



PREPARING ADVICE
ON VICTORIA'S FUTURE
PORTS CAPACITY
Discussion Paper



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Introduction

The Special Minister of State has asked Infrastructure Victoria to provide advice on the future capacity of Victoria's commercial ports. This paper sets out the scope of our advice, and how we plan to prepare it. In particular, in line with the Minister's request, we will focus our study on the timing of, need for, and location of a second container port in Victoria.

Commercial ports are large and long-lived pieces of infrastructure, often being used for over 100 years. They play a key role in anchoring supply chains as a gateway for the movement of goods in and out of Victoria. Commercial ports have significant economic, environmental and social impacts. Where they are located and how they operate are influential factors in determining whether these impacts are positive or negative, and how they are geographically distributed.

Planning and constructing a new port requires a long lead time. A decision on its timing must be based on the best available evidence, and strike a balance between pre-empting inadequate future ports capacity and the prospect of unused capacity in the short and medium term.

Many people are interested in how Victoria plans its future commercial port capacity, and we are interested in hearing people's views. Your input will help us to build consensus on the key factors we need to consider in preparing our advice.

What this paper is about

This paper sets out Infrastructure Victoria's scope and approach in preparing our advice on Victoria's future commercial port capacity. It describes:

- our proposed process for preparing our advice
- key factors and drivers of change likely to affect further development at the Port of Melbourne, Bay West, and Hastings
- the additional work we are likely to undertake to inform our advice.

We want to provide this information early so that stakeholders and anyone interested can see how we intend to prepare our advice. We also want your input on our process, and whether we have identified all the key factors necessary for deciding *when* a second port will be needed, *where* it should be located, and what should drive these decisions.

Your input will help us build consensus on the key factors and drivers of change that we need to examine as we prepare our advice.

What this paper is not about

This paper is not about providing a preliminary view on when a second container port may be needed or where it would ideally be located.

These are important questions and we will release our evidence base for discussion in early 2017. We will use this evidence to form our advice to the Minister in May 2017.

This paper is not about the current process of leasing the Port of Melbourne. We will consider the outcome of the lease transaction as we prepare our advice.



The Port of Melbourne

The Port of Melbourne is the busiest container port in Australia. Container volumes continue to grow, although there is debate about the likely future rate of growth. The Port of Melbourne handles Victorian imports and exports, Tasmanian container trade, as well as trade servicing South Australia and southern New South Wales.

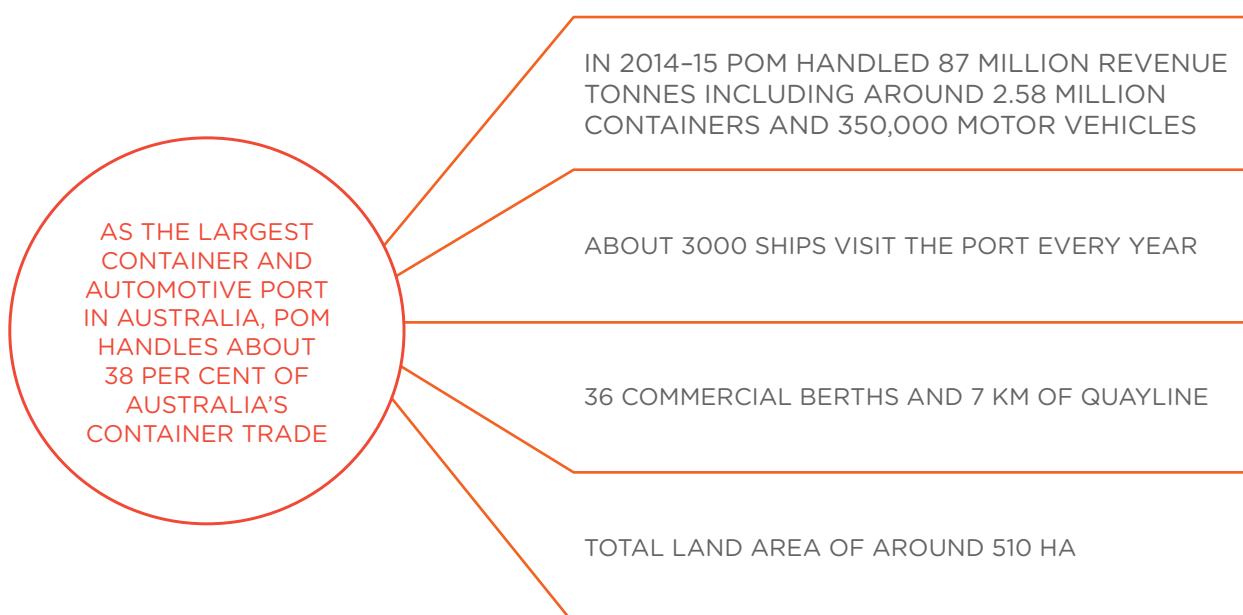
The Port of Melbourne Corporation, a statutory government authority, manages operations at the Port of Melbourne. Figure 1 gives an overview of the Port of Melbourne operations today.

What are supply chains?

The term supply chain describes how goods move from their origin (this could be a farm, factory or mine) to the consumer. Supply chains comprise a combination of nodes, such as airports, ports, or intermodal freight terminals, from which goods are transferred to and from warehouses, distribution centres and shops. Goods are carried between these locations by some combination of ships, trucks, planes or light delivery vehicles.

Ports are critical nodes in supply chains, because they act as an anchor around which supply chains orient. Changing the location of the port, would likely shift the orientation of supply chains, as shipping, trucking and warehousing companies seek to maximise their efficiency by seeking out land relative to the port that is cheap and close to transport links.

Figure 1: Overview of operations at the Port of Melbourne (PoM) today.



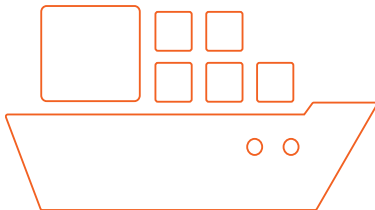
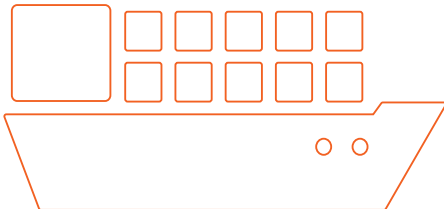
Source 1: Port of Melbourne Corporation Annual Report 2014-15.

