



Australian Government

Department of Infrastructure, Transport,
Regional Development, Communications and the Arts

BUREAU OF INFRASTRUCTURE AND TRANSPORT RESEARCH ECONOMICS
STATISTICAL REPORT



Maritime

Waterline 70

December 2024

Bureau of Infrastructure and Transport Research Economics

Waterline 70
December 2024

Department of Infrastructure, Transport,
Regional Development, Communications and the Arts
Canberra, Australia

The Department of Infrastructure, Transport, Regional Development, Communications and the Arts acknowledges the Traditional Custodians of Country of the land on which we work and live.

We recognise and respect the continuing connections to land, waters and communities.

We pay our respects to them and their cultures and to their Elders both past and present and to all Aboriginal and Torres Strait Islander people.

© Commonwealth of Australia, 2024
ISBN 978-1-922879-62-2
ISSN 2208-9101
BITRE ref. 2024-1215 (December 2024)

Cover Photo: *MSC Tomoko* (IMO 9309461) arriving at Fremantle Inner Harbour. Photo courtesy of Fremantle Ports.

Ownership of intellectual property rights in this publication

Unless otherwise noted, copyright (and any other intellectual property rights, if any) in this publication is owned by the Commonwealth of Australia (referred to below as the Commonwealth).

Disclaimer

The material contained in this publication is made available on the understanding that the Commonwealth is not providing professional advice, and that users exercise their own skill and care with respect to its use, and seek independent advice if necessary.

The Commonwealth makes no representations or warranties as to the contents or accuracy of the information contained in this publication. To the extent permitted by law, the Commonwealth disclaims liability to any person or organisation in respect of anything done, or omitted to be done, in reliance upon information contained in this publication.

Creative Commons licence

With the exception of (a) the Coat of Arms; and (b) the Department of Infrastructure, Transport, Regional Development, Communications and the Arts's photos and graphics, copyright in this publication is licensed under a Creative Commons Attribution 3.0 Australia Licence.

Creative Commons Attribution 3.0 Australia Licence is a standard form licence agreement that allows you to copy, communicate and adapt this publication provided that you attribute the work to the Commonwealth and abide by the other licence terms. A summary of the licence terms is available from <http://creativecommons.org/licenses/by/3.0/au/deed.en>. The full licence terms are available from <http://creativecommons.org/licenses/by/3.0/au/legalcode>.

Use of the Coat of Arms

The Department of the Prime Minister and Cabinet sets the terms under which the Coat of Arms is used. Please refer to the Department's Commonwealth Coat of Arms and Government branding web page <https://www.pmc.gov.au/resource-centre/government/australian-government-branding-guidelines-use-australian-government-logo-australian-government-departments-and-agencies> and, in particular, the *Commonwealth Coat of Arms Information and Guidelines* publication.

An appropriate citation for this report is:

Bureau of Infrastructure and Transport Research Economics 2024, *Waterline 70*, Statistical Report, Canberra, ACT.

Contact us

This publication is available in PDF format. All other rights are reserved, including in relation to any Departmental logos or trademarks which may exist. For enquiries regarding the licence and any use of this publication, please contact:

Bureau of Infrastructure and Transport Research Economics
Department of Infrastructure, Transport,
Regional Development, Communications and the Arts
GPO Box 501, Canberra ACT 2601, Australia

Email bitre@infrastructure.gov.au

Website www.bitre.gov.au

Foreword

Waterline is published by the Bureau of Infrastructure and Transport Research Economics (BITRE) and provides information on container movements on both the wharf-side and the landside of five Australian major port terminals: Brisbane, Sydney, Melbourne, Adelaide and Fremantle. This issue of *Waterline* covers port terminal activity up to the June quarter 2023.

Waterline reports on trends in container handling productivity on the waterfront in Australia, as well as the cost of importing and exporting containers. It covers loading and unloading of container ships and the landside transport of containers to and from container terminals. *Waterline* provides the latest available data on stevedoring productivity and landside performance.

