

# WESTPORT:

What we have found so far

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# Minister's Foreword



We went to the State election early last year with a commitment to plan and build a future Outer Harbour at Kwinana, and its associated road and rail links.

I was therefore pleased – within six months of being elected – to establish the Westport Taskforce,

giving it the task by 2020 to:

- Undertake the planning for future development of the Outer Harbour at Kwinana and the future of the Inner Harbour at Fremantle;
- Investigate the potential for the Port of Bunbury to contribute to handling Perth's growing freight task;
- Answer key policy questions about the location, size, operating model and timing for potential additional port facilities at the Outer Harbour; and
- Plan for the associated road and rail links to support any new Outer Harbour port facilities.

This document – *Westport: What we have found so far* – is a progress report from the Westport Taskforce, communicating an overview for the Western Australian community of its extensive consultation and other work so far.

The approach the Taskforce is taking is thorough, detailed and methodical. It complies, for example, with Infrastructure Australia's notoriously rigorous assessment process.

The Taskforce's approach involves an assessment of a broad range of options, most of which will end up being discarded, and involves a comprehensive cataloguing of the problems, many of which may later be resolved.

The process over the past year has been highly inclusive, involving extensive collaboration with more than 100 representatives from all levels of government, industry, unions, private enterprise, academia, environmental and community groups, who have contributed to the project's various work streams.

This report really just lays out all of the issues that have been raised at this "Problem Identification" stage of the Infrastructure Australia-compliant assessment process.

This stage, which identifies all the challenges for each of the three study areas at Fremantle, Kwinana and Bunbury, supplies the foundation which will inform the Taskforce's work during its next stages.

Work is continuing, and Stage 2 of the process will investigate each option in detail, reducing them to a shortlist that will be analysed through a multi-criteria assessment. The Taskforce's work will culminate in a preferred network solution covering port, road, rail and intermodal facilities across Fremantle, Kwinana and Bunbury at the end of next year.

Westport's final Strategy will tackle the questions about the precise location, size, operating model and – importantly – the timing of a future port.

I commend the Taskforce – and all who have engaged with it – on their work so far, and look forward to future progress reports.

Sincerely,  
The Honourable Rita Saffioti MLA  
*Minister for Transport, Planning, Lands*

# Message from the Independent Chair



In 2017, the State Government established the Westport Taskforce to develop a long-term strategy to deliver an integrated port, road and rail system for freight that will drive Western Australia's economy for decades to come.

The Taskforce is assessing the freight network from Perth to Bunbury, examining and re-evaluating previous port and network planning and research in today's context. The first step is understanding the problem we are trying to solve and the opportunities we are trying to capture, then assessing a range of strategic options to arrive at a preferred network solution. The Strategy timeframe of 50-100 years is a rare but vital opportunity to plan for long-term investment decisions.

Throughout the world, there is a recurring theme of first world economies slowly out-growing, re-inventing or moving beyond their legacy ports, and in doing so, re-invigorating the old while redefining the new. Successful outcomes require patience, sound planning and respect for community values, with most projects spanning one or two decades of sustained effort.

By their nature, supply chains comprise a mix of private and government operators, so it is vital that all parties are able to contribute to the solution. The Taskforce's consultation has been extended to include the broader community and special interest groups to ensure that the Westport Strategy achieves a social licence for implementation.

As the Independent Chair of the Taskforce, I have made it my personal mission to share the story of Westport with as many people as possible. I have presented at many public forums and conferences and met with hundreds of stakeholders from the community, industry, research organisations, peak

bodies and all levels of Government. For the Westport Strategy to be successful, we need to gather, understand and balance the many and varied interests and perspectives to ensure that the process of arriving at a preferred network solution is robust and clear. My key aim has been to make people aware of the process and to capture as many of those perspectives as possible.

I extend my sincerest thanks to everyone who has dedicated their time, energy and insights to being part of the Westport Taskforce. In particular, I acknowledge the members of the work streams, who have contributed significant time and intellectual capital; the hard-working members of the various Reference and Steering Groups; the people who attended Westport's community drop-in events; those who are actively contributing to the conversations through social media; and those who read this report and submit their feedback – this process couldn't work without your support and engagement, so thank you.

The evidence collated so far by Westport's work streams is summarised in this report. It provides an overview of the current and future trade task and investigates the existing ports located at Fremantle, Kwinana and Bunbury and their surrounding areas. Each location is examined in terms of port capability, supply chains, land use and environmental values. From this base line, eight strategic options have been identified to consider in detail in Stage 2 of the Westport process.

I urge you to visit the [MySayTransport.wa.gov.au/Westport](https://www.mysaytransport.wa.gov.au/Westport) consultation hub and have your say – and spread the word among your networks and encourage them to do likewise. On behalf of the Westport Taskforce, thank you for taking the time to review this report. We look forward to hearing your feedback and incorporating it into Stage 2 of the Project.

Sincerely,

*Nicole Lockwood*







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# 1. Executive summary

Western Australia's population and economy are highly reliant on imports and exports. To make sure the growing populations of Perth and surrounding regions have the everyday goods they need well into the future – while allowing the State's industries and economy to grow – we need to have a plan. The Western Australian (WA) Government formed the Westport Taskforce to deliver that plan.

With Perth's current population of two million people expected to double by 2050, it is undeniable that freight needs will continue to grow. WA should prepare now to meet this growth, as our current infrastructure and freight networks will not be sufficient to cope with demand.

*The Westport: Port and Environs Strategy* (the Strategy) will provide guidance to the State Government on the port, rail, road and intermodal facilities required to deliver a long-term, integrated solution to Perth's future infrastructure needs, create jobs and support the Western Australian economy.

The Strategy takes a 50-100 year planning horizon and focuses on the three ports located closest to the Greater Perth area:

- Fremantle Ports' Inner Harbour at Fremantle (Fremantle);
- Fremantle Ports' Outer Harbour at Kwinana (Kwinana); and
- Southern Port Authority's Inner and Outer Harbours at Bunbury (Bunbury).

*What we have found so far* focuses on starting to answer two strategic questions:

- Strategic Question 1: *What problems are we trying to solve and what opportunities are we trying to capture?*; and
- Strategic Question 2: *Where do new port facilities need to be located in Fremantle, Kwinana and Bunbury?*

To answer Question 1, this report starts to set out the current port, transport, land use and environmental challenges and opportunities facing Fremantle, Kwinana and Bunbury. Many of the challenges are common to large, modern cities and are essentially a function of growth in both population and economic development. Historically, WA's trade and freight operations have grown and flourished harmoniously with the communities they serve. However, as the population increases and the demand for freight rises, existing road and rail networks will become increasingly congested, amenity will be reduced and our cities become less liveable. To prevent this, the Westport Taskforce is taking a sustainable approach and examining the economic, environmental and social impacts and opportunities of the future supply chain, from port to customer.

To answer Question 2, this report commences identifying some possible locations for future trades – with the combinations of trades and port locations called a 'strategic option'. Following the public consultation process, the strategic options proposed in this report will be reviewed and the final list determined. In Stage 2 of Westport's process, these strategic options will be comprehensively investigated and compared using a multi-criteria assessment process. Financial implications of any strategic option progressed – whether this is enhancing and augmenting existing infrastructure, or building new infrastructure – and the cost implications and comparisons will also be completed as part of Stage 2.

The proposed strategic options start with today's mix of trades at the three port locations and transition the trades to different locations over time. Key considerations of future work will be to: determine how long Fremantle's Inner Harbour can efficiently and safely operate alongside the increasingly urban environment of the City of Fremantle; identify

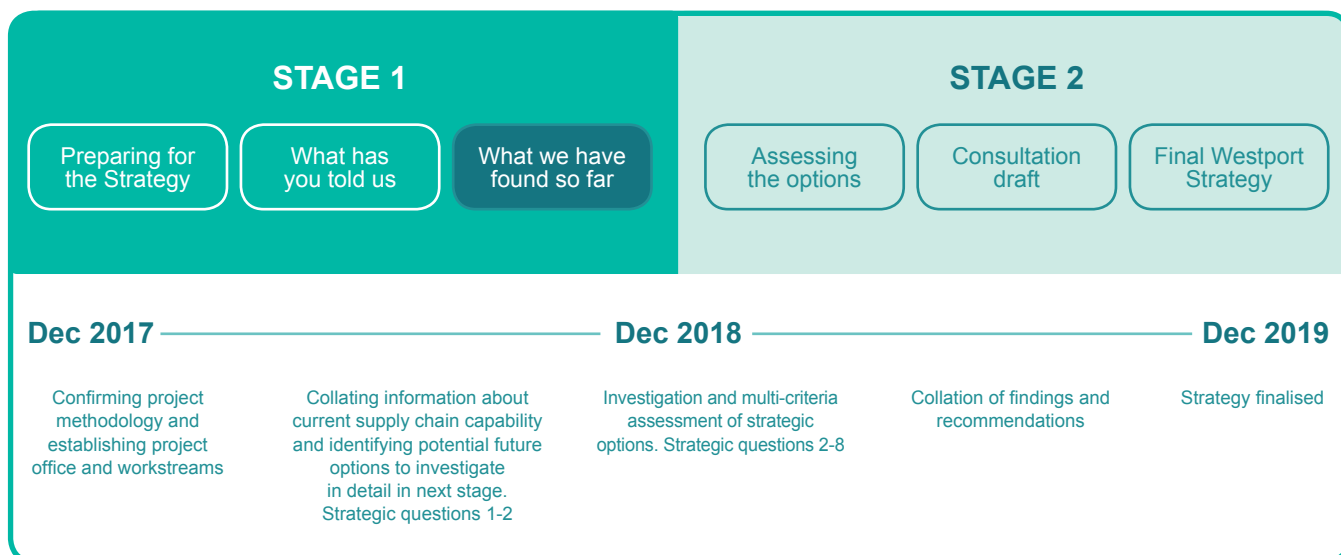


opportunities to facilitate and grow trade; assess if and when any trades should be moved to a different port location; and plan for the infrastructure required to keep freight moving efficiently and the economy growing for decades to come.

Through this approach, the Westport Strategy will enable the best use to be made of investment funds – with large and small infrastructure projects working

together over time to build a port and freight network that grows in tandem with the population.

*What we have found so far* is a summary of investigations to date; it is not endorsed by Government and does not necessarily represent Government's views. The information from this report and later work will be used to develop the ultimate Westport Strategy for Government to consider.



This report has been structured into five sections:

- Section 1: *Executive Summary*
- Section 2: *Introduction*
- Section 3: *What we have found so far*
- Section 4: *Strategic context*
- Section 5: *Communication, consultation and engagement*

## WHAT WE HAVE FOUND SO FAR

This at-a-glance overview of the key features of ports at Fremantle, Kwinana and Bunbury sets the scene for the report and details how the proposed strategic options were derived.

Government has a mandate to grow and diversify the economy, and most importantly, to create jobs for Western Australians. While the focus of Westport is on port trade options, the Government is seeking strategic outcomes on how new jobs and opportunities can be created and how to deliver the growing requirements of the port without limiting unforeseen potential for future growth.

As part of its jobs mandate, the Government expects that:

- existing industries and jobs are not limited as part of this process; and
- that new opportunities across a range of areas, but particularly in the areas of defence and tourism, can be developed and optimised.

Through a series of workshops, key stakeholders were asked to describe what a successful Westport Strategy would look like in 50 years' time and to explore how the trade task could be shared between the three study ports using the concept of 'Westport hypotheses'. A Westport hypothesis is an overall picture of how the three ports can work in combination to handle the future trade task. Using a five-step approach, a total of 343 Westport hypotheses were identified, which were then narrowed down to seven feasible hypotheses by applying a number of assumptions.

The assumptions used to shortlist the hypotheses were:

- Fremantle is unlikely to be a bulk port in the future, as this requires large stockpiles of commodities that are not suitable for being near to residential areas, and also creates additional freight movements;
- Kwinana is unlikely to be a passenger port, given its location in an industrial area and proximity to a competing port at Fremantle;
- Bunbury is likely to continue as a bulk port as it services the nearby industry, resources and agricultural areas;
- containerised trade is unlikely to be handled by all three ports at the same time due to the high costs of the infrastructure required and competition for international trade routes; and
- general cargo needs to be handled in combination with other trades as it does not have the critical mass for Fremantle, Kwinana or Bunbury to handle only this type of trade.

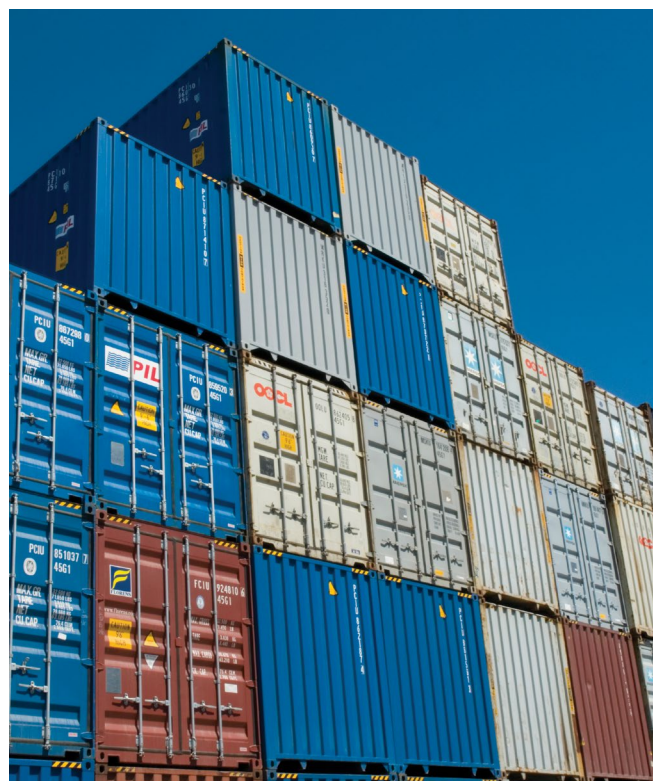
The feasible hypotheses were grouped to transition the current port/trade mix to alternative outcomes; this created Westport's eight strategic options listed below. As container operations are the largest piece of the port jigsaw, the eight strategic options revolve around the placement of container facilities.

1. Current situation – regarded as the base case
2. Optimise Fremantle and transition containers to Kwinana over time, with an option to transition them to Bunbury in the long-term

3. Optimise Fremantle and transition containers to Bunbury over time with no containers in Kwinana
4. De-industrialise Fremantle and move containers to Kwinana as soon as possible
5. De-industrialise Fremantle and move containers to Bunbury as soon as possible
6. Fremantle and Kwinana both have containers for the long-term
7. Fremantle and Bunbury both have containers for the long-term
8. Only Fremantle has containers for the long-term

In Stage 2, each strategic option will be investigated in-depth by work streams focusing on environment, port operations and supply chains, economic development, land activities, commercial implications and opportunities to grow jobs, diversify the economy and realise emerging industries, for example, in defence and tourism. Sustainability principles will be applied so that economic, environmental and social perspectives are considered in detail.

Criteria will be developed to guide the work streams so that sufficient information may be gathered to inform a multi-criteria assessment process. The criteria will be developed using information from the work streams, feedback to this document and other research, and be subject to peer review.







## STRATEGIC CONTEXT

The problems we are trying to solve and some of the opportunities we are trying to capture in Fremantle, Kwinana and Bunbury were explored by five work streams. Between them they: estimated the future trade task; examined each port's capability; assessed supply chain connectivity; described land use and utility infrastructure; and identified the environmental and social values in the three study areas. Through this process, a comprehensive picture of the current situation was ascertained.

### Trade task

To inform the development of this Strategy, Deloitte Access Economics was engaged to develop 50 year macroeconomic and trade forecasts for the ports at Fremantle, Kwinana and Bunbury. Quantified macroeconomic scenario analysis and qualitative assessment of potential high impact/low probability events were also undertaken to understand how the trade forecasts change under a number of alternative futures. Trade forecasts are developed from current trades and known economic development opportunities. Further work will be done as part of Stage 2 to understand the

scale of the trade task associated with emerging and potential trade opportunities.

In the longer term, population growth will remain a key driver of economic activity in Australia, albeit at a slower rate than experienced previously, and exports are forecast to continue to grow faster than the State's economy as a whole. Australian imports are also expected to improve as stronger consumption and investment activity drive demand for international goods.

While containerised trade increased by 7.5 per cent from 2016/17 to 2017/18, the long-term average annual growth rate is forecast to be 2.8 per cent between 2017/18 and 2067/68, to reach 3.1 million TEU<sup>1</sup> by 2067/68, with full container imports accounting for around 45 per cent of total container trade. Total breakbulk volumes are expected to grow at an annual average growth rate of 1.8 per cent reach 2.0 million tonnes in 2067/68. Bulk trade volumes through Kwinana Bulk Terminal and Kwinana Bulk Jetty are expected to rise at an annual average rate of 0.3 per cent between 2017/18 and 2067/68 to 14.3 million tonnes.

Bunbury Port also provides important trade infrastructure for Western Australia, handling around 16.3 million tonnes of bulk trade in 2017/18.

1. TEU stands for twenty-foot equivalent unit. TEUs are used to measure the number of containers that are handled by a port. Containers generally come in two lengths, 20 feet long (1 TEU) and 40 feet long (2 TEU)

## Port capability

This section investigated the ability of the three study ports to handle containerised trade, bulk and general cargo trade and passenger vessels.

It was found that, if port infrastructure and road and rail linkages were developed and expanded to their optimal capacities, the port precincts in Fremantle, Kwinana and Bunbury would be likely to have the capability to collectively handle the strategic freight needs of WA for the next 100 years.

Fremantle is already highly productive, handling 1,003 ships and 769,686 TEUs in 2017/18<sup>2</sup>. This port could potentially handle more than double this number of containers<sup>3</sup> and more passenger ships. This would require a range of operational and infrastructure improvements to accommodate larger vessels (13,000 TEU vessels as opposed to 9,000 TEU currently), significant increases to road and rail freight capacity servicing the port.

Kwinana's jetties had 804 ship visits in 2017/18 (excluding naval vessels) with a throughput gross tonnage of 23.6 million tonnes. Some upgrades to the existing facilities would increase bulk capacity in the short-term. Proposals have been developed for island and land-backed facilities at Kwinana that could accommodate bulk and general cargo as well

as containers with the potential to handle between 3.0 and 6.0 million TEU per year. These would require the development of integrated rail access, intermodal facilities, efficient transport links, bulk handling facilities, and other storage alternatives to maximise supply chain efficiency.

Bunbury Port had 450 ship visits with 16.7 million tonnes of throughput in 2016/17<sup>4</sup>. If upgrades to infrastructure were undertaken, it has the capacity to cater for significant increases in bulk trades, passenger vessels and a container trade (if demand warrants).

## Supply chain

Investigations focused on the road and rail networks and intermodal terminals required to efficiently move freight between the three port locations and their customers.

It was found that access to the port at Fremantle is under pressure at Tydeman Road, Stirling Highway and Stirling Bridge, High Street, Leach Highway, Stock Road and the road and rail bridges over the Swan River. Since the new rail subsidy started on 1 January 2018, the number of containers moved by rail has started to increase, rising from 16.1 per cent in 2017/18 to 18.4 per cent from May to October 2018.



2. Fremantle Ports, 2018, Annual Report
3. AECOM, 2014, Fremantle Ports Inner Harbour Land Transport and Port Capacity, AECOM, Perth
4. 2017/18 figures not yet available for Bunbury Port





At Kwinana, a network of existing, upgraded and new roads will service port facilities into the future as well as the important industrial and commercial centres located along the coast. Access to the Australian Marine Complex could be improved at the intersection of Russell Road and Rockingham Road, and Rowley and Anketell Roads have been identified as potential strategic freight routes to service additional port facilities. The rail network in this area is close to capacity, with the busy Kwinana Triangle and various stretches of single rail track contributing to congestion. A new rail alignment, the Kwinana Rail Loop, designed to relieve stress on the Kwinana Triangle is being investigated as part of the Westport process.

Bunbury is 175 kilometres from Perth, where most of the container trade starts and finishes. Regional roads that service Bunbury Port from the agricultural and mining areas to the south and east are generally

not dual carriageway and pass through the centre of several towns. The South West Main Railway between Perth and Bunbury is one of the busiest sections of the rail network and includes 185 kilometres of single track, narrow gauge railway with 11 passing loops contributing to delays.

Upgrading and enhancing the existing road and rail networks will unlock potential at all three ports. There are opportunities to maximise the existing freight network with some enhancements, although any developments will need to be planned, costed and prioritised. Innovative operational and engineering design solutions are also possible, including: the construction of dedicated freight roads; utilisation of automated transfer vehicles (specialised container transport vehicles); permit systems to extend the hours of freight operations; and grade separations of key segments of the road and rail networks.





## Land use and utilities infrastructure

This section focuses on how land use and utilities infrastructure may impact on increasing or shifting capacity at Fremantle, Kwinana and Bunbury ports.

In Fremantle, the port is adjacent to Fremantle City Centre, a vibrant social and heritage district and one of Perth's 10 Strategic Metropolitan Centres<sup>5</sup>. Given the area's existing public transport linkages, beaches and other amenities, the land in the Fremantle study area is attractive for multiple purposes. The three-kilometre Fremantle Port Buffer is used to manage and mitigate light, noise, odour emissions and safety hazards protecting the amenity of the developed urban areas surrounding the port. However, the Fremantle Port buffer is a guideline rather than a State statutory land use planning instrument. It does not preclude planning for additional residential development, even in the area closest to the port, and is dependent on local governments to regulate.

Changing community expectations about what is shipped from the port should be recognised as a constraint to development in the Fremantle study area. With the relocation of some trades, the port could expand its container operations or alternatively, use the space for non-port purposes.

Changing land use within the port buffer could open opportunities for a range of recreation, commercial and residential activities around Victoria Quay and in North Fremantle.

The Kwinana study area is very large in comparison to the other port locations and includes four key precincts:

- Australian Marine Complex (420 hectares) – strategic planning is needed for the AMC and the Henderson precinct to optimise economic development opportunities, including for defence-related activities;
- Latitude 32 Industrial Area (1,400 hectares) – mostly vacant land, with planning and development deferred pending Westport's outcome;
- Kwinana Industrial Area (1,400 hectares) – has limited additional capacity to facilitate new heavy industries; and
- Rockingham Industry Zone (1,150 hectares) – mixed public and private ownership with capacity for expansion.

There is sufficient land in Kwinana to allow for the development of additional port facilities and strategic master-planned industrial estates that will maximise enterprise and industrial symbioses. Latitude 32 could potentially support a new intermodal terminal and provide room for industrial expansion. The lack of an endorsed plan on the development of additional port facilities in the Outer Harbour has hindered progression of Latitude 32. This has created uncertainty for LandCorp and investors, and caused hardship for some local landowners who have been unable to sell their properties.

5. Perth and Peel @ 3.5 Million: The Transport Network, March 2018

Bunbury has considerable land available for development, including the Preston Industrial Park Northern Precinct (505 hectares), the Picton Industrial Park Southern Precinct (510 hectares), the proposed Waterloo Industrial Park (1,285 hectares) and the Kemerton Strategic Industrial Area (7,543 hectares). The Bunbury Outer Harbour area is being redeveloped as a tourism and entertainment precinct, which may present some opportunity for cruise vessels. As part of the next stage of consideration, Tourism WA will undertake an economic opportunity study of both Fremantle and Bunbury, which will include consultation with the cruise industry, to provide clear information on the cruise vessel opportunities at those locations.

## Environmental and social considerations

The Westport Strategy presents a unique opportunity; between the finalisation of the Strategy and the construction of any new infrastructure, there will be an opportunity to consider environmental issues, implement monitoring programs and undertake work to build resilience into the habitats that may be impacted.

With 28 representatives from key government agencies, conservation, industry and research groups, the Environmental Work Stream has:

- initially identified and defined a total of 79 key environmental and social values within the Fremantle, Kwinana and Bunbury study areas;
- identified potential future sources of pressure in each study area, including pressures not associated with potential port development; and
- discussed possible implications of port-related development on these values in order to identify potential environmental issues and to prioritise areas for further investigation.

There is a substantial difference in the scale of potential development in the three study areas, with:

- the Fremantle study area being restricted to an area within three kilometres from the existing port;
- the Kwinana study area encompassing the whole of Cockburn Sound (as the location and size of potential facilities has not yet been determined) as well as the required transport corridors inland; and

- the Bunbury study area encompassing Koombana Bay and the land surrounding the proposed port expansion and the planned Bunbury Outer Ring Road.

At this stage, the Kwinana study area is extensive so that investigations can inform the location and size of any potential additional port facilities – and the impacts associated with various location options may be compared and assessed. On the land side, the inland transport corridors will likely be required for future urban growth and industrial expansion regardless of any new port developments, but the width of the transport corridors will be informed by potential port expansion in the area.





The marine, estuarine and terrestrial environmental and social values will be examined in more detail in Stage 2. Initial identification has revealed the presence of:

- 21 marine and estuarine environmental values including seagrass habitat, Australian sealions, fairy terns, little penguins, bottlenose dolphins, pink snapper, whitebait, King George whiting and blue swimmer crabs. Of these, 21 were identified in the Fremantle study area, 18 in the Kwinana area and 14 in the Bunbury area.
- 21 terrestrial environmental values including Bush Forever sites and remnant vegetation, black cockatoos, western ringtail possums as well as wetlands and ground formations such as Mount Brown and the Henderson cliffs. Of these, 10 were identified in the Fremantle study area, 16 in the Kwinana area and 15 in the Bunbury area.
- 16 marine and estuarine social values, assets and uses including heritage, public health, social and community and business, industry and commercial categories. These values include recreational activities such as fishing, swimming and boating, as well as commercial fisheries and aquaculture. Of these values, 13 were identified in the Fremantle study area, 15 in the Kwinana area and 12 in the Bunbury area.
- 22 identified terrestrial social values, assets and uses grouped into heritage, public health, social and community, business industry and commercial, and connectivity and access categories. These values included air quality, odour, beaches, horse beaches, agriculture, tourism, road safety and ease of access. Of these values, 15 were identified in the Fremantle study area, 21 in the Kwinana area and 18 in the Bunbury area.

Possible implications of port-related development on these values were discussed to identify potential environmental issues and to prioritise areas for further investigation. Within each area of interest, a number of values were identified that may be impacted by development and will require further investigation. Regardless of location, any potential development will require environmental approval. The highest number of environmental values were noted for Kwinana, which reflects the larger study area as well as the potential scale of construction and operation of additional port facilities.

In Stage 2 of the Westport Project, the Environmental Work Stream will undertake a series of studies and conduct an environmental risk assessment. The results will inform the Westport multi-criteria assessment and assist with planning and designing port-related development that avoids significant impacts.

## COMMUNICATIONS, CONSULTATION AND ENGAGEMENT

A key aspect of the Westport process has been to involve all members of the Taskforce in the development of the work streams. The work streams consist of Taskforce members from State and local government agencies, industry, academia and community groups, as well as other subject matter experts as required. Through numerous meetings, workshops, research and site visits, the work streams have shared and discussed information from many perspectives, identifying problems and opportunities in the process.

With several work streams and more than 100 stakeholders involved, sound project governance has been keeping the project on track. The Westport Taskforce is closely following the Infrastructure Sustainability Council of Australia (ISCA) stakeholder engagement framework in the Infrastructure Sustainability (IS) V2.0 Planning Rating, with a view to achieving accreditation.

Since the release of *Westport: What you have told us* in April 2018, a series of community drop-in events and shopping centre displays were conducted in the study areas of Fremantle, Kwinana and Bunbury to enable interested residents to engage face-to-face with the Westport project team and ask questions. However, the turnout to the drop-in sessions was lower than expected. As the project progresses and plans become tangible, it is likely that public interest will increase.

