container handling is a highly contestable business. Shippers and carriers have a wide choice of ports serving the South China region for South China cargo, and a choice of hub ports in the wider South East Asia region at which they may base their transhipment operations. Factors that differentiate one port from another therefore have a strong influence on market share.

In general:

- For throughput related to **South China**, HKP competes with the major ports in the region: Shenzhen (including West Shenzhen ports and Yantian) and Guangzhou (including Nansha).
- For **international transhipment** (conducted between ocean vessels), HKP competes with major transhipment hubs in the wider South East Asia region: Busan, Kaohsiung, Keelung, Port Klang, Shanghai, Singapore and Tanjung Pelepas.

3.2 Competitiveness for South China Cargo

Current trends suggest a diminishing preference for using HKP for South China cargo, which is related to the significant increase in port capacity that occurred in South China in the last ten years, giving shippers much more choices. Port choice is influenced by a series of factors:

- Cost
- Quality of services including reliability, security and possibility of damage to cargo
- Lead time
- Customs procedures
- Tax rebates
- Connectivity

The influences on HKP's share of the South China cargo base have been examined in detail by reviewing the key attributes impacting port choice.

3.2.1 Cost

The total costs of transporting cargo from factory to port of discharge are the primary determinants of port choice. Monetary costs can be grouped together as the 'total through cost', which may be considered in four parts:

Table 3-1 Total Through Cost and its Components

Inland Transport →	Outward Port →	Ocean Freight →	Inward Port
Trucking or barging costs.	Terminal Handling Charges, documentation charges.	Ocean Freight and carriers' surcharges.	Destination Delivery Charge, ISPS security surcharges.

Source: BMT

HKP is the most expensive port when compared on a like-for-like basis, due to the inland transport and outward port costs. River transport lowers the cost of using HKP, but at the expense of longer lead time. It was also identified that during the past few years the gap in through costs between HKP and Shenzhen Port using truck has widened but the gap using river barges has narrowed, contributing to the shift of inland transport mode from truck to river barge at HKP.

Outward port charges include the THC and documentation charges. THC is estimated as 36% higher at HKP than other South China ports, but it is noted that THCs at HKP and South China ports have not changed in nominal terms since at least 2000.

3.2.2 Lead Time

Lead time includes inland transport and port staying time. Average port staying time is lower at HKP than other South China ports due to differences in customs procedures and the greater frequency of sailings. The efficiency of port operations have less influence as:

- It accounts for a small share in the total lead time, and
- There is little difference in the quality and efficiency of container handling between South China ports.

3.2.3 Summary

While HKP has a disadvantage in terms of inland transport costs it has an advantage in terms of lead time due to the shorter port staying time. In the long run the PRD will face increasing upward pressure on labour costs and the pressure of the possible RMB appreciation against the US dollar may be sustained. These developments will gradually erode the comparative advantages of ports in the PRD and therefore enhance the cost competitiveness of HKP in future.

3.3 Competitiveness for International Transhipment

In choosing transhipment hub locations carriers will consider:

- Geographic location
- Any legal restrictions such as cabotage and customs rules
- Existing frequency of vessel calls and connectivity
- Port and terminal characteristics
- Cost of using the port

3.3.1 Geographic Location

The geographic location of a port determines its attractiveness and suitability as a transhipment hub. Singapore, Tanjung Pelepas, Shanghai and Hong Kong are all located along the key Far East trade route. While there is regional competition in handling international transhipment amongst these ports, it is observed that their respective locations also have some bearings on the respective market positions.

3.3.2 Cabotage Restrictions

Domestic shipping in China is subject to a cabotage rule that prevents foreign carriers undertaking domestic maritime transport.

For foreign carriers a transhipment hub outside Mainland China allows them to undertake both legs of a shipment, as the leg to or from China will not be domestic transportation. As Hong Kong is a Special Administrative Region of China, carrying a container between HKP and a Mainland China port is not regarded as domestic transportation.

China is not unique in having a cabotage rule but the amount of container transport (about one quarter of global container throughput) is on a scale not found in any other country. For this reason ports outside China conveniently located to handle transhipment related to China are attractive to foreign carriers, and Hong Kong therefore is an ideal location for foreign carriers to handle China-related transhipment.

Carriers consulted by BMT indicated they would transfer the bulk of their international transhipment from HKP to Mainland China ports that offer lower charges if there were no cabotage restrictions. However, carriers and other stakeholders do not anticipate any widespread changes to the cabotage rule in the near future.

3.3.3 Frequency of vessel calls and connectivity

The greater the number of a carrier's sailings that are, or could be, scheduled to call at the port the wider the range of destinations that can be linked through transhipment, and greater the frequency of calls, allowing shorter overall transit times.

The presence of other carriers in a common alliance of shipping lines, or short distance feeder connections, further increase attractiveness.

3.3.4 Port and terminal characteristics

Capacity and efficiency

To be a hub implies a concentration of container handling and therefore a relatively large capacity is required. While the majority of containers will arrive and depart from the same terminal, some proportion may need to be transferred between terminals. The physical arrangement of terminals can therefore affect the ease and cost of transhipment. HKP's physical arrangement, where all terminals are co-located, gives it an operational advantage over other hubs where they are more dispersed (e.g. Busan).

Size of vessel that can use the port

The port must be able to accept the largest of the vessels that the carrier intends to use. The constraining dimensions are most commonly the depth of water at the berths, and crane outreach.

Terminal ownership

Schedule reliability is important for transhipping containers between vessels; by leasing or owning a terminal carrier can ensure this as they have control over berth allocation.

3.3.5 Cost of using the port

The cost of using the port, in terms of the Container Handling Charge (CHC) the carrier must pay the terminal operator, will affect the cost of the transhipment operation. Calling at a port purely for transhipment purposes only adds to a carrier's operating costs. If other business is available at the port, such as gateway cargo, the revenue from carrying this cargo can defray the cost of calling for international transhipment purposes.

3.3.6 Summary

At present HKP is competitive for certain subsets of the international transhipment market as follows:

Table 3-2 Competitiveness for International Transhipment

International Transhipment Characteristics	Competitive Strength	Reason
International transhipment by Chinese owned carriers	Weak to moderate	HKP is uncompetitive in terms of higher costs for these carriers, who are unaffected by cabotage in Mainland China. The number of shipping connections is one advantage over South China ports however.
International transhipment by foreign carriers	Strong	HKP is competitive and has a captive market for any foreign carrier wishing to handle transhipment related to China, and may also compete as an international transhipment hub over the wider Asia region.

Source: BMT

Carriers could, at any time, move their international transhipment business to other hubs if it suited their networks to do so. Yet, with the cabotage rule in place, HKP is likely to remain attractive for handling China-related transhipment. That will in turn sustain HKP's competitiveness in handling transhipment for other trade routes, and thus its hub port status.

4 Contribution to Hong Kong's Economy and Forecast Throughput at Hong Kong Port

4.1 The Contribution of HKP to Hong Kong's Economy

4.1.1 Defining the Port Sector

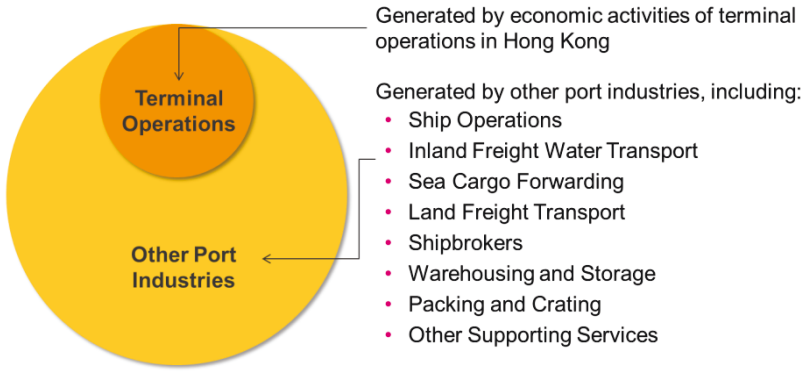
The economic contribution of the port sector has been assessed to understand the significance of HKP to Hong Kong's economy.