The Port of Melbourne has been a key node in Victorian supply chains since the mid-19th century. Container ships first visited the Port of Melbourne in 1969. Since then, technology changes and growth in trade volumes means the size and capacity of container ships visiting Melbourne has increased (Figure 2). There is currently debate about the likely future changes in the sizes of ships visiting Australia. As part of our advice, we will consider what size ships are likely to visit Australia in the future, and what constraints may be present at the Port of Melbourne and other potential port sites.

* TEU

TEU is an acronym for 'twenty-foot equivalent unit'. The most common container sizes for international shipping are 20-foot and 40-foot. TEU is used as a standard measure for the capacity of a container ship, the capacity of a port and the volume of container trade. So that we can have a standard measure, 40-foot containers are converted into 20-foot container equivalents. For example, one 40-foot container is counted as two 20-foot containers or 2 TEU.

Figure 2: Ship sizes over time at the Port of Melbourne.

1969	<p>ENCOUNTER BAY WAS THE FIRST SHIP TO USE THE NEWLY OPENED INTERNATIONAL CONTAINER BERTH AT SWANSON DOCK WEST</p> <p>30.48 METRES WIDE (BEAM)</p> <p>227 METRES LONG</p> <p>1,600 TEU* CAPACITY</p>	
2015	<p>PANGAL IS THE LARGEST CONTAINER SHIP TO VISIT THE PORT OF MELBOURNE</p> <p>40 METRES WIDE (BEAM)</p> <p>304 METRES LONG</p> <p>6,600 TEU CAPACITY</p>	
Future ship size?	<p>WHAT IS THE SIZE OF SHIPS THAT WILL VISIT MELBOURNE IN THE NEXT 100 YEARS?</p> <p>LENGTH?</p> <p>HEIGHT? (AIR DRAUGHT)</p> <p>WIDTH? (BEAM)</p> <p>DEPTH? (DRAUGHT)</p> <p>TEU CAPACITY?</p>	

Source 2: Port of Melbourne website.

Brief history of planning for a second container port

The decision about a future port location is complex and long lasting.

Successive governments have looked at the best location for a second container port in Victoria, with the Hastings site identified in government policy for about 20 years. More recently, governments have also considered the feasibility of a second container port on the north-west shore of Port Phillip Bay, referred to as the Bay West option. For future reference, these are referred to as the Hastings and Bay West options.

The *Victorian Ports Strategic Framework*, released in 2004, set out a strategy for Victorian ports. The strategy was to maximise the capacity of the Port of Melbourne and then progressively relocate port activity to a container port at Hastings. The ultimate capacity of the Port of Melbourne was assumed to be approximately 8 million TEU.

In 2008, the *Freight Futures* strategy was developed. The port strategy was also refreshed and in 2009 the *Port Futures* document was released. These updated policies considered how capacity at the Port of Melbourne would be achieved, assessing in detail future Port of Melbourne layouts and transport links.

In 2010, based on the prevailing container demand forecasts, the government took the position that a second container port was required by the late 2020s. Hastings was the preferred location for a second container port and this position underpinned planning in the *Victorian Freight and Logistics Plan*, released in 2013.

The government is currently in the process of leasing the Port of Melbourne for 50 years. The current government has not taken a position on when a second container port will be needed or where it should be located. Instead, it has sought our advice on when a second container port is required and its ideal location.

We will examine when a second container port is required, and undertake an even-handed assessment of the Hastings and Bay West locations.

Port of Hastings

Western Port has been used for various trading port activities since the early 1800s. The land at Hastings has been reserved for port-related uses since the late 1960s.

In the mid-1970s, three additional areas were identified for port purposes and set aside so that the state's options for any future port development at Western Port could be preserved.

In 2013, the Port of Hastings Development Authority commenced work to examine the feasibility of a container port at the site, and commenced early planning for it.

Bay West

Various Victorian governments have considered the feasibility of a second container port on the north-west shore of Port Phillip Bay. Studies such as the Environment Effect Statements for the Channel Deepening Project and work on the Western Treatment Plant have also examined areas around Bay West.

There is information available about the feasibility and impact of locating a port at either site. We will use the information already available for Hastings and Bay West as a starting point for our investigation and to help us understand the additional information we need to improve the evidence base we use to prepare our advice.

The current role of our commercial ports

Efficient supply chains are essential to support economic development, help Victoria maintain its competitiveness, and increase its productivity. Our ports act as a gateway for Victorian imports and exports. They also act as an important node in supply chains servicing South Australia, southern New South Wales and Tasmania.

Historically, container growth has increased, and there are different views about the relationship between rates of container growth and changes in population, and Gross State Product. The government's population forecast, *Victoria in Future 2016*, predicts that the population will increase from over 6 million people today, to over 9.5 million in 2046. To help plan for future demand, we will consider the relationship between population growth, economic growth and trade demand.

The Port of Melbourne is Victoria's only container port. Containers account for about 68 per cent of the volume of goods that flow through the port. The Port of Melbourne also handles dry bulk, break bulk and liquid bulk*.

Victoria's other commercial ports all handle a combination of dry bulk, break bulk, and liquid bulk. Ports are located at:

- Hastings
- Geelong
- Portland.

Our main focus is on the need for, and timing of, a second container port, and where it might be located. In preparing our advice we will also consider the possible relocation of other trades between Victoria's ports (for example, motor vehicles, chemicals, grain, break bulk cargo and fuel) or terminals for cruise ships, and what factors may drive any relocation. Figure 3 depicts the current distribution of trades across Victorian commercial ports.

* Cargo trade definitions

Containerised trade: cargo transported in containers, usually 20-foot or 40-foot long. Containers can also be refrigerated.

Dry bulk: cargo transported in large, unpackaged quantities and loaded directly into the hold of a ship such as mineral sands, wood chips, grain and alumina.

Break bulk: cargo transported in unitised, palletised, bundled or barrelled form or other non-unitised cargo such as vehicles.

Liquid bulk: cargo transported in bulk liquid form such as oils, petroleum and chemicals.



