



The contents of this document reflect GHD's current position on the subject matter of this document. It is provided for discussion or information purposes and is intended to be a guide only. The contents of this document should not be relied upon as representing GHD's final position on the subject matter, except where stated otherwise. Any views expressed by GHD in this document may change as a consequence of GHD finalising formal technical studies or specifications, or legislative, or procedure and regulatory developments. Any figures provided are indicative only, are subject to change and are dependent upon a number of factors.

Port of Hastings Development Authority  
“Review of Preliminary Container Demand Work”

KPM-CEP0-CE-REP-0015

Draft Final

30 June 2014



In May 2016 the Special Minister of State asked Infrastructure Victoria to provide advice on the future capacity of Victoria's commercial ports. Specifically, the Minister has asked for advice on when the need for a second container port is likely to arise and which variables may alter this timeline. The Minister has also asked for advice on where a second container port would ideally be located and under what conditions, including the suitability of, and barriers to investing in, sites at the Port of Hastings and the Bay West location.

In undertaking this task, Infrastructure Victoria reviewed work that was completed as part of the Port of Hastings development project before it was cancelled in 2014. This document forms part of the initial work undertaken for the proposed port development at Hastings. Infrastructure Victoria considers that much of the previous Hastings work, although preliminary in nature, is relevant and suitable for informing a strategic assessment. Therefore, Infrastructure Victoria has made the reports previously commissioned for the development project part of the evidence base on which Infrastructure Victoria will use in providing the Minister with advice.

The opinions, conclusions and any recommendations in this document are based on conditions encountered and information reviewed at the date of preparation of the document and for the purposes of the Port of Hastings Development Project.

Infrastructure Victoria and its consultants have used the information contained in these reports as an input but have not wholly relied on all the information presented in these reports.



147 Collins Street  
Melbourne VIC 3000

GPO Box 2291U  
Melbourne VIC 3001  
Australia

ABN: 51 194 660 183

Telephone: +61 3 9288 5555  
Facsimile: +61 3 9288 6666  
DX: 30824 Melbourne  
www.kpmg.com.au

## **Commercial in confidence**

Mr Andrew Varga  
Executive Manager Strategy and Projects  
Port of Hastings Development Authority  
2/34 High Street  
Hastings, VIC 3915

30 June 2014

## **Port of Hastings Container Expansion Project – Commercial and Economics – Review of Preliminary Container Demand Report**

We have been engaged by the Port of Hastings Development Authority (the Authority) to provide commercial and economic advisory services in connection with Port of Hastings Container Expansion Project, and attach our report in connection with providing these services.

### **Scope of work**

Our work has been performed in accordance with the scope of work outlined in our engagement contract and Purchase Order 1155 dated 15 May 2014.

### **Procedures**

Our work commenced on 15 May 2014 and was carried out up to 30 June 2014. We have not undertaken to update this report for events or circumstances arising after 30 June 2014.

### **Information**

In undertaking our work we had access to information prepared by the Authority and its specialist advisors. We have indicated in this report the sources of the information presented.

### **Distribution**

This report has been prepared exclusively for the Authority in relation to Port of Hastings Container Expansion Project. This report must not be used for any other purpose or distributed to any other person or party, except as set out in our engagement contract, or as otherwise agreed by us in writing.

Paul Foxlee  
Partner

**DRAFT – FOR DISCUSSION PURPOSES ONLY**

# Table of contents

1.	Introduction.....	1
1.1	Background.....	1
1.2	Purpose of this report.....	1
1.3	Approach and definitions .....	1
1.4	Scope and limitations.....	2
1.5	Structure of report.....	3
2.	Identification of changes .....	4
2.1	Introduction to this section .....	4
2.2	Recent Port of Melbourne and other East Coast port actuals versus forecasts.....	4
2.3	Declining multipliers in global container trades .....	8
2.4	Revised Victorian/ Port of Melbourne container forecasts.....	8
2.5	Port of Melbourne sale.....	8
2.6	Port of Melbourne Webb Dock new container stevedore .....	9
2.7	Port of Melbourne container capacity .....	9
2.8	Business Case forecasting period .....	10
3.	Identification of specific adequacy issues .....	11
3.1	Introduction to this section .....	11
3.2	Forecasting of empty containers.....	11
3.3	Set of Port of Hastings container demand scenarios .....	11
3.4	Tasmanian and mainland container demand .....	11
3.5	No visibility on reefer containers.....	12
3.6	International container trade migration assumptions.....	12
3.7	Other Australian main container port demand.....	12
4.	Identification of gaps .....	13
4.1	Introduction to this section .....	13
4.2	Missing container demand details required for Design team.....	13
4.3	Missing container demand details required for Port Environs .....	13
4.4	Missing container demand details required for Financial Model and Economic BCA analysis.....	13
4.5	Summary of proposed detailing of container demand.....	13
5.	Next steps .....	16
5.1	Introduction to this section .....	16
5.2	Proposed next steps .....	16

## Table index

Table 1	Port of Melbourne recent international container actuals and variance with Deloitte forecasts .....	4
---------	--	---