Future community engagement will involve the new online consultation hub, [MySayTransport.wa.gov.au/Westport](https://www.mysaytransport.wa.gov.au/Westport), that enables people to complete polls, surveys and submission forms to provide feedback into the Westport process, as well as focus groups, surveys and an increased number of public presentations.





Photo courtesy of Tourism WA





## 2. Introduction

The term ‘freight’ refers to goods transported in bulk by truck, train, ship or aircraft. While this may conjure thoughts of heavy-duty, industrial products, in fact much of our freight is everyday consumer items – food, electronics, furniture, medical supplies, online shopping. The efficient movement of freight also stimulates our economy by supporting industry, tourism and defence-related activities, while easing congestion for road commuters.

To make sure the growing populations of Perth and the South West have the goods they need well into the future, while preventing congestion and allowing the State’s industries and economy to grow, we need to have a plan.

WA is highly reliant on imports and exports, and that reliance has grown as the State’s population has expanded in recent decades. WA’s trade gateways to the world are its sea ports and airports, making them critical pieces of economic infrastructure.

There are 23 ports currently in operation or planned in WA<sup>6</sup>. Most of them are export-focused and located in regional areas such as the Pilbara, in proximity to the resources and agricultural sectors they support.

With Perth’s current population of two million people expected to double around mid-century, it is undeniable that freight needs will continue to grow. WA should prepare now to meet this demand, as doing nothing is not an option.

The focus of the *Westport: Port and Environs Strategy* (the Strategy) are the three ports located closest to the Greater Perth area:

- Fremantle Ports’ Inner Harbour at Fremantle (Fremantle);

- Fremantle Ports’ Outer Harbour at Kwinana (Kwinana); and
- Southern Port Authority’s Inner and Outer Harbours at Bunbury (Bunbury).

The Strategy will provide guidance to the State Government on the rail, road and port facilities required to deliver a long-term, integrated solution to Perth’s future infrastructure needs, create jobs and support the WA economy.

In developing the Strategy, the Westport Taskforce aims to achieve best practice in its activities and ensure that sufficient evidence-based information is gathered to meet the needs of decision-makers. The Taskforce has established strong ties with the team forming Infrastructure Western Australia<sup>7</sup>, as well as Infrastructure Australia (IA). Strategic relationships have also been formed with international ports including Rotterdam, Hamburg and Vancouver to facilitate learnings from their development experiences.

In an Australian first, the Taskforce will apply the ISCA rating scheme to a strategic planning project. The IS V2.0 Planning Rating will be used to drive best practice – with economic, social, environmental and governance performance being independently verified throughout the project<sup>8</sup>.

In addition, the Taskforce has adopted the World Association for Waterborne Transport Infrastructure’s<sup>9</sup> (PIANC) Working with Nature philosophy, which embeds environmental and social objectives into the project at the planning phase. This ensures that opportunities for win-win solutions for economic development, the environment and social amenity are actively pursued from the start.

6. Department of Transport, 2017, Ports Handbook

7. Infrastructure Western Australia, <https://www.dpc.wa.gov.au/ProjectsandSpecialEvents/infrastructurewa/Pages/default.aspx>

8. [https://www.isca.org.au/ratings\\_planning\\_12](https://www.isca.org.au/ratings_planning_12)

9. Working with Nature, 2008, The World Association for Waterborne Transport Infrastructure (PIANC) <http://www.pianc.org/wwnpositionpaper.php>

The Westport methodology uses eight strategic questions (Table 1) that align with the first two stages of IA's Assessment Framework<sup>10</sup>:

- Problem identification and prioritisation; and
- Initiative identification and options development.

The information gathered through the Westport process will facilitate the preparation of any future IA submissions.

**Table 1: Westport's Strategic Questions**

WESTPORT STRATEGIC QUESTIONS	
Problem identification and prioritisation	
1	What problems are we trying to solve and what opportunities are we trying to capture?
Initiative identification and options development	
2	<i>Where do new port facilities need to be located in Fremantle, Kwinana and Bunbury</i>
3	How big an area is required for port facilities in Fremantle, Kwinana and Bunbury?
4	How do we make the best use of adjacent and supporting land at Fremantle, Kwinana and Bunbury to stimulate future jobs?
5	How do we connect new port facilities with the surrounding environment to facilitate imports and exports?
6	How can we stage new port facilities at Fremantle, Kwinana and Bunbury so they are operationally and financially sustainable?
7	When will new port facilities be needed?
8	What should be the future governance model for additional port facilities?

*What we have found so far* is seeking to bring together and, where appropriate update, existing information relevant to answering the first two key strategic questions:

- Strategic Question 1: *What problems are we trying to solve and what opportunities are we trying to capture?*

The report sets out the current port, transport, land use and environmental challenges facing Fremantle, Kwinana and Bunbury. Many of the challenges are common to large, modern cities and are essentially a function of growth in both population and economic development. Historically, WA's trade and freight operations have grown and flourished harmoniously with the communities they serve. However, as the

population increases and the demand for freight rises, existing road and rail networks will become increasingly congested, amenity will be reduced and our cities will become less liveable. To prevent this, the Westport Taskforce is taking a sustainable approach from day one and examining the economic, environmental and social impacts of the future supply chain, from port to customer.

- Strategic Question 2: *Where do new port facilities need to be located in Fremantle, Kwinana and Bunbury?*

This report also commences answering the second question of identifying some possible locations for future port facilities – called 'strategic options'. The proposed strategic options start with today's mix of

10. Infrastructure Australia Assessment Framework for initiatives and projects to be included in the infrastructure priority list, 2018. <http://infrastructureaustralia.gov.au/projects/make-a-project-assessment.aspx>

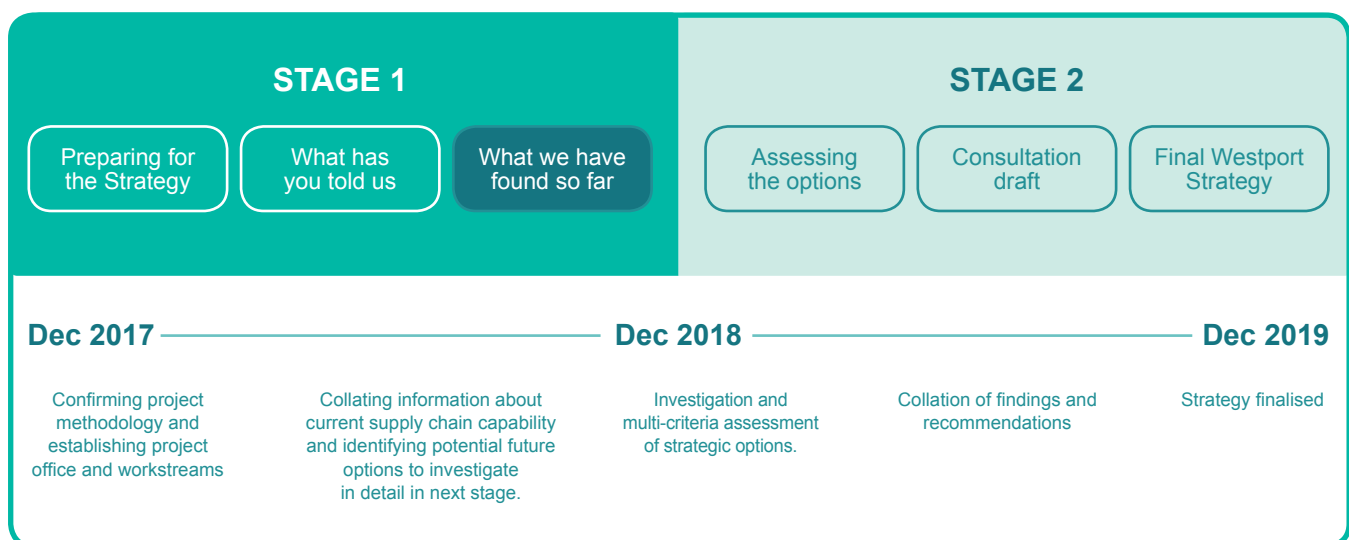


trades at the three port locations and transition the trades to different locations over time. Following the public consultation process, the strategic options proposed in this report will be reviewed and the final list determined. These will be comprehensively investigated and compared in the next stage of Westport's process using a multi-criteria assessment process. There will be financial implications of any option progressed – whether this is enhancing and augmenting existing infrastructure, or building new infrastructure – and the cost implications and comparisons will be completed as part of Stage 2.

The information in this report is drawn from work streams established to cover trade task; ports capability; supply chain; constraints and opportunities (with a focus on land use and infrastructure); environment; and hypotheses development.

*What we have found so far* is a summary of investigations to date. The information from this report and later work will be used to develop the ultimate Westport Strategy for Government to consider.

**Figure 1: Where are we now in the Westport process?**



Key considerations of future work will be to: determine how long Fremantle's Inner Harbour can efficiently and safely operate alongside the increasingly urban environment of the City of Fremantle; assess the impacts that trucks and other traffic has on suburbs west of the Kwinana Freeway as well as on access to the port; identify opportunities to facilitate and grow trade; assess if and when any trades should be moved to a different port location; and plan for the infrastructure required to keep freight moving efficiently and the economy growing for decades to come.

Through this approach, the Westport Strategy will enable the best use to be made of investment funds – with large and small infrastructure projects working together over time to build a port and freight network that grows in tandem with the population.









## 3. What we have found so far

This section provides a summary of information gathered so far to answer strategic question 1 and describes in detail the work undertaken to date to progress strategic question 2.

**Strategic Question 1: What problems are we trying to solve and what opportunities are we trying to capture?**

Information gathered to date has focussed on obtaining a clearer picture of the future trade task we are planning for, the capacity of the current port and supply chain infrastructure, the land available to support future trade and the environmental values that may be impacted by future development.

To examine the future trade task, the services of Deloitte Access Economics were used. They predict that the container task will grow from 0.7 million TEUs to around 3.1 million TEUs in 50 years' time. The executive summary from their report is provided in Section 4.1.

The findings of the work streams are summarised in Sections 4.2 to 4.5.

An at-a-glance overview of the key features of ports at Fremantle, Kwinana and Bunbury are shown in Table 2 and the opportunities identified by the workstreams are shown in Table 3.



**Table 2: Key features of ports at Fremantle, Kwinana and Bunbury**

KEY FEATURE	FREMANTLE	KWINANA	BUNBURY
LOCATION AND LAND USE	<ul style="list-style-type: none"> <li>• City port surrounded by residential and industrial areas</li> <li>• Adjacent to city centre and train station</li> <li>• Adjacent to tourism activities</li> </ul>	<ul style="list-style-type: none"> <li>• Port adjacent to major naval base and industrial areas</li> <li>• Adjacent to marine recreational area</li> </ul>	<ul style="list-style-type: none"> <li>• City port surrounded by urban and recreational areas</li> <li>• Expanding industrial areas nearby</li> <li>• Adjacent to tourism facilities</li> </ul>
TRADE TASK	<ul style="list-style-type: none"> <li>• Largest container port in the state</li> <li>• Handles large cruise ships</li> <li>• General cargo port handling livestock, cars and scrap metal</li> </ul>	<ul style="list-style-type: none"> <li>• WA's largest grain export and oil import facility</li> <li>• Handles many other liquid and dry bulk commodities</li> </ul>	<ul style="list-style-type: none"> <li>• Major regional centre with port handling mainly agricultural and resource sector commodities</li> <li>• Handles cruise ships</li> </ul>
PORT CAPABILITY	<ul style="list-style-type: none"> <li>• 24 berths (including 7 container berths)</li> <li>• Two container terminals</li> <li>• Existing port footprint can handle more containers and general cargo with some site modifications</li> <li>• No capacity for bulk in future</li> <li>• Large passenger terminal</li> </ul>	<ul style="list-style-type: none"> <li>• Five operational bulk jetties</li> <li>• Currently no facilities for containers or general cargo, though Australian Marine Complex handles oversize equipment</li> <li>• Historically, there have been many proposals for additional container facilities at this location</li> </ul>	<ul style="list-style-type: none"> <li>• Seven berths</li> <li>• Capacity for more bulk trades and general cargo</li> <li>• Currently no container facilities, though being considered as part of port's long-term planning processes</li> </ul>
SUPPLY CHAIN	<p><u>Roads:</u></p> <ul style="list-style-type: none"> <li>• Major connections include Stirling Hwy, Curtin Avenue, High St, Leach Hwy and Stock Road that run through residential areas</li> </ul> <p><u>Rail:</u></p> <ul style="list-style-type: none"> <li>• Rail bridge over the Swan River is shared by freight and passenger services</li> <li>• Limits on rail operating hours</li> <li>• 16 per cent of containers in 2017/18 are transported by rail between port and Kewdale intermodal terminals</li> </ul>	<p><u>Roads:</u></p> <ul style="list-style-type: none"> <li>• Multiple connections to Kwinana Fwy and Rockingham Road</li> <li>• Anketell and Rowley Roads identified as potential future freight corridors: corridors poorly defined, at risk of urban encroachment and run through Bush Forever sites</li> </ul> <p><u>Rail:</u></p> <ul style="list-style-type: none"> <li>• Rail capacity is limited by stretches of single rail line and congestion at Kwinana and Cockburn rail junctions</li> </ul>	<p><u>Roads:</u></p> <ul style="list-style-type: none"> <li>• Good road infrastructure to Perth</li> <li>• Bunbury Outer Ring Road will facilitate future access to port</li> <li>• Regional routes from south and east have single lanes e.g. South West Hwy</li> </ul> <p><u>Rail:</u></p> <ul style="list-style-type: none"> <li>• Rail line to Perth is shared by passengers and freight</li> <li>• Rail capacity limited by single rail line between Bunbury and Mundijong with many passing loops causing delays</li> </ul>
ENVIRONMENT	<ul style="list-style-type: none"> <li>• 22 environmental and 24 social values have been identified in a study area with a radius of 2.5km from the port</li> </ul>	<ul style="list-style-type: none"> <li>• 34 environmental and 34 social values have been identified in this area that includes Cockburn Sound</li> </ul>	<ul style="list-style-type: none"> <li>• 27 environmental and 27 social values have been identified in an area with a radius up to 5km from the port</li> </ul>



**Table 3: Opportunities identified by the Stage 1 work streams**

WORK STREAM	OPPORTUNITIES*		
	FREMANTLE	KWINANA	BUNBURY
PORT CAPABILITY	<ul style="list-style-type: none"> <li>• Port functions can theoretically be enhanced through berth and infrastructure upgrades to accommodate bigger vessels up to 13,000 TEU</li> <li>• Upgrading road and rail networks into the port would facilitate more efficient freight movement</li> <li>• Relocating the container trade away from Fremantle would allow Victoria Quay to be redeveloped for residential, tourism or commercial purposes</li> </ul>	<ul style="list-style-type: none"> <li>• Building additional port facilities allows best-practice design – accommodating next generation vessels, handling over 3 million TEU capacity, integrating with road and rail networks</li> <li>• Current facilities (KBT and KBJ) can be upgraded to increase capacity</li> <li>• Land at Latitude 32 is suitable for an intermodal facility</li> <li>• AMC/defence operations can be expanded</li> <li>• Upgrading road and rail networks would improve freight capacity</li> </ul>	<ul style="list-style-type: none"> <li>• New berths can be created</li> <li>• Has the capacity to become a container port</li> <li>• Has the ability to handle an increased passenger trade at the Outer Harbour</li> </ul>
SUPPLY CHAIN	<ul style="list-style-type: none"> <li>• Upgrading and/or expanding road and rail capacities into the port would facilitate more efficient freight movement</li> <li>• Innovative operational solutions, such as permit systems could extend the hours of freight operations</li> <li>• Increase the number of containers moved on rail</li> </ul>	<ul style="list-style-type: none"> <li>• Upgrading and/or expanding road and rail capacities into Kwinana would facilitate more efficient freight movement</li> <li>• Rowley and Anketell Roads recognised as potential freight routes</li> <li>• Removal of obstacles would allow double-stacking of rail freight</li> </ul>	<ul style="list-style-type: none"> <li>• Building the Bunbury Outer Ring Road (BORR) will improve freight access to the port</li> <li>• Innovative engineering and design solutions, such as new dedicated roads and grade separations would enhance road operations</li> <li>• Expanding the South West Main railway line would improve/enhance rail freight capacity</li> </ul>

WORK STREAM	OPPORTUNITIES*		
	FREMANTLE	KWINANA	BUNBURY
LAND USE AND UTILITIES INFRASTRUCTURE	<ul style="list-style-type: none"> <li>• Changing land use in the port buffer (i.e. at Victoria Quay or near the North Freo rail station) opens up alternative recreational, commercial and residential uses</li> <li>• Removing general cargo allows existing land to be used to increase container capacity</li> <li>• Onshore power could be made available to cruise ships to limit diesel generator use in port</li> </ul>	<ul style="list-style-type: none"> <li>• AMC is located near vacant land at Latitude 32 that could potentially be used for AMC-related purposes</li> <li>• Master planning can generate industrial symbioses and stimulate innovation</li> <li>• There is space at Kwinana to accommodate some of the trades at Fremantle and allow associated industries to grow</li> </ul>	<ul style="list-style-type: none"> <li>• The port is surrounded by ample state-managed, developable land</li> <li>• Kemerton Strategic Industrial Park (17km north of Bunbury) has over 7,500ha of land suitable for heavy industry</li> <li>• Preston Industrial Park has nearly 3000ha identified for industrial development.</li> <li>• Proposed Waterloo Industrial Park will add a further 1,285ha for industrial and rural use</li> <li>• Moving some of Perth's freight task to Bunbury would generate employment and economic/community development</li> <li>• The Outer Harbour has potential to redevelop as a tourism and entertainment precinct</li> </ul>

\*Any potential upgrades would need to be investigated for social and environmental impacts before being progressed.







### Strategic Question 2: Where do new port facilities need to be located in Fremantle, Kwinana and Bunbury?

Having determined the future trade demand and identified the status of our current port and supply chain infrastructure, a robust method was needed to identify a shortlist of port strategic options that could be examined in detail to determine a preferred option. This process involved the development of Westport hypotheses and is described in Section 3.1.

## 3.1. WESTPORT HYPOTHESES AND STRATEGIC OPTIONS

To understand stakeholders' expectations for what a successful Westport Strategy entails and to progress the project methodology, a series of workshops was held with Taskforce committees and reference groups, as well as the WA Freight and Logistics Council.

During the workshops, stakeholders discussed and developed their 'Statements of Success' – showing what could be achieved through the Westport Strategy in 50 years' time. These statements were based on economic, environmental and social considerations. Some examples are shown in Figure 2.

The concept of hypotheses was also explored. A Westport hypothesis is an overall picture of how the three study ports can work in combination to handle the future trade task. Developing the hypotheses involves understanding the types of trade and port

locations and applying some assumptions derived during the workshop discussions.

Ports can operate at all hours and handle a wide range of goods, including hazardous materials. Trades handled by the ports have been categorised into four types: containers, bulk, general cargo and passengers.

- *Containerised trade* is moved in containers that are either 20-foot or 40-foot long. They may be refrigerated to transport perishable items, or be unrefrigerated for industry or household goods. Some hazardous materials are transported in containers.
- *Bulk products* may be 'dry', such as minerals and grains, or 'liquids' such as petroleum. Dry products are usually stored in stockpiles near the berth. Bulk products are transported by pipes or conveyor belts to and from the ships.
- *Passenger vessels* include cruise ships, ferries and visiting research and naval vessels. Passenger port facilities include areas for processing passengers and are usually close to entertainment and transport facilities.
- *General cargo* includes breakbulk, such as livestock and scrap metal, and roll-on roll-off (RoRo) vehicles and machinery.

The three port precincts examined are Fremantle, Kwinana and Bunbury – each with their own distinct characteristics that are described in Section 4.

““

The Westport Strategy is economically viable because it delivers sustainable and dynamic economic outcomes over time.

The Strategy will be environmentally sustainable as it protects and enhances local and regional environments.

The Westport Strategy will be socially acceptable because it respects and builds on community values and sense of place.

””

““

The Westport Strategy is successful as it achieves: an agile, flexible and responsive logistics hub whose associated costs permit globally competitive supply chains; whose construction and operations have a net positive environmental benefit; and delivers desirable social benefits resulting in broad public support from the majority of stakeholders.

””

““

The Westport Strategy will provide clarity and direction for the ports of Fremantle, Kwinana and Bunbury, with a demonstrated road map for change that lowers supply chain costs through innovation, automation and the right mode for the task. Westport will be environmentally and socially viable because it engages community and environmental interest groups to improve environmental outcomes and social amenity.

””

““

The Westport Strategy will support the cost effectiveness of the supply chain through the efficient operations and infrastructure, applying technology to lessen the impact on the environment with the effective routes to move containers and commodities through the supply chain. Westport will maintain continual engagement with the community to ensure minimisation of concerns by producing continual benefits to the community.

””

““

The Westport Strategy applies smarter logistics that are efficient and cost effective, ensuring that community gets best value from future infrastructure including access to waterways, beaches and the river; minimising impact and enhancing environmental outcomes i.e. greenfield vs brownfield sites.

””



The Westport hypotheses were generated in five steps based on the combinations of the types of trade that each port would be able to handle.

- **Step 1: What trade types do the ports handle?** As outlined above, there are four types of trade: containerised, bulk, passengers and general cargo. As there is insufficient general cargo to support a ‘general cargo only’ port, it is handled in combination with another trade. Therefore, it is implicit to all of the combinations listed in Step 2 and is not examined separately, leaving three types of trade to progress to the next step.
- **Step 2: What mixture of these three trades could we possibly have?** Each port could potentially handle the three trades in the following seven combinations:
  - A. Containerised, bulk, passengers

- B. Passengers only
- C. Containerised and bulk
- D. Containerised and passengers
- E. Bulk and passengers
- F. Bulk only
- G. Containerised only

- **Step 3: How many locations do we have?** The number of port locations is three: Fremantle, Kwinana and Bunbury.
- **Step 4: How many combinations of trades and location are there?** There are 343 combinations in total. This is a result of multiplying the seven trade combinations for each of the three ports: i.e.  $7 \times 7 \times 7 = 343$ .
- **Step 5: How can we shorten the list?** The list can be shortened by applying the assumptions listed in Table 4 below:

**Table 4: Assumptions for determining the Westport hypotheses**

PORT AND ASSUMPTION	RATIONALE
<b>FREMANTLE</b>	
Unlikely to handle bulk – so cannot support A, C, E, F (listed above)	Fremantle’s bulk commodities are currently liquid bulk trades; there are no dry bulk trades that involve the use of stock piles – unlike bulk trades at other ports. Fremantle’s bulk trades have been included in the ‘current situation’, but as they will be minimal in the long-term, Fremantle will not be considered a ‘bulk port’ for Westport hypotheses.
Likely to handle passengers – so cannot support C, F, G	Passenger vessels benefit from Fremantle’s access to passenger terminal, transport and entertainment precincts.
<b>KWINANA</b>	
Likely to handle bulk – so cannot support B, D, G	Bulk cargo is ideally suited to this port given its close proximity to the Kwinana Industrial Area, which produces and imports bulk cargo materials.
Unlikely to handle passengers – so cannot support A, B, D, E	Passenger vessels are not suited to this port given its proximity to a competing port at Fremantle and a lack of access to transport and entertainment precincts.
<b>BUNBURY</b>	
Unlikely to handle any combination without bulk – so cannot support B, D, G	Bulk cargo must be at this port to service the nearby industrial, resource and agricultural areas;
Likely to handle passengers – so cannot support C, F, G	Passenger vessels are suited to this port given the proximity to the town centre and the South West tourist region.
<b>OVERALL</b>	
Unlikely that the three ports will handle containers at the same time (All A, C, D, G)	Containerised trade is unlikely be handled by all three ports at the same time due to the high costs of the infrastructure required and competition for international trade routes.
General cargo to be handled in combination with any other trade	It is noted that for Westport purposes, general cargo needs to be handled in combination with other trades as there is not a critical mass for Fremantle, Kwinana or Bunbury to handle only this type of trade. Therefore, general cargo has not been considered in its own right when determining the feasible hypotheses.
At least one port must handle each trade	At least one port must handle containers, bulk or passengers so that the overall trade task can be accommodated.

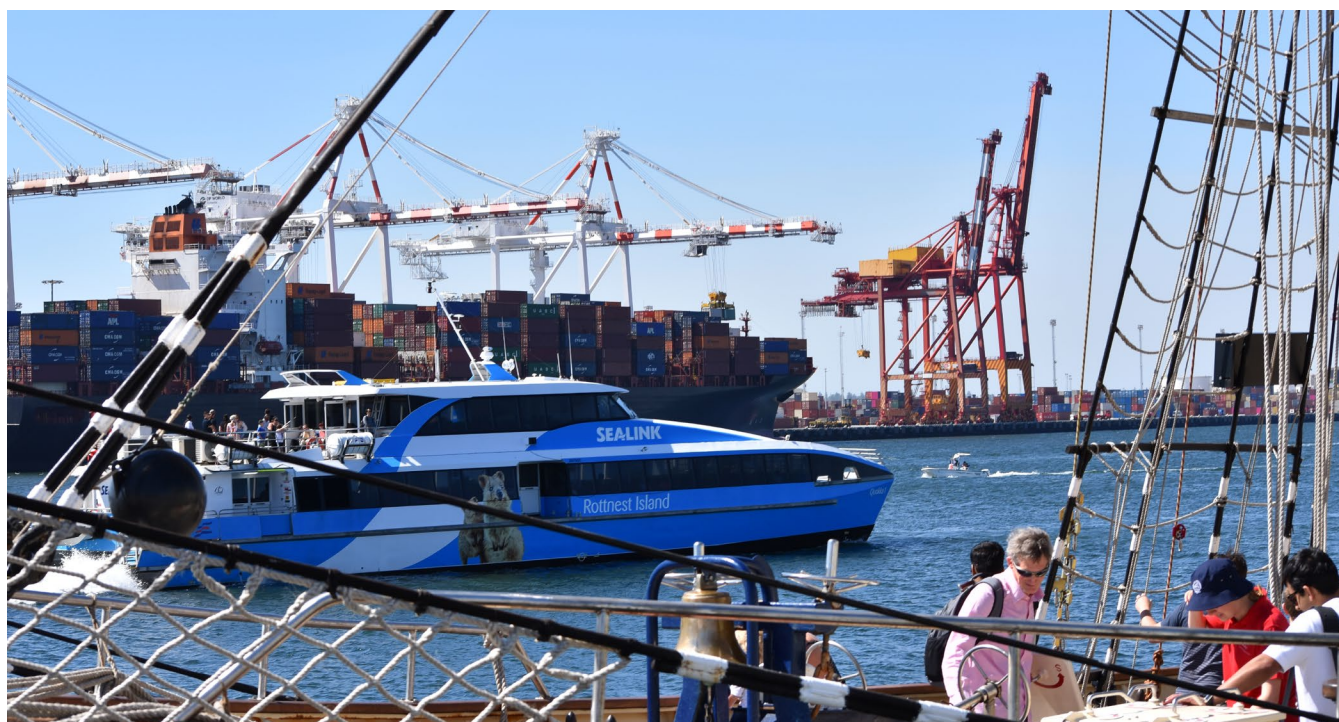
This methodology results in 343 possible hypotheses that are reduced to the seven shortlisted hypotheses in Table 5 when the assumptions are applied.