The port sector includes a spectrum of industries which facilitate or relate to the movement of ships and handling of cargo at the port. Economic contribution may be measured in terms of:

- ***Value Added*** - the value of goods and services produced (i.e. gross output) less the value of goods and services used up in the course of production (i.e. intermediate consumption).
- ***Employment*** - in terms of the number of persons engaged.

To measure the economic contribution, the identified port industries are classified into terminal operations and other port industries.

Figure 4-1 Economic Contribution of the Port Sector



Source: BMT

Table 4-1 Economic Contribution of the Port Sector, 2011

	Value Added (in million HK$)	Number of Persons Engaged	Value Added (in million HK$) / Persons Engaged
Total Contribution of Port Sector	27,300	93,500	0.3
Percentage in Hong Kong Logistics Sector*	40.3%	49.1%	-
Percentage in Hong Kong Economy	1.4%	2.6%	-

Source: 2011 Key Statistics on Business Performance and Operating Characteristics of the Transportation, Storage and Courier Services Sector, compiled based on the Annual Survey of Economic Activities conducted by the Census and Statistics Department (C&SD)

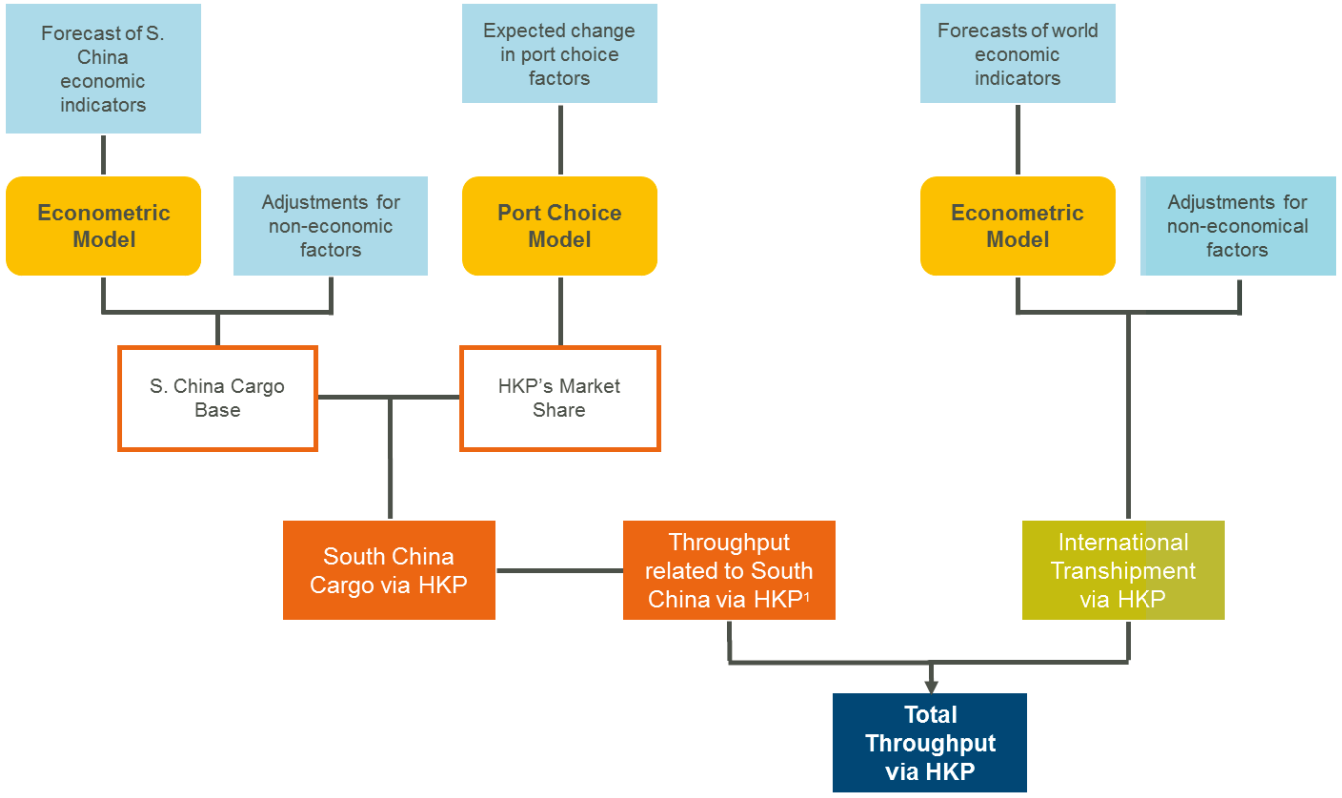
** Based on statistics sourced from a feature article on "The Four Key Industries and other Selected Industries in the Hong Kong Economy" for 2011 from the C&SD.*

4.2 Scope of the Forecast

For the purpose of strategic planning, throughput has been forecast up to 2030 in the Port Cargo Forecast "PCF". The forecast is assumed to be unconstrained, i.e. not limited by the current capacity of HKP. This approach allows future capacity to be planned in anticipation of demand.

A wide range of economic factors impact the quantity of container imports and exports, including: consumption and living standards, trading growth between different countries and regions, changes in economic structure, exchange rate fluctuations, sourcing policies and so on.

Figure 4-2 Overall Forecasting Methodology for Container Throughput



[1] Throughput includes inland transport by river, which is largely associated with South China cargo.

Source: BMT

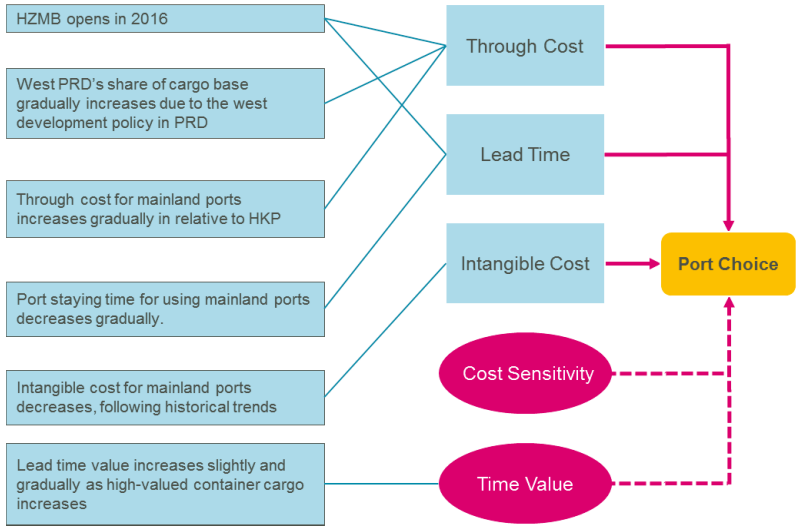
4.2.1 South China Cargo Base

An econometric model based on Gross Domestic Product (GDP) was used to forecast growth of the South China cargo base, together with post-modelling adjustments to reflect rising labour costs in Mainland China and policies to encourage industrial upgrade and structural shifts in South China.

4.2.2 HKP's Market Share of the South China Cargo Base

BMT's Port Choice model was applied to forecast HKP's market share of South China cargo. The key determinants of HKP's share are total through cost, lead time, and intangible costs (factors including customs efficiency / reliability, service level, etc.). Various impacts that may modify port choice probabilities over the forecasting period were factored into the model as shown below.

