

August 2023

navigate

Westport Program Update



Taking a closer look at some of the science, thinking and technical processes behind one of Western Australia's largest ever infrastructure projects.

Managing Director's Message

Perth hosts the only major container port on the western side of Australia. Ensuring efficient, sustainable, and continuous operation is fundamental for the geographically isolated Western Australian local economy, which also supports major export industries underpinning Australia's national economic prosperity.

We have a once-in-a-lifetime opportunity to put the entire supply chain under the microscope, and optimise the flow of containers across all marine, port and landside activities. This holistic approach is the only way to truly maximise benefits to the economy and society.

Recognising the local and national significance of this project, the ongoing efforts of so many people involved in the process, and its implications on industry and community, these Navigate newsletters are intended to share some of the thinking behind our planning and design processes.

Our team is excited to continue to share the process and findings of our various technical projects. If you have questions or would like to discuss any articles in this issue further, please reach out via enquiries@westport.wa.gov.au

Patrick Seares
Managing Director, Westport

Westport's Journey



Problem identification and initiation

WA Government

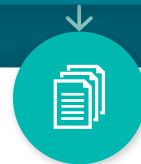
2017



Strategic planning and optioning

Westport Independent Taskforce

2017 - 2020



Business case and definition design

Westport Program

2020 - 2024

Mid 2023: Options for new container terminal and supply chain

Late 2023: Final option for container terminal and supply chain

Late 2023: Anketell-Thomas Road freight corridor updated concept design

Early 2024: Referral to EPA to determine level of environmental assessment

Mid 2024: Submission of Westport Business Case to WA Government



Detailed design, environmental approval, procurement, construction and transition



Planning for tomorrow's port, today

The largest container vessels to ever call into the Fremantle Inner Harbour have carried nearly 10,000 Twenty-Foot Equivalent Units (TEU). But bigger vessels are on their way, so Westport is planning with an eye on the future through one of our goals scalability.

Scalability is about building for what is required in the short or medium term, while also doing enough design and land protection work to ensure shipping channels, marine terminals, road and rail corridors, and intermodal and logistics precincts can grow to accommodate the next century of container throughput, including at higher growth rates and for larger vessels.

WA is part of the Australian 'swing', where vessels call at Fremantle before or after stopping at larger-scale east coast ports which serve greater population centres. This means the size of ships calling at Fremantle, and future Westport, will likely be decided by what vessels visit Australia more generally.

There are currently some constraints on east coast ports, however we need to consider the possibility of Victoria, New South Wales and Queensland accepting larger vessels in the future and the implications this will have on shippings routes across the region. Vessel sizes determine channel dimension, quay wall design, wharf length, and the capacity of the road and rail networks required to efficiently move containers in and out of port during peak periods.

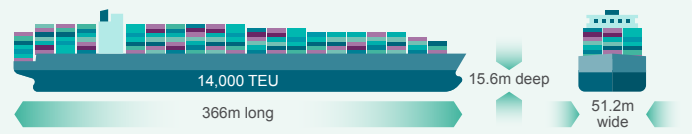
Westport has analysed the types and sizes of vessels around the world, how these vessels move in Australian ports, and the trends in vessel use on global shipping routes.

We calibrated these studies through engagement with Shipping Australia and shipping lines including Maersk, Mediterranean Shipping Company, and Ocean Network Express, as well as discussing ship sizes, future fuels and commercial arrangements.

But what does this mean for Westport?

