



SECURING OUR FUTURE

Westport Business Case Summary

November 2024



“Westport is a transformational program that offers a rare opportunity for genuinely progressive infrastructure planning. We put our container supply chain under the microscope to find a solution that would future-proof trade growth while delivering long-term social and environmental benefits for the State.

“We thank the multitude of individuals who have informed this process, including industry, government, community and Aboriginal representatives, along with leading experts in engineering, marine science, sustainability, and transport.”

Patrick Seares, Managing Director, Westport

“Port infrastructure is foundational for major cities and we need to invest significant capital to set ourselves up for the next century of trade growth.

“Westport has conducted a robust planning process, thoroughly grounded in engagement with port and supply chain operators, and outlining a clear and compelling direction for the future of container trade in Western Australia.”

Chris Sutherland, Chair, Fremantle Port Authority

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We acknowledge Whadjuk and Gnaala Karla Booja people as the original custodians of the land on which Westport is planning.

We respect their cultures and Elders, past and present.



Introduction

Western Australia stands at a critical decision point. As the gateway to \$445 billion in state-wide economic activity, infrastructure limitations at Fremantle will begin impacting the efficiency of container trade as early as the mid-2030s.

Container trade in WA is growing faster than our population. Today, Fremantle Port handles the equivalent of one container for every 3 to 4 Western Australians per year. The continued trend of increasing containerisation of imports and exports means that by 2040 this is expected to have grown by around 20% per person. At the same time our population is growing and is expected to reach 3.6 million by 2036. Long-term, container trade is expected to grow from approximately 857,000 containers annually today to 2.9 million annually by 2070. This means our port and supply chain needs to handle a significant increase in containers.

The question isn't if we need a new port, but rather when will we need it and where will we build it.

The stakes are clear: delaying action and not having port facilities ready to cope with demand could cost WA's economy \$244 billion by the mid-2070s, threatening jobs, increasing the costs of everyday household items and risking our position as a strategic hub in the region.

Fremantle Port has served WA well for more than 100 years, but its location means it faces significant constraints many of which can't be viably solved through major upgrades.

These constraints mean we need to act now to build new port facilities that can serve Western Australia's needs for the next century. Our container port needs to have a footprint that can expand, with fit for purpose transport links, to handle growing container trade, efficiently and reliably.

After 3 years of rigorous environmental testing and research, including one of Western Australia's largest-ever marine science programs involving 150 scientists across 30 projects, Westport has developed a comprehensive plan for a world-leading container port in the Kwinana Industrial Area. This isn't just about building infrastructure - it's about future proofing WA's economy and lifestyle.

The project will:

- Scale up WA's trade capabilities for the next century, ensuring costs for imports, exports and everyday goods remain low.
- Enable larger, more efficient vessels that Fremantle Port cannot accommodate.
- Increase the share of rail freight from 20% to an estimated 30%, reducing road congestion and emissions.
- Protect Cockburn Sound's marine environment through innovative design.
- Enable the transformation of Fremantle Port into vibrant mixed-use waterfront communities, with tens of thousands of new homes for Western Australians.
- Generate thousands of jobs annually during construction and significant skilled employment opportunities once the port is operational.
- Encourage growth within the Kwinana Industrial Area and Western Trade Coast.

This document details how extensive research, environmental science, and community consultation have shaped a project that balances economic necessity with environmental leadership.

It demonstrates why acting now - before we hit capacity and efficiency constraints - is a pragmatic long-term approach that will secure and enhance Western Australia's future.



Why Westport?

Westport is the Western Australian Government's long-term program to design and deliver new container port facilities and a supply chain network to meet the State's future trade needs for the next 100 years.

The import and export of goods is vital to WA's economy and is reliant on having an efficient container supply chain which includes port, road and rail infrastructure, and operations.

Fremantle Inner Harbour (Fremantle Port), opened in 1897, and is the only major container port in WA, handling 99% of WA's seaborne container trade. The closest alternative port is in South Australia, approximately 2,700km away by road.

Situated at the mouth of the Swan River, Fremantle Port accommodates a range of port activities, including container trade, non-container trades (NCT), cruise ships and ferry services. Key freight corridors for containers are provided by Stirling and Leach Highways, as well as a single freight rail line through Fremantle's heritage and tourism precinct.

Fremantle Port has serviced WA very well for the past 100 plus years, and is

still functioning well today. However, over the coming decades, Fremantle and its surrounding freight links, which run through highly urbanised areas, will face significant constraints that impact its ability to function as an efficient container supply chain, with flow-on impacts on the economy and increased costs for businesses and the community.

Westport is the long-term planning program investigating the options for how to develop an efficient and sustainable container port and supply chain infrastructure to support WA through the next 100 years.

This process has included identifying the right location, and developing a preferred design and construction plan that offers value to WA. Westport is progressing strategies to minimise environmental impacts and is coordinating with other major government projects to create wider benefits for the community.

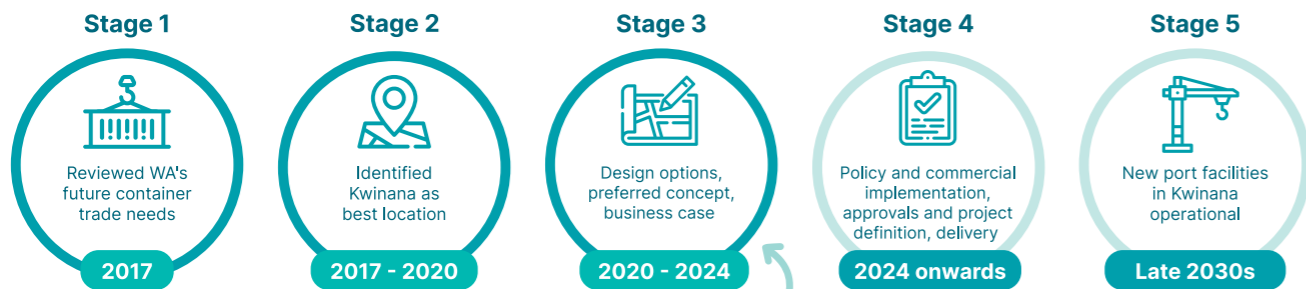


Kwinana Port Terminal 2018. Credit: Fremantle Ports.

Kwinana has long been considered an alternative location to accommodate trade in WA.

Despite many years of discussion, planning to shift to container trade to Kwinana has commenced in earnest, driven by increasing levels of trade and population growth.

- 2000** A privately-owned container and general cargo port facility was proposed for development at James Point, Kwinana. This development did not eventuate.
- 2006** Fremantle Ports proposed the development of an Outer Harbour Container Port.
- 2017** An independent Westport Taskforce was established to investigate the optimal location for a new container port, with Kwinana identified as the preferred location in 2020. This taskforce recommended a location and a raft of further design considerations, environmental studies, and commercial investigations to be undertaken prior to an investment decision.
- 2021** The Westport Program Office began an extensive program of research, modelling and analysis to identify the optimal design for a modern, sustainable and efficient port and supply chain that supports the needs of WA's economy and population. This work included investigating options for transition with a view to creating the greatest value for the State.



We are here

Westport's Goals

Westport's goals have been the foundation for the planning program and have guided the selection of the best path forward for the State.

Westport's Vision

A world-class container port and trade network, built with nature in mind, that unlocks Western Australia's future economic prosperity.

Westport goals

What do we want to achieve?

Criteria

What will this look like?

1.	 <p>Better trade outcomes for exporters, importers, and the economy</p>	<p>Efficient – operating costs for movement of containers across the network</p> <p>Reliable – predictability and visibility of shipment movements</p> <p>Resilient – capacity to better withstand, and recover efficiently from, disruptions</p> <p>Scalable – capacity to expand or adapt to meet forecast trade and population growth</p> <p>Flexible – ability to adapt to future market trends and operator innovation</p>
2.	 <p>Local economic growth and jobs are created</p>	<p>Enabling growth of Western Trade Coast</p> <p>Introduces new technology innovation</p> <p>Leverages Western Australian technological innovation</p> <p>High quality jobs and training are created</p>
3.	 <p>Acceptable impact on the State's finances</p>	<p>Value for money</p> <p>Attractive to private investment through commercial and environmental, social, and governance (ESG) opportunities</p> <p>Minimised impact on utilities and businesses</p>

Westport goals

What do we want to achieve?

Criteria

What will this look like?