**DRAFT – FOR DISCUSSION PURPOSES ONLY**

Table 2	Port Botany recent container actuals and variance with NSW Ports' forecasts .....	6
Table 3	Port of Brisbane recent container actuals and variance with Port of Brisbane forecasts .....	6
Table 4	Port of Brisbane (2011 base) 30 year container trade forecasts, 2012-2041 .....	7
Table 5	Proposed container demand detailing .....	14

## Figure index

Figure 1	Adjusted versus original Deloitte Victorian international container demand forecasts .....	5
Figure 2	Port of Brisbane 30 year container trade forecasts, 2011-2041 .....	7



# 1. Introduction

## 1.1 Background

In 2013, the Port of Hastings Container Expansion Project undertook a preliminary assessment of future container demand for the purposes of developing a preliminary business case. The work was conducted by Deloitte and resulted in a paper entitled “Demand Assessment” dated 12 April 2013 (final version).

The first task of the current 2014 ‘Commercial and Economics’ Business Case work-stream, as specified in the work package CE-WP-005, is to conduct a review of the container demand work completed to date to inform the next stage of more detailed demand project work.

## 1.2 Purpose of this report

This report is a deliverable of work package CE-WP-005 (Demand Forecasting) and is a review of existing container demand work, namely the Deloitte “Demand Assessment” paper with the following points of attention:

- Assessment of the general adequacy of the work completed to date for use in the next stage of work
- Identification of any changes which may affect the results and conclusions of the existing work
- Identification of any gaps which require resolving for the next stage of work, recognising that the preliminary demand assessment was at a relatively high-level and was not intended to support a detailed terminal design or business case
- Recommend immediate actions/ follow-ups to be undertaken as part of the update of container demand forecasts to address any identified issues and new requirements.

## 1.3 Approach and definitions

The approach to conducting the review was a combination of desk-top analysis and a preliminary inter-disciplinary team review to identify and confirm issues and recommendations for updating the container demand forecasts.

Container demand (and forecast) is defined, for the purposes of this review document, as comprising two types:

- *Victorian port container demand* – being the container demand for the Port of Melbourne until the Port of Hastings becomes operational, where Victorian port container demand will be the sum of the container demand of both the Port of Melbourne and the Port of Hastings
- *Port of Hastings container demand* – being the contested container demand captured by the Port of Hastings (its share of the Victorian port container demand) until such time that the Port of Melbourne is closed for containers, in which case the Port of Hastings demand will equal the Victorian port container demand, assuming there is no other Victorian container port.

Victorian port container demand is further defined as comprising four relevant sectors for the future container demand of the Port of Hastings, namely:

- *International non-transshipment container demand* – international full and empty containers which are either unloaded from an international vessel in the port and then exit the port gate

(imports), or enter the port gate and are then loaded on an international vessel (exports). This is the majority of Victorian port container demand.

- *International transshipment container demand* – international full and empty containers which are transferred between two international vessels calling at the port and as such the containers do not leave the port precinct. This is a minor (typically volatile) part of Victorian container demand.
- *Tasmanian (Bass Strait) container demand* – full and empty containers shipped between Tasmania and Victoria across the Bass Strait which are a combination of domestic containers (mainland Australia origins or destinations) and international containers (Tasmanian international imports and exports moving across the Bass Strait connecting with an international vessel at a Victorian port, currently the Port of Melbourne).
- *Mainland coastal container demand* – full and empty containers moved by international vessels between a Victorian port (currently the Port of Melbourne) and other Australian mainland container ports which are a combination of international containers (i.e. two Australian container ports are used to connect two international vessels), domestic mainland containers, and empty containers repositioned between two Australian mainland ports.

The container demand, for the purposes of this review, is also best defined as three types of container of two different sizes, namely:

- Dry (or general purpose) containers – 20 foot (ft) and 40 ft size
- Reefer (refrigerated) containers – 20 ft and 40 ft size
- Other (or special types such as ISO tanks, flat-racks, open-tops, domestic / shipper-owned) – 20 ft and 40 ft size.

Each of these container types and sizes can be either full (loaded with cargo) or empty.

The common measure of container numbers (port volumes or throughput) is the “Twenty-foot Equivalent Unit (TEU)”. One 20-foot container comprises one TEU, and one 40-foot container comprises two TEU.

## **1.4 Scope and limitations**

*This document is in draft form. The contents, including any opinions, conclusions or recommendations contained in, or which may be implied from, this draft document must not be relied upon. GHD reserves the right, at any time, without notice, to modify or retract any part or all of the draft document. To the maximum extent permitted by law, GHD disclaims any responsibility or liability arising from or in connection with this draft document.*

*This report: has been prepared by GHD for the Client and may only be used and relied on by the Client for the purpose agreed between GHD and the Client as set out in section 1.2 of this report.*

*GHD otherwise disclaims responsibility to any person other than the Client arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.*

*The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.*

*The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.*

*The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.*

**DRAFT – FOR DISCUSSION PURPOSES ONLY**

*GHD has prepared this report on the basis of information provided by the Client and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.*

## **1.5 Structure of report**

The structure of this report comprises:

- *Identification of changes* – this section covers relevant changes in market conditions and project parameters since completion of the previous Demand Assessment work for containers
- *Identification of specific adequacy issues* – this section covers issues with previous assumptions, methodology, data and results observed in the previous Demand Assessment work for containers
- *Identification of gaps* – this section covers gaps in the previous Demand Assessment work for containers
- *Recommended immediate study actions/ follow-ups* – this section summarises the immediate actions/ follow-ups required to update the previous Demand Assessment study work for containers.