Figure 4-3 Port Choice Model



Source: BMT

External impacts factored into the port choice model include:

- The Hong Kong-Zhuhai-Macao Bridge (HZMB) will open in 2016 and will reduce inland trucking cost and time for cargo transported between the West PRD and HKP.
- Due to the policy implemented by the Mainland Government in recent years aimed at the restructuring and upgrading of Guangdong's exports, it is anticipated that West PRD cities' share of the PRD's foreign trade value will gradually increase in future. This impacts through cost by changing the distribution of cargo within Guangdong, and hence distance from the ports.
- Due to labour cost increases and the possible RMB appreciation, it is expected that the costs of using Mainland ports will increase gradually relative to using HKP.
- It is anticipated that the difference in port staying time between HKP and Guangzhou and Shenzhen will be gradually narrowed in the future.
- Intangible costs for Mainland ports will gradually decrease in the future.
- Both the upgrading of manufacturing industry and rising affluence in Mainland China will contribute to increasing the value of containerised cargo, which will impact shipper's choice of port as lead time will become increasingly significant to the cargo owner.

These assumptions are based on stakeholder consultations and review of industrial development.

4.2.3 International Transhipment

An econometric model was used for forecasting international transhipment throughput via HKP with post-modelling adjustments for development of Association of Southeast Asian Nations (ASEAN) Free Trade Area and the continuing adoption of “mega vessels”.

4.2.4 Non-containerised Cargo

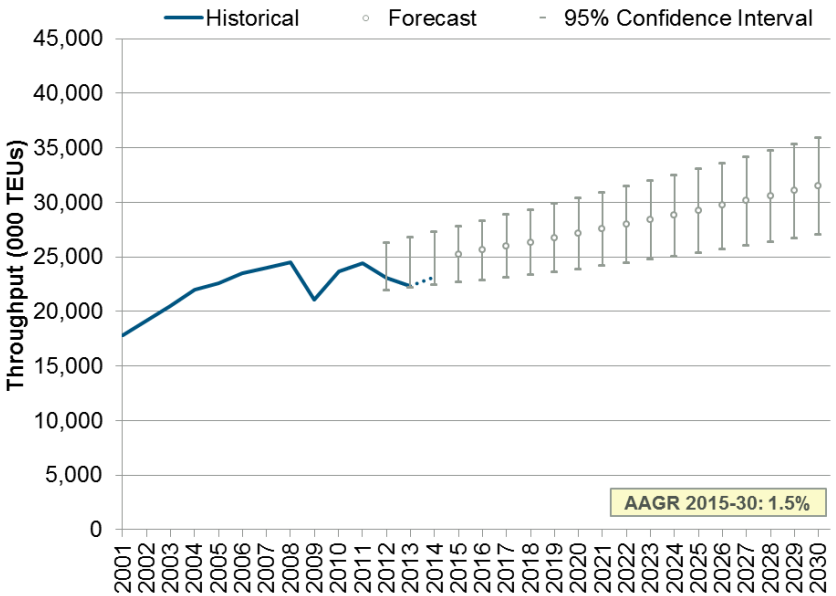
Non-containerised cargo was forecast largely by trend analysis. Specific assumptions on future demand for each commodity type were made following stakeholder interviews.

4.3 Forecast Throughput

4.3.1 Container

The forecast (developed in 2012 on the basis of data up to 2011) is depicted below.

Figure 4-4 Forecast of Total Container Throughput to 2030[1]



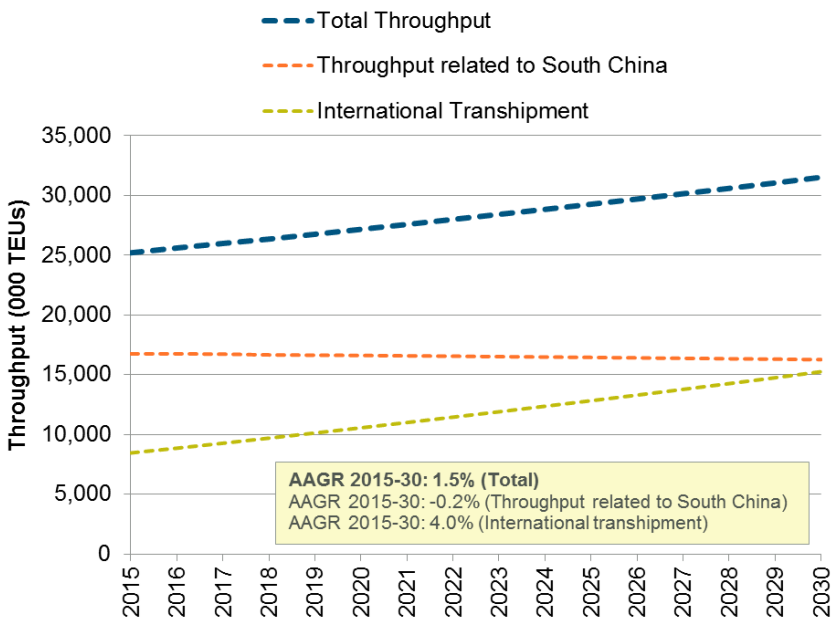
Source: BMT

It is forecast that total container throughput (including throughput related to South China and international transhipment) may expand

[1] *Throughput for 2014 projected based on throughput recorded for January to July.*

to 31.5 million TEUs in 2030, at a rate of 1.5% per annum (international transhipment is forecast to constitute the major growth in throughput, while throughput related to South China is forecast to have a slight negative growth). The components of total container throughput are as follows:

Figure 4-5 Forecast of Throughput related to South China and International Transhipment to 2030



Source: BMT

4.3.2 Non-containerised Cargo

Non-containerised cargo is forecast to slightly decrease from 67.6 million tonnes in 2015 to 66.5 million tonnes in 2030, comprising:

- 3.3 million tonnes of coal, coke and briquettes (dry bulk),
- 5.1 million tonnes of iron and steel (break bulk),
- 20.3 million tonnes of stone, sand and gravel (dry and break bulk),
- 30.2 million tonnes of petroleum, petroleum products and related materials (liquid bulk), and
- 7.6 million tonnes of other non-containerised cargo.

5 Capacity of HKP

5.1 Scope of Capacity Review

An analysis of the capacity of HKP's major cargo handling facilities was undertaken, including:

- Kwai Tsing Container Terminals (KTCT)
- River Trade Terminal (RTT)
- Mid-stream Sites (MSS), Public Cargo Working Areas (PCWAs), Buoys and Anchorages and Private Wharves
- Other Port Facilities (for non-container cargoes excluding passenger terminals, ferry piers, refuse transfer stations and shipyards)

The greatest concerns with regard to capacity affect container handling, and consequently this was the focus of the strategic development plan.

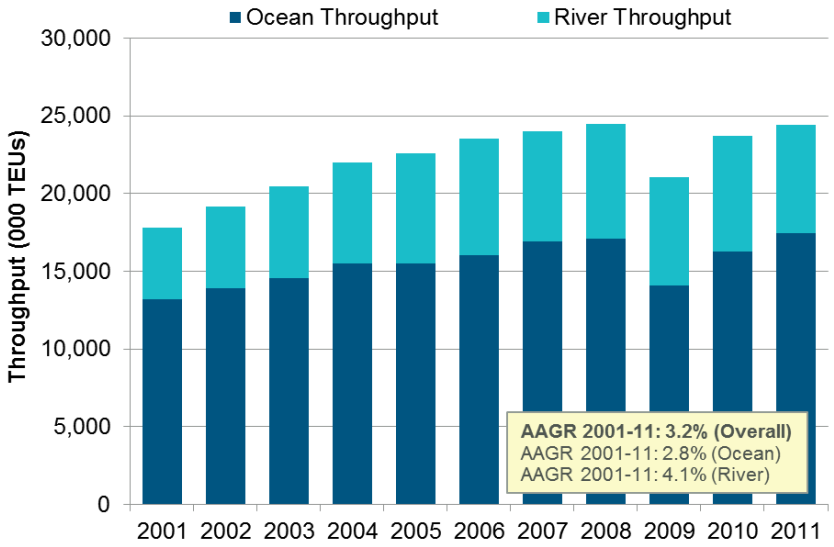
5.2 Trends Affecting Types of Throughput and Usage

5.2.1 Trends in type of throughput

During 2001 – 2011, river throughput recorded an average annual growth of 4.1%, faster than the 2.8% for ocean throughput, though the increase of river throughput has moderated in recent years. There has been more cross-boundary throughput transported by river trade vessels because of the relatively lower cost compared to trucking, and the shift of the manufacturing base within Guangdong.