Figure 3: Current distribution of trades across Victorian commercial ports

What the Victorian Government has asked us to do

- > **The Special Minister of State has requested that Infrastructure Victoria provide advice on the preferred sequencing, timing and location of investment in future Victorian commercial port capacity. We must provide the Minister with our advice by May 2017.**
- > **There are two questions we need to answer.**
 - 1. If and when we need to build a second container port, and what that means for the distribution of trades across Victorian commercial ports.**
 - 2. Whether a second port should be located at Bay West or Hastings.**

The box below describes the scope of our advice. You can find the Minister's full Terms of Reference on our website: yoursay.infrastructurevictoria.com.au

Scope of advice

The Government wishes to ensure that decisions regarding Victoria's long term port capacity and associated infrastructure are developed in accordance with robust, independent advice, particularly in relation to the sequencing, timing and location of investments. IV's advice on options for Victoria's future commercial port capacity should address the following issues:

1. Scenarios for the long term demand for, and capacity of, existing Victorian commercial ports, including:
 - a) when the need for a second major container port is likely to arise and what variables may alter this timeline
 - b) capacity for containers, bulk and other non-containerised cargo;
 - c) the capability of Victorian channels and existing port infrastructure to handle different scenarios of future changes to the international shipping fleet, cargo handling technologies and changes to the supply chain onshore; and
 - d) potential increases in capacity resulting from investment and improved port management under the Port of Melbourne lease arrangement.
2. Where a second major container port would ideally be located and under what conditions, including the suitability of, and/or barriers to investing in, sites at the Port of Hastings, and the Bay West location, including:
 - a) the indicative costs, risks and benefits of above options, including impacts on metropolitan, regional and interstate (including Tasmanian) supply chains;
 - b) any necessary measures to preserve the long term optionality at these sites including any appropriate relevant planning measure, environmental protections, or land and transport corridor reservations which may be required
 - c) impacts and requirements that a second major container port would take place on surrounding and supporting infrastructure, and the impacts – including the costs to Victorian taxpayers – of any complementary infrastructure investments that may need to be considered; and
 - d) the environmental, economic and social impacts of developing a second container port, as well as the environmental, economic and social impacts of the required complementary infrastructure, on existing local communities.

How we will answer the questions

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- > **Our advice is not simply about recommending whether Bay West or Hastings is the ideal location for a second container port.**
 - > **We will focus on when, and under what conditions, a second container port will be required.**
 - > **We will consider environmental, economic and social impacts in preparing our advice.**
 - > **Our advice aims to assess the options, and to help the state preserve strategic flexibility in deciding the timing and location of additional container port capacity.**

The most important thing to acknowledge about planning for future commercial port capacity is the high degree of uncertainty about future conditions. There are a number of issues that we need to consider as we prepare our advice including the:

- ultimate capacity at the Port of Melbourne
- future demand for Victorian import and export trade volumes, as well as interstate trade volumes
- changes in international and national supply chains
- optimal distribution of trades across Victorian commercial ports
- feasibility, advantages and drawbacks of a second container port at Hastings or Bay West.

Our advice on planning for Victoria's future ports capacity will be guided by assessing the economic, environmental and social impacts of these questions. In the following pages we specify the key factors we need to understand better so that we can build a range of plausible future scenarios. Ultimately, our analysis is about providing the government with advice to help it maintain its strategic flexibility in the context of significant future uncertainty.

In line with the Minister's terms of reference, we will focus on two questions.

1. The decision about when to invest in extra ports capacity

Given a variety of future Port of Melbourne capacity and container demand scenarios, when will we need to invest in additional container capacity? At this stage, we are assuming that Victoria will always provide sufficient capacity to meet demand and that, in the short to medium term, the most efficient way to meet demand is to maximise capacity at the Port of Melbourne until further expansion is unfeasible. On pages 20 and 21 (Table 1) we outline a range of key factors that influence the decision about when to invest in extra capacity. Based on plausible, sensitivity-tested high, medium and low demand and capacity scenarios we will recommend a range of years in which we think extra capacity may be required.

2. The decision about where to locate extra ports capacity

Once we have assessed the likely timing of extra capacity we will need to better understand the feasibility, benefits and drawbacks of locating a second container port at either Hastings or Bay West. On pages 26–27 (Table 2) we outline a range of key factors that influence the decision. Based on our assessment, and recognising future uncertainty, we will seek to identify a preferred location. The evidence we gather may not be conclusive enough to identify a preferred location. Regardless, we will outline further work that could be completed to reduce uncertainty.

In considering these two questions we will identify the steps government should consider before deciding on a new port including identifying likely trigger points for a decision.



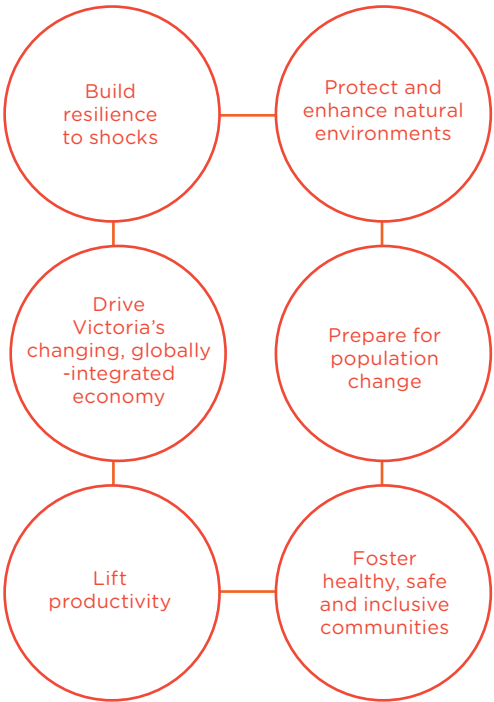
Project objectives

During our analysis of these issues we will draw on the strategic framework and assessment methodology used to prepare Infrastructure Victoria’s 30-year infrastructure strategy.

Infrastructure Victoria’s 30-year strategy framework sets out the vision, guiding principles, objectives and needs for the strategy. The framework recognises that good infrastructure is not an end in itself but an enabler of better social, economic and environmental outcomes. The decision on the timing and location of a second container port should be guided by objectives (in Figure 4), outlined in our infrastructure strategy.