## 2. Identification of changes

### 2.1 Introduction to this section

Since the Deloitte Preliminary Demand Assessment work was completed in April 2013, there have been a number of changes, some of which require an adjustment to container demand forecasts (i.e. recent container throughput actuals for the Port of Melbourne). Additionally, there are other changes which are noted as having the potential to change the dynamics of forecast contestable demand for the Port of Hastings (i.e. the forthcoming terms of the sale of the Port of Melbourne). This section presents the identified changes of relevance for further discussion.

### 2.2 Recent Port of Melbourne and other East Coast port actuals versus forecasts

#### 2.2.1 Port of Melbourne container actuals versus forecasts, 2012-2014

The Deloitte Demand Assessment was based on Port of Melbourne actuals for Financial Year (FY) 2011-12. Table 1 summarises the most recent Port of Melbourne international container throughput data for FY 2010-11 through FY 2013-14 with the last two months of May 2014 and June 2014 projected<sup>1</sup>.

**Table 1 Port of Melbourne recent international container actuals and variance with Deloitte forecasts**

Port of Melbourne international containers	FY 2010-11	FY 2011-12	FY 2012-13	FY 2013-14
Actual Throughput (TEU)	2,008,709	2,112,494	2,068,895	2,105,200* (projected)
Actual Annual Growth Rates (Per cent)	-	5.2%	-2.1%	1.8%*

Source: Port of Melbourne Corporation monthly overseas container statistics.

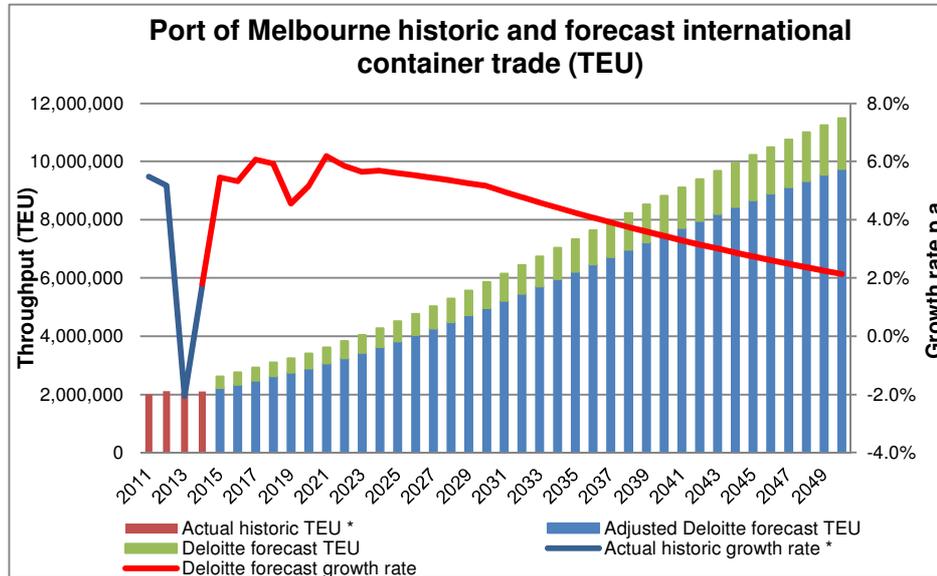
Note: (\*) July 2013-April 2014 actuals with May 2014 & June 2014 projected (see footnote for basis of projection).

For the key container demand segment of international containers, in FY 2012-13 the annual growth rate for the Port of Melbourne (Victoria) based on actuals was -2.1 per cent (a decline), compared with a Deloitte forecast increase of 4.1 per cent for the period. For FY 2013-14 (projected), the annual growth rate for international containers at the Port of Melbourne (Victoria) is estimated to have remained low at 1.8 per cent compared with a Deloitte forecast of 5.6 per cent for the period. The result is that by July 2014 (start of FY 2014-15), it is estimated that an over-forecast of international container demand has reached almost 380,000 TEU, an 18% difference between projections and Deloitte forecasts. However, this does need to be treated carefully in terms of understanding base assumptions for international volumes versus totals and any residual impacts post the Global Financial Crisis (GFC).

An adjusted Deloitte Victorian container demand forecast using FY 2013-14 (projected) actuals as the base and Deloitte forecast annual growth rates thereafter, versus the original Deloitte forecasts (per April 2013) is shown in Figure 1.