Total ocean throughput at HKP continues to grow, but the main element of growth now comes from international transhipment.

Figure 5-1 Hong Kong Port Ocean and River Container Throughput



Source: Transport and Housing Bureau

5.2.2 Trends in use of facilities

From 2001 to 2011 throughput at KTCT grew faster than the total HKP throughput; the increases being attributable to:

- Trends progressively favouring river over road for inland transport,
- More river throughput being handled at KTCT instead of other facilities at HKP,

- A decline in the use of mid-stream facilities, and
- Growth in international transhipment throughput, which is concentrated at KTCT.

5.3 Estimated Capacity of KTCT

There is no absolute value for terminal capacity for any container terminal, as various characteristics of the throughput affect the capacity the port facilities can provide, in addition to the capabilities of the port facilities themselves. This is especially true for the complex set of terminals that comprise KTCT. Depending on the facilities available at any particular time, river barges are accommodated both at the main berths (provided there is no requirement for an ocean vessel to use the berth) and the designated barge berths included in some of the terminals.

An estimate of berth capacity was made based on information provided by operators and the Consultant's own experience. The resulting estimate is shown below:

Table 5-1 Future Berth Capacity of KTCT (Million TEUs/year)

Year	2015	2020	2025	2030
Estimated Capacity	21.7	22.2	22.8	23.4

At all terminals the yard areas are located adjacent to the berths. The shape of these areas has been dictated by the layout of adjacent roads and other developments, such that in most cases the ideal rectangular layout does not exist.

Based on the storage capacity as well as other factors affecting the yard capacity, the estimates of yard capacity at KTCT are:

Table 5-2 Future Yard Capacity of KTCT (Million TEUs/year)

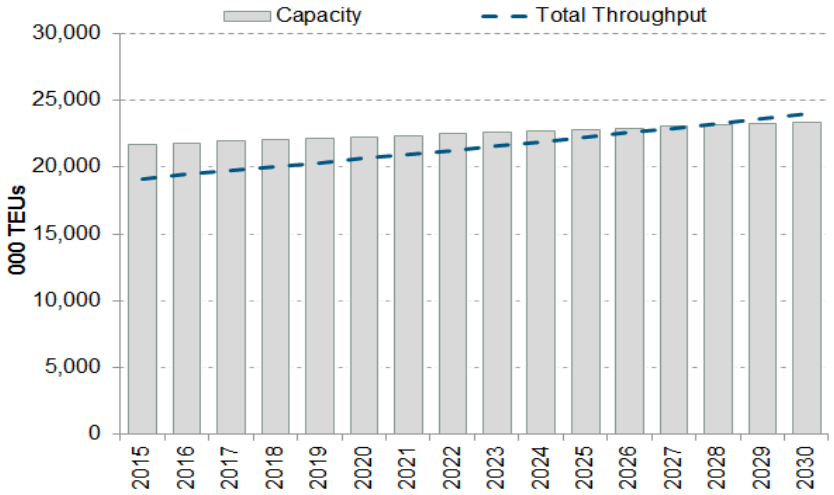
Year	2015	2020	2025	2030
Estimated capacity	22.4	22.9	23.5	24.1

5.4 Demand vs Capacity of HKP

Similar assessments were undertaken for the other container handling facilities at HKP to estimate capacities. The forecast throughput will exceed the capacity of container handling facilities as follows if no measures to enhance capacity are implemented.

- KTCT – 2028
- Berths and Wharves outside KTCT – Not before 2030
- Buoys and Anchorages – Not before 2030

Figure 5-2 Throughput and Capacity of KTCT with no Measures to Enhance Capacity in Effect to 2030



Source: BMT

It is apparent that all buffers at KTCT will be lost in the coming years if some capacity is not added to these facilities, particularly as the increasing throughput by barge will take up space serving ocean vessels, entailing a compromise of handling efficiency. Additional capacity should address the increased throughput by barge, as well as ocean vessels.

6 Issues Affecting HKP

6.1 Introduction

This Chapter summarises the identified issues that HKP faces in the Study.

6.2 Key Issues

6.2.1 Uneven utilisation of facilities

The utilisation of HKP's cargo handling facilities is uneven:

Table 6-1 Utilisation of Cargo Handling Facilities at HKP, 2011

Facility	Utilisation Rate in 2011
KTCT	82%
Other facilities	
RTT	49%
MSS	-#
PCWA	53%
Anchorages	56%

Source: BMT / Transport and Housing Bureau

 # Throughput of MSS is not available for deriving utilisation rate.

HKP's role in sea freight is increasingly as a transhipment point for containers transferring between river and ocean vessels, or between ocean vessels, concentrated at KTCT.

The RTT and PCWA facilities have low utilisation as trends in shipping have made them less attractive to shippers and vessel operators, such as increases in vessel size and the trend towards transhipment between vessels. It would be beneficial for the operators of these facilities, and in terms of land utilisation in Hong Kong, if either:

- A sustainable method of increasing the utilisation of the facilities can be found, or
- The sites are made available for alternative uses, and the function they perform transferred to other locations.

6.2.2 Increasing demand for barge berths

Inland transport is increasingly undertaken by river and as there are a limited number of barge berths at KTCT, terminal operators need to develop additional river berths. While river vessels may use ocean berths, this represents an inefficient use of ocean berth capacity, and the crane systems are inappropriate for these smaller vessels.

6.2.3 Need to accommodate the growth in throughput forecast in the PCF

HKP's facilities need to be able to accommodate forecast throughput to avoid constraining growth. As such, additional capacity should be provided at KTCT before throughput exceeds capacity (forecast to occur before 2030 – the Study's timeframe).

6.2.4 A growing trend of International Transhipment

International transhipment was the fastest growing type of

throughput at HKP over the previous decade, and is forecast to be so in future. This requires ocean berths at facilities where large numbers of ocean vessels call, and the ability to efficiently transfer containers between nearby terminals.

6.2.5 A potential increase in calls by mega-vessels

As more mega-vessels are ordered, built and deployed the frequency with which they call at HKP will rise, subject to carriers' vessel deployment strategies. An increase in calls may reduce the productivity per metre of berth at KTCT because presently there is limited evidence that the TEU exchange per call is significantly greater for mega vessels, yet they occupy a greater length of berth.

6.2.6 Inland trucking costs

High cross-boundary trucking costs have long been recognised as a disadvantage for HKP compared to other South China ports. Trucking to HKP will always be inherently more expensive due to the additional distance involved; however, artificial constraints that would not be present in a single, common trucking market have exacerbated this cost differential. Measures to address this have been taken such as the removal of the 'four-up-four-down' requirement, yet operational practices have not been transformed nor trucking rates made notably more favourable.

6.2.7 Greater THC than competing South China ports

The THC carriers charge for calling at HKP is greater than at competing South China ports, as is the CHC charged by terminal operators to carriers. By international standards HKP has a very low ratio of yard area to berth length. This results in a higher density of container stacks, and high container storage costs for HKP's terminal operators as greater investment in technology is required – impacting CHCs & THCs.

There is a shortage of space at HKP and as a result terminal operators cannot offer competitive container storage terms. Terminal operators may rent land close to KTCT for storage but currently such an arrangement has two disadvantages:

- The storage area is outside the terminal boundary so requires trucking via public roads, and
- The short-term tenure of these sites discourages operators from investing in solutions that would maximise efficiency.

