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Build it – but will they come?

A pre-mortem analysis of the Port of Hastings Development Project to encourage alternative integrated planning

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Introduction

The Victorian Government is committed to expanding the Port of Hastings as Victoria's next container freight port. An allocation of $110 million was made in May 2013 to fund the planning of the proposed port by the newly established Port of Hastings Development Authority, with all necessary planning and environmental approvals to be completed by 2017. The plan is for construction to begin in 2018 and to be completed by 2027 at the latest, excluding major road and rail construction across Metropolitan Melbourne, at an estimated cost of $12 billion.

Planning for the alternatives to the Port of Hastings ceased in May 2013, yet long lead times in planning for and delivering new port capacity requires a continuation of planning for alternatives, should for any reason, the Port of Hastings development project fail.

The Port of Hastings Development Project is a significant response by the Victorian Government to potentially significant increases in the size of vessels serving global supply chains and the current capacity of the Port of Melbourne. The success or failure of the Port of Hastings development will affect every Victorian, and many Australians, over the coming decades.

The Victorian Government is also planning to develop a new multimodal freight network to support the use of the Port of Hastings and to meet the future freight task, which in 2050 is predicted to be three to four times larger than in 2013. The proposed development of the Port of Hastings, as Victoria's next container port, is the key element in the 2013 Victorian Freight and Logistics Plan. The plan includes the construction of new road and rail networks to facilitate the safe and efficient transportation of containers to and from the Port of Hastings. Three thousand hectares of land surrounding the Port of Hastings was reserved in the late 1960s for processing manufacturing and port-related uses.

We hope this paper will encourage all relevant stakeholders to respond with the vast experience, imagination and knowledge available, on either the overall concept or on details of any aspect of the project. It is vital that expert industry and community advice underpins every phase of the Port of Hastings Development Project, to support the Victorian Government in its work to provide for the future port-related infrastructure needs of the State.

A Pre-mortem Analysis

It is difficult to separate projects of this scope from the economic, environmental, political and social realities, which influence the planning, design, consultation and communications procedures, and may affect the government approvals process. Critical discussion of a project of this scale during the early planning stages can face a major obstacle where, as Gary Klein suggests "…subjective overconfidence is determined by the coherence of the story… not by the quality and amount of information that supports it". We decided therefore to follow Klein's pre-mortem technique, as discussed in Daniel Kahneman's "Thinking Fast and Slow" (Penguin, 2011) to explore this immensely significant Victorian proposal and we encourage your participation in the process.

The pre-mortem technique involves imagining that the project has failed, and inventing a story to explain why, as a stimulus to considering changes in the project design, procedure or management. It is a simple technique that can indicate potential problems and prospects, as well as expose any weaknesses in the project.

The procedure offers three very clear advantages in project analysis:

- overcoming the 'group think' that can affect groups and individuals when the political decisions have apparently been made;
- removing the pressure from people who are worried about seeming disloyal if they voice their concerns over the project; and
- stimulating the imagination and harnessing the knowledge of participants, to encourage a broader involvement in assessing the potential challenges, difficulties and prospects that could face the project, before the costly implementation procedures are set in motion.

To illustrate the use of the pre-mortem technique in the context of the Port of Hastings Development Project we propose two distinct sets of conditions that could lead to the failure of the project.

The first condition assumes that mega ships will not replace the current workhorses of the maritime fleet, but instead will be used exclusively between the major global ports serving Europe, China, India, the Middle East and the Americas. The maritime transportation of containers for relatively small distant markets, such as Australia's capital city container ports will, in the short to medium term, continue to be served by the current fleet of vessels, determined by the market, with a capacity of 3,000 to 7,000 containers (twenty-foot equivalent units, or TEU). In this scenario, the Port of Melbourne, through the Port Capacity Project at Webb Dock East and the proposed Swanson Dock capacity development programs, would continue to offer a fit for purpose cost-competitive alternative to the Port of Hastings. This condition is based on the understanding that shipping companies send their ships to markets not ports, and vessel size is determined by the economics of freight volumes, not by government policy.