<sup>1</sup> Projections for May 2014 and June 2014 containers are based on April 2014 actuals with the monthly changes between April, May and June 2013 actuals applied (i.e. the most recent monthly seasonality effects applied to April 2014 actuals).

**Figure 1 Adjusted versus original Deloitte Victorian international container demand forecasts**



(\*) Projections for May 2014 and June 2014 containers are based on April 2014 actuals with the monthly changes between April, May and June 2013 actuals applied (i.e. the most recent monthly seasonality effects applied to April 2014 actuals).

Source: Table 1 data with Deloitte Demand Assessment forecasts (April 2013 paper).

The comparison between adjusted and original forecasts in Figure 1 shows that the Victorian international container demand levels forecast for FY 2024-25 are reached four years later, in FY 2028-29, based on FY 2014-15 as the start of forecasts and no other adjustments (i.e. no change in the Deloitte forecast growth rates for Victorian international containers between FY 2014-15 and FY 2049-50). The question of the adequacy of the forecast growth rates used by Deloitte is a separate issue, which will be addressed in the detailed demand forecasting update work to follow.

### 2.2.2 Other East Coast port container actuals versus forecasts, 2012-2014

The lower recent container demand actuals for the Port of Melbourne compared with forecasts are also evident at the other main East Coast container ports of Sydney (Port Botany) and Brisbane.

#### Sydney (Port Botany)

Table 2 summarises the Port Botany container throughput actuals for FY 2010-11 through FY 2013-14 with the last two months of May 2014 and June 2014 projected<sup>2</sup>, and compares this with NSW Ports' forecasts for the same period.

<sup>2</sup> Projections for May 2014 and June 2014 containers are based on April 2014 actuals with the monthly changes between April, May and June 2013 actuals applied (i.e. the most recent monthly seasonality effects applied to April 2014 actuals).

**Table 2 Port Botany recent container actuals and variance with NSW Ports' forecasts**

Port Botany container demand	FY 2010-11	FY 2011-12	FY 2012-13	FY 2013-14
Actual Throughput (TEU)	2,020,984	2,036,142	2,126,272	2,201,846*
Actual Annual Growth Rates (Per cent)	-	0.8%	4.4%	3.6%*
NSW Ports forecast (TEU)	-	-	-	2,251,040

Source: Sydney Ports / NSW Ports monthly container statistics, and NSW Ports "Five Year Port Development Plan (March 2014)".

Note: (\*) July 2013-April 2014 actuals with May 2014 & June 2014 projected (see footnote for basis of projection).

In FY 2012-13, the annual growth rate of container throughput for Port Botany was 4.4 per cent. For FY 2013-14 (projected), the annual growth rate for international containers at Port Botany is estimated to have remained low at 3.6 per cent, compared with a NSW Ports forecast of 5.9 per cent for the same period. According to NSW Ports<sup>3</sup>, it is worth noting that the container trade forecasts outlined by the NSW Government in November 2013<sup>4</sup> indicate that annual container growth rate could be as high as 7 per cent, implying a container throughput of 3.2 million TEU by 2018, but this high-end forecast annual growth rate has not been adopted by NSW Ports in their five year container trade forecasts as of March 2014.

Based on FY 2013-14 (projected) and the NSW Ports forecast annual growth rate of an average of 6.2 per cent, the recent forecast of reaching 3.2 million TEU in 2019 will now only be reached by 2021, some two years later.

### **Brisbane**

Table 3 summarises the Port of Brisbane container throughput actuals for FY 2010-11 through FY 2013-14 with the last two months of May 2014 and June 2014 projected<sup>5</sup>, and compares this with Port of Brisbane forecasts for the same period.

**Table 3 Port of Brisbane recent container actuals and variance with Port of Brisbane forecasts**

Port of Brisbane Container demand	FY 2010-11	FY 2011-12	FY 2012-13	FY 2013-14
Actual Throughput (TEU)	978,815	1,024,641	1,069,885	1,092,539*
Actual Annual Growth Rates (Per cent)	-	4.7%	4.4%	2.1%
Port of Brisbane forecast (TEU)	N/A	1,042,451	1,110,210	1,182,374

<sup>3</sup> NSW Ports "Five Year Port Development Plan" (March 2014), page 14. **DRAFT – FOR DISCUSSION PURPOSES ONLY**

<sup>4</sup> Transport for NSW "NSW Freight and Ports Strategy (November 2013)", page 31.

<sup>5</sup> Projections for May 2014 and June 2014 containers are based on April 2014 actuals with the monthly changes between April, May and June 2013 actuals applied (i.e. the most recent monthly seasonality effects applied to April 2014 actuals).

Source: Port of Brisbane monthly container statistics, and Port of Brisbane “Brisbane Port Land Use Plan 2013”, page 34.

Note: (\*) July 2013-April 2014 actuals with May 2014 & June 2014 projected (see footnote for basis of projection).