In addition to these objectives we recognise that there are a number of different approaches to solving a problem, in this case, how best to plan for Victoria’s future ports capacity. We will consider the three approaches on page 15 when we prepare our advice.

Figure 4: Objectives of Infrastructure Victoria’s 30-year strategy.



The three approaches:

1 CHANGING BEHAVIOUR, MANAGING DEMAND

Many infrastructure needs can be addressed by changing behaviours to manage demand. These solutions are appropriate where use of infrastructure is heavy at different times of the day or across particular parts of the network, but much lower at other times or locations. In other words, to rationalise our use of infrastructure to its highest value. Rather than building something new, and providing additional capacity during peak periods and locations, the intention of these types of options is to shift demand on infrastructure, either by spreading it more evenly or reducing it overall. This approach could be applied in examining the efficiency of truck movements in and around the port, for instance optimising the travel of trucks outside peak hours, and improving the way trucks bring containers into and out of the port.

There are, however, key factors such as changing consumption patterns and new technology like 3D printing, that may influence future demand for ports capacity.



2 BETTER USE OF EXISTING ASSETS

There are many opportunities to use existing infrastructure in better, more efficient ways. Often we become complacent about how we use our infrastructure because it has worked well enough in the past – why fix something that's not broken? Often the lowest cost way of meeting our infrastructure needs is by using the infrastructure we have now. This means we need to be smart about how we operate and maintain our existing infrastructure to ensure it lasts and is responsive to changing needs.

Better use of infrastructure means changing the way the asset operates to be more efficient and responsive to user demands. In preparing our advice we will investigate actions that may help to improve the efficiency of the Port of Melbourne (such as increased automation) or the use of existing roads in freight and logistics supply chains through a more comprehensive, high performance freight vehicle network, or shifting freight to another mode such as rail.



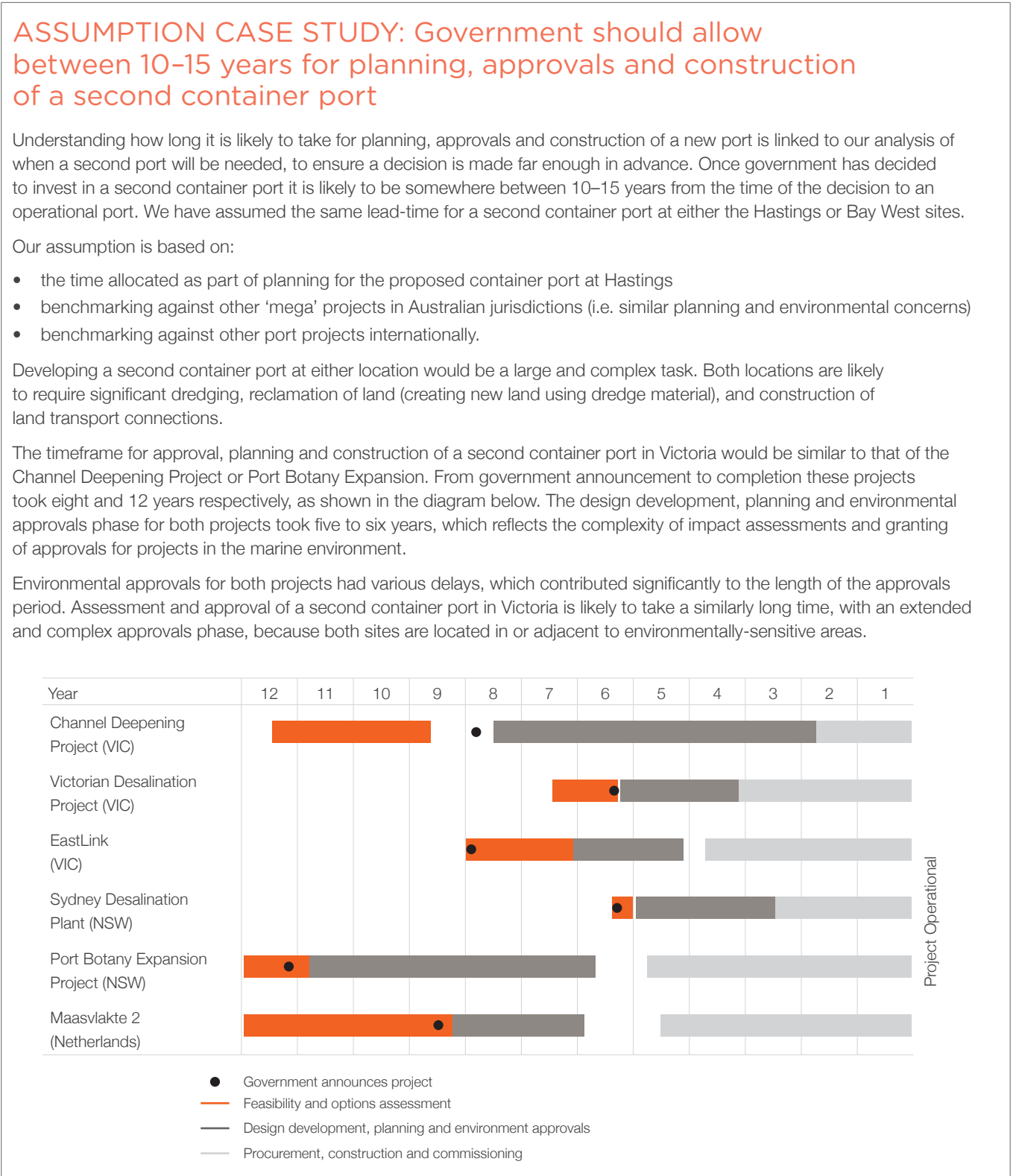
3 EXPANDING ASSETS OR BUILDING NEW ONES

Infrastructure Victoria considers expanding or building assets as the last option. Choosing to build new infrastructure is appropriate when the demand-management and better-use solutions have been exhausted or found to be unfeasible. There are two primary responses in this approach:

- expansion of existing infrastructure such as building extra capacity at the Port of Melbourne or improving transport networks around the port
- building a new asset, for example, a second container port at either Hastings or Bay West, where there is no existing infrastructure or the current assets are unable to meet the projected demand.