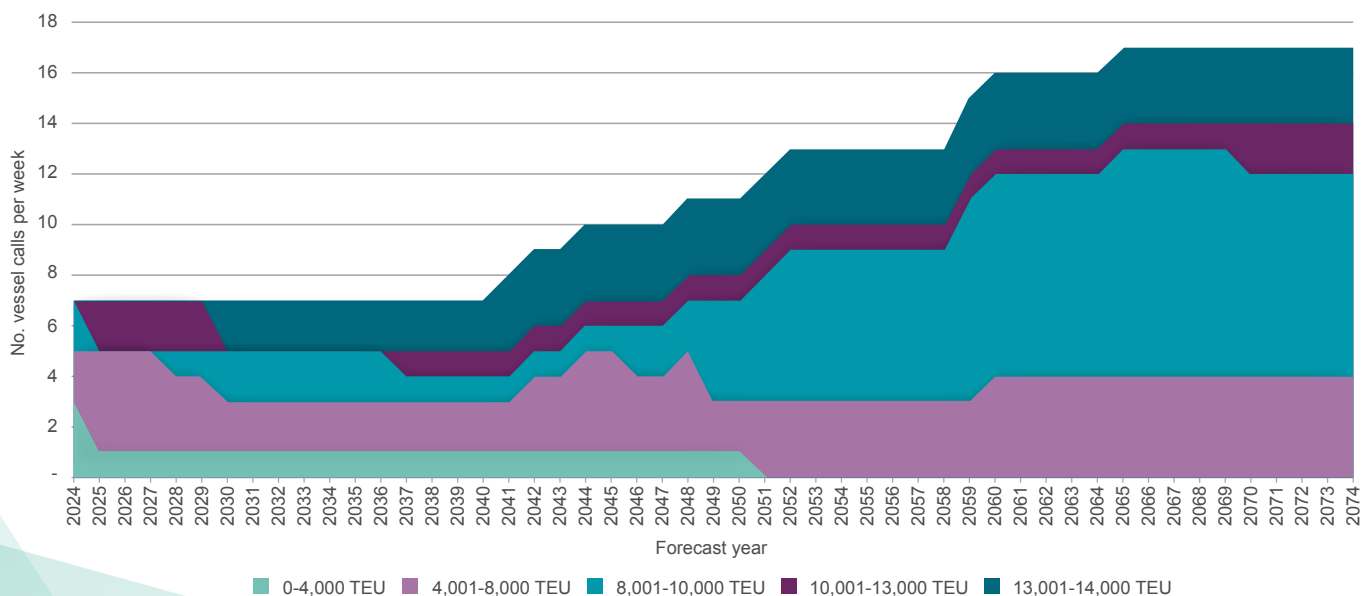
We're planning a port that will service Western Australia for the next century, which means considering global trends towards larger vessels and renewable shipping fuels.

The channels, wharves, cranes, and landside of Perth's future container terminal will be designed to accommodate the efficient operation of a post-Panamax vessel carrying about 14,000 TEU, which may avoid the need for more expensive shuttle runs between Perth and Singapore if these vessels bypass Perth. To future-proof the planning, we are also doing preliminary work to understand how Westport can accommodate vessels carrying up to 18,000 TEU.



Westport's working design vessel is a post-Panamax measuring 366m long, 51.2m wide and 15.6m deep carrying about 14,000 TEU.

50-Year Fleet Forecast

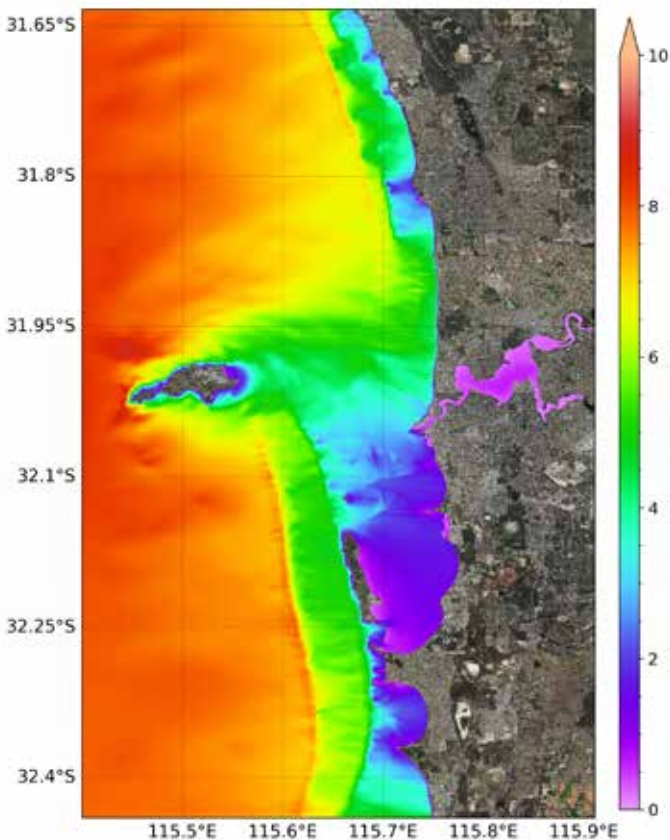


A port for all weather

Cockburn Sound is the only protected open water near Western Australia's main population and industry – a key reason it's been an operating port for over half a century. Unlike the east coast, Western Australia does not have many deep inlets or wide river-mouths suitable for large shipping.

This operating environment was a key part of the comprehensive work completed in 2020 by the Stage 2 Westport Taskforce to identify the best location for the port.

But even in Cockburn Sound, bad weather can halt port operations. Westport's goals include resilience and efficiency. For a terminal design, this means ensuring a high level of operability and availability, in all but the most extreme weather conditions.