4.	 <p>Plan, build and operate the most sustainable port in Australia</p>	<p>Cockburn Sound is protected</p> <p>The container supply chain is carbon neutral</p> <p>Infrastructure development and operations are sustainable</p>
5.	 <p>Benefits to the community and Aboriginal peoples</p>	<p>Recreational values protected or enhanced</p> <p>Aboriginal and non-Aboriginal heritage is protected and promoted</p> <p>Aboriginal economic opportunities are delivered</p>
6.	 <p>Safety for workers and the community</p>	<p>Safe interaction between freight network and the community</p> <p>Safe port operations</p>

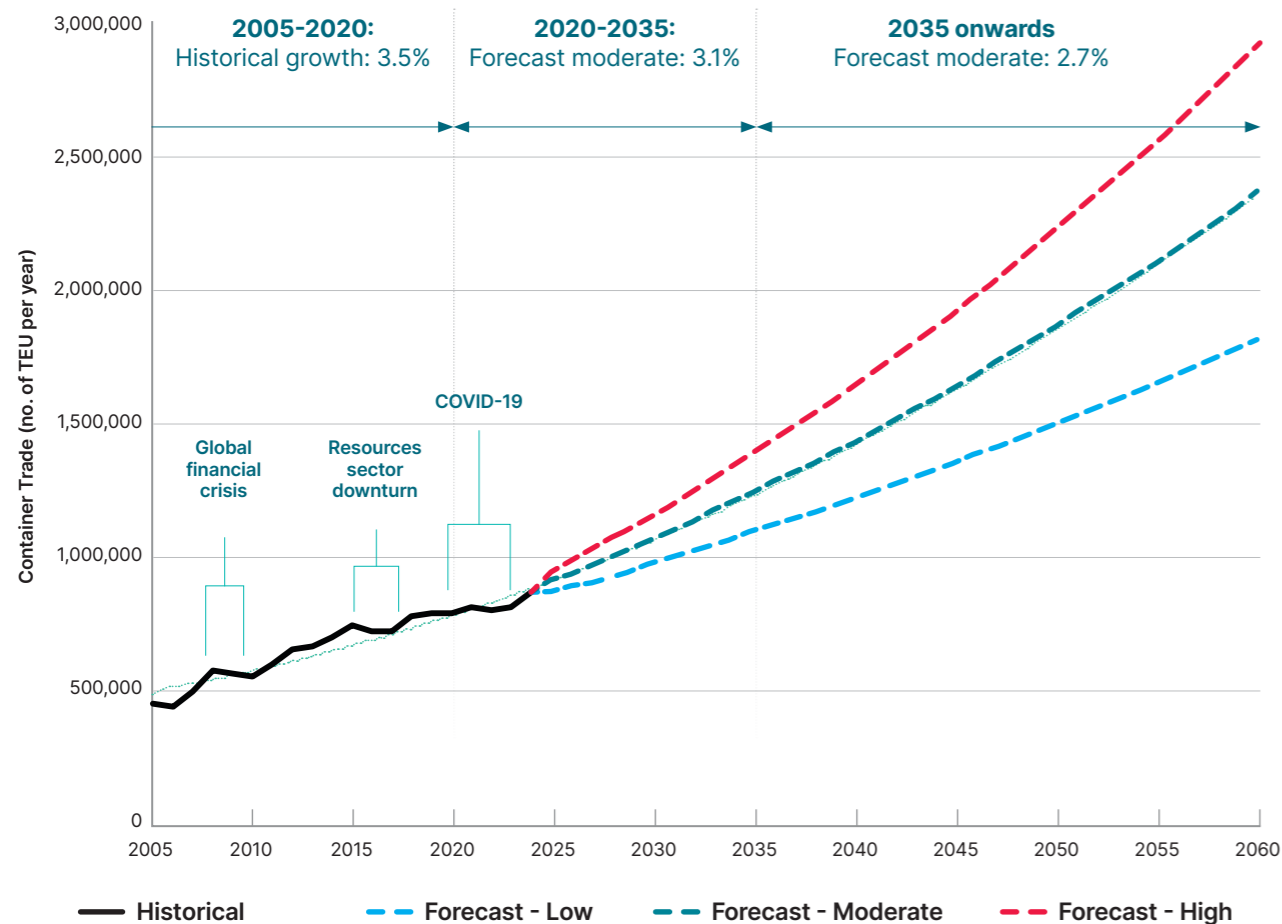
Importance of container trade to WA

With WA's population and international trade continuing to grow, an efficient container port is needed to meet future demand.

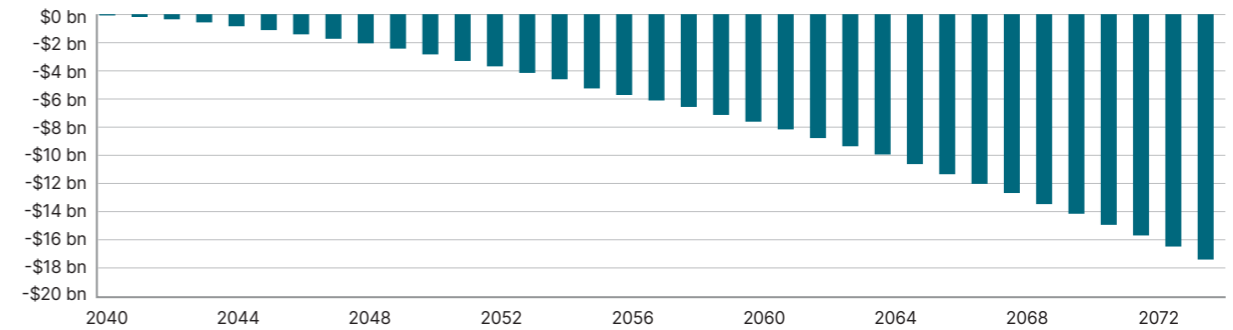
As an isolated state, Western Australia is heavily reliant on imports and has two key ways of bringing in goods - through Fremantle Port, or east coast ports and then transported across Australia via land. Fremantle Port is the gateway to WA's \$445 billion economy and is the only major container port on Australia's

western seaboard. This makes Fremantle Port and its supply chain nationally-significant infrastructure essential to servicing WA's population. Currently, Fremantle Port has an annual maximum practical capacity (MPC) to handle 1.4 million twenty-foot equivalent units (TEU).

Historical and Forecast Container Trade Volumes



If nothing was done to increase container port capacity, reliance on eastern ports and interstate transport could cost \$244 billion in lost GDP between 2040-2074.



Trade volumes will continue to grow with our population and economy, and are expected to reach approximately 2.9 million TEU per year by 2070.

Added to this, there is an ongoing trend for increased containerisation because it provides the cheapest way of transporting goods around the world.

Under a moderate trade scenario, and without investment, Fremantle Port is expected to reach capacity by 2040 or as early as the mid-2030s if higher volumes of trade eventuate. The volume of truck movements will continue to grow with trade growth, putting pressure on impacted urban communities where roads have not been designed for heavy freight use.

This means expanded port facilities are needed by the mid-2030s at the earliest. As it will take at least a decade to plan for and develop a new port, it's critical to get the process underway now.

Not being ready in time would significantly impact the WA economy. In a worst-case scenario, if new port capacity was not available in time, WA would be dependent

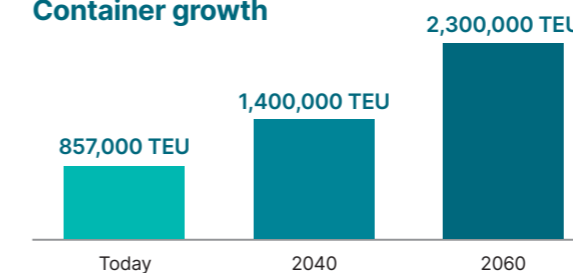
on the east coast ports, with containers transported via land across Australia.

This would result in much higher transportation costs to WA businesses, 3.5 times more per container than if traded directly through a Perth-based port. An additional 1 million tonnes of carbon dioxide (equivalent) would be emitted over the first 10 years, if vessels started to bypass WA around 2040.

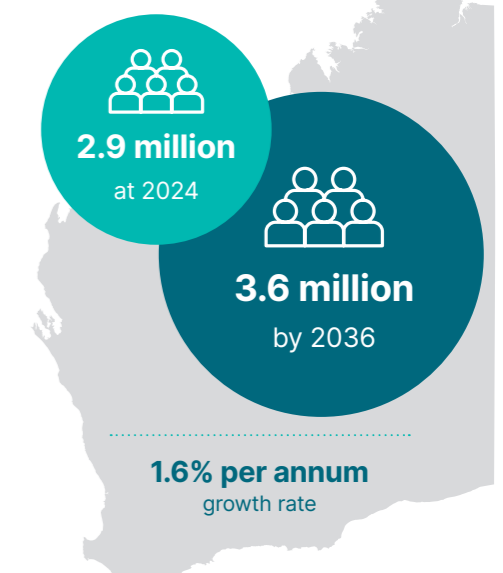
Significantly higher trade costs would adversely impact many industries, resulting in lower levels of trade and business activity, and higher costs for everyday goods. Without investment, the first 10 years could reduce the State economy by about \$11 billion in today's dollars, growing to \$244 billion by the mid-2070s.

To accommodate future trade growth and support the WA economy, the State needs an efficient and reliable container supply chain.

Container growth



WA's growing population



Issues facing Fremantle Port

Over the coming years, Fremantle Port faces significant constraints that will impact costs, efficiencies and the community, making Fremantle an impractical choice for WA's long-term container port.

Fremantle Port has served WA very well for the past 100 years, and continues to operate effectively today. However, Fremantle Port is too small and in the wrong location to support WA's container trade for another 100 years.

Land

A key issue with Fremantle Port is that land, both within the port precinct and around the port, is in short supply to support trade growth.