Infrastructure Victoria's 30-year strategic framework also identifies a series of needs. In preparing our advice we will think about how to best meet Need 13: improve the efficiency of infrastructure freight supply chains in Victoria.

Given the complex and interrelated factors affecting the decision to develop a second port, we will need to make a series of assumptions in preparing our advice. Some of these are highlighted in this paper and, to make sure we are transparent, we will publish our assumptions during our second phase of consultation in early 2017. The box below provides an example of how we will explain any assumptions we make.



Question 1: When will we need a second port?

This section describes how we will answer question 1 including that we will:

- > **examine key factors, and their links and interactions with demand and capacity scenarios, which includes understanding trigger points for a decision. For example, the need to maintain Victorian supply chain competitiveness given expansion costs increase for every additional TEU of capacity at the Port of Melbourne**
- > **develop low, medium and high scenarios of future Victorian import and export demand and the Port of Melbourne Capacity**
- > **sensitivity-test Victorian import and export demand and Port of Melbourne capacity scenarios to understand the impacts at different points on the timeline where these scenarios intersect.**

Reducing uncertainty while preserving flexibility is the key driver in our analysis of the timing for investment in new ports capacity.

In the short to medium term, allowing the Port of Melbourne to grow to its largest feasible capacity is the most cost-effective way of meeting increased Victorian container throughput. Estimates put the ultimate capacity of the Port of Melbourne at between 7–8 million TEU within the existing footprint. We will form an independent view on the capacity of the Port of Melbourne as we prepare our advice, including the impact of increasing container capacity at the Port of Melbourne on transport links beyond the port gate.

The nature of port investment, and the way supply chains form around ports, means it is financially prudent to defer investment in a second port for as long as is efficient. Maximising existing ports' capacity ensures a second port is built only when it is needed.

This is particularly relevant to the Port of Melbourne for a number of reasons.

- Ports require large initial investment in an asset that may be significantly under-utilised in the first years of operation, and the initial investment includes significant land transport and supply chain costs. Construction would be staged which would enable operating revenue to partially-fund future stages of development.
- Ports are vital anchors of end-to-end logistics supply chains, so changing where a port is located is likely to incur significant transition costs to business and governments while supply chains and transport networks re-orient themselves around a new port.

What we will do

We will examine a number of scenarios for when we need to invest in a new port. Any decision government makes will be in the context of a number of key factors.

- An uncertain future: the information used to make a decision will change over time, so postponing a decision until it is necessary means it can be made with the most up-to-date information.
- The potential for making the wrong decision: it is possible that a decision based on currently available figures and forecasts could be wrong and this may have consequences.
- The benefit of deferring the investment (to a point that is still efficient): given the significant cost of new port investment, increasing capacity before it is required would be financially imprudent.
- Allowing for long lead-times: the timing of the decision on a new port must allow for an estimated 10–15-year lead-time.

How does the Port of Melbourne lease transaction interact with our advice?

The Victorian government is currently in negotiations to lease the Port of Melbourne. The legislation enabling the lease of the port, the *Delivering Victorian Infrastructure (Port of Melbourne Lease Transaction) Act 2016*, received royal assent on 22 March 2016.

Initially we will seek to work with the successful bidder to understand their capacity master plans for the Port of Melbourne.

The government reserves an unfettered right to develop a second container port. There are, however, compensation arrangements that apply if the government decides to build a second port within the first 15 years of the lease period.

The transaction is expected to conclude by December 2016.

What we won't do

We won't reduce government's strategic flexibility by making a premature recommendation now, particularly because it would be based on evidence that is likely to change. Alternatively, ensuring government fully understands its options, and takes action to keep those options open for as long as possible, means it can be 'project ready' but maintain the flexibility to change course if circumstances change (i.e., if trigger points occur and a second port is needed sooner or later or new information on the most suitable location becomes available).

By mapping different demand and capacity scenarios we can highlight what government needs to monitor, and the benefits and costs of keeping options open. This makes it more likely that a second port would be delivered in a needs-based timeframe.

Many factors that affect the timing of the need for new port capacity can change over time, for instance, container throughput. Figure 5 describes the container throughput at the Port of Melbourne since 1993. After a long period of steady growth, more recently, we have seen slower rates of growth. This demonstrates that, for government to make port investment decisions of the right scale, at the right time, it needs to consider various scenarios for future changes in indicators (such as trade volumes) rather than just historic growth, as well as the costs and benefits of different options.

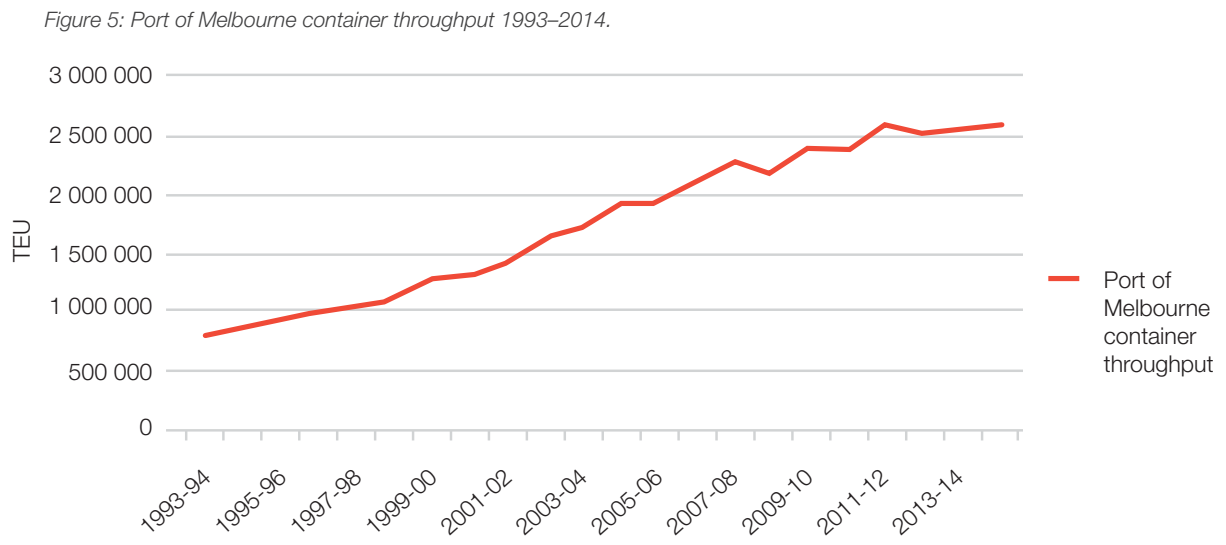
Scenario analysis

To make the best possible decision about meeting Victoria's need for future ports capacity we must be clear about what is driving the decision.