**Table 5: Feasible hypotheses**

HYPOTHESIS #	FREMANTLE	KWINANA	BUNBURY
40*	A Containerised, bulk, passengers	F Bulk only	E Bulk and passengers
64	B Passengers only	C Containerised and bulk	A Containerised, bulk, passengers
68	B Passengers only	C Containerised and bulk	E Bulk and passengers
85	B Passengers only	F Bulk only	A Containerised, bulk, passengers
166	D Containerised and passengers	C Containerised and bulk	E Bulk and passengers
183	D Containerised and passengers	F Bulk only	A Containerised, bulk, passengers
187	D Containerised and passengers	F Bulk only	E Bulk and passengers

Notes:

- \*40 is the current situation
- As general cargo cannot be the only trade at Fremantle, Kwinana or Bunbury, it must be handled in combination with another trade type. Therefore, general cargo is implicit to all of the combinations listed above and will be examined with each strategic option in Stage 2.





The current status quo, or 'base case', is hypothesis 40: Fremantle handles containers, passengers and a very small amount of bulk trades; Kwinana handles bulk; and Bunbury handles bulk and passengers.

Eight strategic options have been created, using combinations of the seven feasible hypotheses listed above. To achieve some of the options, transitional steps are required – with each step involving one or more hypotheses, as shown in Table 6.

**Table 6: Shortlisted strategic options**

<b>OPTION 1: BASE CASE - CURRENT SITUATION</b>					
#	STEPS	FREMANTLE	KWINANA	BUNBURY	COMMENTARY
40	<b>Current situation</b>	Containerised, bulk, passengers	Bulk only	Bulk and passengers	This is current situation and includes planned infrastructure improvements.

<b>OPTION 2: OPTIMISE FREMANTLE AND TRANSITION TO KWINANA OVER TIME</b>					
Staged approach includes option to transition to Bunbury eventually					
#	STEPS	FREMANTLE	KWINANA	BUNBURY	COMMENTARY
40	<b>2a: Current situation</b>	Containerised, bulk, passengers	Bulk only	Bulk and passengers	Current situation.
187	<b>2b: Fremantle bulk to Kwinana or Bunbury</b>	Containerised and passengers	Bulk only	Bulk and passengers	This option optimises space for containers in Fremantle.
166	<b>2c: Build container port at Kwinana and share with Fremantle</b>	Containerised and passengers	Containerised and bulk	Bulk and passengers	Container operations at both ports
68	<b>2d: Move all containers to Kwinana</b>	Passengers only	Containerised and bulk	Bulk and passengers	No containers at Fremantle
64	<b>2e: When Kwinana fills up share with Bunbury</b>	Passengers only	Containerised and bulk	Containerised, bulk, passengers	This is a very long-term possibility

<b>OPTION 3: OPTIMISE FREMANTLE AND TRANSITION TO BUNBURY OVER TIME</b>					
Staged approach, no containers in Kwinana					
#	STEPS	FREMANTLE	KWINANA	BUNBURY	COMMENTARY
40	<b>3a: Current situation</b>	Containerised, bulk, passengers	Bulk only	Bulk and passengers	Current situation.
187	<b>3b: Fremantle bulk to Kwinana or Bunbury</b>	Containerised and passengers	Bulk only	Bulk and passengers	This option optimises space for containers in Fremantle.
183	<b>3c: Build container port at Bunbury and share with Fremantle</b>	Containerised and passengers	Bulk only	Containerised, bulk, passengers	This relies on efficient transport links between Greater Perth and Bunbury.
85	<b>3d: Move all containers to Bunbury</b>	Passengers only	Bulk only	Containerised, bulk, passengers	This relies on efficient transport links between Greater Perth and Bunbury

OPTION 4: DE-INDUSTRIALISE FREMANTLE AND MOVE CONTAINERS TO KWINANA AS SOON AS POSSIBLE					
#	STEPS	FREMANTLE	KWINANA	BUNBURY	COMMENTARY
40	4a: Current situation	Containerised, bulk, passengers	Bulk only	Bulk and passengers	Current situation.
68	4b: Move all containers to Kwinana	Passengers only	Containerised and bulk	Bulk and passengers	No containers at Fremantle

OPTION 5: DE-INDUSTRIALISE FREMANTLE AND MOVE CONTAINERS TO BUNBURY AS SOON AS POSSIBLE					
#	STEPS	FREMANTLE	KWINANA	BUNBURY	COMMENTARY
40	5a: Current situation	Containerised, bulk, passengers	Bulk only	Bulk and passengers	Current situation.
85	5b: Move all containers to Bunbury	Passengers only	Bulk only	Containerised, bulk, passengers	This relies on efficient transport links between Greater Perth and Bunbury

OPTION 6: FREMANTLE AND KWINANA BOTH HAVE CONTAINERS FOR THE LONG-TERM					
#	STEPS	FREMANTLE	KWINANA	BUNBURY	COMMENTARY
40	6a: Current situation	Containerised, bulk, passengers	Bulk only	Bulk and passengers	Current situation.
187	6b: Fremantle bulk to Kwinana or Bunbury	Containerised and passengers	Bulk only	Bulk and passengers	This option optimises space for containers in Fremantle.
166	6b: Build container port at Kwinana and share with Fremantle	Containerised and passengers	Containerised and bulk	Bulk and passengers	Container operations at both ports

OPTION 7: FREMANTLE AND BUNBURY BOTH HAVE CONTAINERS FOR THE LONG-TERM					
#	STEPS	FREMANTLE	KWINANA	BUNBURY	COMMENTARY
40	7a: Current situation	Containerised, bulk, passengers	Bulk only	Bulk and passengers	Current situation.
187	7b: Fremantle bulk to Kwinana or Bunbury	Containerised and passengers	Bulk only	Bulk and passengers	This option optimises space for containers in Fremantle.
183	7b: Build container port at Bunbury and share with Fremantle	Containerised and passengers	Bulk only	Containerised, bulk, passengers	This relies on efficient transport links between Greater Perth and Bunbury.

OPTION 8: ONLY FREMANTLE HAS CONTAINERS FOR THE LONG-TERM					
#	STEPS	FREMANTLE	KWINANA	BUNBURY	COMMENTARY
40	6a: Current situation	Containerised, bulk, passengers	Bulk only	Bulk and passengers	Current situation.
187	6b: Fremantle bulk to Kwinana or Bunbury	Containerised and passengers	Bulk only	Bulk and passengers	This option optimises space for containers in Fremantle.





General cargo has not been included as a separate category as it does not have the critical mass to sustain a port in its own right. In theory, any of the ports can handle general cargo in combination with any other activity. Positioning of general cargo will be examined in more detail in Stage 2 as, in practice, some locations may be found to be better suited than others for particular trades.

### What happens next?

In the next stage of Westport's process, each strategic option will be investigated in-depth by work streams. Sustainability principles will be applied so that economic, environmental and social perspectives are considered in detail. Investigations will determine when port, rail and road networks and intermodal terminals will reach capacity, the additional infrastructure required and where infrastructure will be located to provide for an efficient supply chain to

facilitate trade. Investigations will also compare the environmental sustainability, commercial viability, and community views surrounding each strategic option. All work streams will examine opportunities presented by the strategic options and their flexibility to handle potential technological and social disruptions in the future.

Criteria will be developed to guide the work streams so that sufficient information may be gathered to inform a multi-criteria assessment process. The criteria will be developed using information from the work streams, feedback to this document and other research and be subject to peer review. The criteria and methodology will be shared in *Assessing the options* in early 2019.

In mid-2019, all information from Stages 1 and 2 will be collated and subjected to the multi-criteria assessment process so that the strategic options may be ranked and a preferred option identified.



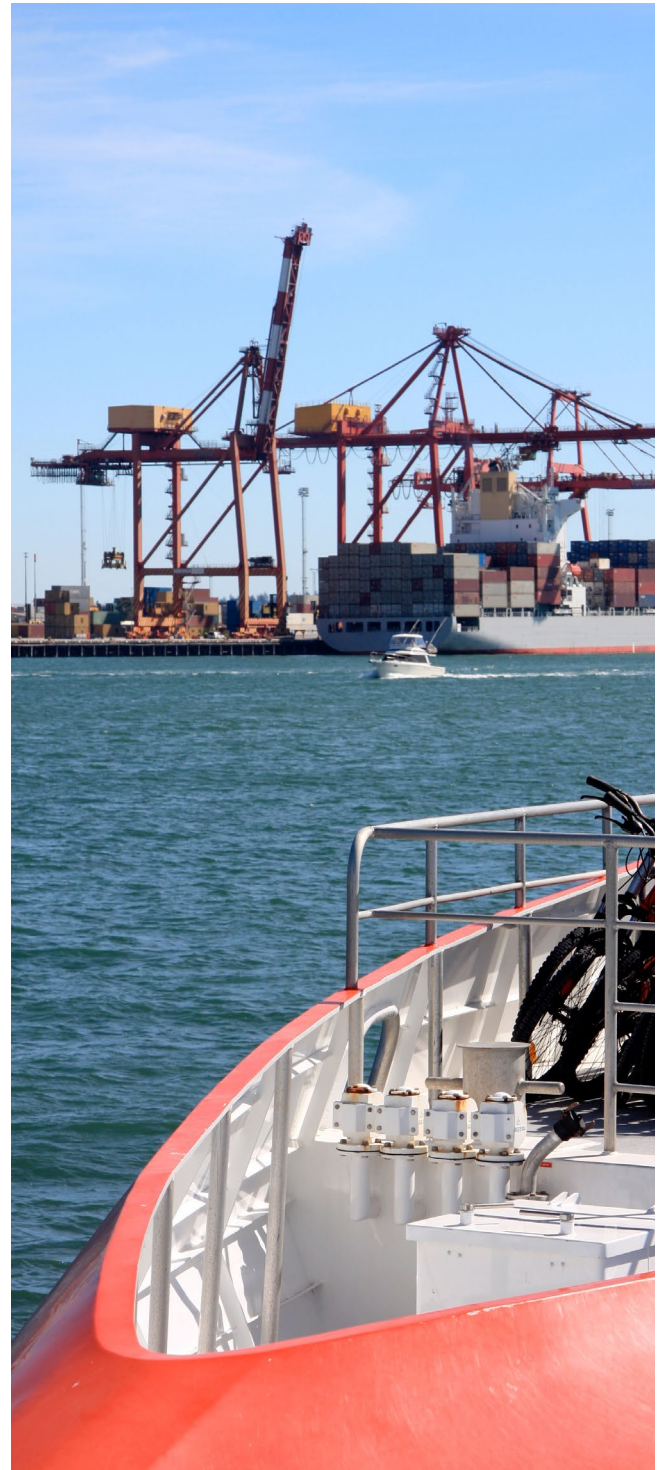


## 4. Strategic context

The problems we are trying to solve and some of the opportunities we are trying to capture have been explored by the Stage 1 work streams, with their findings presented in the following sections:

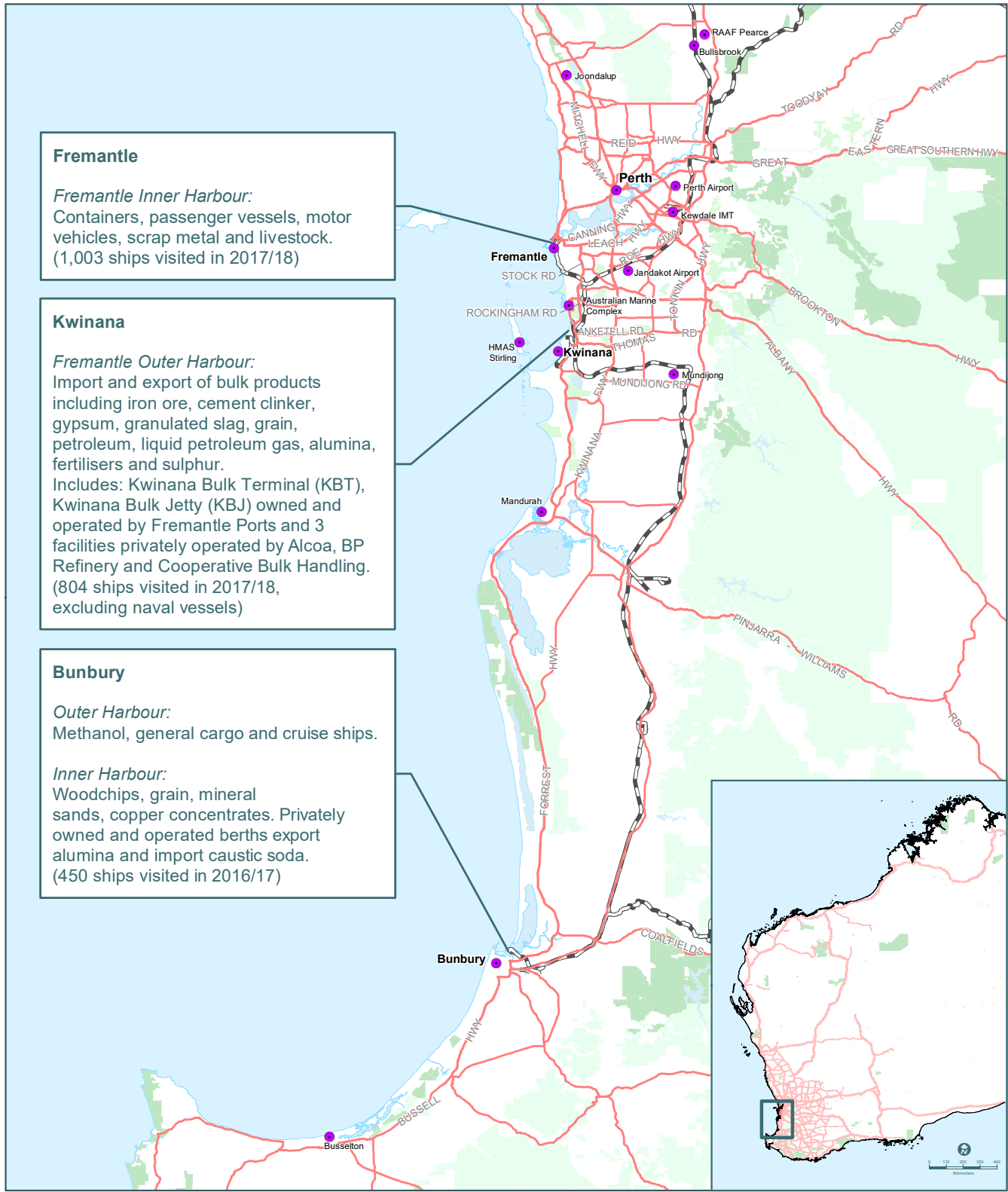
- *4.1 Trade task* – Provides a comprehensive analysis of the trade task to deliver an understanding of the types and amounts of imports and exports handled and to explore how this may change in the future.
- *4.2 Port capability* – Shows how the three port locations handle containers, bulk and general cargo and passenger vessels.
- *4.3 Supply chain* – Shows how road and rail networks and intermodal terminals combine to move freight between the three port locations and their customers, and highlights constraints to the supply chain.
- *4.4 Land use and utilities infrastructure* – Describes the land use of the ports and their surrounding areas in the context of local demographics, land ownership, utilities and planning considerations.
- *4.5 Environmental and social considerations* – Identifies the environmental and social values and pressures at each port.

The locations of Westport's three study areas, together with descriptions of their general trades, are shown in Map 1.

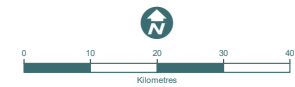




**Map 1: Location of Westport's three study areas and their major trades**



— Freight Roads  
 - - - Freight Rail Network



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## 4.1. TRADE TASK

The ports at Fremantle, Kwinana and Bunbury are vital infrastructure for Western Australia given their role in supporting trade activity in the State. Westport is developing a Strategy to provide guidance to the State Government on the planning, development and growth of Fremantle Ports' facilities in Fremantle and Kwinana, and the potential for Bunbury Port to contribute to the handling of the growing trade task.

This Strategy requires an evidence base on the future trade task through the ports at Fremantle, Kwinana and Bunbury. Deloitte Access Economics has developed 50-year forecasts of trade activity through the ports, based on global and Australian macroeconomic drivers. In addition, Deloitte Access Economics has undertaken scenario analysis to understand how the trade forecasts change under a number of alternative futures.

The trade forecasts are presented on an unconstrained basis, meaning they represent the projected volume of import and export flows without taking into account port capacity or supply constraints. Further, the forecasts are limited to trades which have been observed in history or have existing plans and related infrastructure in place (such as spodumene). As such, the forecasts provide a view of the future demand for port services based on existing information and WA economic drivers.

The trade task work to date is based on current trades and known economic development opportunities. Further work will be done as part of Stage 2 to understand the scale of the trade task associated with emerging and potential trade opportunities, as well as defence-related activities and tourism.

### 4.1.1. Macroeconomic backdrop

A positive global economic backdrop is good news for the Australian and Western Australian economies. Tax cuts in the United States are spurring investment and consumption activity, while Chinese authorities continue to manage the economy's transition to a slower, more stable growth path. Rising trade tensions between the US and China pose a risk to the global outlook, but this is unlikely to materially impact growth in the near-term.

The Australian economy is on steady footing as accommodative monetary policy supports business confidence and broader economic activity. This has

resulted in stronger investment in both capital and jobs, although wages and spending remain subdued. Looking longer term, population growth will remain a key driver of economic activity in Australia, albeit at a slower rate than experienced previously.

The solid global outlook is also supporting trade activity in Australia as a lower currency and growing demand from China for quality products support exporters. The stable outlook for the Chinese economy is also positive for Western Australian iron ore exporters, as mine capacity is sustained through both new projects and brownfields expansions. Over the long-term, exports are forecast to continue to grow faster than the State's economy as a whole.

Australian imports are also expected to improve as stronger consumption, population growth and investment activity drive demand for international goods. The mining investment downturn has dampened imports into the Western Australia economy over the past few years, but the outlook is brighter as conditions improve.

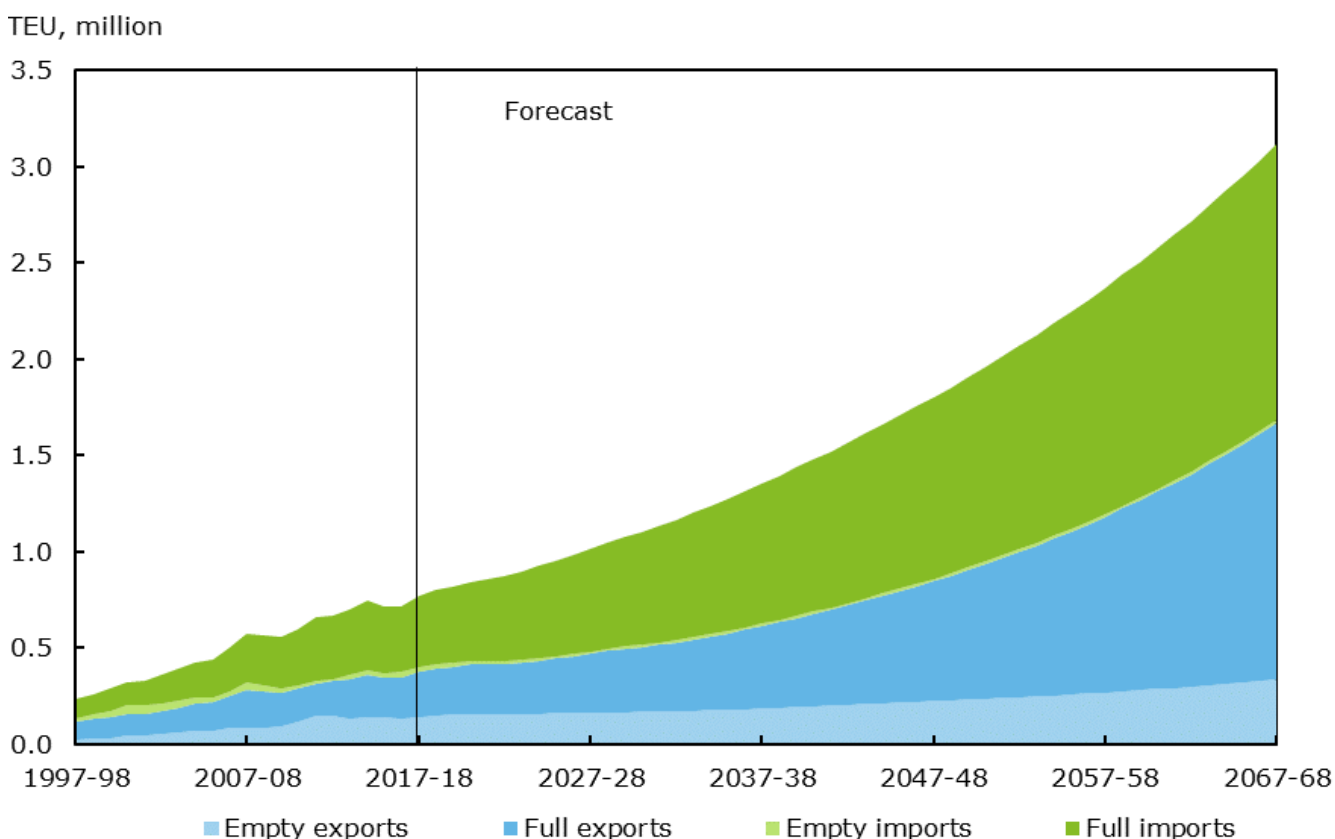
### 4.1.2. Fremantle Ports' Inner and Outer Harbours

Fremantle Ports' Inner and Outer Harbours serve as the State's principal gateway to trade with the outside world, as the largest general cargo port in WA and the country's fourth largest container port. The strong trade outlook for WA is expected to flow through to port activity over the next 50 years. In this report, Fremantle Ports is identified by its two components: the Inner Harbour located in Fremantle and the Outer Harbour located in Kwinana.

The Fremantle Inner Harbour currently facilitates both containerised and non-containerised trade. In 2017/18, there were just under 770,000 TEU of container trade passing through the Inner Harbour, which was a 7.5 per cent increase on the 2016/17 figures. Over the long-term, containerised trade is forecast to grow at an average annual rate of 2.8 per cent between 2017/18 and 2067/68, to reach 3.1 million TEU by 2067/68. This is driven by a positive outlook for key economic drivers of trade, including household consumption and rural exports. Full container imports will remain the dominant trade, accounting for around 45 per cent of total container trade in 2067/68.



**Figure 3: Container trade, TEU**



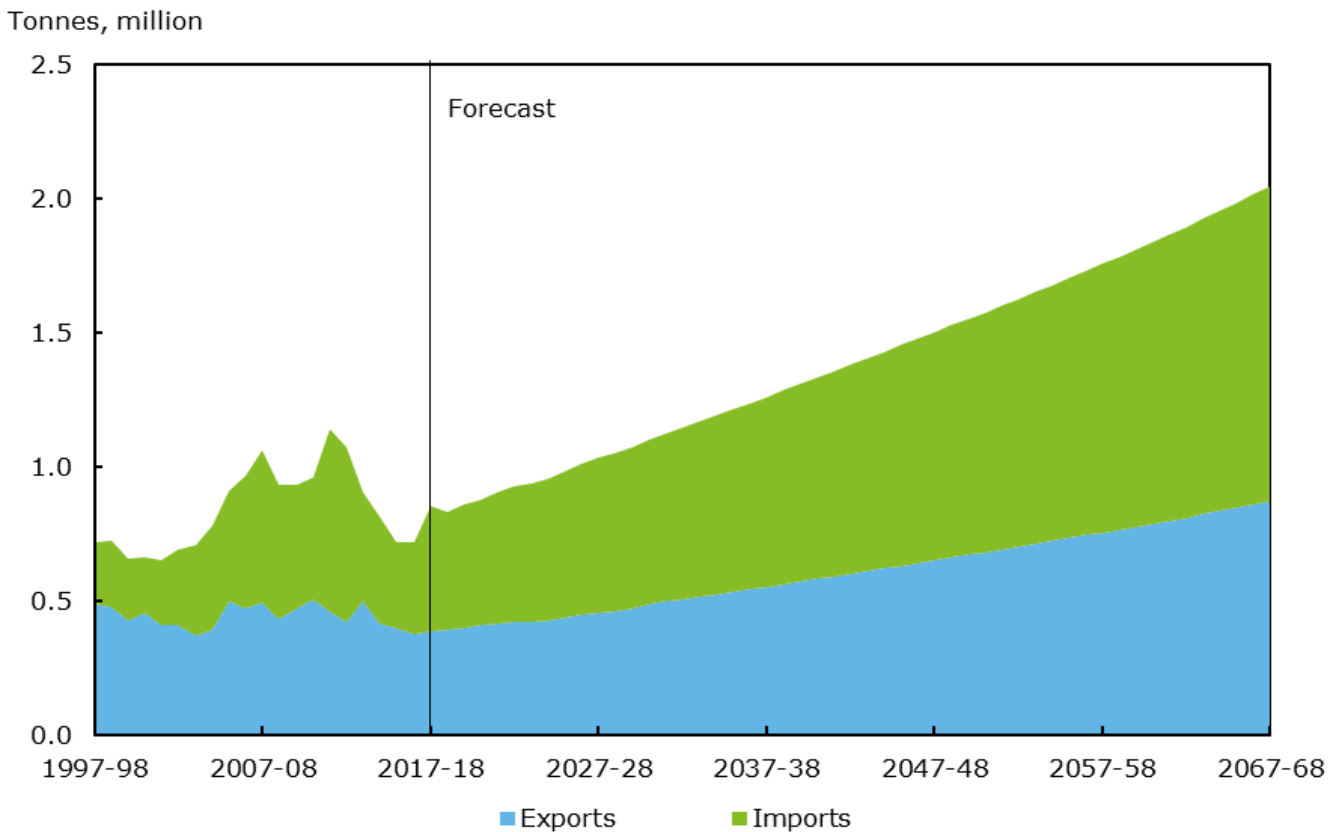
Source: Fremantle Ports, Deloitte Access Economics

Liquid bulk volumes are expected to drop significantly in 2018/19 due to the movement of refined petroleum to the Outer Harbour. This will result in liquid bulk volumes representing a small trade task through the Inner Harbour (around 35,000 litres per annum), and are expected to remain relatively steady over the forecast period.

Total breakbulk volumes through the Inner Harbour are expected to grow at an annual average growth rate of 1.8 per cent from around 851,000 million tonnes in 2017/18 to 2.0 million tonnes in 2067/68. Breakbulk volumes have shown a modest upward trend over the past two decades, but fell with the ending of the mining boom. This was driven by a contraction in imports, as export growth remains relatively unchanged.