To support these goals, Westport has been working to better understand the waters of Cockburn Sound, through two sets of wave modelling. So far we have:

- deployed wave and current monitoring buoys – including for long-period gravity waves
- collated all existing oceanographic and wave data for Cockburn Sound and updated the regional wave model
- consulted with nearby terminal operators, including Fremantle Ports and Alcoa, about the impacts of waves and currents on their berthing, mooring and other operations in the outer harbour

We have learned that, surprisingly, waves generated by prevailing fronts from the southwest are expected to have less influence on operations than longer period swell waves from the northwest, which can affect vessel movement in the port and have even caused mooring ropes to snap.

We have used this wave information to undertake a preliminary 'downtime' analysis for the port, combining it with the outputs of shipping studies and early terminal layout options to identify times of the year when weather may impact port operations and, therefore, what design features may be required to mitigate this.

This image was provided by Ivica Janekovic, UWA and demonstrates the sheltering of Cockburn Sound even in the 100km/h+ winds from the major storms that hit Perth August 2022.

This analysis indicated that a breakwater will be required for the concept completed in Stage 2. We are exploring different layouts of the terminal, turning basins and breakwater to find the best balance between minimising environmental impact, interruptions to operations, and cost. The analysis outputs are also guiding the planning around mooring technology, quay line design and operations, and tug operations.





Co-designing a regenerative port

Cockburn Sound is a significant but degraded marine ecosystem that is now in a state of recovery. Planning a port in this environment, while facilitating this long-term recovery, is a challenge and responsibility Westport takes seriously.

One of our ESG objectives is to embed Working With Nature into planning to regenerate the natural and physical environment, striving for a better environment after construction than before.

We are working with teams of experts, NGOs, community representatives and government agencies to develop measures that help improve the environment around the port and its landside connections.

Our Marine Mitigation Working Group is identifying and co-designing opportunities that will build the health and resilience of the Cockburn Sound environment.

These opportunities are being developed into 'on-ground' projects, which include:

- Using dredge material to create new areas of habitat where seagrass can grow
- Rehabilitating and restoring degraded areas of seagrass habitat
- Deploying specially designed artificial reefs to create habitat and support recreational fishing
- Improving access for recreational fishing through new or upgraded boat ramps and jetties

The WAMSI Westport Marine Science Program has been instrumental in feeding the latest marine science research and modelling into the marine mitigation development process. This ensures these projects are appropriate for Cockburn Sound and are designed with the best chance of success.

While we can't avoid some of the negative impacts of dredging, we can mitigate them and investigate beneficial opportunities.

On the landside, we also have a Terrestrial Mitigation Working Group, investigating mitigation and resilience by building opportunities in the areas around the proposed port site and the Anketell Road expansion.

As part of our mitigation approach, Westport is investigating opportunities to support landscape-scale ecological linkages through acquisition and revegetation properties between major Bush Forever locations.

The Marine and Terrestrial Mitigation Strategies are due for completion in late 2023. These will inform the environmental assessment process and our associated mitigation and offsets package.

Our goal is that, following the construction of Westport and implementation of the mitigation strategy, Cockburn Sound and Westport's terrestrial environments can be left better than when we started.

What lies beneath



A solid port needs a solid foundation and the starting point is geotechnical investigations and geophysical survey.

Geotechnical investigations and geophysical surveys provide valuable information about subsurface conditions. Geotechnical investigation involves collecting and analysing physical samples, whereas geophysical surveying involves the use of various non-intrusive techniques to study the subsurface conditions without drilling or excavation.

These investigations are usually carried out during the later design stages, but Westport is starting them during the development of the business case because of the size of the project and the importance of early planning based on robust science.

Geophysical investigations are now complete within Cockburn Sound which will inform the port navigation channels, dredging and terminal design. The survey will also inform the scope and extent of future marine geotechnical investigations.

Marine geotechnical investigations are critical for informing the dredging strategy and port design. Westport is undertaking a detailed examination of existing marine geotechnical information for the region and is planning a program of its own.



Find out more:

<https://westport.wa.gov.au/environment/>

Prior to these studies progressing, the South West Aboriginal Land and Sea Council (SWALSC) has requested a heritage assessment of the proposed borehole locations. We anticipate geotechnical studies will commence in early 2024, pending SWALSC approval.

Landside geotechnical investigations have started on the land between the port and Rockingham Road, with Main Roads WA leading the geotechnical investigations along Anketell and Thomas Road.



Geotechnical investigations in Kwinana Industrial Area. Image supplied by Fremantle Ports Authority.