We can measure some of these impacts with numbers and dollars, however, others are more subjective. Either way, we need to understand how key factors may influence the demand for containers and capacity at the Port of Melbourne, now and in the future (Table 1), and any interactions between these factors that may be influential.

This knowledge will help us to develop a range of plausible, sensitivity-tested scenarios based on low, medium and high demand and capacity at the Port of Melbourne. This will allow us to predict a timeframe within which Victoria is likely to need a second port.

The scenario analysis will also help to quantitatively and/or qualitatively assess when trigger points are likely to be reached, i.e. one or more of the key factors changes enough to warrant an investment decision for a second container port.



Source: Bureau of Infrastructure, Transport and Regional Economics.



Table 1: A preliminary list of key factors impacting on future demand for containers and capacity at the Port of Melbourne.

KEY FACTOR	EXPLANATION
CONTAINER DEMAND	
Population growth and distribution	Changes over time of south eastern Australia's population growth and distribution (such as southern New South Wales, eastern South Australia, Victoria and Tasmania) are a direct driver of Port of Melbourne containerised import volumes.
GSP – gross state product of Victoria	GSP is the value of goods and services produced within Victoria. Historically, changes in GSP have been correlated with the volume of container trade at the Port of Melbourne, and can be used as a measure to help inform demand forecasting.
Domestic and international production	The majority of the Port of Melbourne container demand is in international full or empty containers (based on whether they are imports or exports). The volume and direction of these containers depends in part on the openness of trade between countries (i.e. free trade agreements), although Victoria is an import-driven economy. Other factors, such as climatic conditions, impact agricultural production, which in turn drives Port of Melbourne containerised export volumes.
Port landside supply chain costs, competition, and regulation	Overall port landside supply chain costs (including the availability of low cost/high transport accessible industrial and warehousing land) combined with relative cost levels at competing interstate ports, impact on container demand at the Port of Melbourne. Government land use and transport regulation will also impact on port landside supply chain costs.
External factors in trade volumes, including technology	There are a range of other external factors which can affect the containerised cargo mix, including changing consumption patterns and increasing containerisation of products such as grain. In the future, this could also include technology changes affecting consumer demand (such as the predicted rise of 3D printing or electric cars) resulting in different containerised volumes.
EXTERNAL FACTORS IN TRADE VOLUMES, INCLUDING TECHNOLOGY	
Trade allocations	In assessing the ability of the Port of Melbourne to grow its container trade, there may be an opportunity to allocate other trades across other Victorian commercial ports. However, not all Port of Melbourne land is suitable for container handling activities. This is due to the need to have sufficient lengths of straight quay line, an appropriate depth at berth and sufficient area for container stacks, as well as efficient and productive connections to the wider Melbourne rail and road network.
Ship sizes	Ship sizes have increased over time, and larger ships result in cheaper costs per-TEU. The size of ships able to visit the Port of Melbourne will impact on supply chain costs.

Road and rail transport accessibility and productivity	Land-based constraints may limit the effective capacity of the Port of Melbourne. For example, road and rail transport linkages to the Port of Melbourne may become congested or expansion is prohibited because they are land locked. This may also occur if new road and rail infrastructure is not developed over time to support Victorian population growth and development
Port industry structure and regulation	The Port of Melbourne lease, stevedore competition dynamics, investment levels, and changes to regulation governing Victorian ports, transport and land use may affect container capacity at the Port of Melbourne.
Societal expectations	Changes in societal expectations, particularly related to standards of amenity and land use, may place constraints on the Port of Melbourne configuration and operations.
Environmental expectations	Changes in the community's environmental expectations over time (possibly resulting in changes to environment and/or planning laws) may impact the capacity of the Port of Melbourne. Changes in environmental expectations may also impact Port of Melbourne container demand by increasing supply chain costs.
Operational and technology changes	Changes in operational efficiency and technology over time (for example, increasing automation) may increase the capacity of the Port of Melbourne.

Outcomes

Predicting investment timing

To construct a plausible timeframe for development of a second container port Infrastructure Victoria will combine the analysis of scenarios, with the actions that government could take to keep different viable options open.

Indicating a timeframe rather than a specific year is important because the uncertainty relating to such a long-term decision means that attempts to choose a specific year will inevitably be wrong.

We will describe the trigger points that we believe are the most useful for government to consider when it regularly reviews the decision on timing of a second container port, and outline the reasonable actions government could take to improve its evidence or keep options open.

In reviewing our approach, we would particularly like responses to the following questions.

KEY QUESTIONS

- Have we missed any key factors that may influence demand and capacity at the Port of Melbourne?
- Which key factors are likely to have the greatest influence on demand and capacity at the Port of Melbourne?
- What do you view as the key links and interactions between key factors?
- Can you provide any evidence to help us better understand a key factor?



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Question 2: Where should the second port be?

This section describes how we will answer question 2 including that we will:

- > **develop a list of the requirements of a second container port**
- > **define location options and likely attributes, and concepts for comparison**
- > **identify key factors affecting location**
- > **compare the two options to assess the suitability of each site.**

What we will do

In line with our Terms of Reference we are examining two possible locations for a second container port – Hastings or Bay West.

To undertake an even-handed comparison of the two options we need to understand the attributes of each option and the key factors that best help us to differentiate them. We will base our assessment on existing studies, where available, and carry out some targeted technical studies to overcome the knowledge gaps we identify as the most material to making a decision.

What we won't do

Due to time constraints it will not be possible to fully investigate every issue. Our focus will be to identify which of the key factors are most important to improve our understanding about the relative suitability of the two sites. For example, we will not be able to complete a full Environment Effects Statement for each site because this would require several years of data collection and analysis.