Fremantle Port has access to 180 hectares of land for all trade operations, including non-container trades.

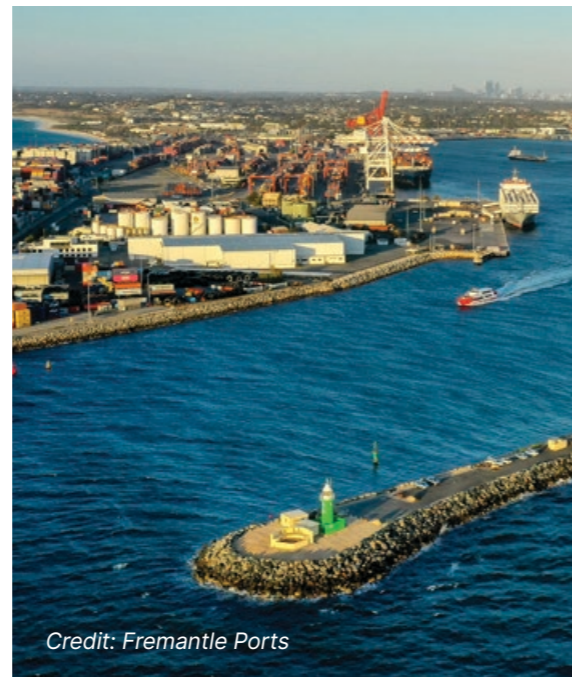
Forecast trade growth will see land constraints emerge past 2040 and importers, exporters and major logistic operators would face difficulties in expanding their operations.

Expansion of container trade activities can occur through land reclamation or the relocation of private businesses, but this would be expensive and disruptive, and would not secure the space required for operations beyond the 2050s. Additionally, increased conflicts would occur as residential development and community amenity issues impact port operations.

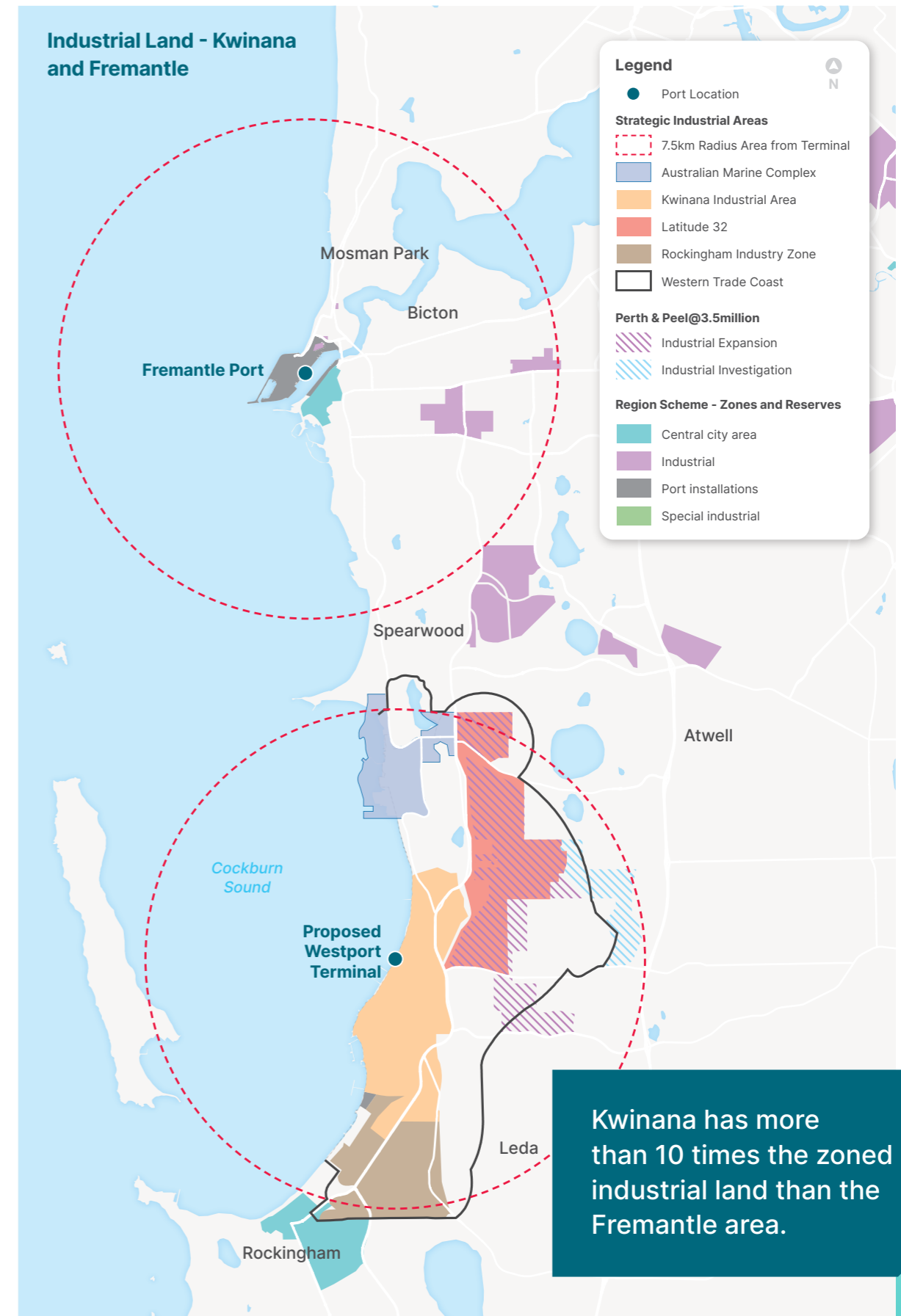
The area around Fremantle Port is highly commercial and urbanised, meaning there is little to no land for importers, exporters

and major logistics operators to position themselves close to the key trade gateway.

Ideally, container staging facilities should be located adjacent to the container terminals in the port area to make the movement of containers faster and more efficient, and enable unloading and loading of ships anytime, day or night. This would be increasingly difficult and expensive to achieve at Fremantle as trade grows. Establishing related activities further away from Fremantle Port would embed inefficiencies in WA's container supply chain .



Credit: Fremantle Ports

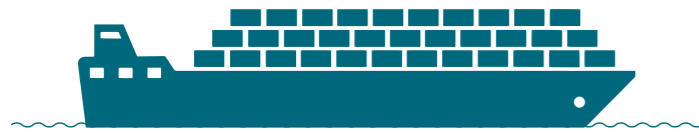


Increasing ship sizes on Australian routes

2024: Largest vessel visiting Australian shipping routes 10,000 TEU



2030: Expected largest vessel visiting Australian shipping routes 14,000 TEU



Fremantle can only accept vessels carrying up to 12,000 TEU containers due to its width and depth.

Ships

Size is again a problem for Fremantle's harbour, which can only accept vessels carrying up to 12,000 TEU containers due to its width and depth. Container ships with a capacity of up to 14,000 TEU containers are expected to be introduced on routes from around 2030 onwards. Given Fremantle Port's size limitations, those ships would need to bypass Perth as they are unable to berth, which will reduce supply chain efficiency and/or competition, impacting costs.

Ageing infrastructure and capacity

By the early 2050s, it is predicted that 2 million TEU of containers will be arriving and leaving WA. To manage the growth over the next 2 decades, Fremantle Port's infrastructure and assets would require significant and disruptive upgrades, which would still not secure its long-term viability.

Significant works would need to commence in the 2030s or earlier, including major berth reconstruction, terminal expansions, the redevelopment or acquisition of land, repurposing land and space within the port precinct, and shifting existing businesses and facilities.

A second tranche of even larger expansions would then be needed to get Fremantle past 2050, including land reclamation for new outer berths, major dredging, a new breakwater, and a major reconfiguration of the port infrastructure, which would still not resolve many issues or inefficiencies Fremantle is facing.

Beyond the Port itself, major road and rail upgrades would be required with growth in both container trucks and commuter traffic. For example, there are 16 sets of traffic lights and rail crossings between the Port and Kwinana Freeway via Stirling and Leach Highways. This route already suffers major congestion and delays, costing \$31 million each year and growing. At a minimum, the duplication of Stirling Bridge and development of a new interchange at Leach Highway and Stock Road would need to be brought forward to mitigate these bottlenecks, however, this would not resolve many other points of congestion or the growing issue of safety on the route.

The single-line freight rail link to Fremantle Port is also shared with commuter rail traffic, constraining the number of trains that can



In some areas the current freight route is 4 metres from front yards with 40 driveways per kilometre.

run in a day. To avoid capacity limits by the mid-2030s, the rail bridge over the Swan River would need to be duplicated, however, this would only provide extra capacity to the mid-2040s. Further expansion of rail capacity is considered unfeasible beyond this point, as the line which runs through central Fremantle would require tunnelling and be prohibitively expensive.

These large works programs would be similar in scale to the port development proposed at Kwinana, however, would not resolve all major constraints at Fremantle, leading to ongoing inefficiencies.

Community and safety

Community and safety are also important considerations in Fremantle. The Port is situated within a growing, cosmopolitan coastal area that will be home to 45,000 people by 2046¹. There are amenity and safety challenges in accommodating a significantly larger port, more heavy rail services and greater truck movements to cope with growing trade.