This issue of *Waterline* was prepared in the Infrastructure and Surface Transport Statistics Section by Thomas Rutherford. For further information on this report, please email maritime_stats@infrastructure.gov.au.

Georgia O’Cianain
Head of Bureau
Bureau of Infrastructure and Transport Research Economics
December 2024

At a glance

Waterline 70 introduces two new indicators: *Indicator 1.14 Ship TEU capacity* and *Indicator 2.19 Berth occupancy*.

Throughput

- *Indicator 1.14 Ship TEU capacity* extends the tally of port calls by vessel size from gross tonnage (Tables 1.7 to 1.9) to vessel TEU capacity. See Tables 1.10 to 1.12 for the latest figures, or the time series tables for a longer history.

- The *number of twenty-foot equivalent units (TEUs) handled by stevedores* decreased by 7.6 per cent in the Five ports in January–June 2023, compared to January–June 2022. TEUs handled decreased at all five ports: by 8.6 per cent in Sydney; 8.4 per cent in Melbourne and Adelaide, 6.1 per cent in Fremantle and 4.6 per cent in Brisbane.

In July–December 2022, throughput in the Five ports increased by 4.4 per cent compared to July–December 2021, with the biggest increase at Fremantle (10.5 per cent).

- The *number of unitised cellular container (UCC) vessels handled by stevedores* increased by 9.2 per cent to 1 931 UCC vessels in the Five ports in January–June 2023, compared to January–June 2022. Vessel calls increased in Fremantle (18.1 per cent), Sydney (14.4 per cent), Melbourne (12.2 per cent) and Brisbane (2.4 per cent) but decreased in Adelaide (8.1 per cent).

In July–December 2022, the *number of unitised cellular container (UCC) vessels handled by stevedores* increased by 16.9 per cent in the Five ports compared to July–December 2021. Increases of greater than 10 per cent occurred in all five ports, with Fremantle posting the largest increase at 27.5 per cent.

- *Lifts per berth visit* decreased by 16.0 per cent in the Five ports in January–June 2023 (compared to January–June 2022), to an average of 1 261.5 lifts. This is 19.0 per cent below the peak of 1 557.1 lifts in July–December 2021.

Declines in *lifts per berth visit* compared to January–June 2022 were largest in Sydney (20.0 per cent), Fremantle (19.3 per cent) and Melbourne (16.6 per cent).

Combined with the increasing number of vessel calls, it is likely that the declining *lifts per berth visit* is primarily a result of normalising schedules and vessel allocations.

Performance

- *Indicator 2.19* can be found in Tables 2.1 to 2.6, under 'Whole of container terminal' performance measures.

Berth occupancy was 39.6 per cent in the Five ports in January–June 2023, down from 45.4 per cent in January–June 2022. In January–June 2023, *berth occupancy* was highest in Sydney (45.2 per cent), followed by Melbourne (41.5 per cent), Fremantle (38.9 per cent), Adelaide (38.2 per cent), and Brisbane (31.8 per cent).

- Stevedoring velocity improved in January–June 2023 compared to January–June 2022. Five-port average *crane rate* increased by 8.2 per cent; *labour rate* by 11.7 per cent and *ship rate* by 11.5 per cent, measured in containers per (net) hour.

Sydney saw the biggest gains in all three measures, with *crane rate* improving by 14.0 per cent, *labour rate* by 15.5 per cent and *ship rate* by 19.6 per cent.

Velocity measures were more mixed in July–December 2022 (compared to July–December 2021), where the Five-port average *crane rate* increased by 1.6 per cent, *labour rate* increased by 5.5 per cent and *ship rate* decreased by 1.1 per cent. Brisbane and Adelaide posted decreases in all three measures, whereas Melbourne and Fremantle improved in all three.

- *Truck turnaround time* decreased by 8.7 per cent (3.1 minutes) over the Five ports in January–June 2023, compared to January–June 2022, and the *average containers per truck* increased by 0.9 per cent, resulting in a decrease in *container turnaround time* of 9.5 per cent (2.0 minutes) on average across the five ports, with improvements in Brisbane (3.0 minutes), Sydney (2.8 minutes), Adelaide (2.7 minutes) and Melbourne (1.1 minutes).