We will compare the economic, social and environmental performance of the two options, as well as identify risks (factors that make a particular option unfeasible). The key factors influencing the economic, social and environmental performance are described in Table 2 on pages 26 and 27.

We will seek to identify a preferred location. Even if the evidence we gather is not conclusive enough to identify a preferred location, we will better understand the choice and trade-offs that need to be made at each site. For both options, we will identify the measures required to keep them open, as well as the information required to make a sound decision when the time comes.

The final decision to invest in a second container port is still likely to be a number of years away, so deciding on its location is not necessary until this time. It is worth waiting to make a final location decision based on the best available information, which may change over time. Any recommendations we make now would still need to be reviewed in the future to take into account any new information about conditions and priorities.

Requirements of a new container port

A second container port in Victoria would need to fulfill specific criteria.

- It must handle a reasonable volume of container freight. At this stage, we don't know what initial capacity is required because this will depend on future trade growth, the ultimate capacity achieved at the Port of Melbourne by the private operator, and the preferred market structure at the time. The new port should, however, have the flexibility for significant expansion if required.
- It must accommodate the larger container ships that are likely to visit Australia within its working lifetime.
- It must integrate with future transport and freight networks to increase the efficiency of import and export supply chains.
- It must achieve social and environmental approvals.

In preparing our advice we will work to better define these criteria and assess the performance of the two locations.

Definition of location options

Hastings

The Hastings site is located 60 km south-east of Melbourne on Westernport Bay, to the north of Long Island Point. Hastings was identified as the preferred location for a major port in the 1960s and a large area of land has been reserved for port development. It was the subject of initial planning and investigations for a container port in 2013 and 2014. Although incomplete, these studies provide a starting point for assessing the location and configuration of this site option.

Bay West

The Bay West site covers the north west coastline of Port Philip Bay between Point Lillias and Point Cook (25–50 km south-west of Melbourne). There are several possible port locations in this area, each with different land and marine access attributes. Based on previous investigations, new technical studies and an options analysis we will select the most likely location and configuration for the purpose of comparison with the Hastings site. The option may still be indicative due to insufficient information available to define the precise location of channels and land access corridors.

Figure 6 is a schematic map of the location of the Hastings and Bay West sites, and the Port of Melbourne.

Understanding the attributes of each option

We intend to undertake an even-handed and unbiased comparison of the two options. Work has previously been undertaken at Hastings and Bay West. We will begin our work by reviewing existing studies, where available to us, identifying gaps and then commissioning new technical studies to fill knowledge gaps.

Figure 6: Location of the Port of Hastings and Bay West sites, and the Port of Melbourne



Any additional work we commission will focus on improving our knowledge about the key factors that will influence the choice of a location. We may undertake the following work:

- **Concept definitions and cost estimates:** We will consider, among other factors, marine and land access, and land availability to determine the best port location at each site.
- **Marine geotechnical studies:** Where there is significant uncertainty about geotechnical conditions we may undertake geophysical surveys to better understand the extent of hard rock, which could impact on dredging costs.
- **Dredging and reclamation studies:** These studies would assess the volume of dredging and reclamation that may be required, as well as methodologies, cost and environmental considerations in constructing a port.
- **Hydrodynamics and navigation studies:** These studies would analyse the feasibility, cost and environmental implications of navigating larger ships to a second container port location, and/or any further upgrading to channels that would be required to accommodate larger ships.
- **Transport and economic modelling:** This study will model the effect of the different port options on the operation of the transport network under a range of scenarios.

In the concept definition and costings for Bay West and Hastings we will assume that stage one of a new port would require a capacity of 3 million TEU. Given the different locations, we recognise that terminal configuration may differ, and we will be clear about the concept definition we are proposing at each site as the basis for capital and operating costs.

Assessing the options

We want to identify the option that delivers the best outcome for Victoria. In economic terms this could mean how an option fits with future land-use planning, or the impact of an option on supply chain costs or freight efficiency, measured by metrics such as cost per TEU for new capacity or the effect on GSP.

Economic outcomes need to be balanced against project risks, resilience to shocks or changed conditions, and social and environmental impacts.

A project of this scale will act as a key anchor node for Victorian and interstate supply chains, and in the medium to long term it will shape the future development of Melbourne's freight networks, manufacturing centres and retail supply chains. The effects will flow-on to the distribution of economic activity, jobs and population growth within Melbourne and Victoria. We will assess the options in the context of long-term plans for Melbourne's and Victoria's growth.

The site options will be assessed using economic and multi-criteria assessments that will focus on key technical, economic, social and environmental factors chosen to:

- assess the suitability of each site
- differentiate the performance of the options in terms of cost, risk and potential impacts
- identify any issues that would make an option unfeasible.

The key factors we plan to consider in the site selection are listed in Table 2. Furthermore, to test the resilience of each option to uncertainty, shocks and changed conditions, we will assess the performance of the options under a range of scenarios using the key factors as a basis. These scenarios will involve a variety of underlying assumptions about future trends and developments such as:

- demand scenarios for containers and other trades
- port and channel developments at other locations
- ship size and technology changes
- development of land transport networks (road and rail)
- changing land use (regional and metropolitan development)
- climate change (for example, rate of sea level rise).

Table 2: Key factors in assessing site selection for a second container port in Victoria