In FY 2012-13, the annual container growth rate for the Port of Brisbane was 4.4 per cent, compared with a Port of Brisbane Corporation forecast of 6.5 per cent for the same period. For FY 2013-14 (projected), the annual growth rate for containers at the Port of Brisbane has decreased to 2.1 per cent compared with a similar forecast by the Port of 6.5 per cent for the period.

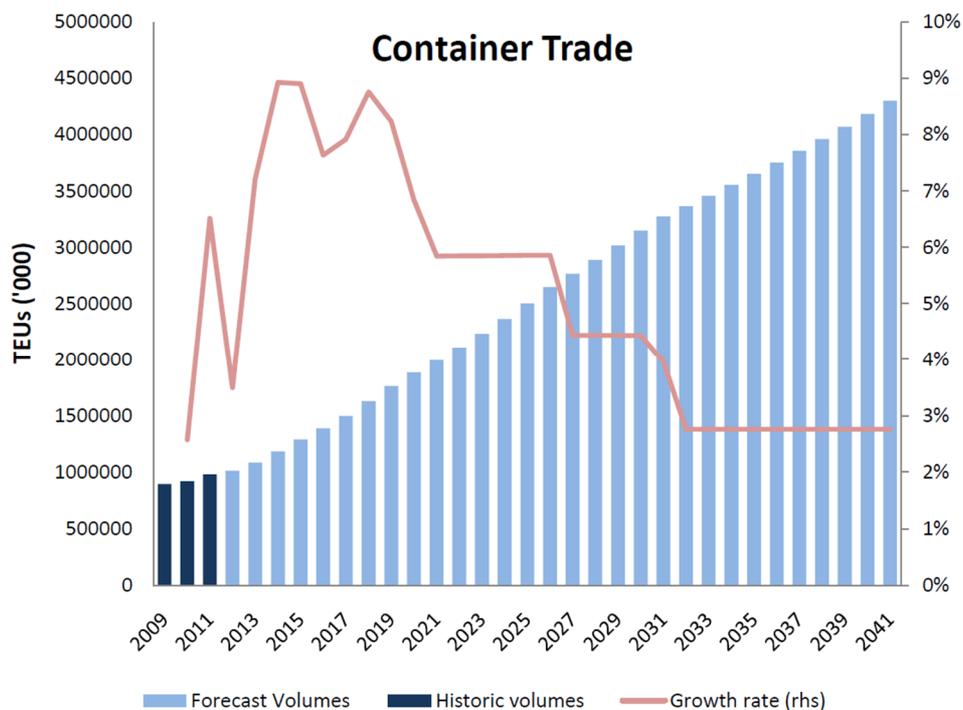
The Port of Brisbane container trade forecasts are summarised in Table 4 and Figure 2.

**Table 4 Port of Brisbane (2011 base) 30 year container trade forecasts, 2012-2041**

Fin. Year end	2012	2016	2021	2026	2031	2036	2041
Forecast volume (TEU)	1,042,451	1,386,562	1,991,891	2,647,154	3,273,457	3,751,004	4,298,260
Forecast growth rates (annual %)	6.5% (onwards)	7.6%	5.8%	5.9%	4.0%	2.8%	2.8%

Source: Port of Brisbane “Brisbane Port Land Use Plan 2013”, page 34.

**Figure 2 Port of Brisbane 30 year container trade forecasts, 2011-2041**



Source: Port of Brisbane “Brisbane Port Land Use Plan 2013”, page 34.

If the Port of Brisbane forecast container growth rates are applied to FY 2013-14 (projected), the original FY 2025-26 level of 2.65 million TEU is not reached until three years later in FY 2028-29, assuming no change to forecast container growth rates.

### **2.3 Declining multipliers in global container trades**

Historically, before the GFC in 2008-09, global container trades had grown at rates that are several multiples above world economic growth, measured as world Gross Domestic Product (GDP) growth. During the period 1990-2005, the average 'multiplier' to world GDP was 3.4<sup>6</sup>. However, in 2012, the 'multiplier' was only 1.5 and a level of around or below 2.0 appears to be the 'new norm' as increasingly acknowledged by the shipping industry<sup>7</sup>. The view of the shipping industry is that the global container trade has moved away from the 9–10 per cent growth recorded over the past three decades.

The reasons for the decline in the 'multiplier', and the resulting global container trade growth, are generally seen as caused by:

- Peaking of the containerisation of goods
- Peaking of globalisation in terms of manufacturing moving away from developed economies to lower cost (developing) economies
- Peaking of the openness of economies and markets to foreign trade (i.e. bi- and multi-lateral free trade agreements).

Hence, the lower than previously forecast container growth rates witnessed over the last couple of years by Australia's East Coast ports appears to reflect trends globally – this is to be examined in more detail in the demand forecasting work.

### **2.4 Revised Victorian/ Port of Melbourne container forecasts**

At the time of writing this report, revised Victorian container forecasts have yet to be provided by the Department of Treasury & Finance (DTF) to the Authority for use as a reference set of Victorian container forecasts. Availability of the DTF supplied data is likely to be in the first week of June, 2014, which will mean that the final version of this Review Report can only be completed after receipt and analysis of this DTF supplied data.