**Figure 4: Total Inner Harbour breakbulk trade volumes, tonnes**



Source: Fremantle Ports, Deloitte Access Economics

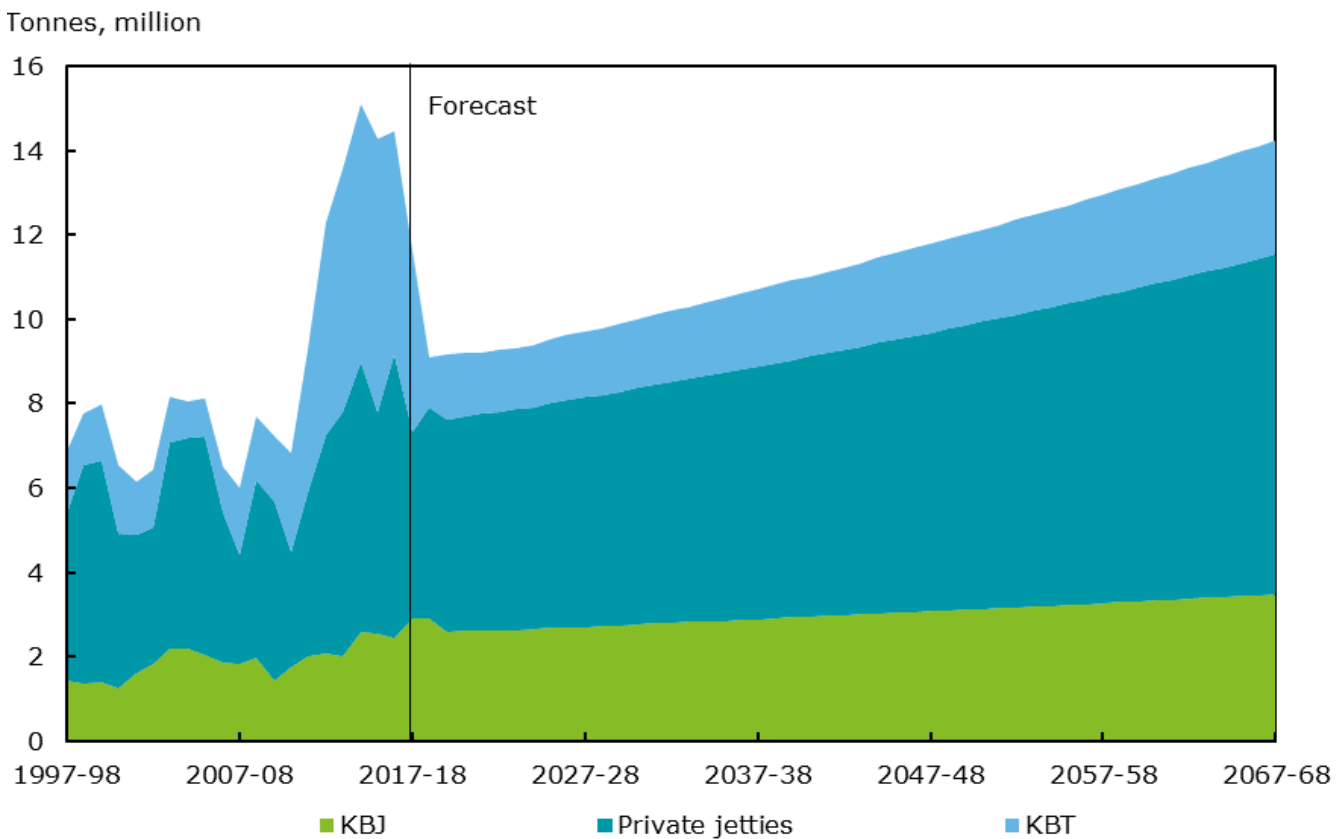
The Fremantle Ports' Outer Harbour at Kwinana is one of Australia's major bulk cargo ports, with the five operational Kwinana jetties handling a range of commodities. The majority of Fremantle Ports' bulk trade occurs through the Outer Harbour, including the bulk-handling facilities at Kwinana Bulk Terminal

(KBT), Kwinana Bulk Jetty (KBJ), and the private jetties operated by Alcoa, BP (both under State Agreement) and CBH, which are dedicated to more specialised throughput. Fremantle Ports also owns the Kwinana Grain Jetty (KGJ) utilised by CBH.





**Figure 5: Kwinana Outer Harbour trade activity, tonnes**

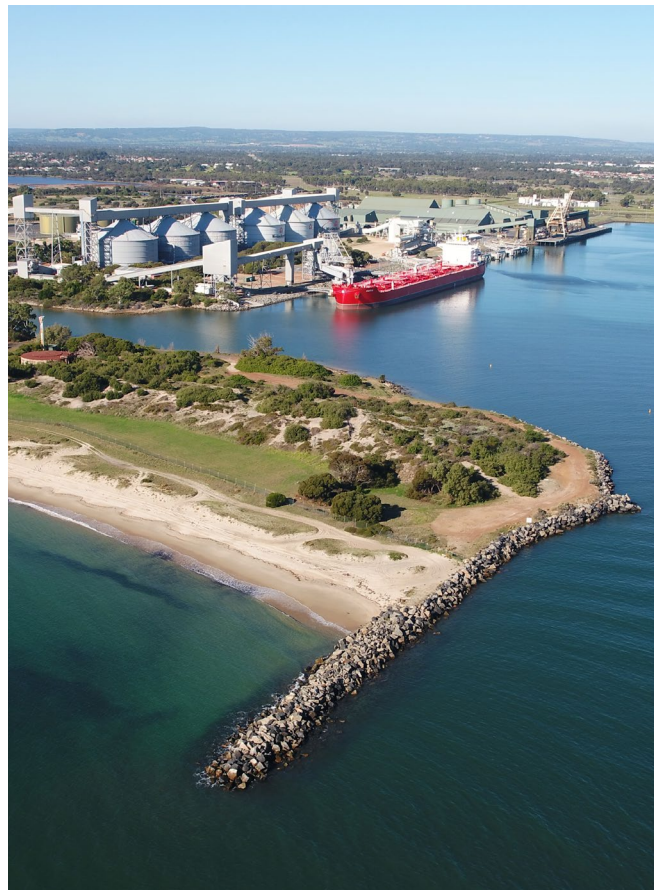


Source: Fremantle Ports, Deloitte Access Economics

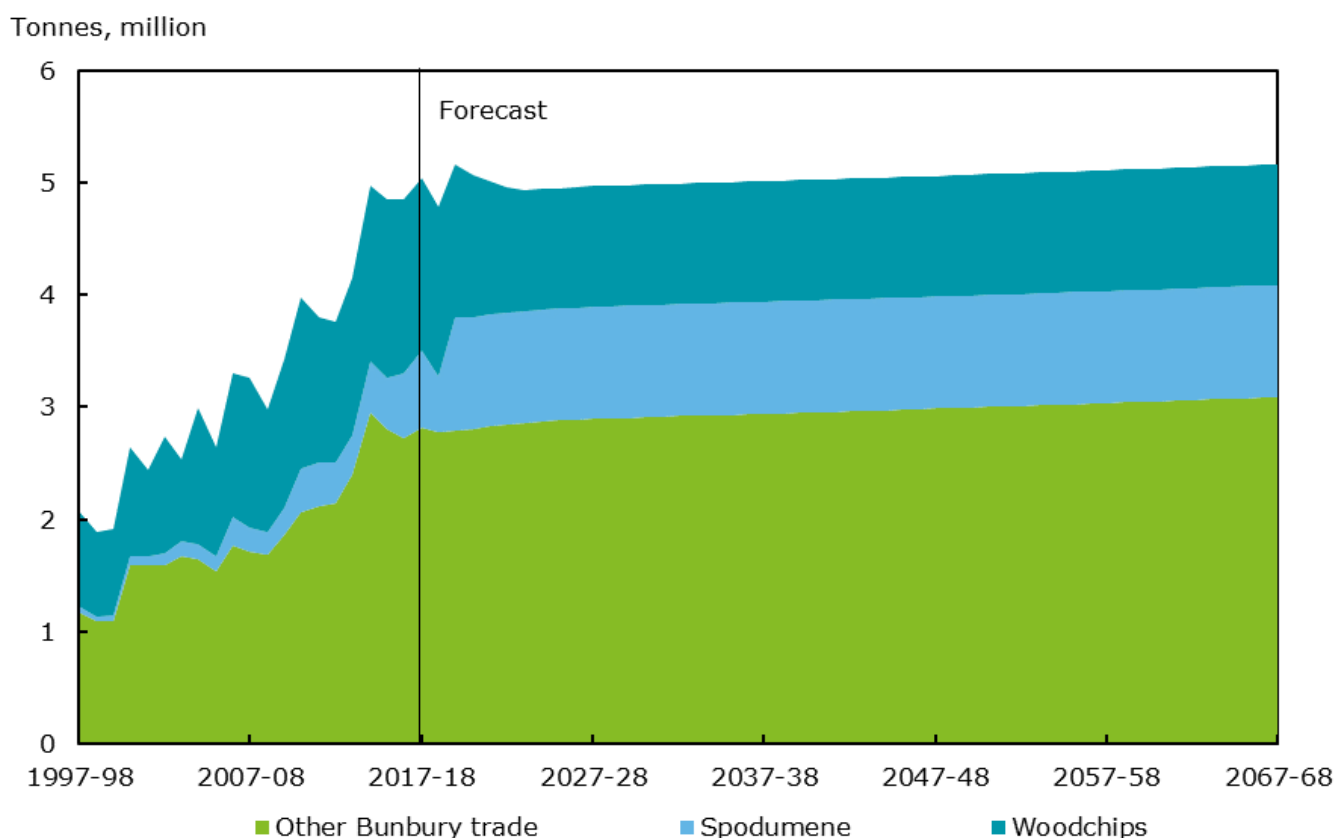
Bulk trade volumes through KBT and KBJ are expected to rise at an annual average rate of 0.3 per cent between 2017/18 and 2067/68. The stronger near-term outlook for activity in WA, especially on the investment and construction front, is driving import activity through the Outer Harbour. However, this is offset by the cessation of iron ore exports in July 2018.

### 4.1.3. Bunbury Port

Bunbury Port also provides important trade infrastructure for WA, handling around 16.3 million tonnes of bulk trade in 2017/18. The trade activity in scope for this analysis was around 5 million tonnes in 2017/18, and this is expected to remain relatively constant over the 50-year forecast period. The trade scope excludes alumina and mineral sand exports. There is a strong rise in spodumene exports driven by rising production capacity as new facilities come online. However, this is mostly offset by a drop in woodchip exports, a result of competition for alternative uses for land besides forestry following the collapse of the forestry managed investment schemes.



**Figure 6: Bunbury Port, total trade volumes, tonnes**



Source: Port of Bunbury, Deloitte Access Economics  
 Note: other Bunbury trade excludes alumina, bauxite, and mineral sands exports

#### 4.1.4. Summary of future trade activity

Table 7 provides a summary of the future trade activity.

**Table 7: Trade activity, Fremantle Ports and Bunbury Port**

TRADE ACTIVITY	2017/18 TRADE VOLUMES	2067/68 TRADE VOLUMES	50 YEAR CAGR
<b>Fremantle Ports</b>			
Containers	770,000 TEU	3,100,000 TEU	2.8 per cent
Breakbulk	851,000 tonnes	2.0 million tonnes	1.8 per cent
Liquid bulk	196,000 tonnes	35,000 tonnes	-8.2 per cent
Outer Harbour dry bulk	12.4 million tonnes	14.3 million tonnes	0.3 per cent
<b>Bunbury Port</b>	5.0 million tonnes	5.0 million tonnes	0.0 per cent

Source: Fremantle Ports, Bunbury Port, Deloitte Access Economics  
 \*Note: only includes in scope trades





## 4.2. PORT CAPABILITY

To develop a robust strategy to optimise Fremantle, Kwinana and Bunbury ports, it is essential to understand the current capabilities and capacities of these facilities. To that end, the three ports were examined for their ability to handle the different types of trade.

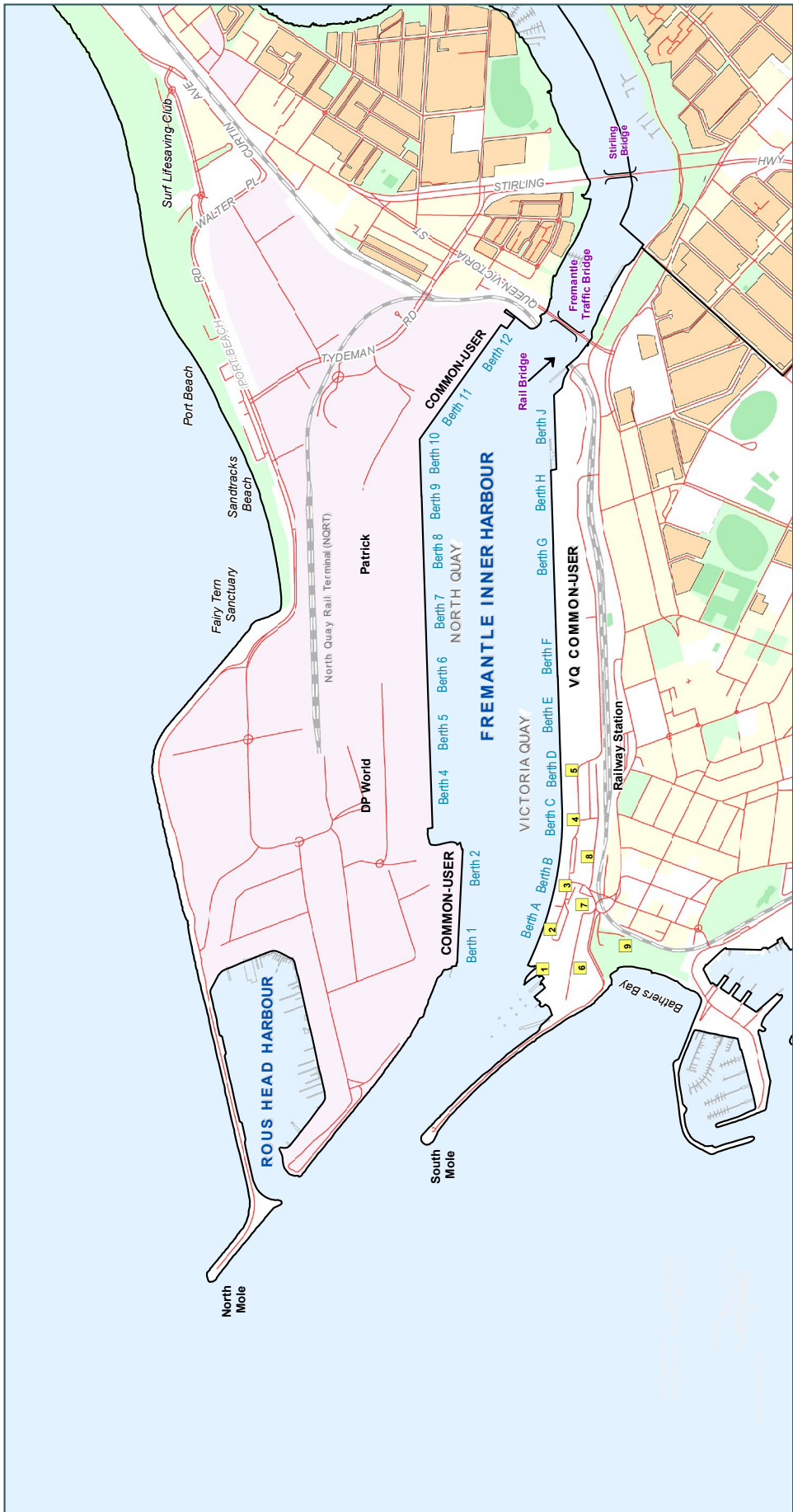
For Westport's purposes, the different types of port trades were grouped into three categories:

1. *Containerised* trade;
2. *Bulk trade* that includes commodities not transported in containers such as:
  - a. Bulk cargo that is transported unpacked in large quantities in liquid or granular form, such as petroleum, oil, grain, coal, mineral sands, woodchips and alumina; and
  - b. General cargo that refers to all other non-containerised, breakbulk trade such as roll-on-roll-off (RoRo), scrap metal, livestock and some mining equipment; and
3. *Passenger ships* including cruise ships, naval and research vessels.

Maps showing the location of the three ports are provided in maps 2, 3 and 4.



Map 2: Inner Harbour at Fremantle



**Roads**

**Residential**

**Built Up Area, Urban Area**

**Built Up Area, Industrial Area**

**Points of Reference**

- 1** WA Maritime Museum
- 2** A Shed
- 3** B Shed Ferry Terminal
- 4** C Shed
- 5** D Shed
- 6** South Metropolitan TAFE
- 7** Fremantle Ports Administration Building
- 8** E Shed Markets
- 9** The Roundhouse

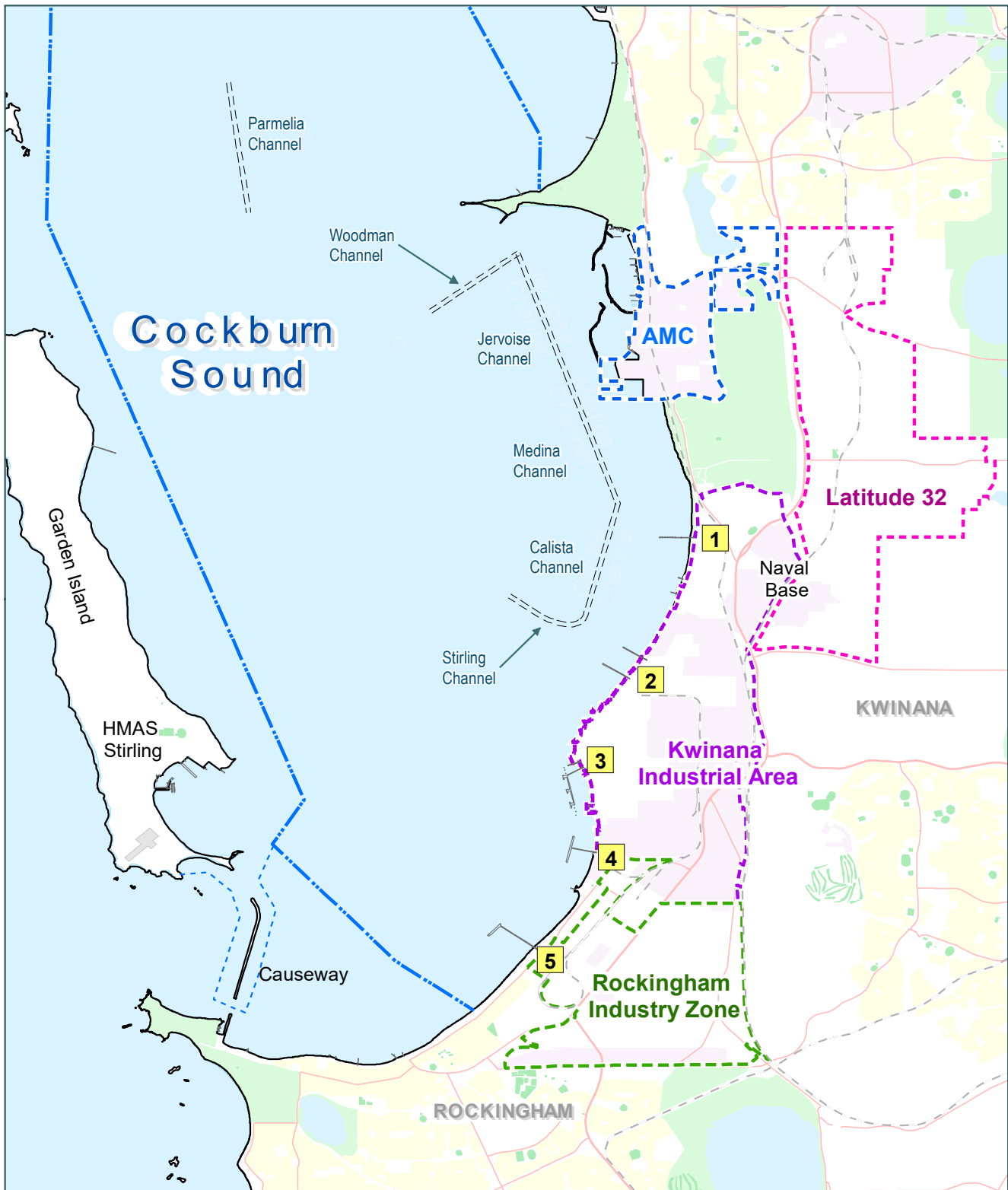
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Map 3: Outer Harbour at Kwinana



- Shipping Channel
- Fremantle Port Boundary
- Latitude 32
- Rockingham Industry Zone
- Kwinana Industrial Area
- Australian Marine Complex

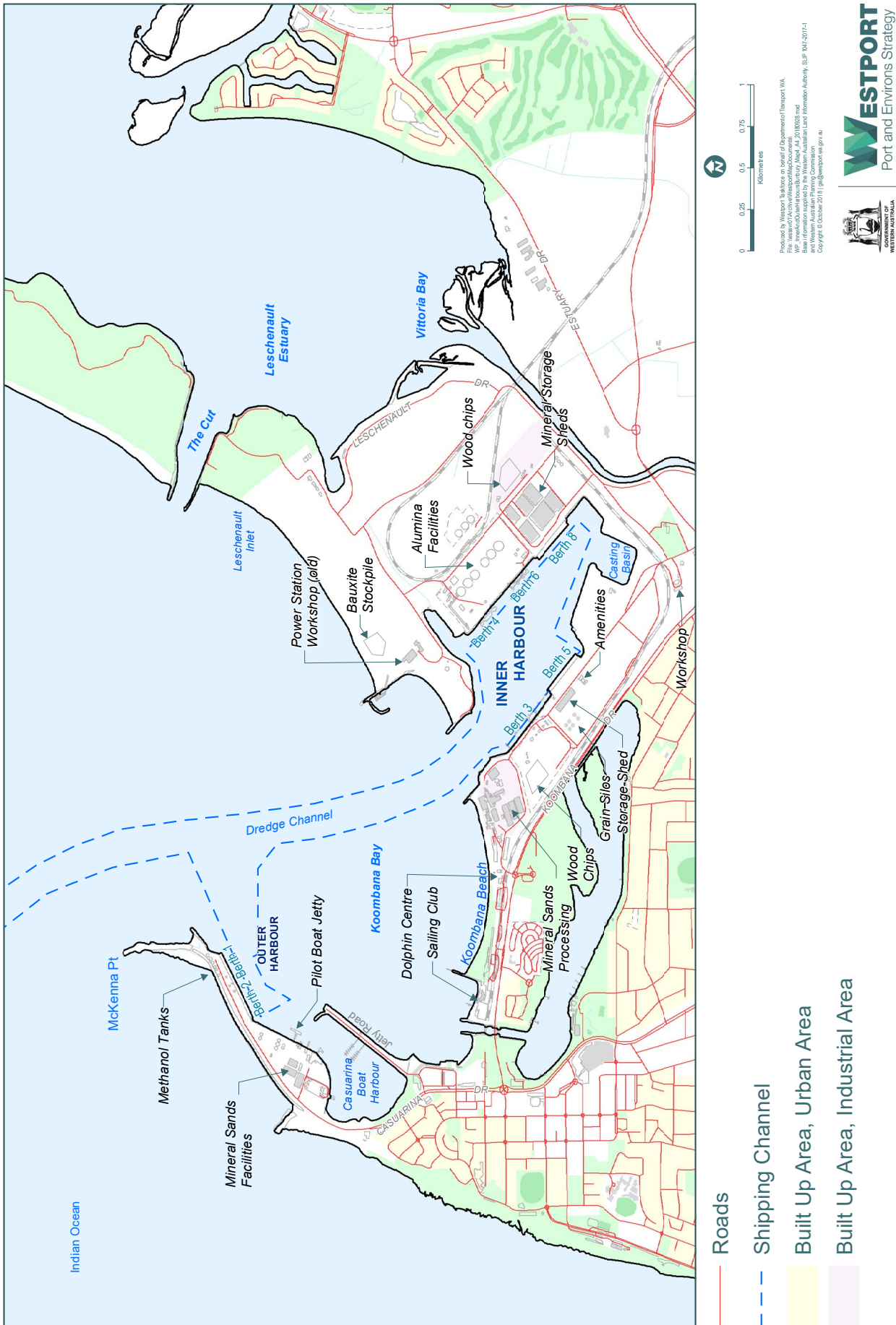
- 1** Alumina Refinery Jetty (ALCOA)
- 2** Kwinana Bulk Terminals
- 3** Oil Refinery Jetty (BP)
- 4** Kwinana Bulk Jetty
- 5** Kwinana Grain Jetty



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Map 4: Inner and Outer Harbours at Bunbury





### 4.2.1. Containerised trade

WA's only dedicated container port is located on North Quay at the Inner Harbour in Fremantle. Containerised trade requires specialised infrastructure, which makes it more cost-effective and efficient to consolidate this trade as much as possible.

Container ships have steadily increased in size since they were first introduced in the 1960s. Early ships carried fewer than 2,000 TEU<sup>11</sup> – some ships today carry more than 20,000 TEU. The largest container ships travel between hub ports such as Rotterdam and Singapore. Container trade to Australia takes place on smaller ships which travel from hub ports, usually Singapore, and stop at ports such as Fremantle, Melbourne, Sydney and Brisbane before returning to a hub port. At each stop in Australia, imported

containers are exchanged with exports which then make their way via a hub port to other destinations around the world. There are also some direct services from Europe and Asia.

The container ships that visit Fremantle and other Australian ports currently have a maximum capacity of about 9,000 TEU, requiring a depth of around 14.5 metres, with most ships being smaller than this. With further deepening and other port infrastructure upgrades, Fremantle Ports' modelling has shown it could theoretically accommodate berthing of the next-generation vessels likely to visit Australian capital city ports (over 13,000 TEU). However, any proposed upgrades would need to be investigated for potential social and environmental impacts before being progressed.

Map 5: Main maritime shipping routes



Source: Dr. Jean-Paul Rodrigue, Department of Global Studies and Geography, Hofstra University

Melbourne and Sydney are the two largest Australian ports and a change at these ports to cater for increasing vessel size such as channel deepening, could be the catalyst for other ports including Fremantle to match the change.

11. TEU stands for twenty-foot equivalent unit. TEUs are used to measure the number of containers that are handled by a port. Containers generally come in two lengths, 20 feet long (1 TEU) and 40 feet long (2 TEU)

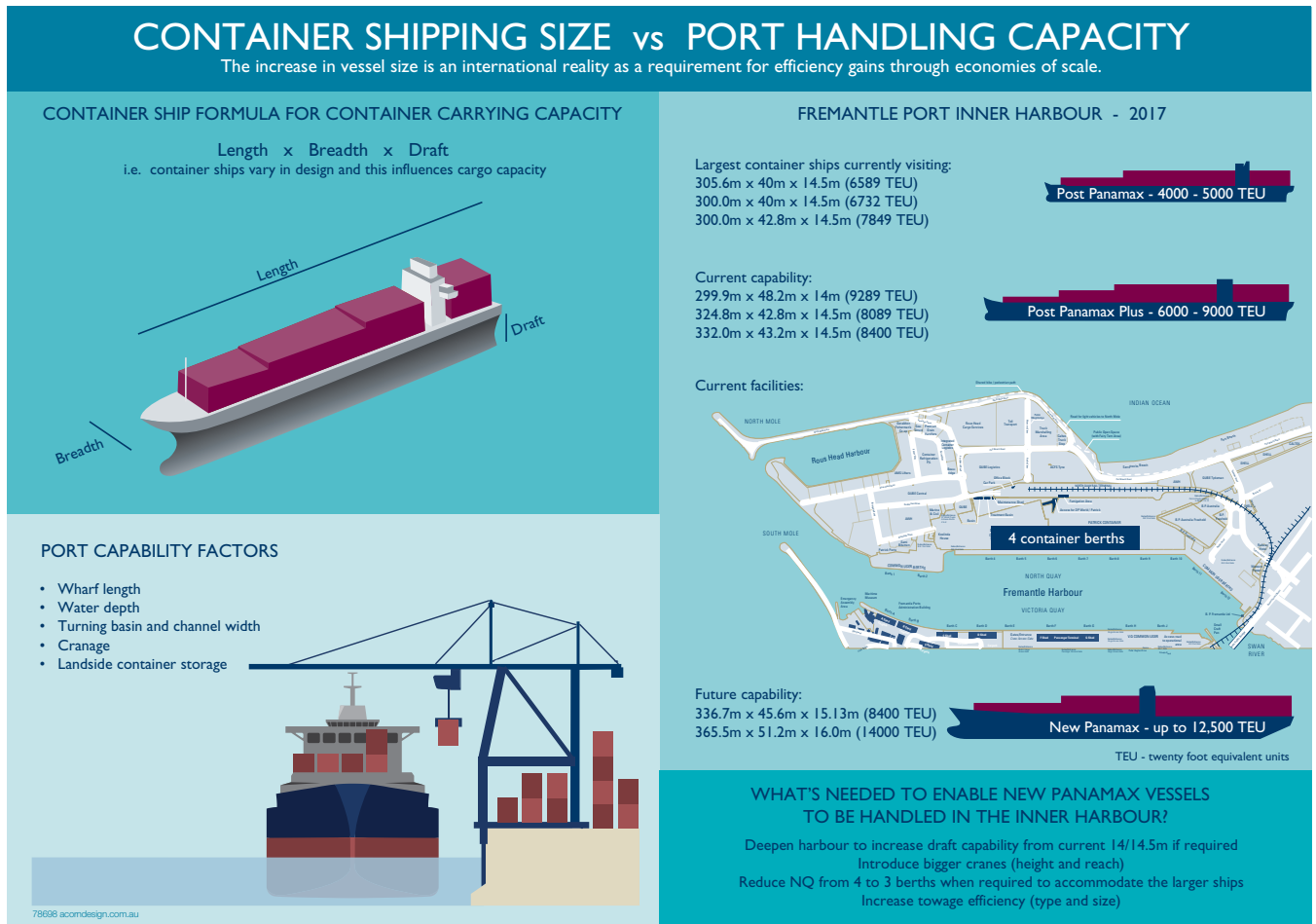
Dynamic Under Keel Clearance (DUKC) technology is used in Fremantle Ports' shipping channels to enable large ships to access its Inner and Outer Harbours with minimal clearance between the ship's hull and the channel floor.