The second condition is predicated on the likely responses from people who will be adversely affected, in one way or another, by the development of the Port of Hastings as a container port, and the necessary road and rail infrastructure that will link it with metropolitan Melbourne and Victoria's regional hinterland. This scenario assumes that there will be very strong and united opposition, representing broad ranging economic, environmental, political and social interests.

The most significant environmental issue will be the internationally significant wetlands protected by the Ramsar Convention that include all of Western Port to the North and East of Phillip Island. The Convention was listed on the Register of the National Estate and the Australian Government has been a convention partner and signatory since 1982.

Constructing a nine million TEU container terminal in the Ramsar Convention-protected area will require intensive and guaranteed mitigation measures, to ensure the wetlands continue to be fully protected. The Government's response will have to withstand very determined local, national and international scrutiny and demonstrate the safety of the wetlands against any foreseeable damage from the construction, dredging, maintenance and maritime operations of the Port of Hastings.

The economic and social issues will likely involve broad-ranging and detailed opposition to:

- Australia's potential failure to fulfil its international obligations and responsibilities as a signatory to an environmental protection convention;

- the potential destruction of Western Port coastal scenery affecting landholders and residential and holiday home owners between Cape Schanck and Stony Point, on the Mornington Peninsula; on French Island; and between Ventnor and Cowes on Phillip Island;
- the impacts on the region's tourist industry, including the internationally significant fairy penguin parade and seals at The Nobbies on Phillip Island, of the Port and its maritime operations;
- very strong concerns throughout Melbourne over the potential loss of properties and amenity resulting from the construction and operation of road works, and the South East Rail Link, for trains to cross the Yarra River and travel via Richmond, Flinders Street and Southern Cross Stations to the Tottenham freight rail yards, which may require excavation work in the affluent 'leafy green' suburbs of Malvern, Armadale, Toorak, Hawksburn and South Yarra.

These politically sensitive social and environmental issues could lead the government of the day to re-evaluate the political costs of the proposed port and associated infrastructure, and decide instead to concentrate on metropolitan and regional commuter transport priorities and other more pressing constituency issues.

As stakeholders in the supply chain industry, and interested members of the community your participation in the application of the pre-mortem technique would significantly enhance the work of the Institute for Supply Chain and Logistics at Victoria University and help to provide sound information as the basis on which the Victorian Government can make the best decisions for the future of the State. It will broaden the examination of the Port of Hastings Development Project in a timely manner; improve the monitoring and assessment of changes in global, national and regional logistics chains; support the concerns of industry and the community in relation to the current and potential port development; and support careful consideration of the economic, environmental and social implications of the Project.

Complex large-scale projects of this type can expect to meet with considerable opposition from affected individuals, organisations, associations and special interest groups. The Victorian Government and the Port of Hastings Development Authority will be judged, from the earliest stages of research and design, on the integrity, sensitivity and transparency of its communications with the community, industry and individuals, and the effective and transparent resolution of issues and problems as they develop.

The Government's responses framework should include the early establishment of a high quality, sensitive and sophisticated consultation and participation process, that encompasses frequent testing and reporting on the changing economic, environmental and social indicators as the work on the Port of Hastings Project gathers momentum.

The planning process would be further improved with the establishment of an independent agency for infrastructure planning to monitor the economic, political and social cost indices of major infrastructure, port development and maritime projects here and overseas.

International Sea Freight Supply Chain and Logistics

Supply chains are complex, multifaceted, interdependent systems that link producers, businesses and consumers through the decisions and interactions of the agencies, governments and people involved in their management. They involve precise time and cost management in logistics and multimodal

transportation, and operate in environments heavily influenced by external variables, including the economic, legislative and social expectations that are managed through government policy and investment.