July–December 2022 also saw improvements in *container turnaround time* compared to July–December 2021, with an average decrease of 1.3 minutes across the Five ports. Melbourne reduced turnaround time by 2.5 minutes, and Adelaide by 2.3 minutes; Sydney was the only port to experience increased container turnaround time (0.7 minutes).

- The *number of VBS timeslots actually used* across the Five ports was 1.3 million slots in January–June 2023, a decrease of 4.9 per cent compared to January–June 2022.

In addition, the *timeslots used by trucks in all off-peak periods as proportion of total timeslots used at container terminals* decreased by 2.9 percentage points to 45.8 per cent.

Port interface costs

- In constant prices, port interface costs for exports increased for all vessel sizes in July–December 2022, then declined again in January–June 2023 (compared to the immediately-prior period).
 - For small ships (5 000 to 20 000 gross tonnes), port interface costs increased by \$2 per TEU in July–December 2022, then decreased by \$4 per TEU in January–June 2023.
 - For medium-size ships (35 000 to 50 000 gross tonnes), port interface costs increased by \$3 per TEU in July–December 2022, then decreased by \$10 per TEU in January–June 2023.
 - For large ships (65 000 to 80 000 gross tonnes), port interface costs increased by \$4 per TEU in July–December 2022, then decreased by \$9 per TEU in January–June 2023.
- In constant-price terms, port interface costs for imports increased for all vessel sizes (except for vessels 65 000 to 80 000 gross tonnes, which remained constant) in July–December 2022. Costs then dropped in January–June 2023, compared to the immediate prior period.
 - For small ships (5 000 to 20 000 gross tonnes), port interface costs increased by \$2 per TEU in July–December 2022, then decreased by \$21 per TEU in January–June 2023.
 - For medium-size ships (35 000 to 50 000 gross tonnes), port interface costs increased by \$4 per TEU in July–December 2022, and then decreased by \$16 per TEU in January–June 2023.
 - For large ships (65 000 to 80 000 gross tonnes), port interface costs per TEU remained the same in July–December 2022 compared to January–June 2022, then decreased by \$14 per TEU in January–June 2023.

Acknowledgements

BITRE is particularly grateful for the assistance of the following organisations in the provision of data used to prepare *Waterline*:

- stevedoring companies: DP World, Flinders Adelaide Container Terminal, Hutchison Ports Australia, Patrick and Victoria International Container Terminal
- individual port authorities and corporations: Port of Brisbane Pty Ltd, Maritime Safety Queensland, Port Authority of New South Wales, NSW Ports, Port of Melbourne Operations Pty Ltd, Flinders Ports and Fremantle Ports
- Ports Australia
- Containerchain Pty Ltd
- shipping lines
- customs brokers
- road transport operators
- pilot, tug and mooring operators.

Contents

Foreword	iii
At a glance	v
1 Measures of container terminal throughput	1
2 Measures of container terminal performance	21
3 Vehicle booking system and empty container park operations	43
4 Port interface cost index	57
A Maps of five major Australian container ports	75