Fremantle Ports has undertaken modelling showing that its container terminals would be able to handle significantly larger ships, and the vessels may be

safely turned at the entrance to the harbour and berthed. Figure 7 describes what would be required for Fremantle Inner Harbour to handle New Panamax-sized (13,000 TEU) vessels.

The two Fremantle container terminals (currently operated by DP World and Patrick) cover an area of around 45 hectares and handled approximately 770,000 TEUs in 2017/18<sup>12</sup>.

Figure 7: Container shipping size vs port handling capacity



Source: Fremantle Ports<sup>13</sup>

A study of the Fremantle's land transport and port capacity in 2014<sup>14</sup>, considered the land transport network that was proposed at the time and found that a throughput of around 2.1 million TEU could be achieved by:

- major improvements to the land transport network;
- adjusting and combining berths;
- supplying land for empty container parks;
- increasing rail mode share;

- extending operating hours for truck movements;
- improving intersections; and
- redesigning the terminal layout and operations.

This figure could rise further as larger ships, new cranes and automation are introduced, provided the land side transport could accommodate this level of trade. However, it is important to note that the road network envisaged by the 2014 report is no longer State Government policy.

12. Fremantle Ports, 2018, viewed 28 June 2018, [www.fremantleports.com.au](http://www.fremantleports.com.au)

13. Fremantle Ports, Annual Report 2017, p54

14. AECOM, 2014, Fremantle Ports Inner Harbour Land Transport and Port Capacity, AECOM, Perth



Kwinana does not currently handle containers. During the 2000s, an offshore island port for containers, bulk and general cargo was planned for Cockburn Sound with an overall footprint of approximately 200 hectares, including a container terminal with the ability to cater for around 3.0 million TEU<sup>15</sup>. This port had the ability to have further stages added which would increase its capacity. More recently proposals have been developed by non-State Government proponents. One such proposal, the Indian Ocean Gateway, proposed a land-backed port concept with a total area of approximately 280 hectares, which included container terminals with the potential to handle 3.0 million TEU and up to 6.0 million TEU at full development<sup>16</sup>.

Bunbury also does not currently handle a container trade; however, the Southern Ports Authority is planning for an expanded port that could accommodate a large container terminal with an area of at least 50 hectares. Subject to economic demand and logistics, Bunbury could accommodate container facilities with a similar capacity to Fremantle. Bunbury's current minimum declared depth of 12.2 metres would not accommodate the larger ships currently visiting Fremantle unless there were infrastructure improvements, including deepening of the port's channels and turning basins and improvements to berths. However, any proposed upgrades would need to be investigated for potential social and environmental impacts before being progressed.

#### 4.2.2. Bulk and general cargo trade

Fremantle, Kwinana and Bunbury all handle bulk and general cargo, though Fremantle does not handle dry bulk commodities.

Fremantle's general cargo activities are centred on its common user berths, with livestock generally located at Berths 1-2 to minimise any associated noise and odours reaching nearby residential areas. Berths 11-12 and E-H handle breakbulk, RoRo, scrap and general cargo. Victoria Quay is similarly used to facilitate breakbulk trades. (Map 2). General cargo trade at Fremantle faces land transport constraints similar to those outlined for the container trade in 4.2.1

Kwinana has five operational jetties with 804 ship visits in 2017/18 (excluding naval vessels) and a throughput gross tonnage of 23.6 million tonnes. Kwinana Bulk Terminal and Kwinana Bulk Jetty are operated by Fremantle Ports. Alcoa Australia and BP Refinery each have their own private jetties operated under State Agreements. Co-Operative Bulk Handling (CBH) also operates a private jetty, but it is owned by Fremantle Ports. Kwinana does not have facilities to import/export general cargos such as vehicles and livestock, though the Australian Marine Complex at Henderson is able to handle oversize mining equipment and fabricated mining machines. The offshore and land-backed port proposals mentioned in section 4.2.1 both made provision for bulk and general cargo (Map 3).

Bunbury has seven berths in its Inner and Outer Harbours. More than 400 hectares of surrounding land is controlled by the Southern Port Authority and could be further utilised for port purposes (Map 4).

Currently, all three ports have some land side capacity to accommodate greater levels of bulk and general cargo trades; however, dry bulk commodities are not suited to Fremantle's central city location. Until recently, the Kwinana Bulk Jetty and Bulk Terminal operated at close to capacity; however, the cessation of iron ore exports in July 2018 has released some capacity at KBT. Upgrades are required to conveyors and ship loaders to substantively increase throughput at both jetties.

All three ports are constrained to varying degrees by road and rail linkages. These are discussed in Section 4.5.

#### 4.2.3. Passenger ships

Fremantle's Inner Harbour is well-suited to handling passenger ships. It is within walking distance of public transport and the Fremantle city centre and entertainment district. The passenger terminal handled 43 passenger ships and 91 naval vessels in 2016/17<sup>17</sup>.

Kwinana is located adjacent to an industrial area making it less desirable as a passenger destination and its proximity to Fremantle would make it difficult to compete with that port for cruise ship visits.

15. Department of Planning, 2018, viewed 19 July 2018 [www.planning.wa.gov.au](http://www.planning.wa.gov.au)

16. Indian Ocean Gateway, 2018, viewed 6 June 2018, [www.indianoceangateway.com.au](http://www.indianoceangateway.com.au)

17. <http://www.fremantleports.com.au/News/Publications/AnnualReport/Documents/2018%20Annual%20Report%20-%20Full%20Report%20-%20interactive%20PDF.pdf>



Bunbury has been growing as a cruise ship port, with Cruise Bunbury and the South West Development Commission promoting the region to cruise ship lines. The Inner Harbour berths are close to the Dolphin Discovery Centre on Koombana Bay and within walking distance of the city centre. At this stage, only a handful of vessels visit the port each year. The number has potential to grow as cruising increases in popularity, however Busselton is providing competition for Bunbury for cruise visits.

#### 4.2.4. Port capability opportunities

##### Opportunities for Fremantle

There are two scenarios in relation to optimising Fremantle's capabilities.

The first scenario is the Inner Harbour remains Perth's primary port facility for the long-term. In this instance, the opportunity relates to expanding and enhancing the port's functions and capacity through infrastructure upgrades, such as enabling the port to take larger vessels up to 13,000 TEU. The capacity of the Inner Harbour to handle containers and other trades can be further increased by de-constraining the road and rail networks leading into the port.

The second scenario involves the relocation of some trades, such as general cargo, to Kwinana. This would allow more space at Fremantle to optimise container trade.

Additionally, if some or all of the industrial functions of the Inner Harbour were relocated to other locations, this presents further opportunities:

- Relocation of the container trade away from the Inner Harbour would allow a change in the buffer zones and enable residential and commercial development possibilities in North Fremantle and Rous Head to be realised, utilising the existing North Fremantle Train Station.
- There are also opportunities at the west end of Victoria Quay to synergise with existing heritage and tourism facilities, such as the passenger terminal and maritime museum, to realise recreation and leisure opportunities.
- Currently the east end of Victoria Quay is used for port-related activities including car unloading, but if these trades were relocated, the east end could potentially become an extension of a tourism precinct.
- If Victoria Quay was integrated with the City Centre, this could improve the experience of passengers from cruise ships and encourage more cruise vessels to visit the port. This may require upgrading existing infrastructure.

It should be noted that the activation of port land for residential and tourism purposes could generate more traffic on the road network, which would require further investigation.



## Opportunities for Kwinana

The biggest opportunity in the Kwinana study area is the development of additional port facilities, integrated with the latest technologies to handle containers, bulk and general cargo. Facilities can be designed to handle the estimated throughput for the next 100 years, which may be in the range of 6.0 million TEUs and accommodate the next generation of ships up to 13,000 TEU or beyond.

Even without investing in new facilities, relatively minor upgrades to KBT and KBJ would enable significant increases in trade.

There is plenty of land available at Latitude 32 to support an intermodal terminal and new general industrial developments to optimise both the flow of goods into and out of the port. (However, it should be noted that land for new heavy industries is very limited in the KIA.)

There is also potential to grow the vessel sustainment and construction operations at the AMC by cross-government coordination of strategic planning for the AMC and Henderson precinct.

Additionally, enhancing the road and rail networks in the Kwinana study area would improve freight capacity.

## Opportunities for Bunbury

Bunbury Port has the space to create new berths to increase trade. It also has the capacity to become a container port in the event that any container trade from Perth needs to be relocated, or when Bunbury and the South West has a large enough population to sustain a container trade service in its own right.

Bunbury also has the potential to handle many more passenger vessels, which complements the current plan to redevelop the Outer Harbour into a tourism precinct.

### 4.2.5. Port capability findings

1. If the port infrastructure and road and rail linkages are developed and expanded to their optimal capacities, the port precincts in Fremantle, Kwinana and Bunbury would be likely to have the capability to collectively handle the strategic freight needs of WA for the next 100 years.

2. Fremantle has the physical capacity within its existing footprint to handle a substantial increase in container trade and to continue in its role as a conventional cargo trades port (e.g. vehicles, livestock and scrap metal). Future growth may be accommodated by adjusting berth allocations, channel dredging, berth strengthening, increasing the number of cranes, automation, improving container handling equipment and improving the container terminal interface with road and rail infrastructure.
3. Additional container capacity increases are possible at Fremantle by undertaking further works, including modifying berths.
4. Road and rail access are constraints to capacity at all three ports. This is explored further in Section 4.3.
5. The various proposals for container facilities in Kwinana would require major port development and also infrastructure upgrades (road, rail, utilities). The touted capacities from 3.0 to 6.0 million TEU, indicate it could operate either as a second container port to complement Fremantle or could accommodate the container trade in its own right.<sup>18,19</sup>
6. The Kwinana port proposals accommodate integrated rail access, intermodal facilities, efficient transport links, bulk handling facilities, and other storage alternatives.
7. The freight rail system to transport goods to and from the KIA is close to capacity, due to operational limitations at the Kwinana Triangle. Relatively minor modifications to sidings and junctions could expand capability.
8. The various port proposals for Kwinana all demonstrate the capacity to cater for long-term bulk, containers and conventional cargo trades.
9. Bunbury Port's draft structure plan indicates that it has the potential to cater for increases in bulk trades, as well as the space to service a container trade demand comparable to Fremantle (subject to logistics, transport and economic constraints). It also has the capability to import cars (RoRo) and export livestock.
10. With fewer shipping lines, larger vessels and a consolidation of ports within shipping services, ships may be reluctant to visit a regional port unless there is sufficient volume to warrant a direct call.

18. GHD, 2006

19. Indian Ocean Gateway, 2018

11. With regards to shipping channels at each port: there are no known engineering obstacles to providing safe approach channels at Fremantle, Kwinana and Bunbury, though dredging will be required to create and maintain these channels.

Fremantle, Kwinana and Bunbury all have capacity to service cruise ships. No obstacles to accommodating the anticipated growth in this trade have been identified, though it is unlikely that such vessels would visit Kwinana.

Any enhancements or proposed upgrades would need to be investigated for potential social and environmental impacts, including community concerns, before being progressed.

### 4.3. SUPPLY CHAIN

Supply chain investigations have involved understanding the world's best practice port and supply chain logistics operations, relevant industry and technological trends and how these may be applied to the Westport planning process. Closer to home, the existing Fremantle, Kwinana and Bunbury port operations and the import/export supply chain pathways were closely examined together with logistics from origin to destination.

There is a distinction between ports servicing large hinterlands with long-distance supply chains (such as in Europe and North America) and those servicing much smaller areas located close by, such as Australian capital city ports, where the metropolitan area is the principal source of demand for trade. Australia's major capital city ports of Fremantle, Sydney, Brisbane and Melbourne have considerable similarities, including:

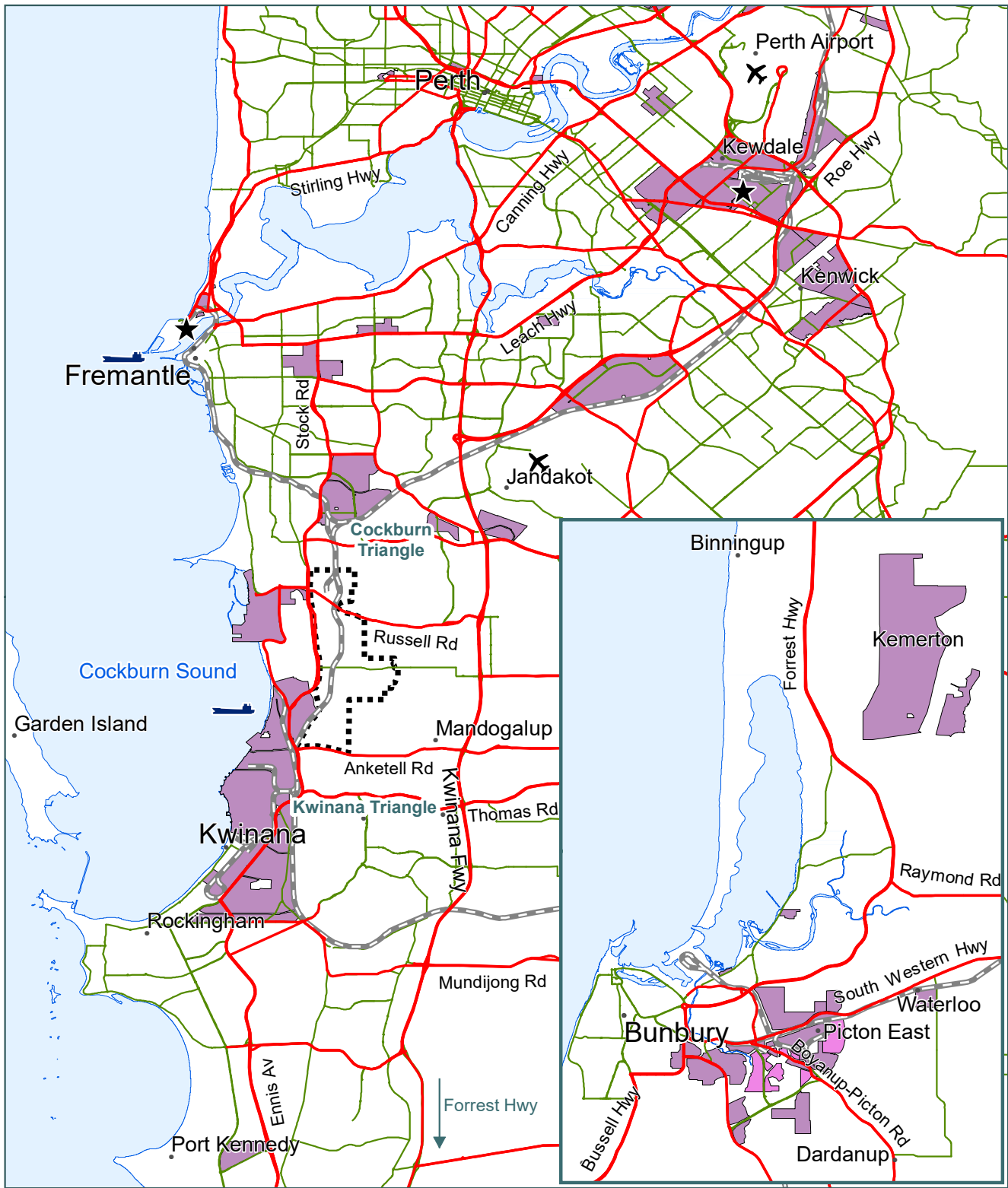
- an excess of import volume over exports (with growing proportions of empty container exports);
- a high percentage of imports consumed (or unpacked) in the immediate urban area;
- a higher proportion of export products sourced in regional areas;
- reliance on legacy rail infrastructure not designed for freight intermodal efficiency;
- competition between stevedores and associated supply chains for shippers' business; and
- varying degrees of urban encroachment placing pressure on road and rail infrastructure.

The current freight network serving Fremantle, Kwinana and Bunbury is shown in Map 6.

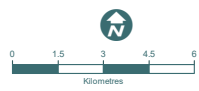




Map 6: Existing freight network for Fremantle, Kwinana and Bunbury



- Airport
- Intermodal Freight Terminal
- Port
- Freight Roads
- Freight Rail
- Latitude 32
- Industrial



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### 4.3.1. Supply chain considerations at Fremantle

Fremantle Ports' Inner Harbour is WA's principal general cargo port and only dedicated container port, processing almost all of the State's container trade. The Inner Harbour also handles motor vehicles, livestock, breakbulk and cruise ships as shown in Table 8.

**Table 8: Fremantle Inner Harbour – major trade berths, volumes and transport mode**

RELEVANT BERTHS	TRADE	VOLUME 2017/18	TRANSPORT MODE 2017/18
4-10	Containers	769,686 TEU	Road (83.9 per cent) Rail (16.1 per cent)
11, 12, D, E, G, H, J	Motor cars	101,899 vehicles	Road
1, 2	Livestock	1,563,021 sheep 146,688 cattle	Road
1, 2, 11, 12, D, E, F, G, H, J	Breakbulk	835,561 mass tonnes	Road

Source: Fremantle Ports Annual Report 2018.

The transport connections to the Inner Harbour are managed by both the City of Fremantle and Main Roads Western Australia (MRWA), with container trucks sharing the local road network with other vehicular traffic. The North Quay Truck Survey found in 2017 that container trucks formed ten per cent of all vehicles on Tydeman Road<sup>20</sup> the main access road to the port. In 2017-2018, approximately 84 per cent of containers to and from the port were carried by road and the remainder by rail.

#### Port access

Approximately 10 per cent of container trucks access the Inner Harbour from the north. Road freight access from the north is via Port Beach Road, Curtin Avenue and West Coast Highway, with connections further east via Reid Highway, Whitfords Avenue and Ocean Reef Road. This route is classified as a RAV4<sup>21</sup> route and also provides for Oversize Overmass (OSOM) access.

Around 90 per cent of container trucks access the Inner Harbour from the east and south. The main road freight access between the Inner Harbour and strategic industrial areas to the east, including Kewdale, Forrestfield, Welshpool and Canning Vale, is via Tydeman Road, Stirling Highway to High Street, High Street/Leach Highway to Kwinana Freeway, Kwinana Freeway to Roe Highway and Roe Highway

further east. This route is classified as a RAV4 route, with Roe Highway classified as a RAV7 route. While Leach Highway east of Kwinana Freeway does not form part of the RAV4 network, it is still a major freight route and provides access for non-containerised freight. A container ban is imposed on South Street between Kwinana Freeway and Stock Road and it does not serve as a primary access route for the Inner Harbour.

Stock Road south of Leach Highway serves as the main road freight link to the Kwinana Industrial Area, and other industrial areas including O'Connor, Spearwood and Bibra Lake to the south. This route also forms part of the RAV4 network.

#### Key transport connection findings:

- *Tydeman Road* – there is significant mixing of port freight traffic with commuter traffic from the north via Curtin Avenue. A possible extension of Curtin Avenue across the Fremantle passenger rail line to link with Stirling Highway at Queen Victoria Street may significantly reduce volumes on Port Beach Road and Tydeman Road, improving operations for port traffic. A reservation has not been included in the Metropolitan Region Scheme (MRS) for this alternative alignment but a Planning Control Area (PCA) has been gazetted.

20. Fremantle Ports, 2017, North Quay Truck Survey, <http://www.fremantleports.com.au/SiteCollectionDocuments/North%20Quay%20Truck%20Survey%202017.pdf>

21. [https://www.mainroads.wa.gov.au/Documents/Standard%20Restricted%20Access%20Vehicle%20\(RAV\)%20Route%20Assessment%20Guidelines%20-%20As%20at%20September%202018.RCN-D18%5E23803147.PDF](https://www.mainroads.wa.gov.au/Documents/Standard%20Restricted%20Access%20Vehicle%20(RAV)%20Route%20Assessment%20Guidelines%20-%20As%20at%20September%202018.RCN-D18%5E23803147.PDF)



- *Stirling Highway and Stirling Bridge* – the intersection with Canning Highway will come under increasing pressure and significant upgrading is constrained by the Stirling Bridge abutment to the north and adjacent development along Canning Highway. The possibility of upgrading Stirling Highway between High Street and Queen Victoria Street as well as potentially increasing the capacity of Stirling Bridge will be considered in the context of Westport’s strategic options.
- *High Street* – High Street between Stirling Highway and Carrington Street experiences significant traffic congestion impacting on traffic efficiency and safety. There is a high motor vehicle accident (MVA) rate along the route: over a five-year period (2013-2017), approximately 450 MVAs occurred, 74 per cent being rear end MVAs and 11 per cent right angle or right turn MVAs<sup>22</sup>. Main Roads WA has worked with key stakeholders to develop a concept plan that assists in addressing efficiency, safety and local access issues. The concept is now a committed, funded and agreed project and includes:
  - a roundabout at the intersection of High Street and Stirling Highway;
  - a four-lane divided standard between Carrington Street and Stirling Highway with wide median to separate traffic and preserve a number of mature trees; and
  - a single lane service road for residents north of High Street.
- *Leach Highway* – Leach Highway between Carrington Street and Kwinana Freeway carries a mix of commuter and freight traffic, with commuter traffic increasing significantly towards the freeway. The signalised intersections at Stock Road, North Lake Road, Murdoch Drive and Moolyean Road currently operate under pressure close to or at capacity during peak periods. Various intersections also have high MVA ratings. Leach Highway between Carrington Street and Kwinana Freeway has been constructed to its ultimate six-lane divided standard and grade separation has not been planned or allowed for in the Metropolitan Region Scheme. Concept design work has been undertaken to investigate the possibility of grade separation of the Stock Road intersection. With traffic growth the intersections along the route as well as road sections close to Kwinana Freeway will come under increasing pressure, resulting in longer travel times and lower efficiency.
- *Stock Road* – the section between South Street and Leach Highway provides access to the O’Connor industrial area to the east and west which supports some port-related industry. It is a four-lane road constructed within a narrow reservation, with a number of at-grade intersections and steep grades. Direct property access is provided in places. The cross-section and design standard are inappropriate for a major freight route and the road will require upgrading. However, no planning is in place and a reservation has not been included in the Metropolitan Region Scheme for implementation. Stock Road south of South Street is planned to potentially accommodate a six-lane freeway and the required reservation has been included in the Metropolitan Region Scheme.
- *Fremantle Bridges* – road and rail access – heavy vehicles servicing the North Quay container port use Stirling Bridge and this is part of the Urban National Land Transport Network<sup>23</sup>. West of the Stirling Bridge is the timber Fremantle Traffic Bridge that has two lanes both ways and load restrictions making it unsuitable for heavy vehicle movements. The railway bridge to the west of the Fremantle Traffic Bridge has two tracks and is shared by freight and passenger trains. During the weekday passenger peak periods, freight rail services are unable to use the tracks due to the risk of delaying passenger rail services. This and current track maintenance practices restrict the ability for rail freight to maximise available capacity at North Quay Rail Terminal (NQRT). Further constraints are likely if additional urban passenger schedules are introduced.

22. Main Roads Western Australia, 2018, Intersection Crash Ranking, <https://mrapps.mainroads.wa.gov.au/icr/default.asp>

23. Australian Government, Department of Infrastructure, Regional Development and Cities, 2014, The National Land Transport Network [http://investment.infrastructure.gov.au/about/the\\_national\\_land\\_transport\\_network.aspx](http://investment.infrastructure.gov.au/about/the_national_land_transport_network.aspx)

## Opportunities

- *Operational solutions* – innovative operational solutions, such as permit systems could extend the hours of freight operations.
- *Containers on rail* – in terms of increasing the number of containers on rail, a new \$50 per TEU subsidy rate (up from \$30 per TEU previously) which took effect on 1 January 2018 has already started to have an impact. Latest statistics show containers moved by rail increasing to 18.4 per cent from May to October 2018, up from 16.1 per cent in 2017/18. However, the freight rail network faces pressures that need to be rectified in order to fully optimise this mode of transportation.

## 4.3.2. Supply chain considerations at Kwinana

The Outer Harbour in Kwinana hosts a mixture of State-owned and private sector port facilities that handle a range of bulk imports and exports from five jetties (Table 9).

Kwinana Bulk Terminal and the Kwinana Bulk Jetty are owned and operated by Fremantle Ports, a State Government Trading Enterprise. Three jetties are operated by private companies, Alcoa, BP and Co-Operative Bulk Handling (CBH). The grain jetty is owned by the State and leased to CBH.

**Table 9: Outer Harbour – major trade berths, volumes and transport modes**

BERTHS	TRADE	VOLUME (TONNES) 2017/18	TRANSPORT MODE
Alcoa Jetty	Alumina	2,986,466	Rail
	Caustic Soda	920,532	Rail
CBH Grain Jetty	Grain	5,057,810	Rail (90 per cent)
Kwinana Bulk Terminal	Spodumene	406,017	Road
	Bauxite	330,000	Road
BP Oil Refinery Jetty	Crude Petroleum	6,777,690	Pipeline
	Refined Petroleum	2,961,693	Pipeline
Kwinana Bulk Jetty	Fertilisers (including liquid)	950,000	Combination of road, rail and pipeline
	Sulphur (including liquid)	350,000	
	Liquid hydrocarbon	250,000	

Note: Iron ore exports ceased in July 2018

## Port access

A network of existing, upgraded and new roads will service Kwinana port facilities into the future and the important industrial and commercial centres located along the coast. The higher order road network includes Stock Road/Rockingham Road/Patterson Road, Kwinana Freeway and Tonkin Highway providing north-south distribution; and Thomas Road, Anketell Road and Rowley Road providing east-west distribution to Kwinana Freeway and Tonkin Highway.

The planned Fremantle Rockingham Controlled Access Highway (FRCAH) will serve as a north-south transport corridor providing high-standard connectivity between the industrial and commercial centres within the Perth South Western Corridor, and access to the Outer Harbour. The road follows the Stock Road and Rockingham Road alignments, and then a new alignment to Kwinana Freeway at Mundijong Road.

The FRCAH is planned to six-lane freeway standard. Once the FRCAH is constructed, Rockingham Road will terminate in the north at Rowley Road.

## Key transport connection findings:

- *Rowley Road and Anketell Road* – These roads have been identified as strategic freight routes to service future freight demands. Current road infrastructure will require upgrading to a standard suitable to meet traffic demand to service a future port and a general increase in traffic resulting from ongoing development in the area.