Furthermore transhipment frequently requires the movement of containers from one terminal to another, and some of these movements require trucking on public roads, which is more costly than trucking within terminals.

6.2.8 Difficulty of implementing port development projects

HKP's facility operators have regularly upgraded their equipment and adapted their operations to keep pace with trends in shipping, however this is limited to within the sites they operate. But, historically HKP has a poor record of adapting whenever significant change requires Government approval; stakeholders note:

- The time taken for Government to reach decisions
- The difficulty of dealing with multiple Government departments
- A perceived tendency to always give greater priority to existing users of land or minor technical issues than to the future benefit gained from change

This situation has led to ineffective use of land around the port. In a city where people, cars, large vehicles such as buses, and activities such as warehousing are so frequently accommodated vertically in multi-storey buildings; and when the ratio of yard area to berth length at HKP is significantly below international standards, it is

surprising to find that significant areas of land are permitted for truck parking at grade, close to HKP's berths.

6.2.9 Broadening range of trading partners and greater growth opportunities in Asia and other regions

Currently 80% of laden ocean throughput (by TEU) is generated from four world regions (as at 2011):

- North America (14.7%)
- Europe (11.1%)
- Mainland China (17.3%)
- Main Asian countries (Excluding China)[2] (36.9%)

North America and Europe have declined in significance over recent years, while Mainland China and main Asian countries (excluding China) have grown as a proportion of the total.

The geographic distribution of laden ocean throughput has widened among world regions. In 2001 10.0% of ocean throughput was to or from regions outside the big four (North America, Europe, Mainland China and main Asian countries (excluding China)). In 2011 this had increased to 20.1%.

Therefore HKP cannot rely on the traditional Asia-Europe or Asia-North America trades as a future source of significant growth. Intra-Asia trade typically utilises smaller ocean vessels than European and American trades, and includes vessel operators who are less time-sensitive but more price-sensitive. To remain competitive HKP needs to offer a choice of facilities offering different levels of service and cost.

[2] Includes South Korea, Japan, Taiwan, Singapore, Malaysia, Thailand, Indonesia, Brunei, Philippines, India, Pakistan, Sri Lanka, Bangladesh and Myanmar.

7 Recommended Development Plan

7.1 Defining and Developing the Vision

Given the competitive nature of the shipping industry and the scarcity of land in Hong Kong it is proposed that the development plan should: (i) allow better use to be made of existing infrastructure, (ii) increase the competitiveness of HKP, and hence (iii) enable HKP to adapt to market trends.

Stakeholder consultation revealed that a lack of a clear strategy for the type of port HKP should become is a major concern. It is important that the stakeholders of the port industry (local and international) know the Government has a clear direction. That "vision" must be relevant to future trends in the shipping industry, HKP's strengths and key issues affecting the port. The following *Vision* and *Actions* have been developed in response to the identified Issues.

Table 7-1 Developing the Vision: Determination of Actions for the Development of HKP

Vision	Rationale	Issues	Actions
To be the preferred transhipment and inbound distribution hub for South China, leveraging the PRD waterway network to minimise the environmental impacts of cargo transport in South China.	• Allow better use to be made of existing infrastructure, • Enable HKP to adapt to trends in the shipping industry, and • Increase the competitiveness of HKP.	• Uneven utilisation of facilities	**Action 1:** Allow better use to be made of existing infrastructure by: • Reviewing how RTT and PCWAs may be better used
		• A shift from road to river for inland transport, creating river-to-ocean transhipment • A potential increase in calls by mega-vessels • A growing trend of international transhipment • Need to accommodate the throughput forecast in the PCF	**Action 2:** Enable HKP to adapt to trends in the shipping industry by: • Facilitating river and ocean vessels to use the same facility • Preparing for increasing inland transport by river • Providing adequate ocean berth capacity • Optimising HKP for handling transhipment: develop 'hub' facilities that can accommodate large numbers of ocean and river vessel calls, with adequate land area, and efficient transfer of containers between terminals • Confirming that provision of ocean and river berths, and yard capacity, can accommodate the throughput forecast in the PCF
		• Greater inland transport costs than competing South China ports, particularly by truck • Greater THC than competing South China ports • Difficulty of implementing port development • Broadening range of trading partners and greater growth in Asia and other regions	**Action 3:** Increase the competitiveness of HKP by: • Strengthening HKP's competitive advantages • Lowering inland transport costs (by truck) • Facilitating lowering of the CHC • Overcoming the stasis affecting port development from long Government procedures • Promoting Hong Kong port to the global shipping community, targeting cargo from world regions with the greatest growth potential

7.2 Delivering the Vision

For each of the three actions, one or more measures have been proposed. These measures may need to be further validated through various feasibility assessments (including marine traffic impact assessment or traffic impact assessment / review).

Action 1: Allow better use to be made of existing infrastructure

7.2.1 Measure 1: Upgrade Stonecutters Island PCWA to become a modern container handling facility for ocean or river vessels with a view to improving operational efficiency

The PCWA on Stonecutters Island could be upgraded with significantly better container handling equipment, and more space for efficient container storage. Hours could be extended to 24 hours daily and individual berths consolidated, and integration with the KTCT investigated. Handling of non-containerised cargo may be re-located to other PCWAs or RTT. Benefits include:

- Additional ocean or barge berth capacity,
- Additional yard capacity,
- Avoidance of trucking on public road for container transfers,
- Improved utilisation of other facilities through shifting of non-containerised cargo handling from Stonecutters Island PCWA.

Action 2: Enable HKP to adapt to trends in the shipping industry

7.2.2 Measure 2: At sites that can physically accommodate ocean vessels today, develop them as dual ocean and river facilities

It is proposed to allow RTT to also handle ocean vessels.

RTT is an under-utilised facility, built primarily for river vessels but having the physical capability to accept small ocean going vessels (up to approximately 1,000 TEUs). Presently the operator is only licenced to accept river vessels. Benefits of this measure include:

- Additional ocean berth capacity for HKP,
- Improved utilisation of RTT,
- Reduced pressure on KTCT to accommodate river and smaller ocean vessels, and
- Increased choice of facilities for operators of ocean vessels.

7.2.3 Measure 3: Provide additional barge berths at KTCT to relieve congestion caused by river throughput

There are opportunities to construct additional barge berths at KTCT in locations that could not be developed as ocean berths at CT5, within the Rambler Channel, and at CT9 South. Benefits include:

- Additional barge berth capacity,
- Release of ocean berth capacity to handle ocean vessels, and
- Some additional container storage area.

7.2.4 Measure 4: Make better use of land around terminal boundaries and other facilities to accommodate growth in transhipment and allow efficient operation

This measure increases container storage area and reduces the need for trucking transhipment containers on public roads. A series of specific sites have been identified. Benefits include:

- Reduces need for expensive, inefficient, high container stacks,
- Enables terminal operators to offer better storage terms,
- Container transfers between KTCT and the upgraded Stonecutters Island PCWA site avoid using public roads,
- May facilitate lower CHCs by reducing operating costs, and
- Better use of land as the need for truck parking has diminished.

7.2.5 Measure 5: Build CT10

The Government has studied the feasibility of constructing a further container terminal (CT10), to complement the existing KTCT terminals 1-9.

Following the rationale of allowing better use to be made of existing infrastructure first, only if the preceding measures (Measures 1 to 4) to enhance capacity cannot accommodate forecast throughput, should consideration be given to construction of CT10. However, review of the demand and supply assessments indicates that CT10 will not be required before 2030 if proposed Measures 1-4 are implemented first.

Action 3: Increase the competitiveness of HKP

7.2.6 Measure 6: Establish "HKP Development and Promotion Team"

An individual Government-supported body (similar to the Tourism Commission or Trade Development Council) could take a development and promotional role for the port as a whole, as happens for tourism and trade.