Under a moderate trade scenario, Fremantle Port would need to accommodate more than double the current truck movements by 2051, with some 4,500 trucks per day requiring access to and from the port. These trucks would also be interacting with almost twice the level of general traffic over the same period, as compared to today's traffic movements. These trucks would be navigating established residential areas, passing hundreds of driveways from homes and businesses that have direct access onto Leach Highway.

Highest and best use

Given Fremantle Port is located on prime land due to its location to both beach and river waterfronts, links to the CBD, adjacency to commuter rail and its proximity to residential, commercial, tourism and retail assets across Fremantle, there are also questions about the suitability of this land for industrial use.

Removing container trade would provide an opportunity to re-use this land for residential, commercial and tourism purposes. This would help consolidate population growth within Perth's current urban footprint.

¹ Population forecast for the City of Fremantle local government area.

Finding the right location for the new port

WA has a limited number of options for port locations due to a lack of natural embayments or major river mouths near our major demand centres. From 2018 to 2020 Westport undertook a detailed analysis to determine the suitability of a number of locations to support WA's future long-term container port needs.

Three potential coastal locations were identified:

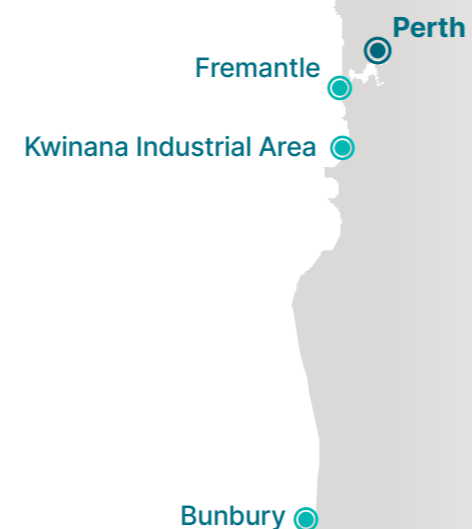
- Bunbury Inner and Outer Harbour
- Fremantle (current Inner Harbour)
- Kwinana Industrial Area (current Outer Harbour)

Bunbury:

With 90% of WA's container trade destined for the Perth metropolitan area, Bunbury's major disadvantage is its distance from Perth (approx. 172km by road).

Other major challenges to locating a container port in Bunbury include:

- High transport costs to move containers between Bunbury and Perth.
- Significant infrastructure costs to upgrade the South West Main Line, Forrest and South West Highways to work as an efficient supply chain.
- Environmental damage from blasting the basalt layer in the Bunbury Inner Harbour channel to create the required depth for larger vessels.
- Concerns that even with expansion, Bunbury Port may not be able to accommodate trade growth over the next 100 years.



Fremantle:

- Maintaining Fremantle as WA's main container port has been extensively investigated by Westport. It is not a viable long-term solution.
- Extending Fremantle Port's lifespan would require significant upgrades and reconstruction over the next 2 decades (2030s and 2040s).
- Beyond the 2050s, Fremantle Port's footprint and infrastructure would need to be expanded to a scale comparable to that proposed at Kwinana. Redeveloping Fremantle Port while it is operating and approaching its capacity would be expensive and disruptive.
- However, several major issues for which there are no viable solutions would remain, including inefficiencies with the road and rail supply chain.
- This means investment in Fremantle Port to extend it past the 2050s would result in a less-efficient container port, which leads to higher costs, large disruptions, ongoing amenity issues, and wasted investment.

Key remaining issues include:

- The **existing freight road in and out of Fremantle**, including Stirling Highway and Leach Highway, negatively impacts hundreds of residential properties due to heavy freight movements, and provides direct access to hundreds of businesses. Resolving freight congestion impacts in the long-term would require extensive and expensive road upgrades that would impact a large number of properties and businesses and would leave broader noise issues unaddressed.
- A **single freight train line** runs through the heart of Fremantle. This rail line will reach capacity around the mid 2030s, meaning more containers will need to be transported by road. The only way to significantly improve capacity on this rail line is to take it underground, which is cost prohibitive and technically challenging, and would likely face issues associated with heritage areas in Fremantle.
- An ongoing **lack of industrial land around Fremantle** that will not allow the growing port services to expand, preventing the co-location of a range of supply chain and other marine businesses with the Port.

Credit: Fremantle Ports





Why Kwinana is the answer

The Kwinana Industrial Area was identified as the most suitable location for a new container port in 2020. Locating the new port in Kwinana means there is capacity to build a modern and fit-for-purpose port precinct and integrated road and rail network.

Kwinana has several features that make it the best choice to meet WA's long-term container trade needs:



Kwinana is already home to the Outer Harbour – working port facilities which co-exist with recreational use. Moving container trade would add about one ship per day to the 2-3 ships the KIA already receives daily.



It has a road and rail freight network and connections that are not urbanised and can be upgraded over time to work as an efficient and modern supply chain, while also better serving the local industry and community.



Alignment with other State and Federal Government strategic objectives and programs, including the Global Advanced Industries Hub, redevelopment of the Kwinana Bulk Terminal and Kwinana Bulk Jetty, the Future of Fremantle, improvements to road connections in the Western Trade Coast, and proposed Commonwealth Defence infrastructure.



A new container port in Kwinana will catalyse growth of the Kwinana Industrial Area and broader Western Trade Coast, improving road connections, efficiency and collaboration across WA's major industries in the region.



It is located within the Perth metropolitan region, allowing for cost-effective container distribution.



There is new industrial land under investigation in the Western Trade Coast, which will enable co-location of port services and heavy industrial uses, with ease of access to critical supply chain infrastructure.

Developing the preferred design

Design of WA's optimal container supply chain relied on new research and modelling, industry, government and community engagement, and input from leading experts in engineering, marine science, economics, sustainability, and transport.

Following the identification of Kwinana as the optimal location for a new port, a raft of studies identified what was needed next to complete a detailed examination of the location and port design.

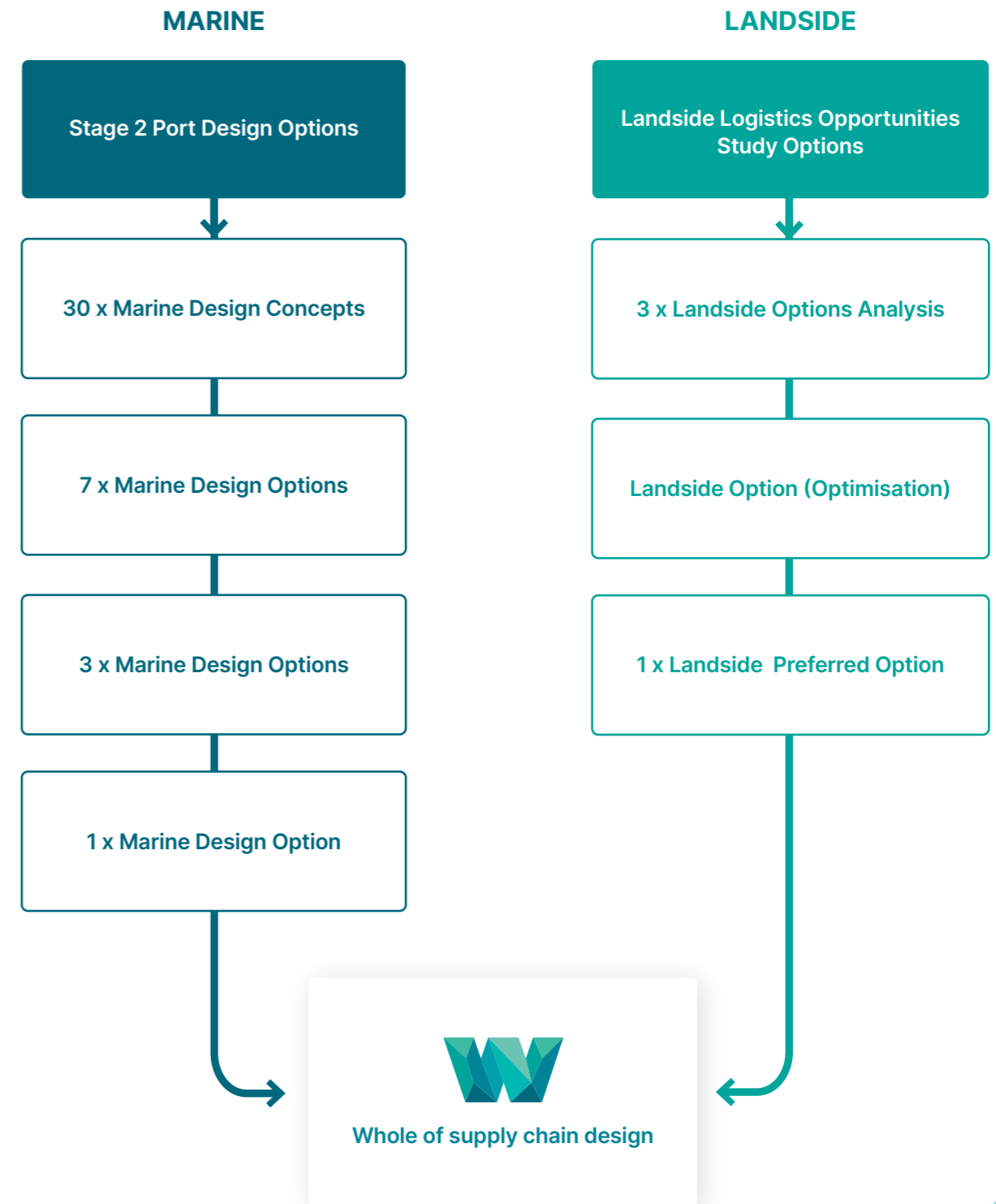
These studies included examining impacts on existing industry of the preliminary design, understanding the implications for key utilities in the area such as Synergy's power station and Water Corporation's desalination

plant, understanding the environmental features in the area, and analysing wave behaviour to consider the need for a breakwater.