There are currently two existing Planning Control Areas (PCA) covering both Rowley and Anketell Roads west of the Kwinana Freeway. In Stage 2, these road connections will be examined in the context of the strategic options as one or both may be required to provide a high-standard freight



route between the Tonkin Highway and future port facilities. This could imply expressway<sup>24</sup> standard for one or both of these routes with associated grade separation at major intersections.

Alignments of these roads would also need to consider the location of a potential second seawater desalination plant on the coast and Bush Forever and wetland areas inland.

- *Australian Marine Complex (AMC)* – The Australian Marine Complex (AMC) is located at Henderson and encompasses an area of 420 hectares. This facility performs activities associated with marine, defence, oil and gas and mining services, providing manufacturing, fabrication, assembly, technology, repair, maintenance and servicing capabilities. Since opening in 2003, it has grown with more than 150 separate commercial entities operating within the precinct.

However, this growth has led to the following logistical problems that must be addressed:

- the AMC is primarily served by road-based logistics via Russell and Rockingham Road. The intersection at the corner of Russell Road and Rockingham Road is restricting efficient logistics due to significant peak period traffic congestion;
- labour efficiencies at the AMC are impacted by poor public transport access; however, start times and the dispersed workforce origins make public transport unfeasible; and
- the standard and design limitations of Russell Road, the main feeder road for the AMC, constrains effective links between the AMC and land available for future expansion in the adjacent Latitude 32 industrial site.
- *Kwinana Triangle* – the Public Transport Authority (PTA) manages the lease of the State-owned freight rail network, which is leased to Arc Infrastructure (with the exception of some private sidings and the CBH unloading track), until 2049. The Kwinana Triangle is the busiest part of the freight rail network and provides the only freight rail access into the Kwinana Industrial Area (KIA). It currently accommodates 66 train movements a day. Additionally, two strategic freight rail corridors converge at the Kwinana Triangle:

- the dual gauge Eastern Goldfields Railway (EGR), which connects the eastern states with Kewdale, Forrestfield and the KIA with 36 daily services; and
- the narrow-gauge South West Main (SWM), which is a busy corridor connecting the southern part of Western Australia to Kwinana, carrying bulk freight primarily servicing the cement and alumina refining industries with 30 daily services.

The assessed unused capacity through the Kwinana Triangle is 16 train movements daily; however, throughput is constrained by the capacity of the terminals it services, namely CBH, Alcoa and KBT. This single point of access means that major import and export operations at CBH, Alcoa and KBT are at significant risk should the Triangle fail operationally. In addition, the reliance on a single rail access point into the KIA provides no risk management in the event of derailed locomotives or wagons in the Triangle.

- *Kwinana Rail Loop* – this is an existing unused rail corridor that potentially provides an alternative access to the Kwinana area, by-passing the north leg of the Kwinana Triangle
- *Single-track section of rail between the Cockburn Triangle and the Kwinana Triangle* – this is at its maximum capacity<sup>25</sup> and without operational and infrastructure improvements, there will be insufficient capacity to support any future increase in demand.
- *Obstacles to double stacking of rail freight* – numerous structures, bridges and power lines are located over the track between Kewdale, Fremantle and Kwinana, which prevents the double-stacking of rail freight. To allow double-stacking of containers on trains, 25 power lines would need to be raised or placed underground; 10 overbridges would need to be raised; and one gantry would need to be raised.

## Opportunities

- *Defence* – future port-enabled supply chains in Kwinana must efficiently service Australian Defence Force (ADF) operations. Both HMAS Stirling at Garden Island and the Australian Marine Complex in Henderson are nationally significant assets with important roles in the future of Australia's national security.

24. See glossary

25. Metropolitan Freight Rail Capacity Analysis Final Report, February 2013 (URS / GHD)

- There is opportunity to unlock land in Latitude 32 and create routes for very heavy modules directly to the AMC.

The Westport Taskforce has identified that future ADF logistic requirements will need to be accommodated into the design of both civil supply chain operations and their associated infrastructure. These opportunities will be explored further in Stage 2 of the project.

### 4.3.3. Supply chain considerations at Bunbury

Greater Bunbury, 175 kilometres south of Perth, is the second largest population centre in Western Australia and the industrial, tourism and commercial centre of the South West.

The Port of Bunbury is a pivot point for the world-wide distribution of products from south west WA. Its strategic location provides a natural distribution point for mining, manufacturing and agricultural products. Rail and road links enable the port to capitalise on cargo throughput.

Regional routes to the port from the south and east are generally not dual carriageway and, in some cases, not well-suited to increased freight cartage tasks. The South West Highway carries up to 8 million tonnes per year of heavy vehicle traffic between Manjimup and Bunbury, including forestry, agricultural and mineral products. The forthcoming expansion of the Talison lithium mine, increasing output from 400,000 tonnes to over 2 million tonnes per annum by 2020, will put further pressure on this route, which passes through the centre of several towns including Donnybrook, Balingup and Bridgetown.

Strategic transport and urban planning is in place to provide for the long-term use of Bunbury as a bulk commodity export facility. Companies have and continue to see opportunities at Bunbury for bulk bauxite and coal; this is in addition to existing alumina, caustic and other bulk commodities. To ensure that sufficient bulk capacity is available, adequate rail and road infrastructure is required to ensure that companies can quickly take advantage of market conditions. This includes the capacity to scale up export volumes.

While the Port facilities may provide for scalable opportunities, the rail infrastructure may not be able to meet these without time-consuming negotiations and capital upgrades. Similarly, upgrading rail

capacity impacts on the road network in the Bunbury area. Integration of infrastructure scalability to separate road and rail crossings would benefit Port capacity and efficiency.

### Key transport connection findings:

- *South West Main (SWM) railway line* – the South West Main (SWM) is one of the busiest sections of the rail network, providing transport for products such as bauxite, alumina, caustic, coal and lime, as well as passengers. It comprises 185 kilometres of single track, narrow-gauge railway. Operational reliability is currently poor with trains routinely unable to complete their timetabled round-trip cycles due to delays at passing loops, inefficient loading and unloading practices and other delays. There are 11 passing loops between Mundijong and Bunbury. Most passing loops and loading/unloading sidings are less than 700 metres long, limiting most train lengths to around 600 metres which allows 38-40 wagons for alumina and 52-54 wagons for bauxite.

Any major increase in rail traffic, such as intermodal trains between Bunbury Port and Perth, would require passing loops to be extended to at least 1,000 metres, with the consideration of duplicated track or dynamic passing lanes to enable efficient overtaking. This and the potential double-stacking of cars and/or containers will be included in the investigations of the strategic options in Stage 2.

### Opportunities

- In Bunbury, enhancing the existing road network presents opportunities for innovative engineering and design solutions, such as construction of dedicated roads and grade separations around existing residential areas to handle a bigger freight task.
- Relevant agencies including MRWA, are working closely to identify opportunities for current and future road/rail use. For example, MRWA, in conjunction with the City of Bunbury and other stakeholders, is planning the Bunbury Outer Ring Road (BORR), to improve the efficiency of freight access to Bunbury Port. It will provide a more direct north-south road route that bypasses Bunbury's built-up areas. New and upgraded east-west road connections from the BORR can also be planned to further improve access to the Port.



## 4.4. LAND USE AND UTILITIES INFRASTRUCTURE

To optimise a port and its supply chain, we also need to consider the infrastructure that feeds it, along with how the surrounding land is utilised. In this section, we will consider how land use and utilities infrastructure may impact on increasing or shifting capacity at Fremantle, Kwinana and Bunbury ports.

Land use and utilities infrastructure constraints can prevent proposals being implemented and deter investment. They can require time and money being spent on investigating causes, identifying potential solutions and seeking the necessary approvals to overcome them.

Land use planning considerations include situations where:

- existing land uses or zoning are not compatible with current or future proposals;
- structure planning has not been undertaken or completed;
- residential areas are built close to transport corridors or port-associated industries. This 'urban encroachment' can result in restrictions being placed on when and where freight may be transported by road or rail infrastructure;
- land ownership is fragmented making it difficult to acquire suitably-sized land packages, especially for larger projects;
- acquiring privately-owned land leads to significant cost and time implications for the State or developer; and
- leasing arrangements inhibit potential proposals, as generally longer leases are needed for time to offset the costs of building larger infrastructure, but may also impede flexible use of the land.

Ports can operate at all hours and handle a wide range of goods, including hazardous materials. Port and associated supply chain activities can generate light, noise, odour, emissions and safety hazards that impact on surrounding land uses. Therefore, buffers (transition areas) are used to separate industrial and residential uses with agencies monitoring environmental impacts.

Utilities infrastructure associated with the provision of water, wastewater, power and gas can also restrict developments, particularly when:

- there is insufficient capacity to support development, or
- the alignment of pipelines and transmission corridors conflicts with a proposal.

An investigation of existing land use and utilities infrastructure was undertaken for the three study areas in Fremantle, Kwinana and Bunbury and a summary of findings is shown below.

### 4.4.1. Land use and utilities infrastructure considerations at Fremantle

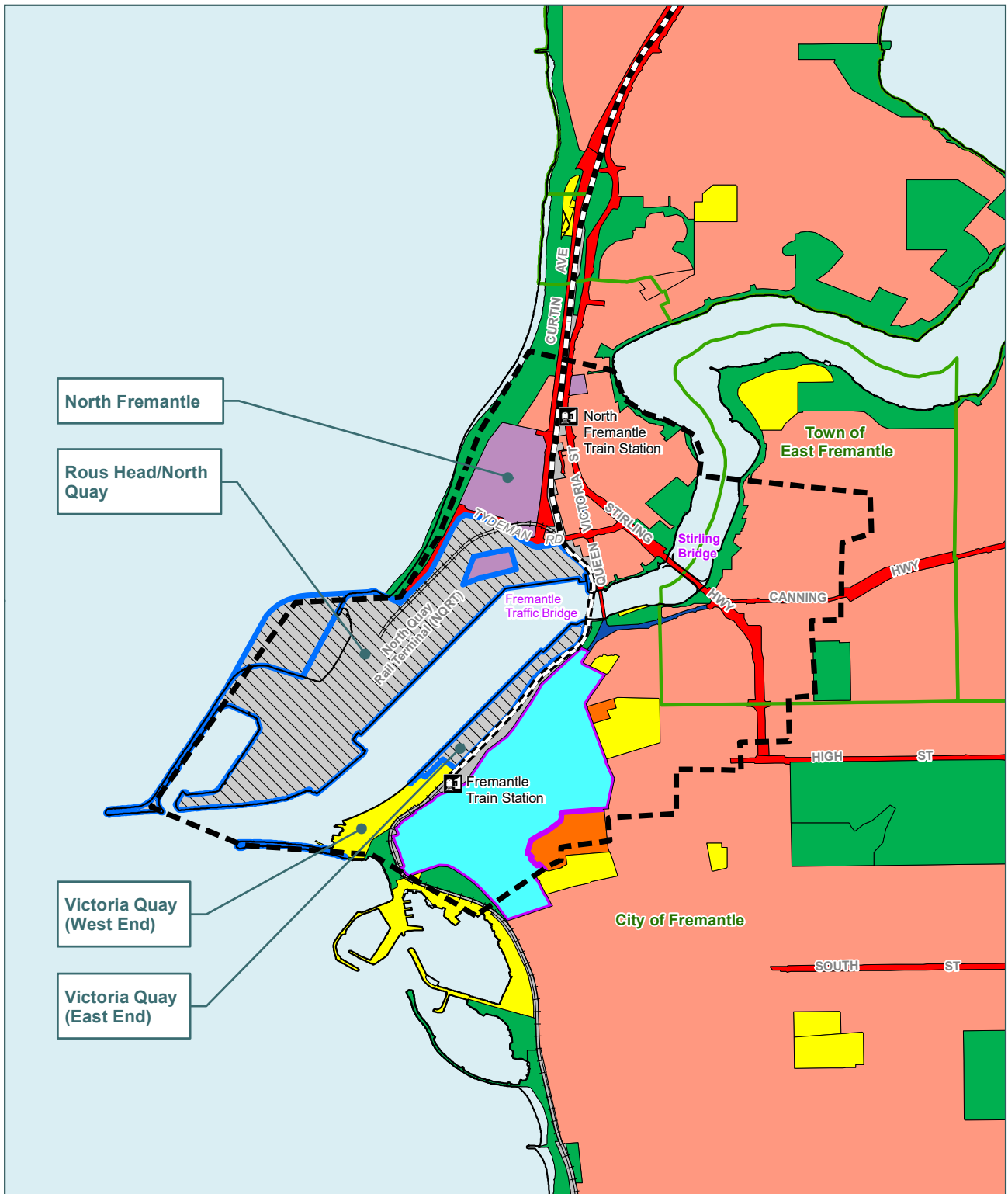
The Fremantle study area consists of the Inner Harbour and the parts of the City of Fremantle (including the Fremantle City Centre) and Town of East Fremantle (Map 7).

The City of Fremantle is one of Greater Perth's ten Strategic Metropolitan Centres<sup>26</sup> where commercial, retail, entertainment and tourism activities combine with education and medical services and some high-density housing that is well-served by public transport and cycling connections.



26. Western Australian Planning Commission, 2015, Western Australia Tomorrow

Map 7: Land use – Fremantle



- |  |                            |  |                    |  |                        |
|--|----------------------------|--|--------------------|--|------------------------|
|  | Freight Rail               |  | Urban              |  | Primary Regional Roads |
|  | Both Freight and Passenger |  | Central City Area  |  | Other Regional Roads   |
|  | Passenger Railway          |  | Civic and Cultural |  | Parks and Recreation   |
|  | Fremantle Port Buffer      |  | Public Purposes    |  | Waterways              |
|  | Harbour Boundary           |  | Industrial         |  | Railways               |
|  | Local Government Boundary  |  | Port Installations |  |                        |



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The land in the Fremantle study area is attractive for multiple purposes. Its access to the Fremantle City Centre – a vibrant social and heritage district – along with the existing public transport linkages, proximity to Perth, beaches and other amenities makes the land desirable.

Fremantle is also a focal point to develop tourism opportunities. A clear constraint at the present time is the limited connectivity between the Fremantle Inner Harbour and the Fremantle town centre and tourist activities. Inner Harbour port planning provides the opportunity to improve connectivity. Similarly, there is a need for continued supply base support for both ferries and cruise ships within Fremantle Inner Harbour.

Land use in the study area aligns with the Metropolitan Region Scheme (MRS) and there is a mix of public and private land ownership. The land comprising the Inner Harbour is owned in freehold by Fremantle Ports. The port undertakes land use planning on its site with specific land use policies for six identified port precincts<sup>27</sup>. Outside of the port, at the local level, land use is managed through the local planning schemes of the City of Fremantle and Town of East Fremantle<sup>28</sup>.

The three-kilometre Fremantle Port Buffer<sup>29</sup> is designed to manage and mitigate light, noise, odour emissions and safety hazards, protecting the amenity of the developed urban areas surrounding the port. Changing community expectations about what is shipped from the port should be recognised as a constraint to development in the Fremantle study area.

The Fremantle Port buffer is a guideline rather than a State statutory land use planning instrument. It does not preclude additional residential development, even in the area closest to the port, and is dependent on local governments to regulate. While it is not usually possible to retrofit a land use planning buffer on an existing residential area, steps can be taken to mitigate effects such as noise, light, odour and visual amenity. However, these factors are difficult to manage and may be influenced by other factors

such as wind and variation in people's tolerances. Increased port throughput in a built-up area may escalate these risks.

Activities in the study area rely on stable supplies of utilities. The area is supplied with 66kV high-voltage overhead transmission lines, gas mains (with easements), water mains and wastewater treatment infrastructure. The Central Metropolitan Sub-Regional Planning Framework<sup>30</sup> identifies improvements to power infrastructure that are proposed in the medium term between 2022 and 2031, depending on population growth rates.

### Key land use planning and utilities infrastructure considerations at Fremantle include:

- *Changing land use in the port buffer* – this may present an opportunity cost, as other forms of development are limited while the buffer is in place. For example, buffer land near the North Fremantle Railway Station has been identified for its urban development potential, at the west end of Victoria Quay for its entertainment potential and the east end of Victoria Quay for a range of recreation, commercial and residential activities. A clear plan on the future direction of the Inner Harbour will be critical in determining whether alternative forms of development can occur;
- *Removing general cargo* – will enable existing land to be used for other purposes;
- *Changing port land to another use* – will involve comprehensive land use planning investigations that meet MRS and local planning scheme requirements; and
- *Onshore power for cruise ships* – from a utilities perspective, there is an opportunity to investigate making onshore power available to cruise ships so they do not need to run diesel motors while docked.

27. Fremantle Port Authority, 2010, Inner Harbour Development Plan

28. Local planning schemes are available at [www.planning.wa.gov.au/Local-planning-schemes.aspx](http://www.planning.wa.gov.au/Local-planning-schemes.aspx)

29. Fremantle Ports, 2015, Buffer Guidelines Fact Sheet

30. Western Australian Planning Commission, 2018, Sub-regional planning frameworks, Central sub-region

## 4.4.2. Land use and utilities infrastructure considerations at Kwinana

The Kwinana study area is very large in comparison to the other port locations. It includes parts of the City of Cockburn, City of Kwinana and City of Rockingham that accommodate industrial activities, State Agreement areas, and components of the road and rail network (see Map 9). Rockingham is one of Greater Perth's ten Strategic Metropolitan Centres<sup>31</sup>.

Key precincts within the Kwinana study area are zoned 'Industry' under the MRS that also shows road and rail corridors and reserves, 'Port Installation' areas and land to accommodate infrastructure. The Beeliar Regional Park and a number of smaller areas zoned 'Parks and Recreation' are present. The *Hope Valley Wattleup Redevelopment Act 2000* provided LandCorp with the authority to plan, undertake, promote and coordinate the development and redevelopment of Latitude 32, which operates under its own legislation and is not contained within the MRS.

Development in the study area requires compliance with legislation and policies administered through the Fremantle Port Authority, Western Australian Planning Commission (WAPC), Department of Planning, Lands and Heritage (DPLH), Department of Jobs, Tourism, Science and Innovation (DJTISI), Department of Transport portfolio, LandCorp, environmental agencies, local governments and agencies providing utilities.

With regard to utilities, pipeline networks that run through the study area include:

- gas supplied from the Dampier-Bunbury Natural Gas and Parmelia pipelines;
- water from the Water Corporation's Perth Seawater Desalination Plant that produces 18 per cent of Perth's fresh water supply with water dispersed through trunk and large water mains;
- recycled water from the Kwinana Water Recycling Plant that is distributed through a dedicated network to local industries; and
- wastewater from three wastewater treatment plants located at Woodman Point, Kwinana and East Rockingham.

In addition, the Sepia Depression Ocean Outfall Landline is a significant wastewater pipeline from Woodman Point in the north to Point Peron in the south.

Major improvements to power and water infrastructure are planned, with additional electricity and water substations to support future developments in the medium-term (2022-2031) and long-term (2031-2050), depending on population growth rates.

There are four key industry precincts in the study area:

- *Australian Marine Complex (AMC)* – covering 420 hectares, the AMC focuses on the construction, maintenance and repair of naval and commercial vessels, along with making and assembling modules to support the offshore oil and gas industry. The five precincts of the AMC include areas for fabrication, a common user facility that has a floating dock, a shipbuilding area, a technology innovation area and an area that provides goods and services to support the AMC. The HMAS Stirling naval base is located nearby on Garden Island and the newly established Defence West (part of DJTISI) is exploring opportunities for more defence-related activities to be undertaken at the AMC.
- *Latitude 32 industrial estate (Latitude 32)* – within this 1,400-hectare precinct, land is administered by LandCorp; however, there are still many private landowners who currently undertake mostly rural activities. Many of these landowners are seeking clarity on the future development of the Outer Harbour, as they are unable to secure buyers for their land until this is decided. See the feature box for further information.
- *Kwinana Industrial Area (KIA)* – this covers 1,400 hectares and its core consists of a Strategic Industrial Area that accommodates a wide range of heavy industries, including five refineries and fabrication and construction enterprises. It includes the Kwinana Bulk Terminal and Kwinana Bulk Jetty that are operated by Fremantle Ports and which handle bulk and liquid bulk products. Additionally, there are three private jetties handling alumina (Alcoa), oil (BP) and grain (CBH). Many of the industries operate under long-term lease

31. Strategic Metropolitan Centres are community hubs that provide commercial, retail, entertainment and tourism activities along with education and medical services and where high density housing is well-serviced by public transport



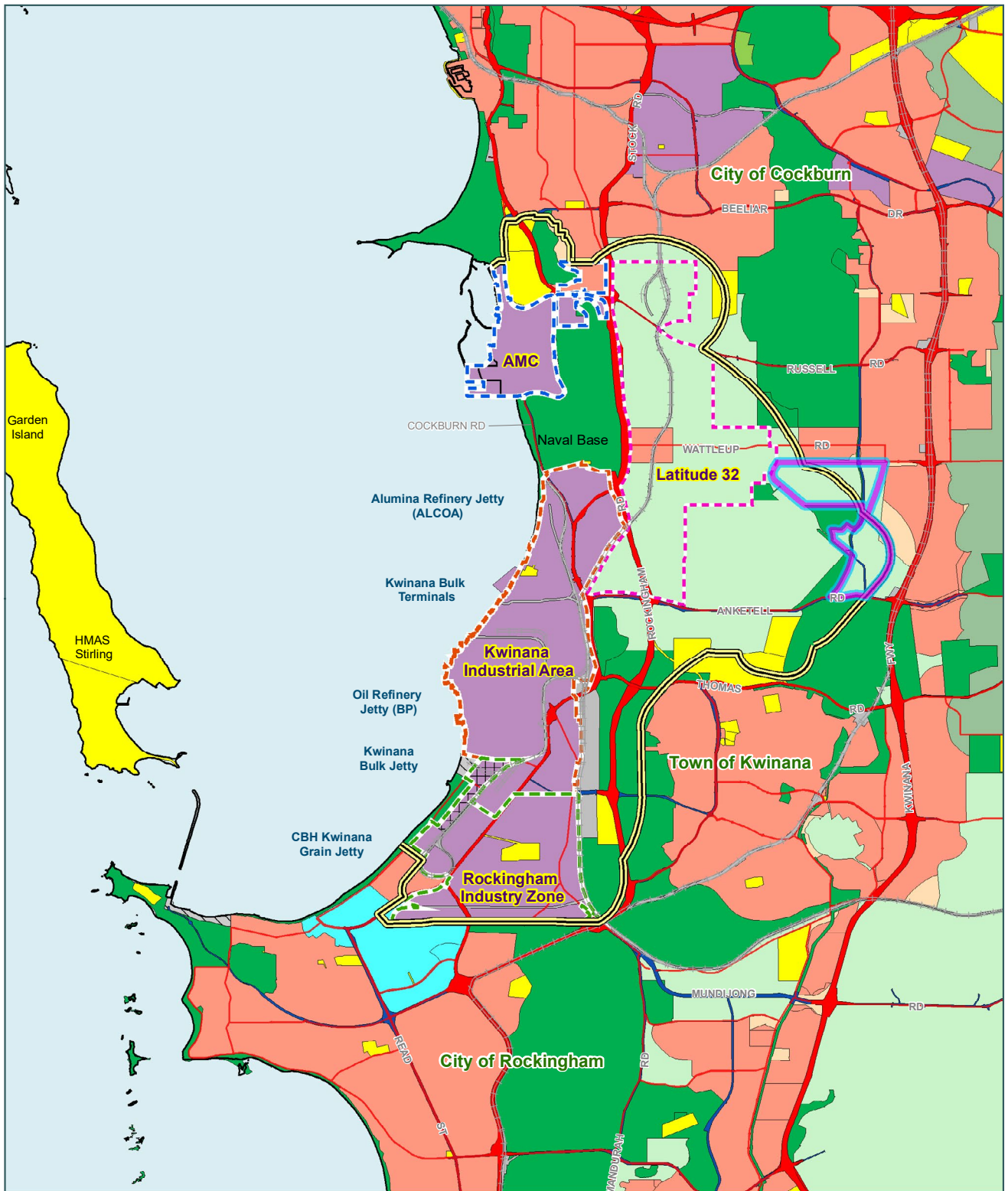
arrangements. The rail and road access to and within the KIA is currently sub-optimal, with two road entrances and a heavily congested rail triangle.

- *Rockingham Industry Zone (RIZ)* – this consists of 1,150 hectares in mixed public and private

ownership with industries including CBH's grain terminal, a chemical plant, a 92-hectare conservation reserve and a wastewater treatment plant. The RIZ comprises land intended for strategic industries which include the downstream processing of nickel and other energy metals.



Map 8: Land use – Kwinana



- |   |                           |                        |                          |
|---|---------------------------|------------------------|--------------------------|
| Freight Rail                                | Latitude 32               | Public Purposes        | Parks and Recreation     |
| Kwinana Air Quality Buffer                  | Rockingham Industry Zone  | Industrial             | Private Recreation       |
| Improvement Plan 47 Mandogalup (Proposed)   | Kwinana Industrial Area   | Special Industrial     | Rural                    |
| <i>*Indicative Alignment - Not To Scale</i> | Australian Marine Complex | Port Installations     | Rural - Water Protection |
| Local Government Boundary                   | Urban                     | Railways               | Waterways                |
|   | Urban Deferred            | Primary Regional Roads |                          |
|   | Central City Area         | Other Regional Roads   |                          |



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## Latitude 32

Latitude 32 Industrial Area is bound by Cockburn Cement's quarrying and batching operations to the north, Anketell Road to the south, Rockingham Road to the west, and the rural areas of Mandogalup and Wattleup to the east.

The estate was an outcome of the recommendations of the WAPC's *Fremantle Rockingham Industrial Area Regional Strategy 2000* and the *Economic and Employment Lands Strategy: Non-heavy Industrial, Perth Metropolitan and Peel Regions 2012* to identify industrial land supply to meet the growing needs of industry sectors.

Given its strategic location, this area is critical for growing the Western Trade Coast – a vital economic hub for the State – due to its access to the freight transport network and availability of land. The broad vision for Latitude 32 encompasses a range of activities associated with freight logistics, general and light industry, and the possibility of an intermodal terminal.

The lack of an endorsed plan on the development of additional port facilities in the Outer Harbour has hindered progression of Latitude 32, and created uncertainty for LandCorp and investors about whether the land will be required for port-related purposes. Most importantly, this has, in many circumstances, prevented local landowners from being able to sell their properties and created hardship.

Upgraded road and rail links will be required to connect this area with the city, airports, other parts of the Western Trade Coast and the Kewdale Industrial Area – where the intermodal terminal servicing the eastern states is located. However, planning for road and rail links has been deferred until the long-term future of the Outer Harbour is clarified.

To determine Latitude 32's role in the Strategy, the Westport Taskforce is working with LandCorp to respond to critical project area requirements and to coordinate planning. This includes providing much-needed certainty for private landowners, progressing planning for strategic freight routes, and identifying constraints to development and ways to work through each issue. The Taskforce will continue to collaborate with stakeholders, including the landowners, as it works through these steps.