It is proposed that the new HKP Development and Promotion Team be established as a division within the new statutory maritime body (see: *"Consultancy Study on Enhancing Hong Kong's Position as an International Maritime Centre"*), and have two main functions focussed on (i) port development projects, and (ii) marketing. The benefits are expected to include:

- Reduced decision making time,
- Achieving outcomes that give appropriate weight to the long-term interests of the port sector,
- Helping HKP to remain competitive,
- Greater awareness among the global shipping community of HKP's strengths,

- Possible increases in vessel calls at HKP, in turn strengthening its attraction as a transhipment hub, and
- Showing the global shipping community that Hong Kong is still a thriving competitive port.

7.2.7 Measure 7: Expedite development of proposed logistics facilities e.g. in New Territories

Aimed at strengthening HKP's competitive advantage for higher value, or time sensitive, or import shipments. This measure also complements the development of Hong Kong as a Regional Distribution Centre (RDC), for which additional modern warehousing and logistics facilities are needed. Indirectly benefitting the port by enhancing Hong Kong's logistics capabilities, this does not directly affect the port's physical facilities or handling capacity. Benefits include:

- Greater opportunities for HKP facilities, particularly RTT, to handle sea cargo that such logistics facilities may create, and
- Strengthening Hong Kong's image as a logistics hub, of which the port is a key component.

7.2.8 Measure 8: Increase supply of truck drivers for cross-boundary and intra-terminal trucking

It is proposed that the artificial constraint affecting the supply and demand balance for truck drivers is removed. Permitting truck drivers from the Mainland to work through to Hong Kong or take intra-terminal truck driving jobs would increase the supply of drivers thereby lowering the equilibrium price, i.e. labour costs, for trucking. This measure would bring the trucking industry on a par with the successful river transport network feeding HKP. Benefits include:

- It will narrow the cost differential in inland trucking costs between HKP and other South China ports,
- Potentially win market share in South China cargo from competing ports, and
- May facilitate lowering of CHC by reducing terminal operating costs.

7.3 How the Measures Address the Issues Identified at HKP

The following table summarises how the issues facing HKP can be addressed through the proposed measures.

Table 7-2 Matrix of Measures vs Issues Faced

Issues	1 Upgrade Stonecutters Island PCWA.	2 Dual ocean and river facilities	3 Provide additional barge berths at KTCT	4 Better use of land around terminal	5 Build CT10	6 HKP Development and Promotion Team	7 Proposed logistics facilities	8 Increase supply of truck drivers
Uneven utilisation of facilities	✓	✓	✓	✓			✓	
A shift to river-to-ocean transhipment	✓	✓	✓					
Increase in calls by mega-vessels	✓				✓			
Growing international transhipment	✓	✓		✓	✓			
Accommodate PCF forecast throughput	✓	✓	✓	✓	✓			
High inland trucking costs								✓
Greater THC than competing ports				✓				✓
Difficulty in port development						✓		
Broadening range of trade						✓		

Source: BMT

7.4 Assessment of Overall Impact on HKP

7.4.1 Ease and effectiveness

The measures proposed have been evaluated in terms of their effectiveness and ease of implementation. Effectiveness has been scored based on achieving the following key goals:

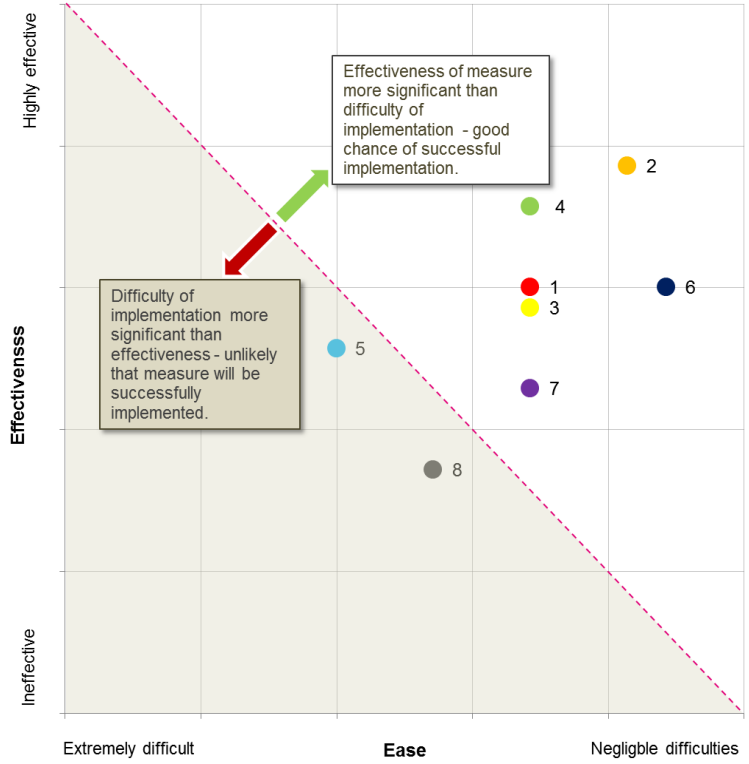
- Allow reduction in terminal operating costs
- Provide additional capacity in the correct locations
- Complement existing facilities
- Allow environmental impacts to be reduced
- Can take effect in a short time frame
- Increase the attractiveness of HKP for shippers and carriers
- Offers a needed service that competitors do not

The ease of implementing each measure has been scored based on:

- Land requirements
- Adverse environmental consequences
- Relative cost
- A long time frame for implementation
- Disruption during construction
- Displacement of jobs
- Likelihood of objectors (e.g. residents, unions, competitors or land owners)

All attributes were given equal weighting. Considering the effectiveness and ease of implementation, Measures 1 to 4, 6 & 7 are being taken forward in the strategic development plan. Measures 5 and 8 are considered to have a low chance of successful implementation, within the timeframe of this study.

Figure 7-1 Evaluation of Proposed Measures



Source: BMT

Where:

- 1 - Upgrade Stonecutters Island PCWA
- 2 - Dual ocean and river facilities
- 3 - Provide additional barge berths at KTCT
- 4 - Better use of land around terminal boundaries
- 5 - Build CT10
- 6 - Development and Promotion Team for HKP
- 7 - Proposed logistics facilities
- 8 - Increase supply of truck drivers

Table 7-3 Recommended Measures for the Strategic Development Plan

	Measures and Details	Preferred timeframe[3]
1	Upgrade Stonecutters Island PCWA to become a modern container handling facility for ocean or river vessels with a view to improving operational efficiency.	*In phases from 2018[4].*
2	At sites that can physically accommodate ocean vessels today, develop them as dual ocean and river facilities - RTT to be allowed to accept ocean vessels as well as river trade vessels (subject to lease modification with premium implication).	2015
3	Provide additional barge berths at KTCT to relieve congestion affecting river throughput.	
	***3a** - Construct 1 additional barge berth N. of CT5, as soon as possible.*	*2015*
	***3b** - Construct up to 4 additional barge berths N. of Cheung Tsing Bridge subject to physical constraint and rezoning, as soon as possible.*	*In phases by 2018.*
	***3c** - Construct up to 5 additional barge berths SW. of CT9S, marine traffic impact assessment to be conducted as soon as possible to ascertain feasibility.*	*In phases by 2018.*
4	Make better use of land around terminal boundaries and other facilities to accommodate growth in transhipment and allow efficient operation[5]. Land to be offered on long term tenures.	
	***4f** - Assign land at Kwai Chung north of CT5 for permanent container storage use.*	*2015/16*
	***4a & 4g** - Assign land east of CT7 for permanent container storage use. Extend Tat Mei Rd to connect with Mei Ching Rd, and abandon Container Port Rd South between Kwai Chung Customs House and roundabout with Mei Ching Rd. Abandoned section of Container Port Rd South to be part of the container yard.*	*2015/16 for 4a; 2020 or after for 4g.*
	***4e & 4h** - Assign land at Tsing Sheung Road for permanent container storage use. Abandon Hong Wan Road and make it an internal road as part of the container yard to maximise the benefit of 4e Tsing Sheung Road. This measure will complement the addition of up to 5 additional barge berths SW. of CT9S.*	*2017/18 for 4e; 2020 or after for 4h.*
	***4c** - Assign land at Tsing Yi Cheung Fai Road and vacant land nearby for permanent container storage and handling use, with barge berths.*	*2018*
	***4d** - Assign land at Tsing Yi Hong Wan Road for permanent container storage use.*	*2015/16*
6	HKP Development and Promotion Team – to be established as soon as possible within the context of the new statutory body for maritime.	Hopefully in the next 3-5 years.
7	Expedite development of proposed logistics facilities e.g. in New Territories	In phases from 2015.