The studies helped Westport develop a final preferred design option, which addressed a range of substantial risks and capitalised on the opportunities the location offered.



Westport Design Process



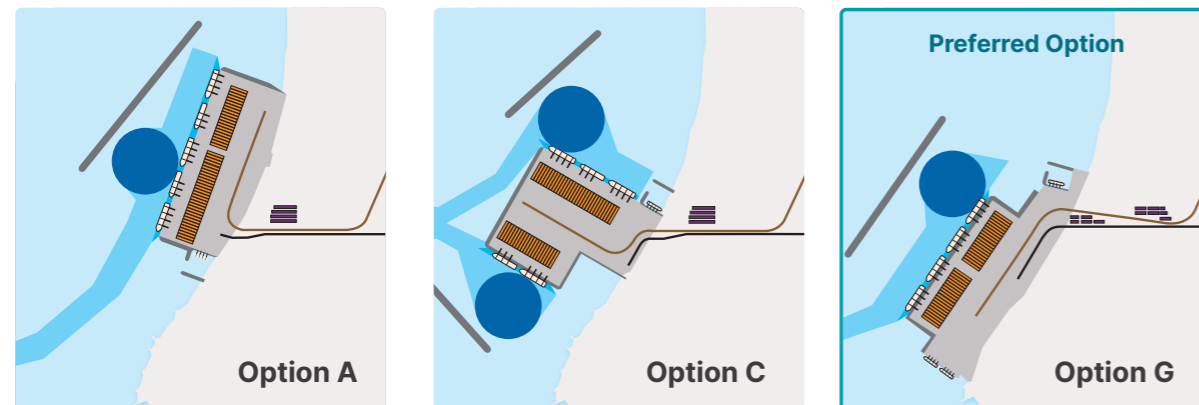
Marine

Developing the marine infrastructure

Westport identified 30 different design options for the new terminal in Kwinana, which were screened to 7 and then narrowed to 3 options using a multi-criteria analysis (MCA) and rapid cost-benefit analysis (CBA) process.

Marine infrastructure shortlist

● Turning basin — Breakwater ■ Channel



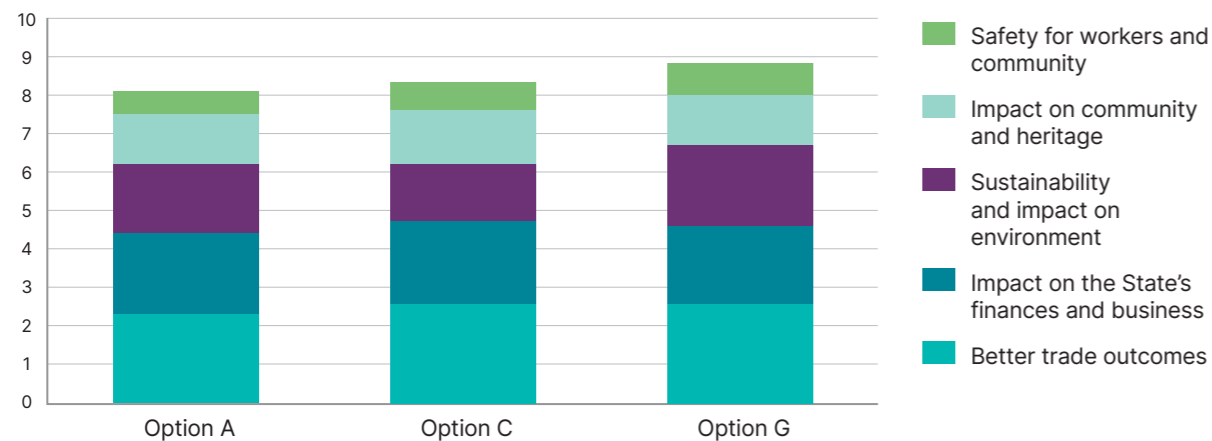
The MCA considered environmental impacts, long-term sustainability, efficiency of the supply chain and port, and financial value. Assessment criteria used in the MCA were based on the Westport Goals and Criteria, which were translated into scoring criteria and measures.

Evaluation of the final 3 terminal options was informed by a series of specialist stakeholder workshops to identify potential gaps in the proposed assessment criteria, re-evaluate

the goal and sub-goal weightings, and provide general feedback on the options. Following this, more than a dozen sensitivity tests were undertaken to 'stress test' the assessment criteria.

Of the 3 options shortlisted, the preferred design performed best in terms of environmental outcomes and minimising impacts to critical utility infrastructure located within the precinct.

Phase 3 MCA assessment outcomes



Landside

An integrated freight network

Beyond the terminal and marine infrastructure, Westport considered the entire landside supply chain, including road and rail corridors, intermodal terminals, empty container parks, and complementary land uses for freight activities.

The scope for road and rail also had to consider wider infrastructure solutions that would best solve road and rail demands for, and outside of, container trade, including:

- Container truck movement (~10% of traffic at the Anketell/Kwinana interchange).
- Heavy non-container freight trucks to support the wider industry and Western Trade Coasts (~10% of traffic).
- Normal car and truck movement (~83% of traffic).
- Other freight rail users.

Another key consideration was the commerciality of the freight solution. This included evaluating 8 potential sites for future intermodal terminals, and analysing their throughput, commercial viability and land constraints.

Westport identified 3 network options for the freight and logistics network, with inputs including:

- Consultation with more than 50 stakeholders including shipping lines, stevedores, logistics operations, importers, and exporters;
- An assessment of constraints on the current network around the Fremantle Port;
- National and international case study analysis; and
- Filtering via minimum standards and performance metrics.

Modelling and stakeholder engagement was used to test and refine the 3 design options, to identify the preferred option for the supply chain, including road and rail corridors, and intermodal terminals.



Engagement

Given the scale and strategic importance of a new container port to WA, development and review of the design options involved an unprecedented level of consultation and feedback, including government, industry, community and experts across multiple disciplines.

Westport spent more than 1,000 hours engaging with:

- Importers and exporters
- Industry groups and associations (including freight and logistics, energy, commerce and industry, shipping, and ports sectors)
- Potential investors
- Kwinana industry
- Local Governments
- Marine service providers
- Other ports (national and international)
- Quarantine services/Border Force
- Rail and Intermodal Terminal operators
- Road transport operators
- State Government agencies
- Shipping lines
- Port operators
- Thought leaders and academics
- Traditional Owners

Snapshot of engagement outcomes:

- Stakeholders were invited to advise on the weightings between the competing design criteria (for example trade efficiency versus capital cost) and sensitivity tests to stress test decision making processes.
- Importers, exporters, and stevedores helped optimise the configuration for the terminal and supply chain.
- Industry helped define acceptable downtime and vessel queueing durations.
- Industry groups and operators provided insights on the future of their industries, including a shift to net-zero operations.
- Stevedores shared recommendations for terminal integration with rail and preferences regarding equipment.
- Data from marine researchers (including wave movements and benthic habitats maps) helped shape the design options.
- Community groups, conservationists, and researchers helped identify potential mitigation initiatives.
- Mapping of social values associated with Cockburn Sound and surrounds.
- Mapping of Noongar cultural and spiritual values in and around Cockburn Sound.

Projects and analysis to inform the design

In addition to stakeholder and community feedback, key inputs that helped develop, evaluate, and refine the design for the terminal and supply chain included:

Transport and trade modelling:

- Capacity calculations for the container terminal and intermodal terminals.
- Simulation of container movements and mode choice across road and rail networks, private and non-container traffic.
- Calculations of emissions across the network.
- Analysis of key performance metrics, with a focus on the cost per container for movements across the supply chain.
- Scenario analysis of trade impacts due to changes in supply chain capacity and efficiency.
- Analysing and determining economic drivers of container trade such as population growth, income levels, consumption, and exchange rates.

Marine and terrestrial investigations:

- WAMSI-Westport Marine Science Program.
- Geophysical and sediment surveys within Cockburn Sound.
- Landside geotechnical site investigations between the port and Rockingham Road, as well as Anketell and Thomas Roads.
- Environmental and ground surveys west of Rockingham Road and the Anketell Road corridor.
- Dynamic Under Keel Modelling.