KEY FACTOR	EXPLANATION
TECHNICAL FEASIBILITY	
Ability to host approximately 1–3 million TEU p.a. in its initial development stage	<p>Ports are built in stages to avoid over capitalisation and having capacity built long before it is needed.</p> <p>This factor relates to the cost of constructing the first stage of the port, relative to the potential costs of a maximum port size.</p>
Ability to expand in stages to an ultimate capacity of around 6–10 million plus TEU p.a.	Any new port should have significant expansion potential to handle long-range future demand and/or accommodate the transfer of a large share of Port of Melbourne trade if required.
Ability to provide marine access to handle larger vessels and channel capacity to cater for existing and forecast future trade volumes	This factor relates to the ability to handle larger container vessels of a size likely to visit Australian ports over the next 50 to 75 years. If larger vessels experience delays or cannot access the port, this will add to costs and reduce the port's competitiveness.
Ability to connect to existing and future Victorian road and rail networks	Assessing the availability of land for transport corridors, and the fit with existing road and rail networks, enables comparative assessment of the network-wide impacts of different port locations. For example, this relates to local congestion patterns and flow-on effects of investment in roads for other non-freight users.
Ability to locate an integrated logistics precinct at the port gate	We will investigate whether co-location of port terminals and a logistics precinct is likely to generate significant cost savings in supply chains in the Victorian context.
Ability to align with surrounding land uses	Surrounding land uses may place constraints on port configuration and operation. For example, container cranes operating near airports have to consider relevant height restrictions.
ECONOMIC	
Estimates of the capital and operational costs	<p>This factor relates to the estimates of the capital cost and operational costs for each stage of capacity development. To allow separate consideration of marine and land access, costs will be broken into:</p> <ul style="list-style-type: none"> marine access – dredging, reclamation and spoil disposal required for channels and berths port construction – quays and terminals transport corridors – road and rail connections to existing highway and rail networks. (NB: road and rail upgrades beyond the primary connections to existing networks are considered separately as 'complementary' infrastructure upgrades. For further information see below.)
Total cost per TEU for capacity provided	Assessment of this factor enables high-level comparison of the capital cost per TEU of the additional capacity provided at each stage.
Potential cost impacts of project risks	This factor relates to the identification of the issues that are most likely to influence the end project cost (increase or decrease) and risk-adjusted cost estimates.
Surrounding and supporting infrastructure	We will assess the impacts on surrounding and supporting infrastructure such as existing road and rail networks, and airports.
Estimated cost of any complementary infrastructure investments required	This factor captures costs of any major infrastructure upgrades that are geographically separate from the port project, but may be required to make the option feasible. For example, this might relate to road or rail upgrades elsewhere in the network.

Supply chains, including the average operating cost per TEU for supply chain operations	Different port sites may cause significant positive or negative impacts on cost, time or reliability of local, regional, interstate and international supply chains.
Access to employment	Each port site will provide different distribution of employment, which could provide opportunities in lower socio-economic areas, including the level of employment created during construction and operation.
Economic impacts	This factor relates to the economic analysis to determine the impact of changes to freight costs and transport congestion on the wider economy, for example, GDP and GSP.

SOCIAL

Road congestion and traffic levels	Different port sites will produce a different effect on congestion patterns across the road network, which will impact on other road users.
Visual amenity and amenity of surrounding areas	We will assess the potential impact the construction of a port will have on the amenity of surrounding residential areas or public space.
Heritage	This factor relates to the level of Aboriginal, cultural and historical heritage impacts.
Recreational and commercial activities	We will assess the potential for the construction or operation of the port to impact recreational/commercial activities in the surrounding areas, for example, boating, fishing and aquaculture.
Planning permitting risks and social impacts or costs	This factor relates to the ability to obtain planning and development approvals, including the likely costs of social offsets.

ENVIRONMENTAL

Marine environment	This factor relates to the comparison of different levels of sensitivity of, and risk to, the marine environment from port construction (particularly dredging) and operation. This includes the impacts on water quality and water body hydrodynamic and coastal processes.
Terrestrial environment	We will compare the different levels of sensitivity of, and risk to, the terrestrial environment from port construction and operation.
Environmental offsets and compensatory measures	Environmental approvals may require offsets for any habitat loss, particularly within or adjacent to wetlands protected by international treaties such as the RAMSAR convention (an international treaty for the conservation and sustainable use of wetlands).
Environmental permitting risk – ability to obtain approval for ultimate development	Not obtaining the necessary permits and approval is a risk to the delivery of a project.

In reviewing our approach, we would particularly like your comments on the following questions.

KEY QUESTIONS

- Do you think we have missed any important factors for assessment of the sites?
- Do you think there are any constraints to testing the key issues we have identified?
- Can you provide any evidence to help form our evidence base in considering where a second container port may be located?

How you can help us

Your input is an important part of the advice we provide to the Minister.

In this initial phase of engagement we are seeking your feedback on the process for developing the advice, and the key factors we will consider in preparing our advice, which are included in this discussion paper. Specifically, we would like you to consider some key questions.

- Have we missed any key factors that may influence demand and capacity at the Port of Melbourne?
- Which key factors are likely to have the greatest influence on demand and capacity at the Port of Melbourne?
- What do you view as the key links and interactions between key factors?
- Do you think we have missed any key factors or issues for assessment of the sites?
- Do you think there are any constraints to testing the key factors we have identified?
- Do you have any information to help us build our evidence base?

To provide feedback, visit yoursay.infrastructurevictoria.com.au to:

- complete our feedback form
- submit existing evidence or reports
- register interest in our engagement program.

Register your interest

We are seeking expressions of interest for our ongoing engagement program to develop the port advice. You can register at yoursay.infrastructurevictoria.com.au and we will contact you about our engagement activities in 2016.

Your involvement will help us test key issues and better understand available evidence.

What happens next?

In 2016 we are undertaking a program of work to develop the port advice including undertaking technical investigations. Stakeholder and community feedback in this phase of engagement, and evidence received, will also be assessed and considered.

These inputs will be incorporated into a report presenting our evidence base, which will be released for another phase of engagement in early 2017. Submissions on the report outlining our evidence base will be invited following its release.

A final report, including our advice, will be presented to the Victorian Special Minister of State in May 2017.

2016

Q3

Release of discussion paper
Consultation on key factors



Q4

Stakeholder engagement
Technical studies and internal analysis



2017

Q1

Release of evidence base
Consultation on evidence base



Q2

Provide advice to Special Minister of State



About us

Infrastructure Victoria is an independent advisory body, which began operating on 1 October 2015 under the *Infrastructure Victoria Act 2015*.

It has three main functions:

- preparing a 30-year infrastructure strategy for Victoria, to be refreshed every three to five years
- providing written advice to government on specific infrastructure matters
- publishing original research on infrastructure-related issues

Infrastructure Victoria will also support the development of sectoral infrastructure plans by government departments and agencies.

The aim of Infrastructure Victoria is to take a long-term, evidence-based view of infrastructure planning and raise the level of community debate about infrastructure provision.

Infrastructure Victoria will not directly oversee or fund infrastructure projects.

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