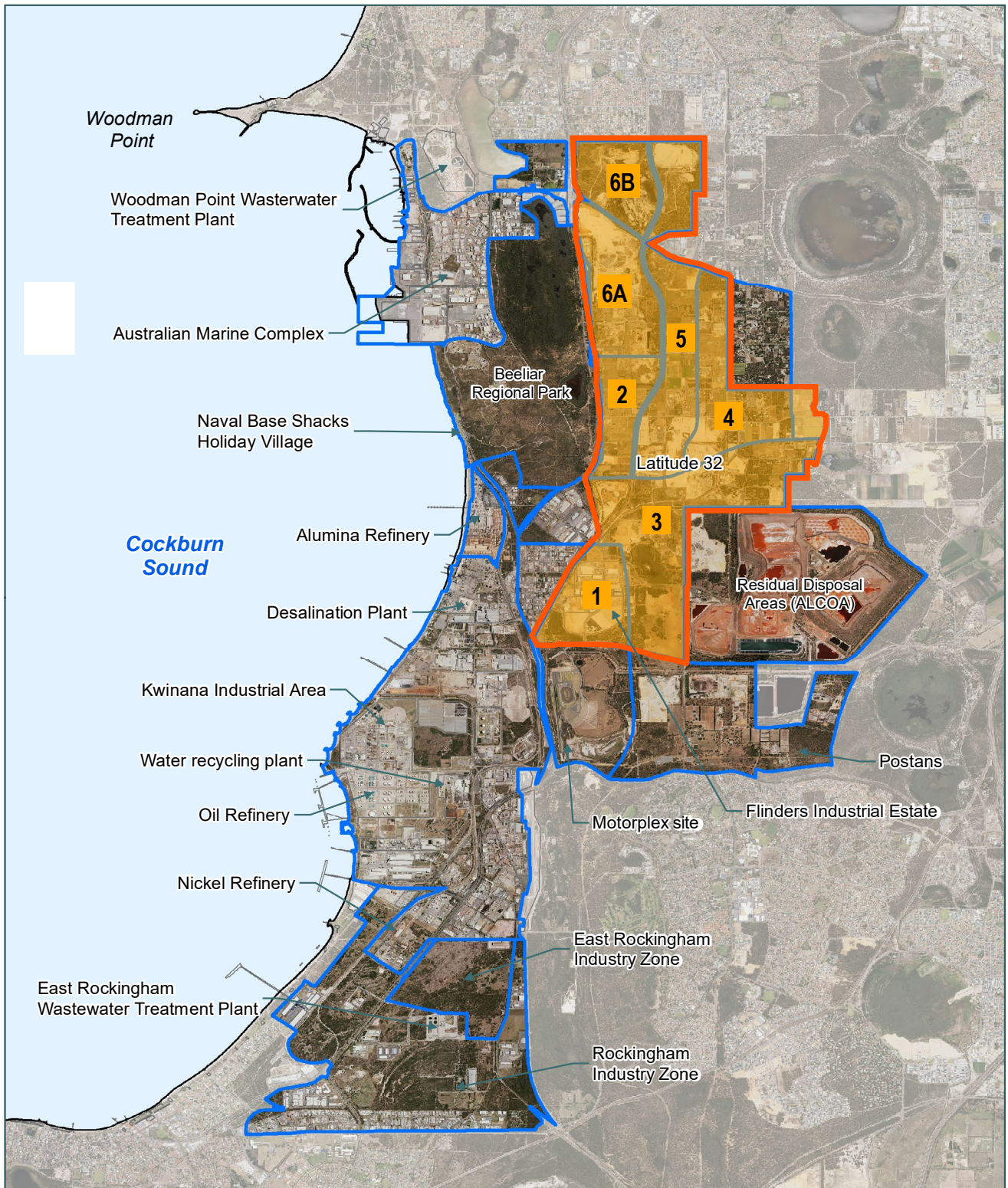
### Key land use planning and utilities infrastructure considerations at Kwinana include:

- *Naval Base Shacks Holiday Village* – located between Mount Brown and the ocean the Holiday Village consists of 176 holiday shacks. The City of Cockburn currently manages this site through a management plan that allows five-year lease terms with subsequent leasing at the discretion of the City of Cockburn. Lessees may stay in their shacks for up to 120 days in a calendar year<sup>32</sup>.
- *State agreements* – there are six in place to support the establishment and operation of some large industries including cement works, alumina and oil refineries, fertilisers, as well as some mineral sands mining in Cockburn Sound. These are all administered by DJTSl.

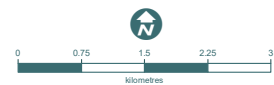
32. City of Cockburn, Naval Base Holiday Park Management Plan, [www.cockburn.wa.gov.au](http://www.cockburn.wa.gov.au)



Map 9: Key locations of land use and utilities infrastructure considerations – Kwinana



Development Precincts



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- *Kwinana Air Quality Buffer zone* – established in 1992, the buffer is used to manage interactions between industry and sensitive land uses. The Environmental Protection (Kwinana) (Atmospheric Wastes) Policy 1999 provides for the monitoring of ambient air quality standards. State Planning Policies already exist and are currently under review, to protect industrial zones and provide for appropriate planning of compatible land uses<sup>33</sup>, as well as to manage potential noise levels and protect major transport corridors<sup>34</sup>.

## Opportunities

- *AMC* – as an advanced ship building, fabrication and oil and gas industry support centre, the AMC has the potential to be involved in future defence-related activities given its wide range of facilities and experienced workforce. Additional capacity may be available at Latitude for the AMC to grow if required so it may respond flexibly to changing economic cycles.
- *Lot sizes within Latitude 32* – there are large areas of land available (from two hectares to over 100 hectares) which are not available in the KIA. They are suitable for general and light industry to support economic growth and could potentially accommodate an intermodal terminal and transport services.
- *Industrial symbiosis* – past and current planning of the KIA is recognised for its attention to fostering industrial symbioses to maximise benefits for users across the estate. Many industries in the KIA already benefit from utilising the outputs of nearby operations<sup>2</sup> through a complex system of pipework and there may be opportunities to expand these synergies in the future.
- *Future of Inner Harbour* – opportunities in Kwinana are tied to the future of Fremantle's Inner Harbour, particularly the timing of any trade reconfigurations. Should the management of the trade task include more functions at Kwinana, then new opportunities to facilitate economic growth will emerge, particularly growth of associated industries.
- *Other opportunities in Kwinana* are linked to the availability of industrial land close to existing industries and a potential new port.

### 4.4.3. Land use and utilities infrastructure considerations at Bunbury

The Bunbury study area includes Bunbury Port, Bunbury City Centre and surrounding industrial lands. The Greater Bunbury Region includes the City of Bunbury, located 175 kilometres south of Perth, as well as the Shires of Harvey, Dardanup and Capel.

From a land ownership perspective, the port is vested in the Southern Ports Authority, while Bunbury City Centre and industrial areas are a mix of private and public ownership.

The Greater Bunbury Regional Scheme<sup>35</sup> zones the port as 'Port Installation'. The City of Bunbury includes a 'Regional Centre' and 'Urban' zone. There are areas zoned 'Industrial' and large areas of land zoned 'Urban' in surrounding local governments. Land use is also controlled through the local planning schemes of the City of Bunbury and the three town planning schemes of the Shires of Capel, Dardanup and Harvey.



33. State Planning Policy 4.1: Industrial Interface, Department of Planning, Lands and Heritage (draft)

34. State Planning Policy 5.4: Road and Rail Transport, Noise and Freight Considerations in Land Use Planning, Department of Planning, Lands and Heritage (draft)

35. Western Australian Planning Commission, 2013, Greater Bunbury Strategy, [https://www.planning.wa.gov.au/dop\\_pub\\_pdf/Greater\\_Bunbury\\_Strategy\\_2013.pdf](https://www.planning.wa.gov.au/dop_pub_pdf/Greater_Bunbury_Strategy_2013.pdf)



Development opportunities, including interfaces between the port and the surrounding areas, are managed through the Southern Ports Authority’s Inner Harbour Structure Plan and local government.

The Southern Ports Authority is investigating future opportunities at the port, including providing additional capacity to meet the growing trade task and upgrading the Outer Harbour to encourage more cruise vessels. The Bunbury City Centre has well-established commercial, leisure and recreational facilities, and its proximity to the port creates opportunities for tourism.

Development in the Bunbury study area is controlled through legislation and policies of the Southern Ports Authority, WAPC, DPLH, DJTSL, South West Development Commission, Transport Portfolio agencies<sup>36</sup>, LandCorp, utility and environmental agencies and the local governments.

Power is provided through the South West Interconnected System from coal-fired power stations at Muja and Collie. To handle future developments, upgrades are planned for the Picton and Bunbury substations, with a new substation planned for Dalyellup. Water is provided by Aqwest in Bunbury and Water Corporation in surrounding areas, with water coming from groundwater and surface water sources. The Southern Seawater Desalination Plant, located at Binningup north of Bunbury, supplies about one third of Perth’s total fresh water needs.

The key industry precincts in the study area include:

- *Kemerton Strategic Industrial Area* – consisting of 7,543 hectares located 17 kilometres north of Bunbury. This is zoned a significant heavy industry area and will likely remain so in the future. At the present time, the heavy industry core accommodates a number of resource processing and chemical manufacturing industries and projects associated with the resources sector.
- *Preston Industrial Park* consisting of 2,950 hectares has been identified for industrial development. This land is being developed in precincts, including the:
  - *Picton Industrial Park Southern Precinct*<sup>37</sup> covering 510 hectares, of which 384 hectares are zoned for industrial use, accommodating light and general industrial activities; and
  - *Preston Industrial Park Northern Precinct*<sup>38</sup>, which will eventually provide a total of 505 hectares – 50 hectares has already been developed, while there are approximately 250 hectares of developable land and 234 hectares of conservation and enhancement areas.
- *Waterloo Industrial Park* will soon become available, adding a further 1,285 hectares for industrial use and associated infrastructure together with zoning for rural and regional open space reserves.<sup>39</sup>

36. Transport Portfolio agencies include the Department of Transport, Main Roads Western Australia and the Public Transport Authority

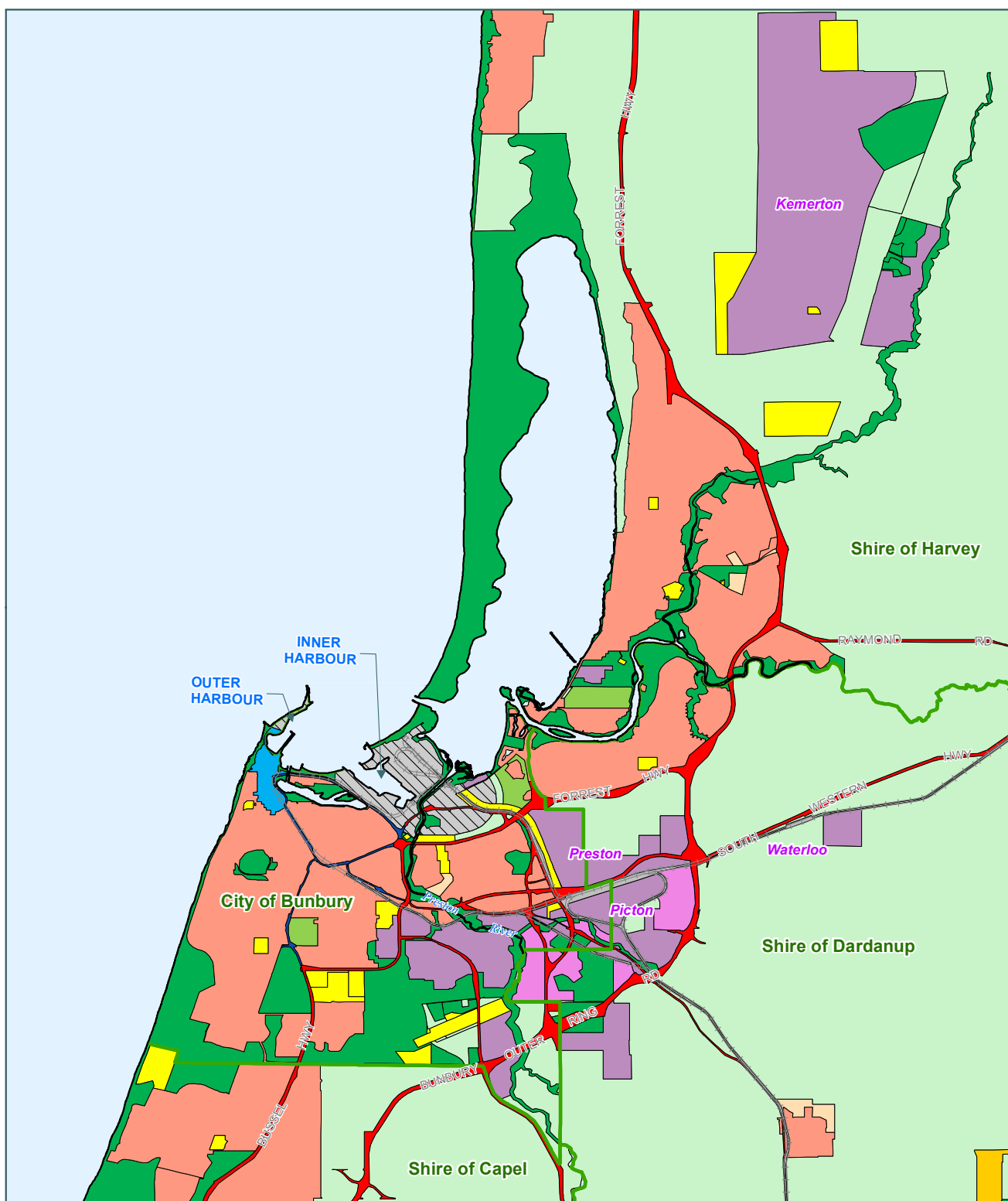
37. Western Australian Planning Commission, 2016, Picton Industrial Park Southern Precinct Draft District Structure Plan [https://www.planning.wa.gov.au/dop\\_pub\\_pdf/Draft\\_Picton\\_Industrial\\_Park2016.pdf](https://www.planning.wa.gov.au/dop_pub_pdf/Draft_Picton_Industrial_Park2016.pdf)

38. Landcorp, 2016, Preston Industrial Park – Northern Precinct, <https://www.landcorp.com.au/Documents/Projects/Industrial/Preston%20Industrial%20Park/Preston%20Industrial%20Park%20Flyer%20October%202016.pdf>

39. Western Australian Planning Commission et al, 2017, draft Waterloo Industrial Park District Structure Plan, [https://www.planning.wa.gov.au/dop\\_pub\\_pdf/Draft\\_Waterloo\\_Industrial\\_Park\\_District\\_Structure\\_Plan.pdf](https://www.planning.wa.gov.au/dop_pub_pdf/Draft_Waterloo_Industrial_Park_District_Structure_Plan.pdf)



Map 10: Land use – Bunbury



- |  |                           |  |                        |  |                     |
|--|---------------------------|--|------------------------|--|---------------------|
|  | Freight Rail              |  | Industrial             |  | State Forests       |
|  | Local Government Boundary |  | Industrial Deferred    |  | Regional Open Space |
|  | Urban                     |  | Port Installations     |  | Private Recreation  |
|  | Urban Deferred            |  | Railways               |  | Rural               |
|  | Regional Centre           |  | Primary Regional Roads |  | Waterways           |
|  | Public Purposes           |  | Other Regional Roads   |  |                     |



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## Key land use planning and utilities infrastructure considerations at Bunbury include:

- *Timing and nature of future port requirements*, as any changes to Fremantle and Kwinana may have a flow-on effect in Bunbury.
- *Intermodal terminal facilities* – the Picton South Structure Plan<sup>40</sup> and the draft Waterloo Structure Plan<sup>41</sup> have identified potential sites for establishing intermodal facilities as part of respective planning processes. More detailed investigations are required to examine the feasibility of these options in the context of the wider freight task serviced by the Bunbury Port.

## Opportunities

- *Kemerton Strategic Industrial Area* – is recognised as one of the State’s priority strategic industrial areas and is intended for strategic industries including downstream processing of resources such as lithium, as well as chemical manufacturing and other high value heavy industry uses.
- *Possible expansions of the Perth freight task to include Bunbury* – would be a significant driver of future employment opportunities and also stimulate community development.
- *Tourism* – the redevelopment of the Outer Harbour area into a tourism and entertainment precinct presents an opportunity to attract more cruise ships.

## 4.5. ENVIRONMENTAL AND SOCIAL CONSIDERATIONS

The Westport Taskforce is committed to protecting biodiversity, ecosystem health and social amenity in Fremantle, Kwinana and Bunbury. However, it can be difficult to build new or expand existing infrastructure that is essential for WA’s economic prosperity without having an impact on the environment.

The Taskforce has adopted the PIANC Working with Nature<sup>42</sup> philosophy that ensures environmental and social objectives are built into the project at the planning phase, when the capacity to secure benefits are highest.

The Westport Strategy presents a unique opportunity. Between the finalisation of the Strategy and the construction of any new infrastructure, there will be an opportunity to consider environmental issues, implement monitoring programmes and undertake work to build resilience into the habitats that may be impacted.

With 28 representatives from key government agencies, conservation, industry and research groups, the Environmental Work Stream has:

- identified and defined a total of 79 key environmental and social values within the Fremantle, Kwinana and Bunbury study areas;
- identified potential future sources of pressure in each study area, including pressures not associated with potential port development; and
- discussed possible implications of port-related development on these values in order to identify potential environmental issues and to prioritise areas for further investigation.

Figure 8 represents how the activities of the Environmental Work Stream align with the development of the Westport Strategy.



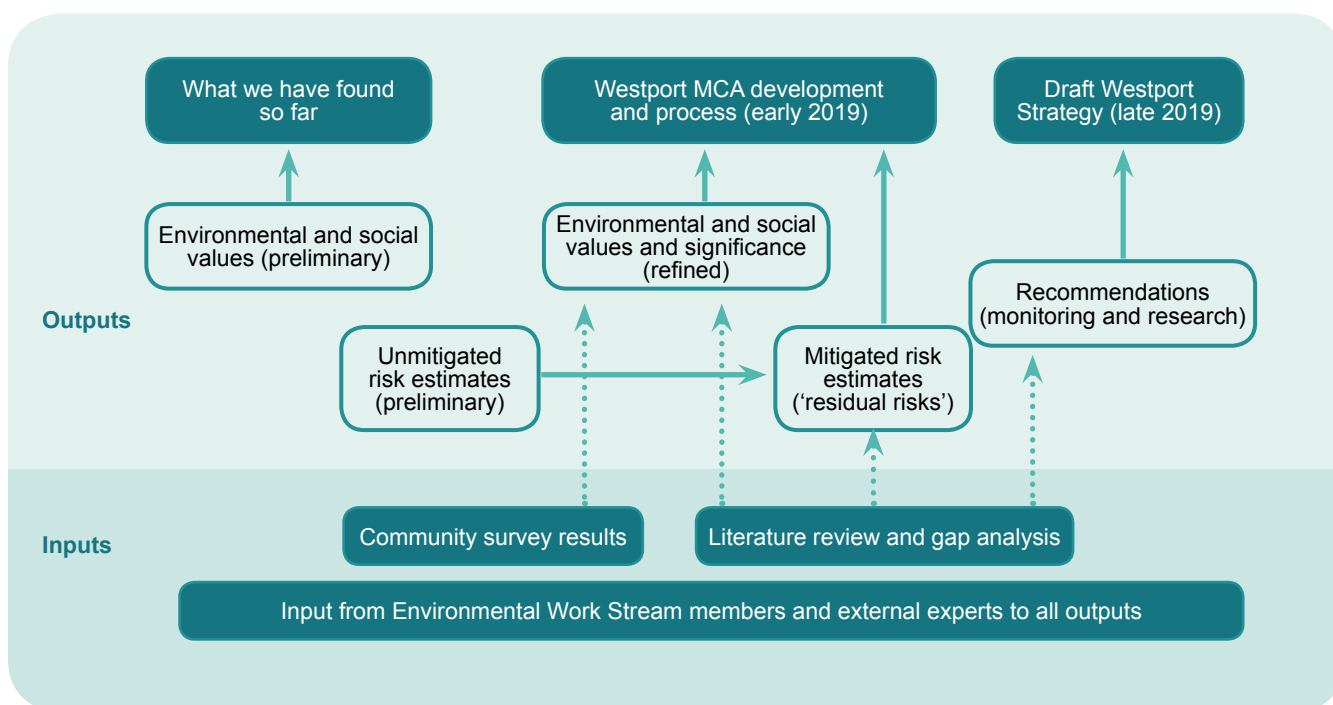
40. WAPC, 2016

41. WAPC, 2018

42. The PIANC (The World Association for Waterborne Transport Infrastructure) Working with Nature philosophy, <http://www.pianc.org/workingwithnature.php>



Figure 8: Environmental Work Stream input into the Westport Strategy



There is a substantial difference in the scale of potential development in the three study areas. An increase in throughput at Fremantle Ports' Inner Harbour represents the smallest scale of development, while the construction and operation of a new container port at Kwinana and associated intermodal terminals and freight routes representing the largest scale of development. This is reflected in the size of the study areas, with:

- the Fremantle study area being restricted to an area within 3 kilometres from the existing port;
- the Kwinana study area encompassing the whole of Cockburn Sound and the land surrounding required new freight corridors up to 20 kilometres inland; and
- the Bunbury study area encompassing Koombana Bay and the land surrounding the proposed port expansion and the planned Bunbury Outer Ring Road.

At this stage, the Kwinana study area is extensive so that investigations can inform the location and size of any potential additional port facilities – and the impacts associated with various location options may be compared and assessed. On the land side, the inland transport corridors will likely be required for future urban growth and industrial expansion regardless of any additional port developments, but the width of the transport corridors will be informed by potential port expansion in the area.

The values for each of the three study areas have been arranged into four groups:

- Marine and estuarine environmental values
- Terrestrial environmental values
- Marine and estuarine social values, assets and uses
- Terrestrial social values, assets and uses

Tables 9-12 compare the values present in the Fremantle, Kwinana and Bunbury study areas.

### 4.5.1. Marine and estuarine environmental values

A total of 21 marine and estuarine environmental values were identified across the three study areas. These included seagrass habitat, Australian sealions, fairy terns, little penguins, bottlenose dolphins, pink snapper, whitebait, King George whiting and blue swimmer crabs. Of these 21 values, 12 were identified in the Fremantle study area, 18 in the Kwinana study area and 14 in the Bunbury study area (Table 10).

**Table 10: Marine and estuarine environmental values**

MARINE & ESTUARINE ENVIRONMENTAL VALUES					
ID	CATEGORY		FREMANTLE	KWINANA	BUNBURY
	SUB CATEGORY	SPECIFIC			
1	Integral functioning ecosystem		●	●	●
2	Sheltered marine ecological community			●	●
3	Biological diversity		●	●	●
4	High level of water quality		●	●	●
5	High level of sediment quality		●	●	●
<b>Significant benthic communities and habitats</b>					
6	Seagrass habitat			●	●
<b>Listed and significant fauna:</b>					
Threatened fauna for which area provides significant habitat					
7		Australian sealion	●	●	●
8		Fairy tern	●	●	●
9		Other threatened fauna	●	●	●
10	Priority & specially protected fauna		●	●	●
11	Migratory birds		●	●	●
Iconic fauna					
12		Little penguins	●	●	
13		Bottlenose dolphins	●	●	●
<b>Regionally significant spawning / nursery area</b>					
14		Pink snapper		●	
15		Whitebait			●
16		King George whiting (nursery)		●	
17		Garfish		●	
18		Blue swimmer crab		●	
<b>Marine reserves (existing and proposed)</b>					
19		Shoalwater Islands Marine Park		●	
20		Swan Estuary Marine Park	●		
21		Leschenault Regional Park (p)			●
<b>Total number of values</b>			<b>12</b>	<b>18</b>	<b>14</b>
Key: ● value present					

## 4.5.2. Terrestrial environmental values

The 21 identified terrestrial environmental values included Bush Forever sites and remnant vegetation, Black cockatoos, western ringtail possums as well as wetlands and ground formations such as Mount Brown and the Henderson cliffs. Of these 21 values, 10 were identified in the Fremantle study area, 16 in the Kwinana area and 15 in the Bunbury area (Table 11).

**Table 11: Terrestrial environmental values**

TERRESTRIAL ENVIRONMENTAL VALUES						
ID	CATEGORY			FREMANTLE	KWINANA	BUNBURY
	SUB CATEGORY		SPECIFIC			
<b>Terrestrial reserves (existing and proposed)</b>						
22			Existing		●	●
23			Proposed			●
<b>Significant habitats for biodiversity conservation:</b>						
24			Bush Forever sites	●	●	
25			Remnant native vegetation	●	●	●
<b>Listed and significant fauna</b>						
Threatened						
26			Black Cockatoo (threatened)	●	●	●
27			Western ringtail possum			●
28			Other threatened fauna	●	●	●
29			Priority & specially protected fauna	●	●	●
<b>Listed and significant flora</b>						
30			Threatened flora		●	
31			Priority flora	●	●	●
<b>Conservation significant communities</b>						
32			All State and Commonwealth listed Threatened Ecological Communities – TEC; and Priority Ecological Communities – PEC		●	●
<b>Significant Wetlands</b>						
33			Swan Canning Estuary	●		
34			Beeliar Regional Park		●	
35			Leschenault Inlet/Estuary			●
36			Other significant wetlands (i.e. geomorphic and 'conservation' / 'resource enhancement' wetlands)		●	●
37			High level of terrestrial environmental quality	●	●	●
<b>Groundwater and surface water resource</b>						
38			Hydrological resource	●	●	●
39			High level inland water EQ			●
<b>Significant Landforms / features</b>						
40			Henderson Cliffs		●	
41			Mt Brown		●	
42			Other	●	●	●
<b>Total number of values</b>				<b>10</b>	<b>16</b>	<b>15</b>
Key: ● value present						



### 4.5.3. Marine and estuarine social values, assets and uses

The 16 identified marine and estuarine social values, assets and uses included heritage, public health, social and community and business, industry and commercial categories. These values included recreational activities such as fishing, swimming and boating as well as commercial fisheries, aquaculture and assimilation of wastewater. Of these 16 values, 13 were identified in the Fremantle study area, 15 in the Kwinana area and 12 in the Bunbury area (Table 12).

**Table 12: Marine and estuarine social values, assets and uses**

MARINE & ESTUARINE SOCIAL VALUES, ASSETS AND USES					
ID	CATEGORY		FREMANTLE	KWINANA	BUNBURY
		SUB CATEGORY			
	Heritage				
42		Aboriginal	●	●	●
43		Maritime & historic	●	●	●
	Public health				
44		High quality source water for desalination		●	
45		Recreational water quality	●	●	●
46		Seafood quality safe for eating	●	●	●
	Social and community				
47		Recreational fishing	●	●	●
48		Recreational swimming	●	●	●
49		Recreational boating access	●	●	●
50		Marina facilities	●	●	●
51		Educational & scientific values	●	●	●
52		Landscape and visual amenity	●	●	●
	Business, industry & commercial				
53		Tourism (including ferries and cruise ships)	●		●
54		Commercial fisheries	●	●	●
55		Aquaculture	●	●	
56		Suitable quality water for industrial use		●	
57		Assimilation of wastewater		●	
		<b>Total number of values</b>	<b>13</b>	<b>15</b>	<b>12</b>
Key: ● value present					

#### 4.5.4. Terrestrial social values, assets and uses

The 22 identified terrestrial social values, assets and uses were grouped into heritage, public health, social and community, business industry and commercial and connectivity and access categories. These values included air quality, odour, beaches, horse beaches, agriculture, tourism, road safety and ease of access. Of these 22 values, 15 were identified in the Fremantle study area, 21 in the Kwinana area and 18 in the Bunbury area (Table 13).