### **2.5 Port of Melbourne sale**

The Base Case Port of Hastings container demand scenario (referred to as '2E' – Victorian Hub with Port of Melbourne closure) in the Preliminary Demand Assessment assumed a Port of Melbourne closure date of 2045, which implied that after this date all Port of Melbourne volume would be transferred (migrated) to the Port of Hastings, i.e. the Port of Hastings becomes Victoria's sole international container port.

Since this assumption of a closure date has been made, the current Government has announced the sale of the Port of Melbourne with a 40 year lease period. If the sale of the Port of Melbourne occurs in 2015, then this lease term would imply that the Port of Melbourne would remain operational until at least 2055.

It is recommended to reconsider the original Deloitte Port of Melbourne closure date assumption as a point of further consideration.

---

**DRAFT – FOR DISCUSSION PURPOSES ONLY**  
<sup>6</sup> UNCTAD – "Review of Maritime Transport 2013".

<sup>7</sup> Global Container Outlook, Containerisation International, 2013, based on UNCTAD Review of Maritime Transport, 2013

## 2.6 Port of Melbourne Webb Dock new container stevedore

In April 2014, the Government and the Port of Melbourne Corporation announced that the concession for the new Webb Dock container terminal had been won by International Container Terminal Services, Inc. (ICTSI) of the Philippines – a new stevedore to both Melbourne and Australia. This implies that a new competitive tension has been introduced, which will need to be factored into the ability of the Port of Hastings to attract containers away from the Port of Melbourne.

A press release (dated 2 May 2014) issued by ICTSI stated that:

- the terminal lease concession to 2040 covering two 330 metre long berths with a combined throughput capacity of up to 1.4 million TEU per year serviced by a total of six post-Panamax gantry cranes on an area of 35.4 hectares (this includes an empty container park with capacity of up to 280,000 TEU)
- the first phase (a 330 metre berth with three post-Panamax gantry cranes) is to be operational by 31 December 2016 with the second phase and 330 metre berth planned to be operational by 31 December 2017
- total full development cost of the terminal is estimated at A\$ 550 million with around 200 new jobs created
- the terminal will be able to handle containerships with a capacity of up to 8,000 TEU.

Ship sizes at the existing Swanson Dock container terminals are currently constrained by a combination of the ship swing basin which allows for a maximum 300 metre long vessel, and the 200 metre width of Swanson Dock. This dock width feature constrains vessels to a maximum beam of around 42 metres when multiple ships are berthed on either side of Swanson Dock. These constraints limit the maximum size of vessels calling at Swanson Dock to around 6,500-7,000 TEU.

The Port of Melbourne has set a common limitation to maximum vessel size for both Swanson Dock and Webb Dock of 300 metres length overall and 42.9 metres beam. However, it appears from the ICTSI press release that the Webb Dock Terminal could cater for vessels of up to 8,000 TEU noting that the Webb Dock has less physical constraints than the upriver Swanson Dock. However, two factors determining the technical capability of Webb Dock to handle vessels larger than the maximum size at Swanson Dock will be the strength of the designed quay/berth and the necessary size of ship-to-shore gantry cranes (outreach and crane-rail loads) to service the larger ships.

It is recommended to monitor the ordering of the six post-Panamax gantry cranes by ICTSI in terms of their outreach and resulting ability to service post-Panamax containerships.

It is further recommended to consider this new aspect of competition (a new 'single-port' stevedore player) as a point of further consideration.

## 2.7 Port of Melbourne container capacity

In the Government's "Victorian and Freight Logistics Plan (VFLP)", which was released in 2013, the Port of Melbourne was stated as having a certain container port capacity comprising the combined total of Swanson Dock container terminal and the new Webb Dock container terminal capacity. However, it appears that a recent plan for upgrading Swanson Dock (part of the Port Capacity Project) and the committed maximum container capacity at the new Webb Dock terminal together result in more international container capacity being available at the Port of Melbourne than originally envisaged in the Government's VFLP.

It is recommended that the implications on the timing of demand for the Port of Hastings of this higher international container capacity at the Port of Melbourne be a point of further consideration.

## **2.8 Business Case forecasting period**

The forecasting period of the preliminary demand assessment considered a 30 year project period from the start of operations in 2023. If it is considered necessary for DTF Business Case requirements to extend the project evaluation period further out (i.e. start plus 40 years or longer) then the demand forecasting period will need to be extended out beyond 2053-54 by an equivalent number of years.

## 3. Identification of specific adequacy issues

### 3.1 Introduction to this section

This section presents identified issues regarding the adequacy of the Preliminary Demand Assessment for containers, focussing on the methodology and assumptions used to derive (forecast) Victorian container demand and container throughput at the Port of Hastings.

### 3.2 Forecasting of empty containers

There appears to be a wrong approach (due to an over-simplification) in forecasting empty containers by purely extrapolating historical growth rates and the share of empty containers of total container volumes, irrespective of changes in full imports or exports and resulting trade imbalances.