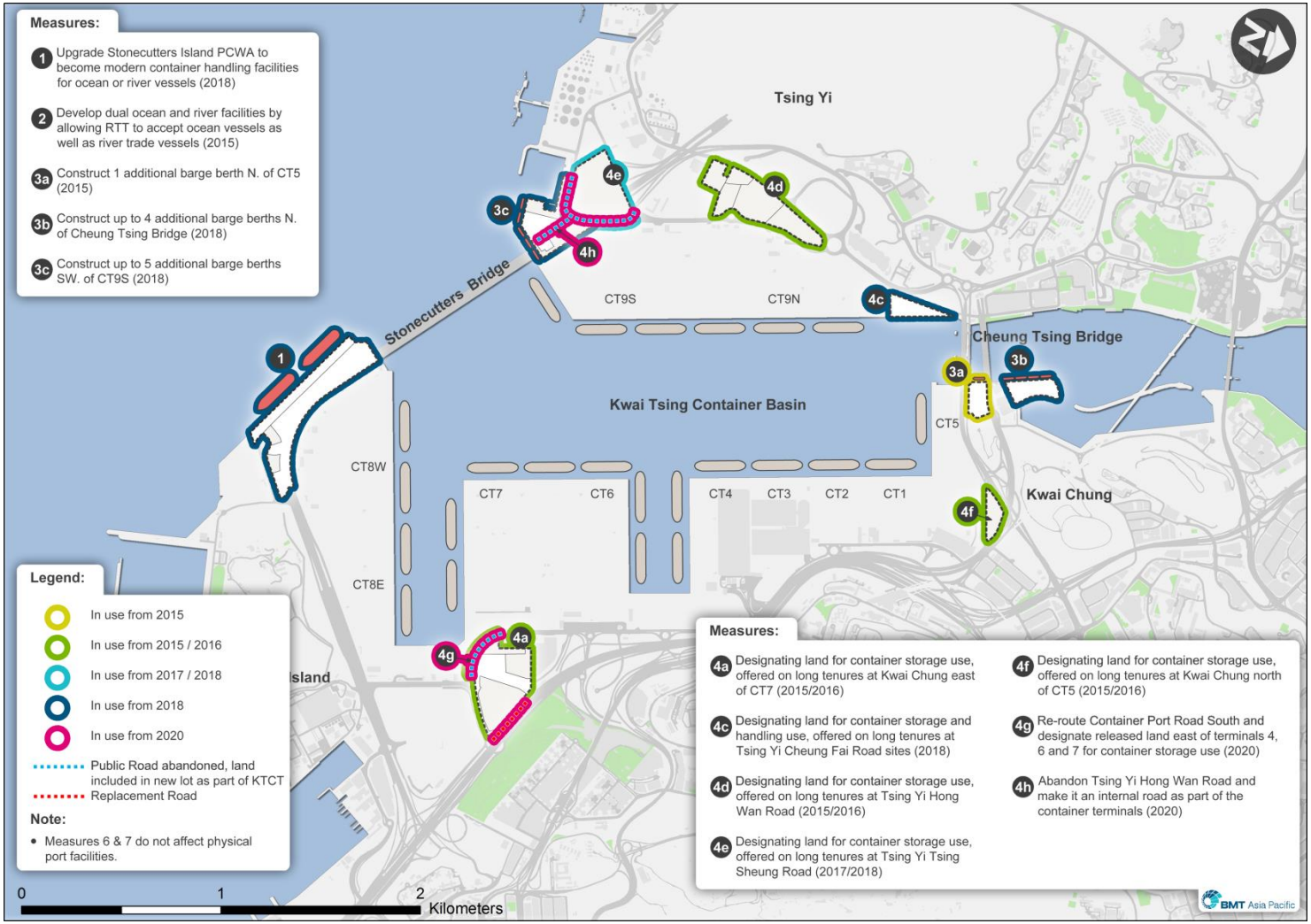
Source: BMT

[3] *The preferred timeframe best meets the development needs of HKP, however this may be subject to change after taking into consideration various detailed constraints and factors during implementation.*

[4] *The Public Cargo Working Area Berth Licence Agreement for Stonecutters Island PCWA will be expired in July 2016. Then, it takes about another year to install handling equipment at the site for terminal operations.*

[5] *The additional container storage area that could be created using all of the proposed measures is greater than the shortfall in yard capacity up to 2030. Recommended changes to land use have been selected from the proposed measures based on: the additional capacity required up to 2030, future availability of sites currently occupied, proximity to berths with lower yard-area-to-berth-length ratios, locations that would reduce the need for trucking via public roads, and the complexity of traffic engineering needed where changes to the road network are proposed. No need for measure 4b has been identified prior to 2030.*

Figure 7-2 Map Showing Recommended Measures to be Implemented



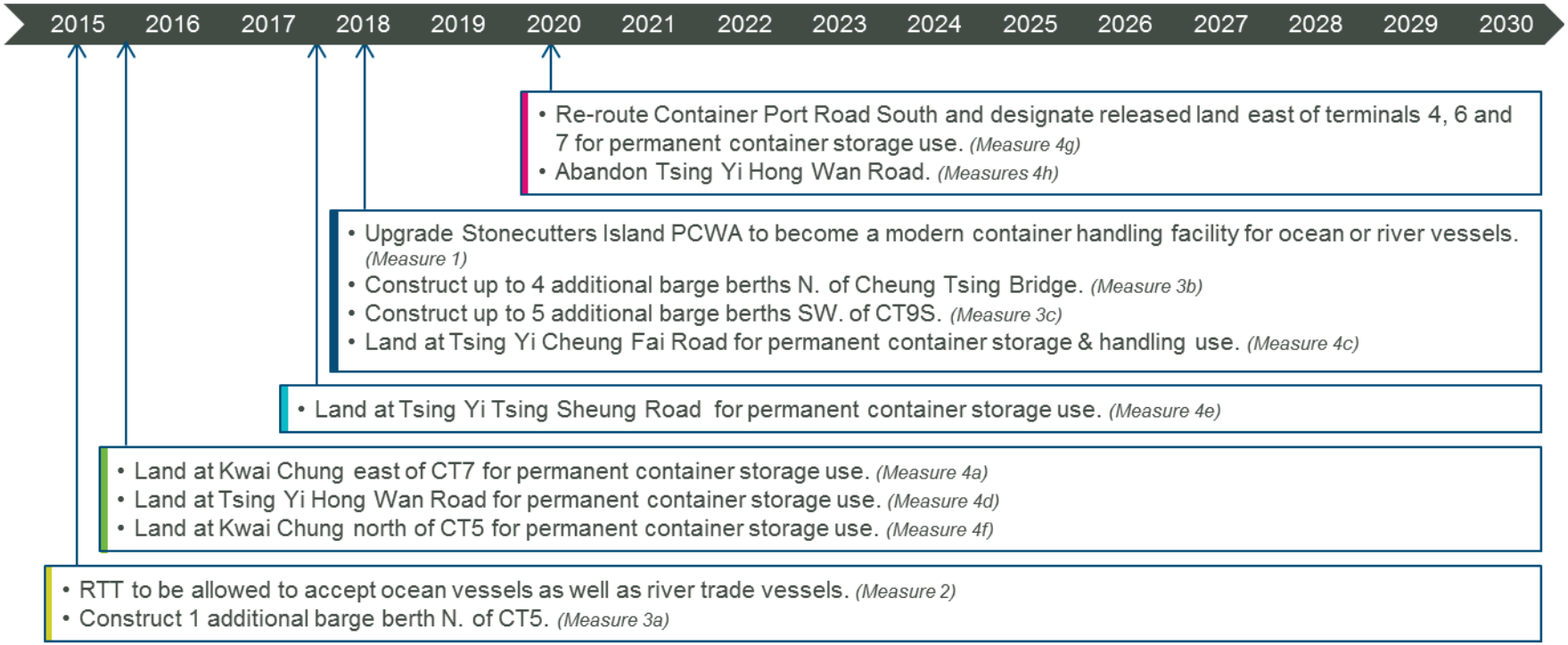
Source: BMT

Note: Measure 4b on land at Kwai Chung east of CT8 for permanent container storage use is not recommended as no need is identified prior to 2030.

