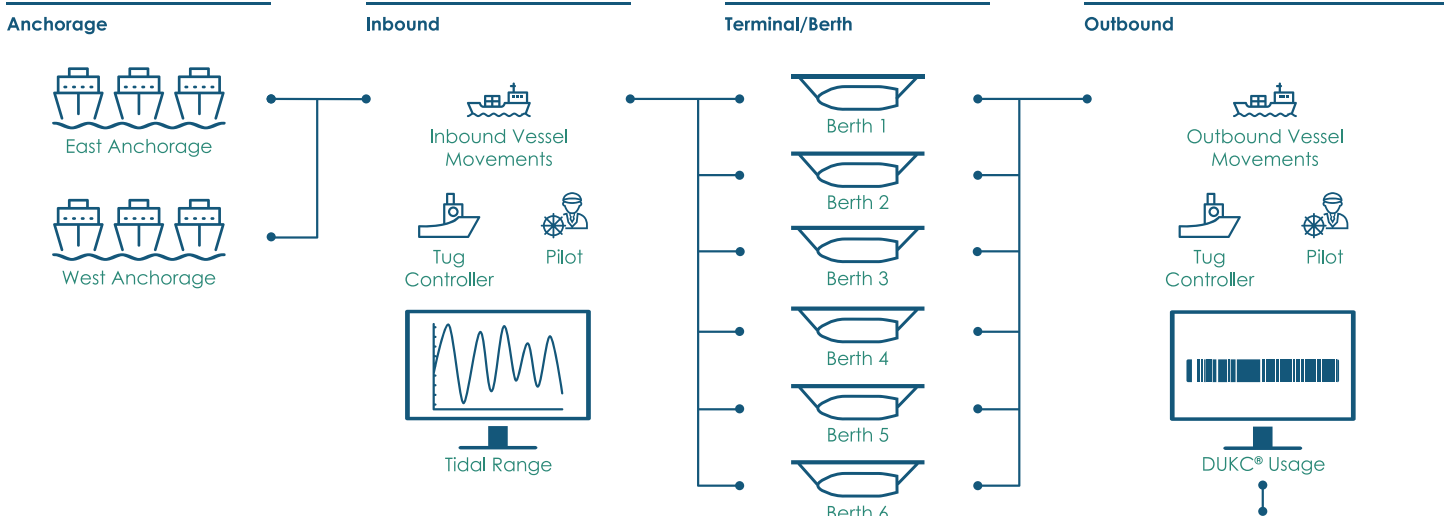


# Dynamic Port Capacity Model

Reveal your port's true throughput potential

2015 winner of the prestigious IBJ Safety in Bulk Handling Award



The Dynamic Port Capacity Model (DPCM®) accurately simulates port operations, capturing the interactions that occur between the various elements within the port. The DPCM® takes a holistic approach to evaluate port performance, factoring in the uncertainty inherent in any port operations, to provide a reliable decision support tool.

## DPCM® Output

  
51.49 Mtpa  
Total Throughput

  
DPCM Analytics

  
Throughput Over Time



# Optimising Port & Waterway Throughput

The Dynamic Port Capacity Model (DPCM®) is the world's first and only port capacity model that fully integrates dynamic under keel clearance calculations, site specific environmental conditions, and unique port factors. Through a discrete event simulation model of a port's operations, the DPCM® provides a tool to assess the impact on port capacity from changes to variables such as ship loader rates, vessel fleet profiles, services and asset availability (tugs, pilots, etc), as well as the effects of port closures (e.g. due to cyclones or harbour resonance).

The DPCM® is a decision support tool that allows port operators to assess port performance indicators, and evaluate various operational strategies to rank the performance of each against a range of criteria such as total throughput, dead freight, waiting times, berth occupancy, pilot fatigue, etc. It can be used for

existing port operations, or as a forecast tool to model potential future scenarios, such as larger vessel classes, or a new trade.

The DPCM® has been successfully applied at Port Hedland, the world's largest bulk export port, to evaluate the port's total capacity. Utilising the DPCM®, Port Hedland's declared port capacity has increased by 16 per cent from 495 million tonnes per annum to 577 million tonnes per annum. This increase is one third of the additional capacity proposed by the now shelved Outer Harbour project, which had an estimated cost of AUD\$20b.

The performance of the DPCM® has been validated each year since its development against actual port throughput, and has proven its ability to reliably reproduce the port's operations.

In addition to realising an additional port capacity of 82mtpa, the DPCM® has been used to:

- Assess the impacts of dredging (both proposed and actual campaigns);
- Monitor and forecast the impact of changes to the vessel fleet profile, specifically the shift towards 250,000+ DWT vessels.
- Evaluate changes to port protocols;
- Better understand requirements, benefits, and limitations for port assets and services including:
  - loader rates and surge bins,
  - mooring technologies such as Cavotec MoorMaster;
  - pilots and tugs

## Questions DPCM® can Answer



What is the capacity of the port's channel?



What is the impact on throughput of a new type and size of vessel?



What size and type of vessels should we charter to maximise throughput?



How much more throughput can we expect if we add a new berth or a new loader?



Will this significantly reduce the need for capital dredging with its associated environmental costs?



If we add another tug, how many more vessels can be handled?



What is the impact on throughput if we modify our port operational procedures?



**"The (capacity) modelling looked at recent operational changes at the port including the use of innovative maritime technology, which has resulted in increased sailing drafts, the shipping companies' move to larger and more draft efficient vessels, and the port's ability to sail more ships on a tide."**

**WA Transport Minister, Dean Nalder,**  
November 2015