The appropriate approach, which will be adopted in forecasting container demand, is to forecast full exports and imports taking account of different equipment types (20 ft, 40 ft, dry and reefer) and calculating the resulting trade direction imbalances (import versus export) which then determine the level of empty container movements. A further refinement will also be included when container demand is assessed by main trade routes (i.e. NE Asia, SE Asia, North America, Europe, etc.) in that certain overseas regions act as empty container supply and return points, affecting the mix of full and empty containers on specific trade routes and vessels calling at the Port of Hastings.

### 3.3 Set of Port of Hastings container demand scenarios

There was merit in noting and examining a full range of container demand scenarios covering Hastings as a New Zealand transshipment hub, Hastings as an East Coast hub, etc. The selection of the base case demand scenario, where Hastings is a Victorian hub (main port) commencing 2025, appears to be reasonable given the demand forecasts at the time of the preliminary business case, on the grounds of containership economics and the shipping line operational strategy of multi-port calling along the East Coast.

It is unlikely that the Hastings non-Victorian hub demand scenarios would eventuate in practice, thus it is worthwhile to focus only on the Hastings Victorian hub (main port) demand scenario going forward. If necessary, this conclusion can be supported and evidenced by a containership economics analysis of transshipment versus direct calling, and consultation with the shipping lines – this possible work would need to be discussed further.

A recommended refinement of the Hastings Victorian hub (main port) demand scenario would be the inclusion of a 'new-player' versus 'existing/transferring' stevedore dynamic on demand. An existing stevedore transferring demand from the Port of Melbourne (e.g. Swanson Dock) would create a different demand and terminal staging profile than a new Victorian stevedore which would be more dependent on organic growth and overflow demand when the Port of Melbourne becomes full or is (progressively) closed.

### 3.4 Tasmanian and mainland container demand

Tasmanian and mainland (coastal) container demand have been aggregated in the demand forecasts. In practice, mainland containers are carried by international containerships and Tasmanian containers by separate Bass Strait domestic container/ roll-on/ roll-off vessels.

It is more likely that mainland containers will be captive to international ship calls at Hastings; it is recommended that these are separately identified and added to throughput at the international terminals.

The Tasmanian containers need to be investigated and discussed further as to whether they form part of the base contestable demand, noting that Tasmanian international containers are most likely, from a cost perspective, to connect to an international vessel at the same port where Bass Strait vessels call. This implies that a Bass Strait service would need to also call at Hastings to secure international Tasmanian containers for the international terminals at Hastings.

### **3.5 No visibility on reefer containers**

Reefer containers were excluded as an identified part of the total container demand due to the stated lack of historic data/ visibility. However, data does now exist for the Port of Melbourne and other East Coast ports such that this data gap can be filled in the next detailed update of the container demand forecasts. This aspect is also discussed in section 4 as a required level of detail for the Terminal Design team and the future financial modelling work.

### **3.6 International container trade migration assumptions**

The North East Asia container trade (or route) is the largest Victorian international container trade, representing around 45% of the Port of Melbourne's total overseas container throughput.

In the preliminary Hastings Base Case demand scenario (2E – Hastings as Victorian hub and Port of Melbourne closure), it has been assumed that 100% of the Port of Melbourne's North East Asia trade is captured in Year 1 – some 1.8 million TEU in 2023. Other trades are captured in later years. This appears to be an overly optimistic assumption in terms of stevedore and shipping line dynamics and also effectively assumes that there is inland transport cost parity between the Port of Melbourne and Port of Hastings, which is not the case (i.e. the Port of Hastings is more distant for a significant share of the inland origins/ destinations around metropolitan Melbourne).

It is suggested that the level of trade capture should be treated as being dynamic in terms of understanding ship size fleet economics and shipping line market shares. Melbourne's ship access constraints at Swanson and Webb Docks and other East Coast ports, relative port cost levels for shipping lines, stevedore migration/ competition dynamics, and overall supply chain cost impacts need to be considered in this context and discussed further with the Authority.

### **3.7 Other Australian main container port demand**

International containerships call at multiple ports along the Australian coast and as a result are sized according to the total Australian main port demand, not just Victorian demand. In order to forecast ship sizes and fleet spectrum, it is necessary to have an understanding of total Australian port container demand per shipping trade route.

The preliminary demand assessment did not analyse this aspect and used other fleet spectrum work (VFLP study) to determine future ship sizes. It is necessary to integrate a ship size analysis methodology into the demand work which requires that total Australian main port demand be assessed. It is proposed that this assessment will be conducted using similar forecast growth rates to Victoria with any known specific state variations included.

## 4. Identification of gaps

### 4.1 Introduction to this section

This section presents identified gaps in the preliminary container demand data for the purposes of future Terminal Design, Port Environs Assessment, and Financial Modelling/ Economic Analysis work.