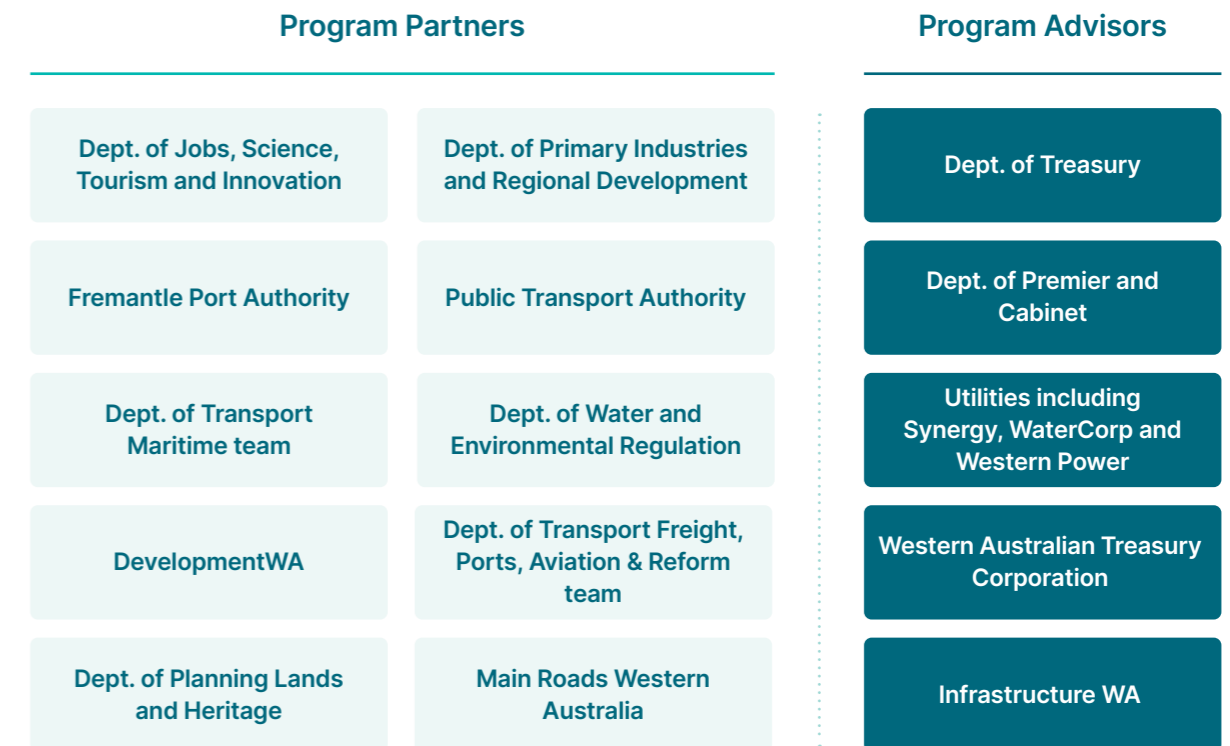
Port operations modelling:

- Simulation of vessel movements through the channel and into the port, under different conditions such as storms and engine failure.
- Forecasting the number of containers and ships that will arrive in WA over the next 50 years.
- Wave modelling data and downtime analysis.

Whole of Government

A wide range of State Government departments and authorities were consulted on the design to ensure it aligned with other government programs and priorities.

Summary of collaboration across State Government



Westport worked with HR Wallingford, whose Australia Ship Simulation Centre is located in Fremantle, to test navigation to, and berthing at Westport under dozens of different weather conditions and emergency scenarios.

Significant investment in independent science to support the long-term health of Cockburn Sound

To support the long-term health of Cockburn Sound, Westport established a \$13.5 million marine science program with the Western Australian Marine Science Institution (WAMSI). It's given us an unparalleled understanding of Cockburn Sound and has significantly influenced the design of the new port facilities.

The WAMSI-Westport Marine Science Program is one of the most comprehensive science programs ever undertaken in Cockburn Sound. The Program is delivering Westport important baseline data and information needed to inform key planning decisions that avoid and minimise environmental impacts to the greatest extent possible.

To do this, the WAMSI-Westport Marine Science Program commenced early in the infrastructure design process to ensure the critical science inputs were delivered when needed to inform key decision making.

More than 150 scientists and researchers worked on around 30 projects, filling important gaps in understanding about Cockburn Sound's ecosystem through

extensive research and modelling to provide a better understanding of:

- Environmental baselines for key species, ecological processes and underwater noise.
- The benthic habitat in and around Cockburn Sound, including high-resolution seagrass mapping.
- Hydrodynamic modelling based on oceanographic data.
- Effective mitigation and restoration approaches for key environmental values, including Little Penguins and seagrass, to inform Westport's long-term environmental plans.
- How the community uses and values Cockburn Sound's environmental features, including for recreational fishing.

This research program significantly influenced the port design and decisions to ensure the best environmental outcomes. For example:

- Shifting the port 1km to the south to avoid areas of mapped seagrass beds to the greatest extent possible.
- Ensuring the breakwater alignment causes minimal impact on existing circulation and flushing patterns in Cockburn Sound.
- Minimising impact on snapper spawning through port footprint configuration and breakwater alignment.
- Aligning the new channel into Cockburn Sound to minimise seagrass impacts by following areas of historic dredging impact.

The science delivered through WAMSI will continue to guide critical decisions around the port development, and is being used by Westport to inform a thorough environmental impact assessment.

WAMSI reports are being published following a rigorous peer review process, with all remaining reports expected to be publicly available by early 2025, before the EPA's Public Environmental Review, so the community can read them.

The WAMSI-Westport Marine Science Program is creating a legacy of public information to support long-term planning and management of the Sound to the benefit of the environment and community.

Credit: Western Australian Marine Science Institution

The preferred design

In November 2023, following extensive consultation, research and economic and environmental modelling, the preferred design for the new port and supply chain in the Kwinana Industrial Area was released.

The preferred design provides for a modern, efficient and sustainable port and freight network that will transform Kwinana into a world-class global industrial hub and be a vital link to support trade between WA and the rest of the world for the next century.

The preferred design includes:

- New port facilities in Kwinana between the end of Barter Road and the end of Mason Road.
- A new shipping channel to accommodate larger container ships expected in the future.
- Road upgrades along Anketell Road, Kwinana Freeway, and Roe Highway. Ultimately, the Anketell-Thomas Road Freight Corridor will connect the port with Tonkin Highway in Oakford.
- Upgrades to the existing freight rail network between Kwinana and Cockburn, connecting the port with logistic hubs in Kenwick, Kewdale, and Forrestfield.



Benefits of the preferred design

As well as delivering a modern, efficient and sustainable port and supply chain to support the WA economy for the next 100 years, the preferred design offers wider benefits, including environmental and community benefits.



Supply chain:

100 containers per train. One train equals 60 trucks



Community:

Seagrass restoration and artificial reef



Future proof:

Port elevated higher for resilience to increased sea levels

Design benefits:

This preferred design was chosen as it offers significant benefits, including:

Future-proofed:

- ✓ The port design allows for future expansion as WA's population continues to grow over the next 100 years, including space for additional berths when needed, and a shipping channel deep enough to accommodate larger vessels.
- ✓ To account for potential future sea levels, the port has been elevated higher than Fremantle.
- ✓ Flexibility at the container terminal to improve efficiency and allow for new technologies to be adopted as they arise.

Supply chain:

- ✓ Upgrades to Anketell Road and Kwinana Freeway will happen early in the development process, reducing congestion for commuters and residents in the area. It will also mean fewer heavy vehicles travelling through highly urbanised areas like Fremantle and along Leach Highway.
- ✓ Upgraded port and rail infrastructure to increase the share of containers transported by rail from 20% to around 30%, reducing the number of trucks on the road as well as carbon emissions.
- ✓ The spacing for future containerisation provides options for general cargo operations for the next several decades at the north end.

Environment:

- ✓ The location of the port was moved 1km south, avoiding existing seagrass beds that support snapper spawning in Cockburn Sound. The change means there is almost no direct impact on perennial seagrass from the port or breakwater.
- ✓ Westport aligned the new shipping channel to pass through previously dredged and deeper water areas that do not contain seagrass. It is estimated that approximately 2% of seagrass from Cockburn Sound to Gage Roads will be directly impacted by construction.
- ✓ Use of an offshore breakwater (open at both ends) and the angles set for the port and

breakwater, has a minimal impact on the currents that drive Cockburn Sound's marine environment, including snapper spawning and other functions driven by these currents.

- ✓ The least impact to water quality and coastal processes (including erosion) in Cockburn Sound.
- ✓ Reduced dredging and land reclamation required due to positioning the port towards the shallower waters of James Point and on top of previously dredged areas surrounding the Kwinana Bulk Terminal. Dredged materials from the new shipping channel will be used for the reclamation.

Community:

- ✓ Thousands of jobs per year to support construction of the marine infrastructure over the life of the project.
- ✓ A range of measures will be implemented to support the long-term health of Cockburn Sound, including an expansion of seagrass restoration.
- ✓ New community amenities are being explored, including an artificial reef to support marine habitat and recreational fishing.
- ✓ Major improvements to commuter roads and road/rail level crossing removals.