The need for, combination of, and timing of measures that enhance capacity have been determined with reference to the throughput forecasts from the PCF and assessment of HKP's capacity, and the availability of any required land.

Measures affecting institutional arrangements in Hong Kong are all recommended for early implementation to address the issues that have been affecting the port for some years. The timing of measures to enhance the capacity of physical facilities is specifically identified in the following timeline[6]:

Figure 7-3 Preferred Timeline of Enhancements to Capacity showing Year by which Measures should be in Effect

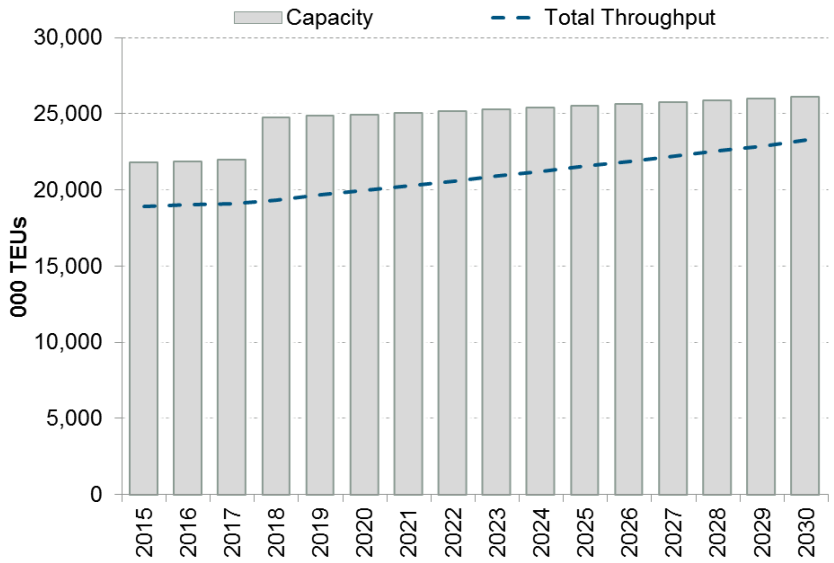


Source: BMT

[6] *The preferred timeline best meets the development needs of HKP, however this may be subject to change after taking into consideration various detailed constraints and factors during implementation.*

Implementation of the recommended measures will maintain sufficient capacity at KTCT throughout the Study timeframe to 2030.

Figure 7-4 Throughput and Capacity of KTCT with Measures to Enhance Capacity in Effect to 2030[7]



Source: BMT

There is inherent variability in forecast throughput, and therefore some spare capacity is desirable. Berths and Wharves and Buoys and Anchorages both have significant spare capacity.

The measures proposed for KTCT provide approximately 10% - 20% spare capacity based on the forecast throughput, which is consistent with the provisions of the previous few years. Spare capacity provides flexibility, and can help accommodate changes or events that are difficult to predict such as:

- The effect of increased calls from mega vessels,
- The possibility that container dwell times may increase in future, which has the effect of lowering yard capacity, and
- Vessel delays caused by weather - not just in Hong Kong but along the China coast - which cause a backlog of vessels to inundate KTCT.

Given that adequate capacity can be provided by increasing the utilisation of existing container handling facilities, and land around KTCT, it is not recommended to pursue the planning of CT10 for operation prior to 2030.

Additionally analysis has identified that CT10 is not considered financially or economically viable within the timeframe of this study, mainly due to the following reasons:

- Throughput forecasts for HKP are now lower than in previous studies, when CT10 was recommended as a possible option.
- Around 75% of HKP's throughput will be transhipment in 2030, which makes a smaller economic contribution and generates less revenue than import/export shipments.

[7] *This assessment is based on mixed-mode operation, i.e. ocean berths are used to serve both ocean and river vessels as required.*

- The development of CT10 requires a total CAPEX of HK$60.9 billion, much higher than the capital costs estimated in previous studies when CT10 was recommended. Combined with a lowered throughput, the expected economic and financial incomes cannot fully recover the investment costs.

It is suggested to review the Port Cargo Forecast in 5 years or so to monitor the development of Hong Kong's port sector and ensure timely provision of port facilities and port related infrastructure.

8 Summary & Conclusion

This Executive Summary has presented the key findings of the consultancy *"Study on the Strategic Development Plan for Hong Kong Port 2030"* which has addressed the growth and potential development response for cargo handling at Hong Kong Port (HKP).

The report highlights the positioning, competitiveness and future trends to which the current facilities must respond, and identifies the broad trends of diminishing share of South China cargo via HKP, counter balanced by growing captive (due to current Mainland cabotage rules) international transhipment market.

The competiveness of HKP for South China cargo and the issues impacting international transhipment has been examined. Factors associated with geography, legal structures, call frequency, port characteristics and cost that impact the outlook for these distinct cargo sources have also been reviewed.

It is anticipated that HKP will retain a certain level of market share of the South China cargo base due to increasing labour costs and the possible RMB appreciation impacting other South China ports, and thus enhancing the cost competitiveness of HKP. HKP is competitive and has a captive market for foreign carriers wishing to tranship China related cargo, and may also compete as an international transhipment hub over the wider Asia region.

A forecast of HKP's containerised throughput related to South China and international transhipment has been developed. It is forecast that demand for facilities will continue to grow at HKP up to 2030, but at a slow rate, averaging 1.5% per annum over this period.

The capacity of the existing HKP facilities, centred at the Kwai Tsing Container Terminals (KTCT) have been estimated and trends in usage outlined. It is identified that additional capacity will be needed at KTCT prior to 2030.

The key issues associated with HKP are the focus of specific review, relating to the uneven utilisation of facilities, the shift of inland transport mode for South China cargo from trucking to barging, the challenges with supporting international transhipment, and the growth of vessel sizes. Local challenges have also been highlighted: notably greater transport and handling costs and the difficulties of implementing port development projects.

Responding to forecast demand and issues identified in the Study, the definition, development and recommended options for future vision for HKP have been developed. A series of development measures that seek to meet required capacity and the future competitive environment, and maximise the capacity of existing facilities, are identified and prioritised based on their relative ease of implementation and effectiveness. These measures cover better use of existing facilities (RTT and Stonecutters Island PCWA), additional barge berths, improved land use around KTCT, and more co-ordinated development and marketing activity.

With these measures it is forecast that the existing infrastructure can be augmented to meet future demand forecasts up to 2030 without the need for creation of new terminal from scratch (i.e. CT10).

This plan provides a viable and valuable development path for HKP, based on the strengths of the industry that will allow it to continue to play a key role in Hong Kong's future advancement.

It is suggested to review the Port Cargo Forecast in 5 years or so to monitor the development of Hong Kong's port sector and ensure timely provision of port facilities and port related infrastructure.