Supply chains face constant change in response to the global, national and regional business environment, with innovations in communications, equipment, operations, strategies and infrastructure. Air and sea ports are vital elements in supply chains and logistics, but they are single points within the overall integrated, complex system and therefore require a systems approach to assessing the costs and benefits of any single major project across the whole supply chain.

Australia's import/export container freight supply chains are served by about seven million containers (TEU) annually, using a large number of shipping lines, with the following approximate distribution according to port:

- Port of Melbourne: 2.5 million containers (TEU), including Tasmania's mainland domestic and international freight;
- Port Botany Sydney: 2.1 million containers (TEU);
- Port of Brisbane: 1.1 million containers (TEU);
- Port of Fremantle: 650,000 containers (TEU); and
- Port of Adelaide: 300,000 containers (TEU).

Container vessels routinely visit and serve the capital city ports of Australia, all of which have restrictions on vessel size. The proposed water depth at the Port of Hastings will be sufficient to allow vessels with a draft of 16 metres to berth at any time, compared with a draft of 14 metres at the Port of Melbourne (potentially 14.5 metres with tidal assistance), 15 metres at Port Botany, 14.7 metres at the Fremantle Inner Harbour, 14.2 metres at Adelaide's Outer Harbour, and 14 metres at the Port of Brisbane. The greater proposed water depth at the Port of Hastings, therefore, may have little or no influence on the size of vessels, given that the container ships normally also serve the other capital cities with ports that will not accommodate the larger vessels. Unless each major capital city port deepens their shipping channel and berths, the larger vessels will not come.

The capacity of container vessels has significantly increased over the past three decades (see table below) but presently the Post Panamax Plus class of vessels is the largest servicing Australian ports.

Year of introduction	Generation (class) of container vessel	Capacity (TEU)	Design draft
1988	Post Panamax	4,000 – 5,000	13 metres
2000	Post Panamax Plus	6,000 – 8,000	14.5 metres
2013	New Panamax	12,500	15 metres
2014	Maersk Triple E Class	18,000	14.5 metres

Source: Alphaliner 2014

The newest Maersk Triple E vessels, with their 18,000 container (TEU) capacity and draft of 14.5 metres, could theoretically enter Port Phillip Heads with tidal assistance if only considering their draft, but this would require significant evaluation. But their length of 400 metres and width of 59 metres would potentially prohibit them from entering the Heads and berthing safely at the Port of Melbourne.

The capital city ports of Australia, except the Port of Fremantle, are all privately owned or being proposed for sale and each port owner will separately determine the costs and benefits of increasing water depth sufficiently to accommodate larger vessels.

The Port of Hastings Development Project's anticipated service of container mega ships can be put into context by comparing with those trading on the major East-West shipping routes between Asia and Europe. The Port of Rotterdam handles mega ships to service a market hinterland of 350 million people, compared with Australia's total market population of 23 million people and Victoria's current population of 6 million that is anticipated to grow to 10 million people by 2050.

The stark differences in market sizes emphasise that in order to maintain a container shipping service that satisfies Australia's need for reliable, regular (weekly) movement of imports and exports, particularly the substantial agricultural and perishable food-related exports, the smaller container vessels are likely to be more suitable than the larger mega ships; the transit times of Australia's agricultural and food exports are kept to a minimum through regular and frequent direct vessel calls across all Australian ports.

Landside Logistics: Trucks and Trains

The Port of Hastings Development Project is designed to cater for nine million containers (TEU) per annum by 2050. Changes can be anticipated across the hinterland if businesses relocate and adjust their operations to optimise their use of the new container port. While freight logistics and transport service providers may relocate they must pass on to customers the higher operating costs resulting from moving approximately an extra 100 kilometres away from the current industrial 'heartland' in the West of the metropolitan region, with the same long distances on the return trip.