Sustainability:

- ✓ A pathway for net zero port construction and operations by 2050, and directions to encourage uptake of net zero practices by the users of the freight network.
- ✓ Accommodation for using recycled (or circular) steel, concrete and asphalt during construction.

Kwinana Industrial Area:

- ✓ Redevelopment of the Kwinana Bulk Terminal integrated into the container terminal.
- ✓ Ongoing access to berths used by industry across the Kwinana Outer Harbour during construction and operation of the proposed port facilities.
- ✓ Catalyse the Kwinana Industrial Area and broader Western Trade Coast to further enhance what is already a nationally-significant industrial hub.

Transition, timing and cost

Three options were evaluated to determine when and how container trade should transition to Kwinana to achieve the best value for WA. The optimal pathway is a one-step transition in the late 2030s.

With the 2050s representing an 'upper limit' for the transition of container trade, Westport explored the optimal transition timing between now and then.

The options considered were to:

- Operate 2 container ports at once for a period of 10 to 12 years.
- Invest in Fremantle to extend its capacity until the late 2040s, following which container trade would transition to Kwinana.
- Invest in developing Kwinana earlier and transition once, in the late 2030s, before Fremantle requires significant asset renewal.

Stage 3 Options assessments and outcomes for container trade

Options	Late 2030s	Late 2040s	Assessment
Dual operations for a decade			<p>Inefficient</p>
Remain at Fremantle to the late 2040s			<p>Wasted investment Inefficient and disruptive Higher risk</p>
Westport by late 2030s			<p>Efficient Value for money</p>



While back in 2020 it was estimated that Fremantle would hit constraints by 2032, further analysis found that the life of Fremantle could be extended to the late 2030s, getting more value out of the existing infrastructure.

The review of the 3 options found:

Run the two ports simultaneously: Feedback from industry and economic regulators was this would create an unacceptable increase in costs and inefficiencies, as they would have to run operations from two locations. This approach would hamper investment in more efficient but costly equipment by stevedores at both locations, given the imminent closure of Fremantle Port and lower volumes at each port. The State would also need to invest heavily to improve the berths at Fremantle Port and road and rail heavy freight, while at the same time having to invest in Kwinana.

The design analysis of building the second smaller container port at Kwinana found less benefit from this construction process. For example, the material dredged for the new shipping channel would be more than required for reclamation of the new port footprint, meaning it would need to be dumped on the seafloor, and then the reclamation material would likely need to be mined from inland for the future expansion of the port.

This option does not achieve benefits from staged development, but rather introduces additional impediments to the project and was therefore ruled-out on both commercial and construction factors.

Upgrade Fremantle to extend to the late 2040s: This option would involve investing in infrastructure to extend Fremantle Port to the late 2040s, but not beyond because of the significant upgrades required from this time.

Extending Fremantle to the late 2040s would accommodate increased container throughput but not address other challenges and risks including limited land availability, vessel size constraints, and ongoing issues with increasing road congestion and rail capacity limits. The upgrades would also be highly disruptive given they would occur in an operational port environment.

The increasing inefficiencies of Fremantle Port during this period, despite the upgrades, would increase the risk of significantly higher import and export costs for WA residents and businesses.

Additional capital investment required to expand the capacity of Fremantle Port and its transport connections is estimated to be at least \$2.2 billion.

With the move to Kwinana required regardless, this investment in the Fremantle Port and rail would be short-term and largely wasted.



Develop and move once to Kwinana by the late 2030s:

A transition to Kwinana in the late 2030s would reduce overall infrastructure and development costs by avoiding expensive and short-lived upgrades to Fremantle Port and improving the entire port and supply chain ecosystem earlier.

This option would allow for the earlier development of a modern and fit-for-purpose supply chain enabling larger vessels to be accommodated, boosting the use of freight rail, shifting heavy freight vehicles to more suitable corridors, and improving road connections in the southern metropolitan region.

Increasing efficiency of the whole ecosystem would put downward pressure on container trade costs for industry and consumers, from 2040.

This approach would also provide options for non-container trade to remain at Fremantle Port for longer, expanding into areas previously occupied by container trade prior to ultimate relocation, and provides certainty for industry and benefits the WA economy. Ultimately, it also facilitates the transition of Fremantle Port land into vibrant residential and commercial communities and supports the continued growth of strategic industries in our nationally significant Western Trade Coast.

² Applying a 4% discount rate.

The government investment required in the new Kwinana container port is estimated to be \$7.2 billion in today's dollars. Significant upgrades to the surrounding road and rail network will also be required, with the Business Case identifying several major enabling projects that will serve not only Westport, but wider community needs including for the Western Trade Coast and future defence industries at Henderson.

Detailed economic analysis has shown that the benefit to cost ratio (BCR) of moving container trade to Kwinana by the late 2030s was over 4.0² (with BCRs over 1.0 demonstrating that the benefits outweigh costs).

Westport's recommendation is to 'start now and move once', shifting container trade to Kwinana in the late 2030s, as this option provides the most benefit to the State, industry and community. It also increases our ability to achieve important construction synergies with other major projects, such as METRONET and Defence projects.

The commercial model

The WA Government will own the new port at Kwinana under a traditional landlord model, similar to the current operation of Fremantle Port, giving the Government control over the port's development and operation.

Westport will be one of the largest infrastructure programs the WA Government will have ever undertaken. It will have a significant impact on commercial operations, from stevedores to rail operators, contractors and developers. It will also support the WA economy and consumers by safeguarding efficient container services well into the future.

Westport developed options for the commercial arrangements to ensure that the state of Western Australia, operators, and importers and exporters would benefit from the operating model. This included developing a series of financial modelling, and conducting global market testing with operators and major infrastructure investors.

Port Precinct Ownership and Management:

A Government Landlord model has been recommended, similar to the current model for Fremantle Port where the Government remains the owner of the port and long-term leaseholders invest in their own equipment and operations. This was selected due to:

- Government's ability to retain a high degree of control over the development and operation of the port, and an ability to control the competitive landscape around terminal operators, fees and charges, and entry of new participants.
- Market appetite from contractors and terminal operators for this model, given it is tried and tested.

Rail infrastructure: ARC is the long-term leaseholder and operator of the freight rail network. Various rail infrastructure delivery models are being considered for both the on-dock rail terminal and broader shared network upgrades in conjunction with relevant stakeholders.

Intermodal terminals: Decisions on the delivery of future IMTs have been deferred given there is sufficient capacity available for some time. The State Government land ownership will allow future governments to consider development of a major intermodal and logistics precinct.

Credit: Department of Transport



Credit: Fremantle Ports



Environmental management

The questions that remained central through all stages of the design process were: would the option presented enable us to support the long-term health of the ecosystem? And would it be acceptable to the WA community and the Environmental Protection Authority?

Cockburn Sound has been home to WA's premier industrial area for more than 60 years, supported by the Kwinana Outer Harbour which currently accommodates about 850 large freight ships annually.

The Sound is valued for its marine environment, as a unique ecosystem that supports a diverse range of marine species and recreational activities including fishing, diving, beachgoing, horse riding and swimming.

Significant investment and effort have been directed towards developing the new knowledge and science needed to manage impacts of delivering a new port.

Importantly, this research has been undertaken early in the infrastructure planning process to ensure critical science inputs

were available when required to shape design outcomes and make decisions that successfully avoid and minimise impacts.

The research is also supporting Westport to plan a suite of activities to build long-term resilience in Cockburn Sound before works begin, and during the construction and operation phases of the new port facilities.

Part of Westport's approach was to assign environmental values as much importance as capital cost or operational efficiency during multi-criteria analyses of the design concepts. We have also undertaken one of the largest-ever bodies of marine research on the Cockburn Sound ecosystem through the \$13.5 million WAMSI-Westport Marine Science Program.

Our approach

To develop a port design that is environmentally acceptable, delivers 'net positive' outcomes for the affected environmental values, and meets environmental regulations, Westport has:

- Developed a program of environmental and social investigations, assessments and strategies that exceeds expectations set by the WA Environmental Protection Authority and the Commonwealth Department of Climate Change, Energy, the Environment and Water.
- Used independent expert input from a wide range of stakeholders, including scientists from WAMSI, regulators, industry and community representatives.
- Invested early in technical environmental and social impact investigations, so they can be undertaken in a timely manner and used as a key input into both Westport's decision-making process and environmental impact assessment process.
- Applied a mitigation hierarchy of 'avoid, minimise/manage and restore' to the:
 - Design process and options analysis for the preferred design;
 - Planning for construction, delivery and operations; and
 - Planning for extra measures to support long-term ecosystem health.
- Ensured robust technical and quality control reviews are in place to establish high-level aspirational environmental and social performance objectives.
- Co-designed mitigation and offset projects with experts and community.

Westport has been successful in avoiding and reducing environmental impacts through the port design, achieved by moving the port footprint, minimising seagrass and water circulation impacts in the Sound, along with other environmental benefits (See Design Benefits on page 27).