### 4.2 Missing container demand details required for Design team

The Design team has provided an initial request for further detailing of the container demand data to cover:

- Reefers and any special containers (domestic/ Tasmanian, etc.)
- 20 ft/40 ft /fulls /empties
- Seasonal variations (peak periods)
- Dwell times of fulls and empties (in container yards and in empty container depots)
- Transshipment versus hinterland (through the gate) containers
- Average container exchange per ship call
- Gate transport modality shares (road versus rail and truck/ rail configurations and loadings) and share of near/ back-of-port container stuffing/ stripping – this item will be handled by Port Environs with “who provides the information to the Design team” to be discussed.

These items will be considered further and confirmed with the Design team and the Authority.

### 4.3 Missing container demand details required for Port Environs

The Port Environs team will provide the “bottom-up” origin/ destination detail to the “high-level” demand forecasts. However, to provide identification of supply chains, an import and export commodity analysis will be performed using procured ABS/ Customs statistics at the 5-digit Standard International Trade Classification (SITC) level. The detailing of this work is to be discussed further with the Port Environs team and the Authority.

### 4.4 Missing container demand details required for Financial Model and Economic BCA analysis

The Preliminary Financial Modelling was carried out using demand aggregated to TEU numbers, with per TEU tariffs and costs applied. This appears to be over-simplified and has the potential to mask financial viability for the Port and stevedores, as well as the identification of potential operating efficiencies. It is proposed that the container demand data will be transferred to and inputted in the Financial Model at an improved level of detail (see section 4.5 below for details).

It would also be useful to understand the average value of goods per import and export container as part of assessing the impact of total supply chain cost on value of the goods, i.e. ability to pay for port costs as well as impact on inventory costs of differences in transit times. This information is included in the ABS/ Customs data that has recently been received.

### 4.5 Summary of proposed detailing of container demand

Table 5 is a summary of the proposed detailing of container demand.

**Table 5 Proposed container demand detailing**

Demand category	Data detail
Port range for forecasting (re. ship sizing & fleet spectrum analysis)	Port of Melbourne Port Botany (Sydney) Brisbane Adelaide Fremantle
Container demand segments	Overseas – hinterland (through gate) Overseas – transhipment (on terminal) Tasmanian Bass Strait – domestic Tasmanian Bass Strait – international Mainland coastal – domestic Mainland coastal – international (port relay)
Trade directions	Import (overseas) or Inbound (domestic) Export (overseas) or Outbound (domestic)
Container status	Full (loaded) Empty (unloaded)
Container types	Dry (general cargo) Reefer (refrigerated) [Other – to be discussed further]
Container sizes	20 ft 40 ft For discussion – possible account of Hi-cube 9’ 6” container share for terminal operations design and required TEU volumes (Note: Possible sources of Hi-cube container data to be investigated further)
Trade & Shipping Routes	North East Asia South East Asia North America West Coast North America East Coast Europe New Zealand Pacific Islands / PNG Other (rest-of-the-world)

**DRAFT – FOR DISCUSSION PURPOSES ONLY**

Demand category	Data detail
Timeline for forecast	<p>2014-15 to 2059-60 at minimum (matching length of the Authority's current mandate)</p> <p>Ideally should extend to 2064-65 or 2069-70 given some of the potential assumptions regarding Melbourne and container growth rates, as well as the needs to the financial model</p>
Specifics	<p>Seasonal variations (total demand)</p> <p>Dwell times (incl. plugged times for reefers), free-times, % demurrage &amp; average demurrage times</p> <p>Transport modality shares (gate)</p> <p>Origins/destinations (inter-state, regional, metropolitan, back of port, etc.)</p> <p>Import and export containerised commodities by trade route / overseas ports</p> <p>Tasmanian domestic – trailers and other</p> <p>Average container exchange per ship call</p> <p>Average value of goods per import and export container</p>

Source: GHD (summary of the content of this report)

## **5. Next steps**

### **5.1 Introduction to this section**

This section specifies the proposed next steps to be followed by the C&E team and the Authority in order to further progress the Demand Assessment work.

### **5.2 Proposed next steps**

It is proposed that the scope of the subsequent purchase order to CE-WP-005 implements the resolution of the identified gaps, methodology issues, and required detailing as specified in this report. This will allow the container demand assessment to be progressed in July and August 2014 resulting in container demand data outputs to both the D&E team and the C&E financial modelling and economic analysis team.

There is also a need to produce a short paper (aide), which provides a clear and simple outline of what the Demand comprises, how it is going to be assessed, and what the output of the assessment will look like.

GHD

180 Lonsdale Street  
Melbourne, VIC 3000  
T: 03 8687 8000 F: 03 8687 8111

© GHD 2014

This document is and shall remain the property of GHD. The document may only be used for the purpose for which it was commissioned and in accordance with the Terms of Engagement for the commission. Unauthorised use of this document in any form whatsoever is prohibited.

Document Status

Rev No.	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
1	Guy Reynolds (GHD)	Richard Rawnsley (GHD)		Richard Rawnsley (GHD) / Paul Levelton (KPMG)		30/05/2014
2	Guy Reynolds (GHD)	Wennie van Lint (GHD)	On file	Paul J Foxlee (KPMG)		30/06/2014

[www.ghd.com](http://www.ghd.com)