Business locations, including that of national distribution centres, are determined by many criteria and compelling commercial considerations, including the location of the core business; the asset investment strategies; customer locations; land availability and suitability; costs; access to labour; and proximity to international airports and national transport networks (road and rail). Personal, family and community reasons also influence business location decisions.

The 2009 Port of Melbourne Container Chain Logistics Study showed that approximately half of all import and export containers passing through the Port of Melbourne originated in or were destined for the crescent of industrial land located on both sides of the Western Ring Road between Altona and Laverton in the West and Hume in the North, with 65% of total containers transported less than 22 kilometres in the first and last transport legs via the Port of Melbourne. Based on 2011/2012 container volumes, mathematical modelling by the Institute for Supply Chain and Logistics at Victoria University shows a shift to the Port of Hastings would cause a doubling of truck operating costs, increased travel time and emission as well as air quality degradation.

If a significant proportion of the businesses currently established to the west of Melbourne's central business district remain in their current locations, the potential freight transportation impact could be

significant. When the Port of Hastings reaches its capacity of nine million containers (TEU) as planned in 2050, the land-side task could potentially involve the movement of 4.5 million containers annually to and from Melbourne's main western industrial district.

Nevertheless, when the Port of Hastings reaches its capacity of nine million container (TEU) this would require:

- 1.5 million B-double trucks, or 50,000 freight trains carrying 90 containers per train, annually;
- over 4,000 trucks or 140 trains moving across Melbourne's road and rail network between Melbourne's industrial West and North, and Hastings, daily.

The freight logistics industry and the Victorian Government recognise that the current freight rail network cannot cope with this substantial increase in traffic. The proposed South East Rail Link will provide the essential land transport link between Hastings and Melbourne's industrial West and North to prevent Melbourne's shared road network from carrying millions of containers, with the associated major cost and efficiency implications for Victoria's supply chains and Melbourne's commuters. The landside logistics task involved in the development of the Port of Hastings is complex, expensive and requires the cooperation of many stakeholders; however, the likely costs of the land transport networks have so far not been made available by the Government.

Given the current road and rail infrastructure and distribution of import/export containers, over 70% of all containers would have to work their way through the Melbourne Metropolitan area to reach Hastings. The current road network will require substantial improvement and development to cope with the increased traffic and truck trip distances. The Victorian Freight and Logistics Plan nominates ring roads, as opposed to direct cross-city transport links, that will require container and construction industry trucks, taut liners, and over-dimensional and light commercial vehicles to circumvent the City to reach their destination, thereby increasing truck trip times and costs, and reducing the daily utilisation of port-related vehicles.

Managing Supply Chain Risk

The resolution of the complex issues that will determine the success of the proposed Port of Hastings should involve the implementation of contingency planning and fail-safe options, including:

- developing a plan for an alternative port location to the west of the Port of Melbourne in Port Phillip Bay to optimise the use of the $717 million channel deepening investment and the anticipated $1.6 billion Port Capacity Project investment;
- monitoring container trade growth and megaship utilisation rates against what could be over-optimistic forecasts;
- determining expected container vessel dimensions for the Port of Melbourne for the next 50 years in view of forecast changes in global market conditions.

The economic significance of maximising and optimising Victoria's current container port capacity and, if necessary, building a new container port to serve the businesses that compete daily in increasingly competitive global markets, requires early contingency planning should the current Port of Hastings Development Project fail for economic, environmental, political or technical reasons.

In 2013, the Victorian Government determined that the process of developing independent investigations into an alternative container port to the west of the Port of Melbourne in Port Phillip Bay was no longer required. The case for the Port of Hastings Development Project was considered sufficiently strong on the assumption that landside logistics efficiency was assured through the development of the South East Rail Link.

The Victorian Freight and Logistics Plan contends that for Victoria to maintain its status as the "Freight State" a new deep-water port at Hastings is required to attract the largest vessels and ensure that Victoria maintains its dominance over the other capital city ports. This simplistic view is not reflected in the commercial operations of shipping companies or the supply chain industries in international or capital city markets.