Next steps

The process of securing State and Federal environmental and planning approvals is also underway for the:

Proposed port design (managed by Westport), comprising:

- Port marine infrastructure, which includes shipping channels, offshore breakwater;
- Landside infrastructure associated with the port precinct; and
- Connections to the road and rail freight network.

Road upgrades (managed by Main Roads WA), which include upgrades to Anketell Road (from Leath Road to Kwinana Freeway) to support the future freight requirements for Westport and the Western Trade Coast.

Westport is preparing environmental management plans to deliver positive environmental outcomes during the construction and operation of the new port facilities.

Westport's construction strategy is being developed to factor in careful management of water quality (including managing dredging activity intensity to provide the lowest risk of environmental harm), the ability to secure the required environmental approvals, and ensure community concerns are addressed.

Beyond our mitigation hierarchy of avoid, minimise/manage and restore, we are developing a program of activities co-designed with independent environmental experts to deliver lasting environmental restoration and resilience for Cockburn Sound. This will include activities such as significantly scaling up seagrass restoration that will support our commitment to the long-term health and recovery of Cockburn Sound.

Credit: Western Australian Marine Science Institution



Future of Fremantle

Moving container trade to Kwinana will also pave the way for the redevelopment of industrial land at Fremantle Port, creating a significant opportunity to reimagine the future of Fremantle.

Fremantle is a vibrant, cultural inner urban hub, with an engaged community, a thriving local economy and strong recreational appeal. Connected to the CBD by high frequency public transport, active transport infrastructure and established road corridors, it can accommodate a significant increase in population as WA continues to grow.

Led by the Department of Planning, Lands and Heritage, the *Future of Fremantle* initiative was borne out of the State Government's decision recommending Kwinana as the preferred location for a container port to meet WA's long-term needs.

Future of Fremantle illustrative visualisation



The *Future of Fremantle* is the long-term vision for the redevelopment of Fremantle Port, based on the relocation of all freight-related trades from Fremantle, with cruise, ferry and visiting naval to be retained.

It envisages the redevelopment of 370 hectares of port land and waterways at Fremantle, adding capacity for up to 55,000 residents and 45,000 new jobs, according to *Future of Fremantle*.

- Container trades occupy 55% of the 260-hectare current port site, which includes the North Quay.
- The North Quay footprint covers the most suitable locations for densification, including 84% of land where the target population would reside, and 66% of new jobs.

While some development in North Fremantle and Victoria Quay can occur prior to the delivery of Westport, the transition of container trade to Kwinana is the fundamental driver for enabling the overall vision.

If container trade remains in Fremantle, opportunities for residential redevelopment cannot reach their full potential due to the impact of an operating port on the urban environment.

The *Future of Fremantle* is therefore dependent on the transition of container trade to Kwinana.

Collectively, Westport and *Future of Fremantle* provide the opportunity for large-scale and relatively rapid urban infill and employment creation, both in highly suitable areas for this transformation.

What about the other trades at Fremantle Port?

Fremantle Port will remain operational, welcoming cruise ships, leisure craft and visiting military ships.

The other trades that operate at Fremantle Port include vehicle imports (roll-on roll-off), break bulk and live export trades. Collectively these are known as non-container trades. Ultimately, it's expected these other trades will also be relocated out of Fremantle Port to accommodate the *Future of Fremantle* vision. The relocation timelines for non-container trade will be further defined as planning progresses on the *Future of Fremantle*.

What's next?

Westport is now moving into its final stage of planning.

Funding

Westport has received \$273 million in funding for 'definition' of the program, including ongoing land acquisition. This involves developing detailed plans for the port development, along with the enabling road and rail infrastructure, to support future construction and final decisions.

The funding includes \$33.5 million from the Federal Government for landside infrastructure, with additional Federal funding anticipated as the program progresses towards construction.

The definition and delivery phase for Westport – including the enabling road and rail infrastructure – is expected to run from the mid-2020s until the late 2030s.

Construction will not start until the environmental impact assessment (EIA) process is complete and Ministerial approvals are received.

Environmental approvals

The marine infrastructure is undergoing an EIA process with both the State and Federal environmental regulators.

The Western Australian Environmental Protection Authority (EPA) will undertake the highest level of assessment – *Public Environmental Review* – and the Commonwealth Department of Climate Change, Energy, the Environment and Water

will undertake a Public Environment Report, which is expected to commence in 2026.

Recommendations from the EIA processes will be included in Westport's development plans, once approved.

Government strategy and coordination

The Kwinana Industrial Area is part of the broader Western Trade Coast, which includes the Australian Marine Complex, Latitude 32 and Rockingham Industry Zone.

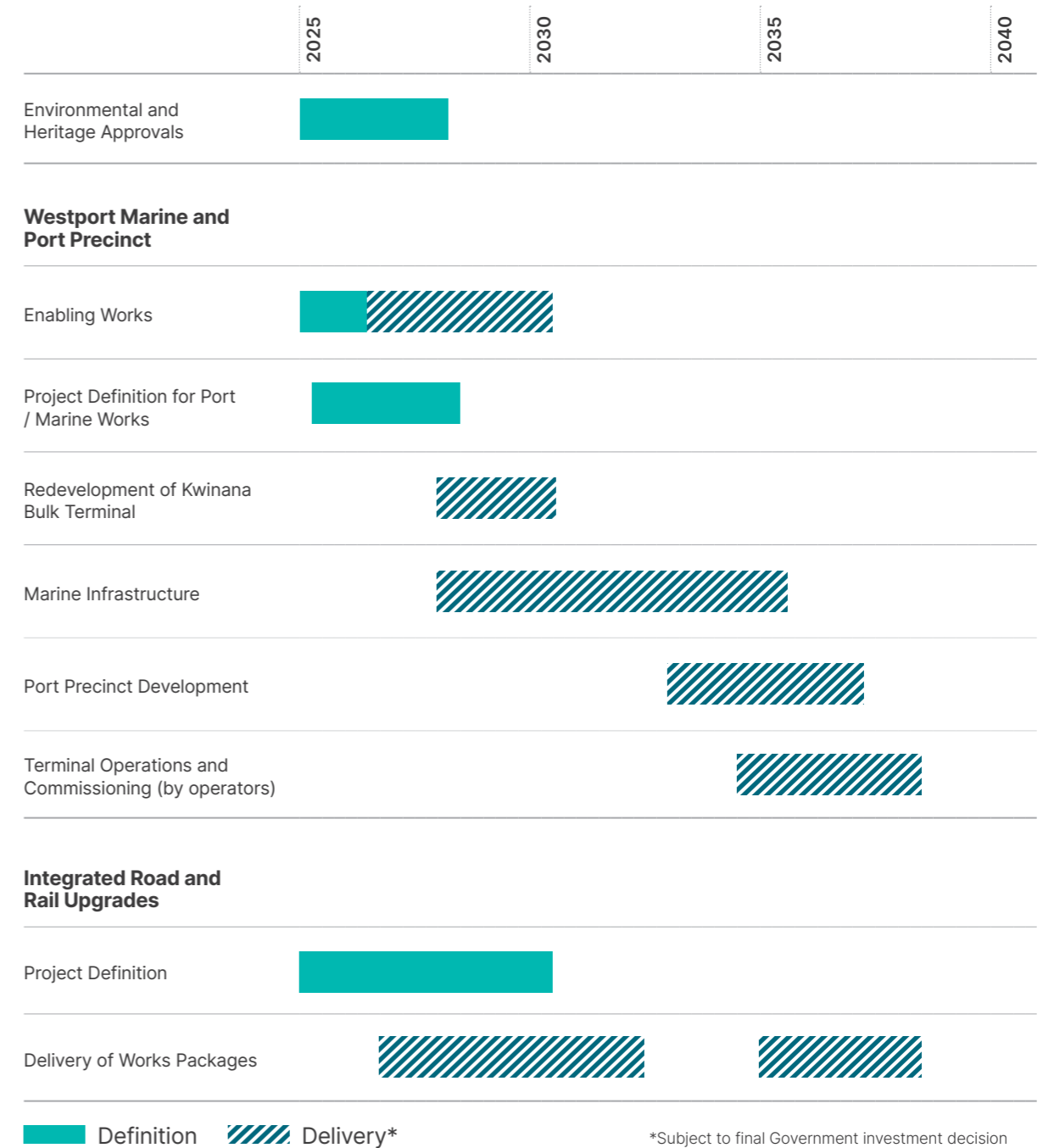
Over the coming decades, Westport will be delivered alongside other major infrastructure projects across the Western Trade Coast, including Defence developments at Henderson and Garden Island, the redevelopment of the Kwinana Bulk Terminal and expansion of the Kwinana Bulk Jetty.

Collectively, these and other initiatives are part of the State and Federal Governments' strategies to transform Perth's premier industrial precinct into a Global Advanced Industries Hub that will position WA as a leader for defence, trade, and clean energy industries, creating long-term local jobs and diversify the State's economy.

Westport is working closely with State and Federal agencies to capitalise on development synergies and manage risks, ensuring a coordinated approach.

The definition and delivery of Westport, including the supporting road and rail infrastructure, will take more than a decade.

Indicative schedule





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