**Table 13: Terrestrial social values, assets and uses**

TERRESTRIAL SOCIAL VALUES, ASSETS AND USES					
ID	CATEGORY		FREMANTLE	KWINANA	BUNBURY
		SUB CATEGORY			
Heritage					
58		Aboriginal	●	●	●
59		Historic	●	●	●
Public health					
60		Air quality	●	●	●
61		Dust	●	●	●
62		Noise	●	●	●
63		Odour	●	●	●
Social and community					
64		Beaches		●	●
65		Horse beach		●	
66		Naval base shacks		●	
67		Walk trails		●	
68		Four-wheel driving			●
69		Coastal access		●	●
70		Natural areas / open space	●	●	●
71		Educational & scientific values	●	●	●
72		Landscape and visual amenity	●	●	●
Business, industry and commercial					
73		Industrial use	●	●	●
74		Urban development	●	●	●
75		Agriculture		●	
76		Tourism	●	●	●
Connectivity and access					
77		Road safety	●	●	●
78		Access to transport options	●	●	●
79		Ease of transport (lack of congestion)	●	●	●
<b>Total number of values</b>			<b>15</b>	<b>21</b>	<b>18</b>
Key: ● value present					

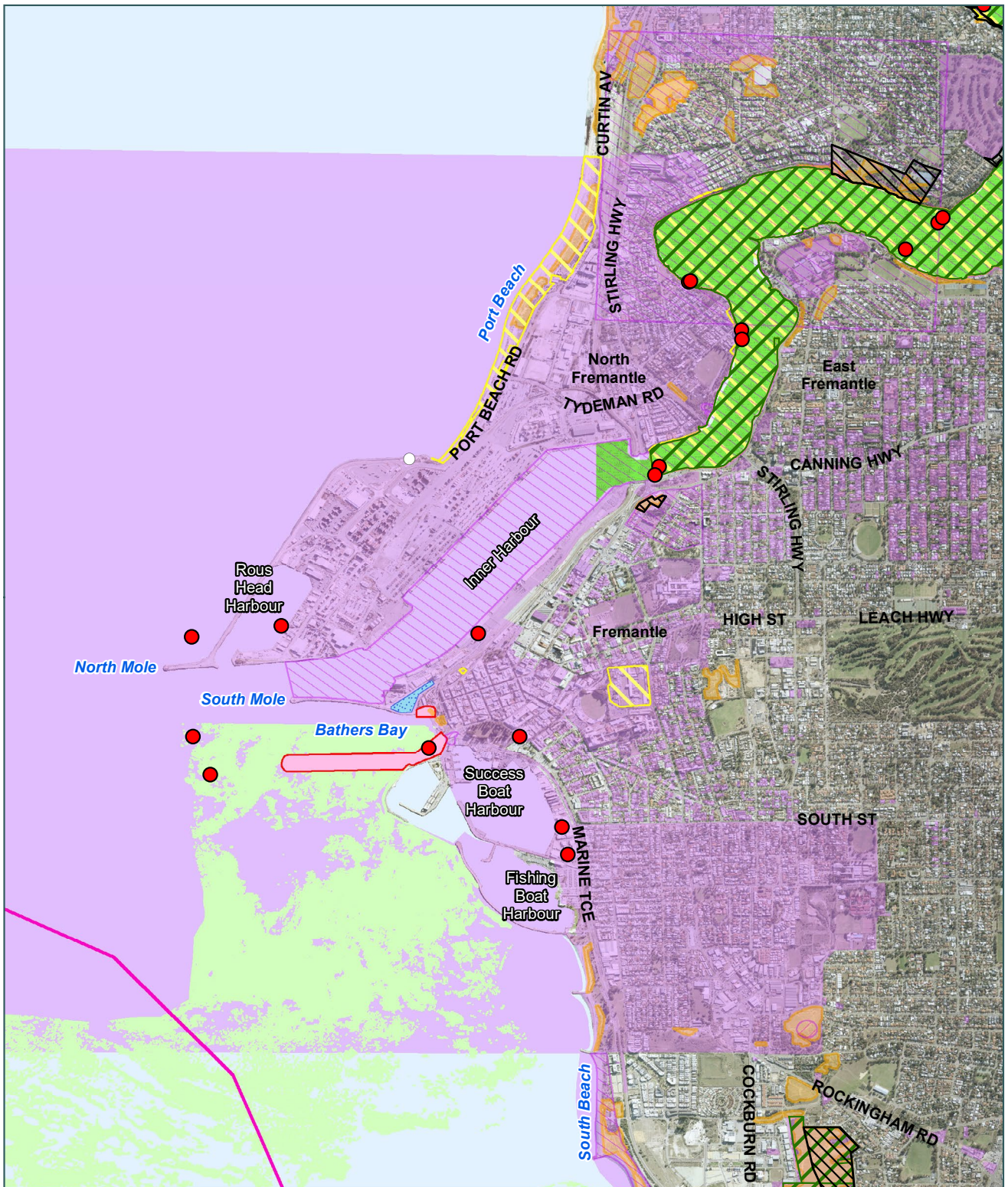
#### 4.5.5. Environmental and social considerations at Fremantle

The Fremantle study area consists of the existing port footprint and a zone extending up to 2.5 kilometres around the port. This study area reflects that the Inner Harbour is an established port that is located in an urban area, where amenity is a defining characteristic.

Risks associated with an increase in throughput at the existing Inner Harbour, such as impacts related to dredging to deepen the existing channel and berths, will be investigated in Stage 2, along with potential new freight roads and rail routes and Impacts on urban social values such as road safety, ease of access and air quality

The locations of Fremantle's key environmental and social values are shown in Map 11.

Map 11: Environmental and social values – Fremantle



- |   |   |  |
|---|---|--|
| Bush Forever Areas                                  | Indicative Pink Snapper Spawning Ground | Fairy Terns Breeding Sanctuary                     |
| DBCA Legislated Lands and Waters; Lands of Interest | Maritime Archaeological Sites           | Shipwrecks   |
| Reserves with a Conservation Purpose                | Seagrass                                | State Heritage Places                              |
| Aquaculture Sites                                   | Geomorphic Wetlands - Conservation      | Aboriginal Heritage Places - Registered Sites      |
|   |   | Aboriginal Heritage Places - Other Heritage Places |

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kilometres

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#### 4.5.6. Environmental and social considerations at Kwinana

The Kwinana study area encompasses the coastal strip of land between Woodman Point and Point Peron, the whole of Cockburn Sound and the stretches of land directly adjacent to the two proposed freight routes (Rowley and Anketell Roads) extending up to 20 kilometres inland. The study area supports extensive leisure activity, aquaculture, recreational and commercial fishing, much of Perth's heavy industry, the AMC and HMAS Stirling on Garden Island.

At this stage, the Kwinana study area is extensive so that investigations can inform the location and size of any potential additional port facilities – and the impacts associated with various location options may be compared and assessed. On the land side, the inland transport corridors will likely be required for future urban growth and industrial expansion regardless of any new port developments, but the

width of the transport corridors will be informed by potential port expansion in the area.

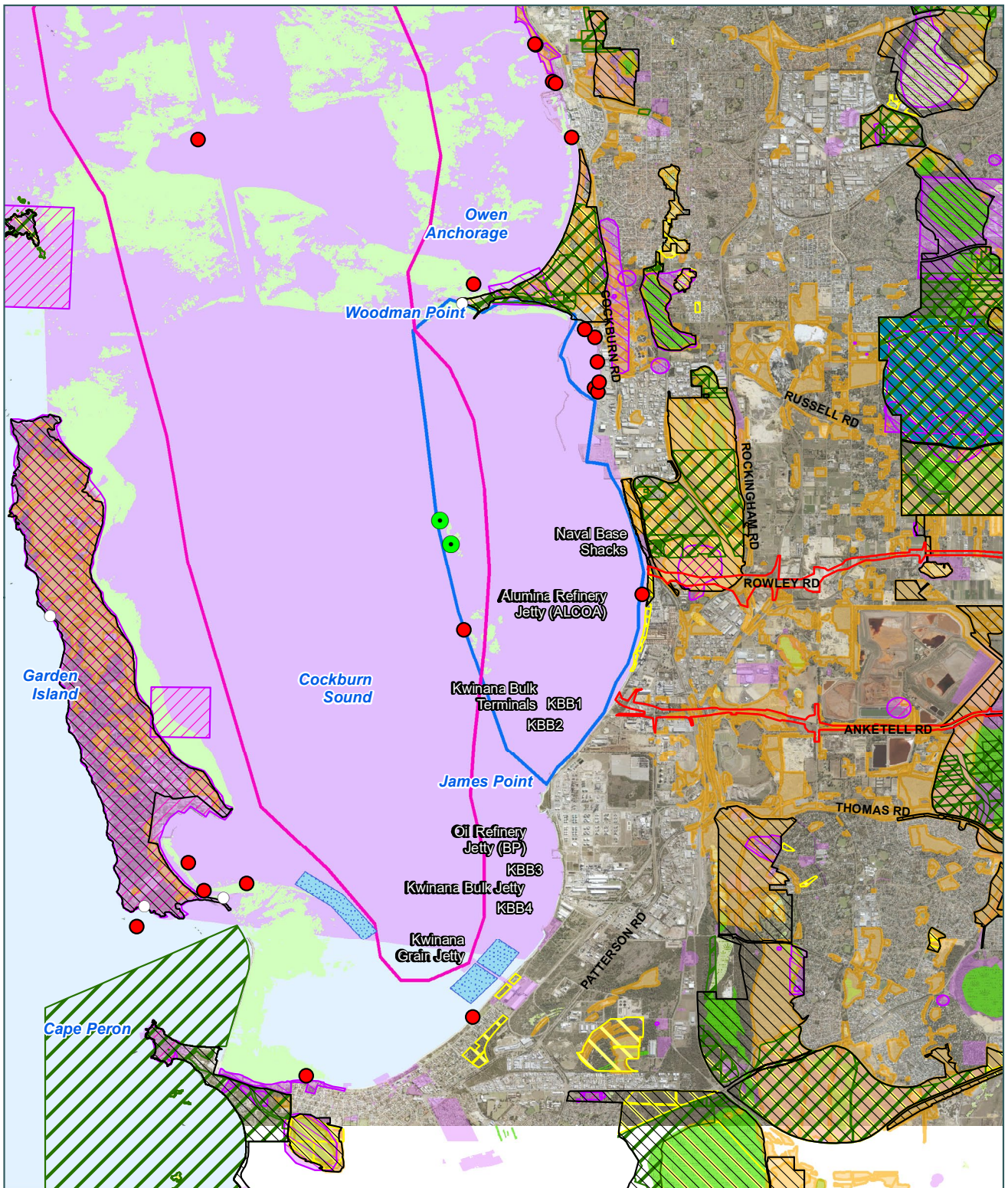
In Stage 2, the Environmental Work Stream will consider risks associated with:

- an expansion of operations in the Outer Harbour, including the construction and operation of a new container port;
- proposed extensions and expansions of Rowley and Anketell Roads;
- dredging and shipping traffic associated with potential new channels north and south of Garden Island, a second approach channel parallel to the existing shipping channel and a turning basin; and
- a potential second Perth Seawater Desalination Plant adjacent to the existing plant, including potential reconfiguration of the associated inlets and outfalls to deeper waters.

The locations of key environmental and social values for Kwinana are shown in Map 12.



Map 12: Environmental and social values – Kwinana



Proposed Freight Road Corridors	Indicative Dolphin Foraging and Nursing Ground	Fairy Terns Breeding Sanctuary
DBCA Legislated Lands and Waters; Lands of Interest	Indicative Pink Snapper Spawning Ground	Recreational Fishing Spots
Reserves with a Conservation Purpose	Ramsar Wetlands	Shipwrecks
TEC/PEC Boundaries	Geomorphic Wetlands - Conservation	State Heritage Places
Aquaculture Sites	Geomorphic Wetlands - Resource Enhancement	Aboriginal Heritage Places - Registered Sites
Seagrass		Aboriginal Heritage Places - Other Heritage Places

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#### 4.5.7. Environmental and social considerations at Bunbury

The Bunbury study area is defined as the zone occupied by the port footprint (as identified by Southern Ports Authority), as well the Bunbury Outer Ring Road (BORR) extending 15 kilometres from the port.

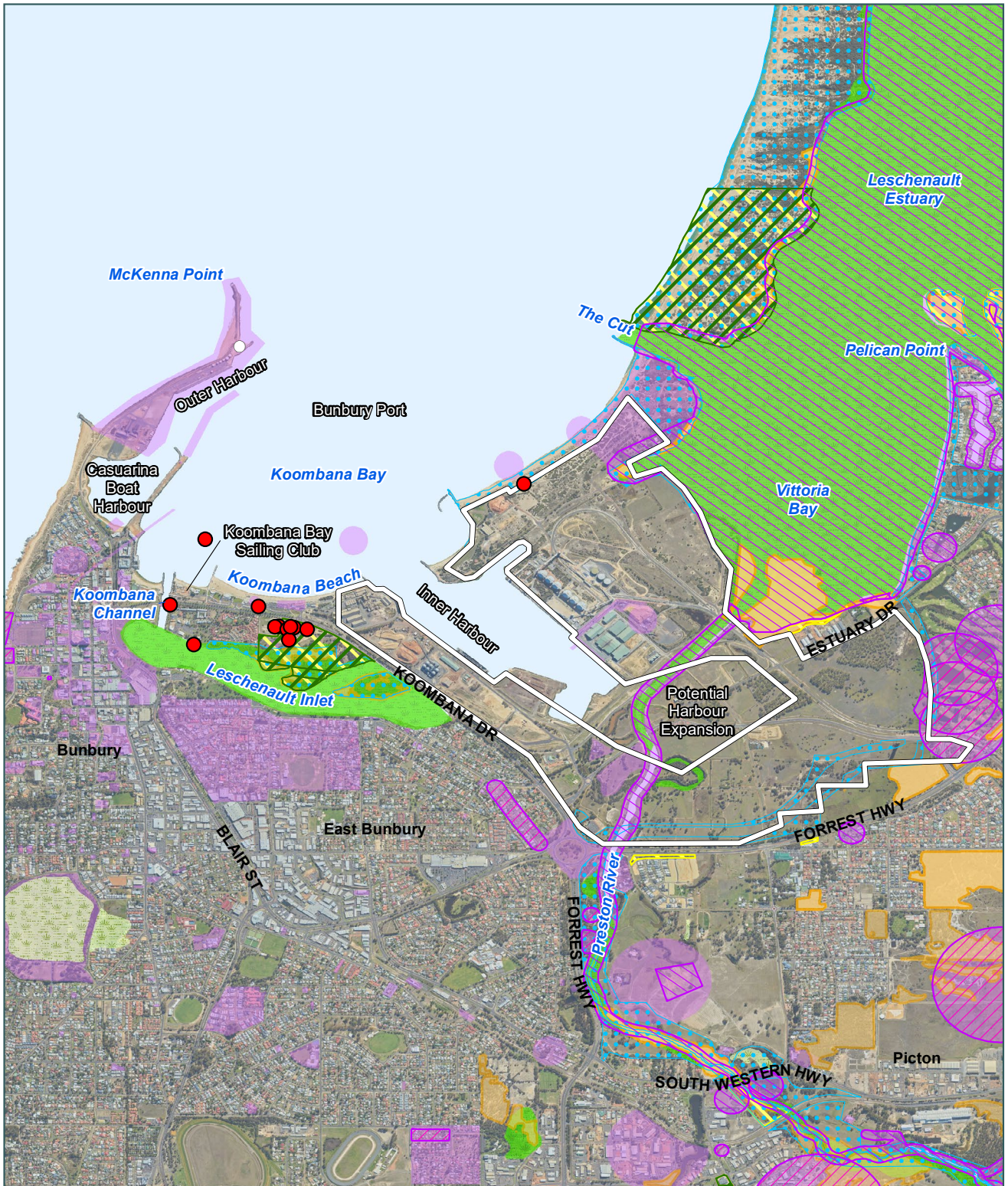
The Environmental Work Stream will consider in Stage 2, risks associated with:

- expansion of the port further inland;
- dredging associated with deepening the existing shipping channel and Harbour;
- truncation of the Preston River (which transfers river outflow from Leschenault Estuary to the harbour);
- port-related development of the land surrounding the harbour; and
- the proposed development of the BORR, and expansions of Casuarina Harbour and Koombana Bay Sailing Club.

The locations of key environmental and social values in Bunbury are shown in Map 13.



Map 13: Environmental and social values – Bunbury



- |   |  |  |
|---|--|--|
| Potential Bunbury Port Expansion                    | TEC/PEC Boundaries                         | Fairy Terns Breeding Sanctuary                     |
| DBCA Legislated Lands and Waters; Lands of Interest | Geomorphic Wetlands - Conservation         | Shipwrecks   |
| Proposed Regional Parks                             | Geomorphic Wetlands - Resource Enhancement | State Heritage Places                              |
| Reserves with a Conservation Purpose                |  | Aboriginal Heritage Places - Registered Sites      |
|   |  | Aboriginal Heritage Places - Other Heritage Places |



Produced by Westport Taskforce on behalf of Department of Transport, WA.  
 File: \\essand1\kchive\Westport\MapDocuments\WS7\_EnvironmentalAndSocialValuesBunbury\_Map14\_A4\_20180628.mxd  
 Base information supplied by the Western Australian Land Information Authority, SLIP 1041-2017-1  
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#### 4.5.8. Environmental and social considerations – next steps

In Stage 1 of the Westport process, the Environmental Work Stream identified a total of 79 marine and terrestrial environmental and social values at Fremantle, Kwinana and Bunbury.

Possible implications of port-related development on these values were discussed to identify potential environmental issues and to prioritise areas for further investigation. Within each area of interest, a number of values were identified that may be, or are likely to be, at risk of impact and that will need further investigation.

In Stage 2, the Environmental Work Stream will study these values further, identify and consider risk control measures and conduct an environmental risk assessment. The results will inform Westport's multi-criteria assessment and assist with planning and designing port-related development to avoid significant impacts. The Environmental Work Stream will focus on:

- reviewing and examining values and risks in more detail;
- defining and, where possible, addressing knowledge gaps;
- investigating potential control measures for avoiding, mitigating and offsetting potential impacts as well as opportunities for enhancing environmental and social values; and

- estimating residual risks.

Studies will include:

- a scientific literature review and gap analysis;
- an analysis of risks to urban social values from an increase in freight and port activity;
- identification and investigation of control measures and opportunities;
- consideration of the risks and potential impacts to environmental and social values from global climate change;
- a community survey for value mapping and weighting and the identification of potential issues;
- development of recommendations for research and environmental monitoring programs to address key gaps; and
- predictive scenario modelling (to investigate hydrodynamic implications of potential designs).

More comprehensive technical investigations, such as flora, fauna and ecological community surveys and mapping, high quality benthic habitat mapping and analysis, sediment fate modelling and detailed geotechnical studies (where required), are currently out of scope. These would generally be undertaken when a preferred option is endorsed by Government in the lead-up to an Environmental Impact Assessment process.





# 5. Communication, consultation and engagement

A key aspect of the Westport process has been to involve all members of the Taskforce in the development of the work streams, which comprised members from State and local government agencies, industry, academia and community groups, as well as other subject matter experts as required. Through numerous meetings, workshops, research and site visits, the work streams have shared and discussed information from many perspectives, identifying problems and opportunities in the process.

With more than 100 stakeholders involved, sound project governance has been keeping the project on track and has included:

- risk management being undertaken on the overall project, as well as for each individual work stream;

- six-monthly risk ‘health checks’ being undertaken with an independent external consultant;
- strictly adhering to Infrastructure Australia’s processes<sup>43</sup>; and
- appointing independent peer reviewers to assess Westport’s procedures.

The Westport Taskforce is closely following the ISCA stakeholder engagement framework in the IS V2.0 Planning Rating, with a view to achieving accreditation. We are applying five ‘beyond business as usual’ principles<sup>44</sup> to stakeholder engagement to ensure all relevant parties are properly identified and have the opportunity to provide input that will be used to guide the decision-making process (see Table 14).

**Table 14: ISCA’s guiding principles for stakeholder engagement**

PRINCIPLE	DESCRIPTION
<b>Clarity of Purpose</b>	The extent to which the purpose of engagement, and how input will be used, is clear
<b>Inclusive</b>	The extent to which those that are potentially affected by, or interested in, a project are able to be involved
<b>Integrated</b>	The extent to which stakeholder engagement is integrated into the project
<b>Credible</b>	The extent to which stakeholder input influences the project and decision making
<b>Continuous Improvement</b>	Strategy and implementation contribute towards improved stakeholder engagement (e.g. lessons learnt, regular monitoring and review and knowledge sharing)

43. Infrastructure Australia Assessment Framework for initiatives and projects to be included in the infrastructure priority list, 2018. <http://infrastructureaustralia.gov.au/projects/make-a-project-assessment.aspx>

44. ISCA, 2018, Adapted from Table S1: Guiding principles for the stakeholder engagement credits. Infrastructure Sustainability V2.0 Technical Manual Planning Rating

Since the release of *Westport: What you have told us* in April 2018, a series of community drop-in events and shopping centre displays were conducted in Fremantle, Kwinana and Bunbury to enable interested residents to engage face-to-face with the Westport project team and ask questions.

The details of these events were:

1. Fremantle Woolstores shopping centre display – Saturday 7 July 2018
2. Fremantle drop-in session at Stackwood – Wednesday 11 July 2018
3. Kwinana Marketplace shopping centre display – Saturday 14 July 2018
4. Kwinana drop-in session at the Darius Wells Centre – Wednesday 18 July 2018
5. Bunbury Forum shopping centre display – Saturday 28 July 2018
6. Bunbury drop-in session at Maker + Co – Wednesday 1 August 2018

These events were promoted through the following methods:

- delivering nearly 8,000 flyers via mail to local residences and businesses in Fremantle, Kwinana and Bunbury;
- advertising in eight local newspapers covering Fremantle, Kwinana and Bunbury with a combined reach of 508,130 people;
- releasing an official statement from the Office of the Minister for Transport, Planning and Lands;
- providing details to Westport's stakeholder network and Reference Group, with request to forward onto their networks;
- promotion on the Department of Transport's and Main Road WA's social media channels;
- providing details in the Westport digital newsletter; and
- promotion on the Westport website.

Despite this promotion, the turnout to the drop-in sessions was lower than expected, with 55 people attending the Fremantle event, 57 in Kwinana and 30 in Bunbury. It is believed that the low turnout is due to Westport not having any specific plans as yet, so people are not exactly sure what the project is or how it affects them. As such, community ambivalence has been high up until this point. However, as the project progresses and plans become tangible, it is likely that public interest will increase.

Future community engagement will involve:

- Westport's new online consultation hub, [MySayTransport.wa.gov.au/Westport](https://www.mysaytransport.wa.gov.au/Westport), which enables people to complete polls, surveys and submission forms to provide feedback into the Westport process;
- an increase in Westport presentations at public events and conferences;
- community surveys to gather quantitative data and input;
- a series of focus groups comprising different demographic groups from Fremantle, Kwinana, Bunbury and wider Perth to obtain more in-depth, detailed understandings;
- an increased focus on the media;
- dissemination of information about Westport through our stakeholder network – comprising 30 companies, 33 peak bodies and membership organisations, three unions, numerous environmental groups, 35 Local Government Authorities, nearly all State Government agencies, and several Federal Government agencies. The combined reach of this network encompasses over 1.5 million people; and
- meetings and/or presentations with community groups (over 300 stakeholder meetings were already conducted in Westport's first year).

The quantitative data derived from this research will allow robust statistical analysis and inform the Taskforce on:



- the community's views on the importance of environmental and social assets/values/uses;
- socially acceptable and unacceptable levels of change to assets/values/uses; and
- the values that may be site constraints, differentiators between options or provide opportunities for port development.

The outcome of the Westport Strategy will have far-reaching consequences on our economy, our

environment and our way of life today and for future generations. We need to get the balance right. The Westport Taskforce sees the development of the Westport Strategy as a shared journey and welcomes feedback at every stage, so that problems and opportunities are examined from many perspectives.

You can help by providing feedback on *What we have found so far* to inform the next stage of the Westport process.



*Photo courtesy of Southern Ports Authority*



# Appendix 1: Abbreviations

ADF	Australian Defence Force	ISCA	Infrastructure Sustainability Council of Australia
AMC	Australian Marine Complex	KIA	Kwinana Industrial Area
ATV	Automated Transfer Vehicle	KBJ	Kwinana Bulk Jetty
BORR	Bunbury Outer Ring Road	KBT	Kwinana Bulk Terminal
CBH	Cooperative Bulk Handling	KGJ	Kwinana Grain Jetty
DAE	Deloitte Access Economics	KIA	Kwinana Industrial Area
DJTSI	Department of Jobs, Tourism, Science and Innovation	Lat 32	Latitude 32 Industrial Area
DPLH	Department of Planning, Lands and Heritage	MCA	Multi-criteria assessment
DoT	Department of Transport	MRS	Metropolitan Region Scheme
DUKC	Dynamic Under Keel Clearance	MRWA	Main Roads Western Australia
ECP	Empty Container Park	NQRT	North Quay Rail Terminal
EPA	Environmental Protection Authority	OH	Outer Harbour
EQ	Environmental Quality	PEC	Priority Ecological Communities
FLCWA	Freight and Logistics Council of Western Australia	RIZ	Rockingham Industry Zone
FPA	Fremantle Ports Authority	SWM	South West Main railway line
GDP	Gross Domestic Product	TEC	Threatened Ecological Communities
GSP	Gross State Product	TEU	Twenty-Foot Equivalent Unit
HMAS	Her Majesty's Australian Ship	vpd	Vehicles per day
IA	Infrastructure Australia	WAPC	Western Australian Planning Commission
IWA	Infrastructure Western Australia	WTC	Western Trade Coast
IH	Inner Harbour		
IMEX	Import Export		
IMT	Intermodal Terminal		





## We would like to extend our sincere thanks to the members of the Westport Taskforce for their contributions.

Arc Infrastructure	Department of Jobs, Tourism, Science and Innovation	Peel Development Commission
Australian Defence Network WA	Department of Planning, Lands and Heritage	Perth Airport
Australian Marine Complex	Department of Primary Industries and Regional Development	Planning and Transport Research Centre (PATREC)
Bunbury Wellington Economic Alliance	Department of the Premier and Cabinet	Property Council of Australia
CBH Group	Department of Transport	Rail Tram and Bus Union WA
Chamber of Commerce and Industry WA	Department of Treasury	Recfishwest
Chamber of Minerals and Energy of WA	Department of Water and Environmental Regulation	Regional Development Australia Perth
City of Armadale	DP World Australia	Shire of Chittering
City of Belmont	Eastern Metropolitan Regional Council	Shire of Dardanup
City of Bunbury	Freight and Logistics Council of WA	Shire of Murray
City of Canning	Fremantle Ports	Shire of Serpentine Jarrahdale
City of Cockburn	Kwinana Industries Council	South West Development Commission
City of Fremantle	LandCorp	South West Group
City of Gosnells	Latitude 32 Community Group	Southern Ports Authority
City of Kalamunda	Livestock and Rural Trade Association	Town of East Fremantle
City of Kwinana	Main Roads WA	Transport Workers Union Western Australia
City of Mandurah	Maritime Union of Australia	Urban Development Institute of Australia
City of Melville	Mediterranean Shipping Company	WA Livestock Exporters Association
City of Rockingham	Member for Bunbury	Watco
City of Swan	Member for Cockburn	Water Corporation
City of Vincent	Member for Fremantle	Western Australian Fishing Industry Council Inc.
City of Wanneroo	Member for Kwinana	Western Australian Marine Science Institution
Cockburn Power Boat Association	Naval Base Holiday Association	Western Australian Port Operations Taskforce
Cockburn Sound Management Council	Pastoralists and Graziers Association of WA	Western Harbours Alliance
Committee for Perth	Patrick	Western Roads Federation
Conservation Council of Western Australia		
Curtin University Sustainability Policy Unit		



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