The potential implications of conceptualising competition in this way can be gleaned by looking at similar projects overseas. For example, in an effort to compete with the Port of Rotterdam, in the late 1990s the Port of Amsterdam decided to grant and subsidise a concession to a private operator to build a 54 hectare container terminal on the shores of the North Sea Canal, using an "indented dock", where container cranes could work both sides of vessels simultaneously. The container terminal was completed in 2001 but only a small number of containers were handled until it was decided to close the facility in 2012. The City of Amsterdam and the private operator incurred losses of millions of euros.

This, and other examples, suggest that building a successful container terminal in a new location, specifically the Port of Hastings, involves:

- providing sufficient and well-connected infrastructure on the landside, as well as the waterside, ahead of time;
- achieving an early commitment from shipping lines that they will use the new facility, based on firm estimates of global commercial imperatives;
- guaranteeing efficiencies and the costs will be comparable with the available alternatives;
- ensuring that the supply chains and logistics industry enterprises formally agree to support the new facilities;
- developing an effective, sensitive and knowledgeable agency to respond to complaints and requests for information, and to assist affected people in resolving their problems with the Project;
- providing an alternative to the Port of Hastings, prepared from a risk management perspective, to ensure that the experience of years of project planning and design processes are not lost if the proposal is discontinued.

Conclusion

Over the last 30 years the world has changed in ways that were once unimaginable. To compete in global markets and succeed, Victoria's supply chain and freight logistics businesses must be able to keep pace with changes through their agility, reliability, resilience and cost competitiveness.

Governments have stated the crucial reason for the development of the Port of Hastings is that a deep water port is needed to cater for much larger ships with a draft of 16 metres. In 2014 however, many industry experts suggest these mega ships may not come to Australia and Victoria, since the economic demand driven by population will probably not provide the commercial justification for international shipping companies to bear the cost of sending larger vessels to our ports. Our relatively small and diverse import/export markets and the dominance of food and perishable agricultural commodities are more likely to be best served by smaller vessels of 8,000 to 10,000 containers (TEU).

The Port of Hastings Development Project will affect every business, industry and individual in Victoria over the next 40 years, whether or not it is completed. This clearly needs to be considered in relation to the proposed lease of the Port of Melbourne to a private operator for a 40 year period.

There are many in the broader community who are willing and able to contribute to the examination of major infrastructure project issues when their interest and involvement is stimulated. The participation of all interested parties will add immeasurably to the quality of the decisions and the Institute for Supply Chain and Logistics hopes many firms, associations and individuals will offer their time and energy to refine and extend the ongoing debates.

We also hope the Government will establish excellent and well supported public and industry communications programs, to encourage the fullest possible participation in this most important investment concept. Issues will arise that will demand our contribution and support to make sure Victoria benefits to the maximum from the results and the lessons learned throughout the course of the Port of Hastings project and the implementation of the Victorian Freight and Logistics Plan.

The significance of planning and developing the critical freight infrastructure and port system to support Victorian business will have a multi-generational impact and is sufficiently critical to our society and future generations of Victorians to demand our fullest possible attention and contribution to the Port of Hastings planning and development processes.

This pre-mortem analysis was prepared by the Institute for Supply Chain and Logistics at Victoria University with the support of the Supply Chain Advisory Network. It responds to the need for clarity and is based on the synthesis of many detailed reports and the expert opinion of stakeholders across the supply chain.

The Institute for Supply Chain and Logistics (ISCL) at Victoria University is a specialist research and knowledge centre that focuses specifically on freight logistics and value added supply chain, and provides independent, industry-focused study to support relevant and sustainable public and private sector decision making.

The Supply Chain Advisory Network is an informal network of supply chain practitioners, with companies representing each point of Victoria's international import export supply chains. The network has a long term involvement in improving supply chain efficiency and productivity through 'whole of chain' understanding and its contribution to the people of Victoria.

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