Tables

1.1	Container terminal throughput: Brisbane	13
1.2	Container terminal throughput: Sydney	14
1.3	Container terminal throughput: Melbourne	15
1.4	Container terminal throughput: Adelaide	16
1.5	Container terminal throughput: Fremantle	17
1.6	Container terminal throughput: Five ports	18
1.7	Container ship visits by gross tonnage: January–June 2023	19
1.8	Container ship visits by gross tonnage: July–December 2022	19
1.9	Container ship visits by gross tonnage: January–June 2022	19
1.10	Container ship visits by TEU capacity: January–June 2023	20
1.11	Container ship visits by TEU capacity: July–December 2022	20
1.12	Container ship visits by TEU capacity: January–June 2022	20
2.1	Container terminal performance: Brisbane	36
2.2	Container terminal performance: Sydney	37
2.3	Container terminal performance: Melbourne	38
2.4	Container terminal performance: Adelaide	39
2.5	Container terminal performance: Fremantle	40
2.6	Container terminal performance: Five ports	41
3.1	Timeslots available and actually used by trucks: Brisbane	50
3.2	Timeslots available and actually used by trucks: Sydney	51
3.3	Timeslots available and actually used by trucks: Melbourne	52
3.4	Timeslots available and actually used by trucks: Adelaide	53
3.5	Timeslots available and actually used by trucks: Fremantle	54
3.6	Timeslots available and actually used by trucks: Five ports	55
3.7	Empty container park operations	56
4.1	Port interface costs by ship type—parameters and estimates: Brisbane	64
4.2	Port interface costs by ship type—parameters and estimates: Sydney	66
4.3	Port interface costs by ship type—parameters and estimates: Melbourne	68
4.4	Port interface costs by ship type—parameters and estimates: Adelaide	70
4.5	Port interface costs by ship type—parameters and estimates: Fremantle	72
4.6	National port interface costs, by size of ship (current prices)	74
4.7	National port interface costs, by size of ship (constant prices)	74

Figures

1.1	TEU throughput by container port: wharf-side	7
1.2	TEU throughput by container port: landside	8
1.3	TEU throughput by container port: whole of port	9
1.4	Container terminal traffic: number of UCC ships handled	10
1.5	Container terminal traffic: number of trucks used in VBS/TAS operations	11
1.6	Rail share of TEUs handled	12
2.1	Wharf-side crane rate	27
2.2	Wharf-side elapsed labour rate	28
2.3	Wharf-side ship rate	29
2.4	Performance in five ports: Comparison of wharfside rates	30
2.5	Average TEUs per truck on landside of container terminals	31
2.6	Average container turnaround time on landside of container terminals	32
2.7	Longest and shortest truck turnaround time in five ports	33
2.8	Longest and shortest container turnaround time in five ports	33
2.9	Average number of lifts per hour a ship spent at berth	34
2.10	Average number of lifts per berth visit	35
3.1	Timeslots used by trucks in all off-peak periods	46
3.2	Timeslots used by trucks in off-peak periods Monday to Friday	47
3.3	Timeslots used by trucks on Saturday and Sunday	48
3.4	TEUs processed per VBS timeslot used at container terminals	49
4.1	Port interface costs, constant prices (January–June 2023), by ship size	63
A.1	Brisbane (Fisherman Islands terminals)	76
A.2	Sydney (Port Botany terminals)	78
A.3	Melbourne (Swanson and Webb Dock terminals)	82
A.4	Adelaide (Outer Harbor / Pelican Point)	86
A.5	Fremantle (North Quay terminals in the Inner Harbour)	88

CHAPTER 1

Measures of container terminal throughput

Overview

Chapter 1 of *Waterline* presents all container port throughput indicators in a consolidated format. The indicators are in four groups—wharf-side, landside, whole of container terminal and whole of port.

There are five wharf-side quarterly throughput indicators:

- 1.1 UCC ships handled, as reported by stevedores
- 1.2 Total containers handled by stevedores
- 1.3 Total TEUs handled by stevedores
- 1.4 40-foot containers as per cent of all containers handled

There are seven landside quarterly throughput indicators:

- 1.5 Number of trucks used in VBS/TAS operations
- 1.6 Total number of containers transported by trucks and rail
- 1.7 Total number of containers transported by trucks
- 1.8 Number of containers by rail
- 1.9 Total number of TEUs transported by trucks and rail
- 1.10 Total number of TEUs transported by trucks
- 1.11 Number of TEUs by rail

Using data from port authorities, there are two quarterly whole-of-terminal throughput indicators:

- 1.12 Total number of container ship visits
- 1.13 Total number of containers (lifts) exchanged
- 1.14 Ship TEU capacity

Using data from port authorities, there are seven quarterly whole-of-port throughput indicators:

- 1.15 Total cargo throughput

- 1.16 Non-containerised general cargo throughput
- 1.17 Total number of TEUs exchanged
- 1.18 Number of TEUs: Full import
- 1.19 Number of TEUs: Empty import
- 1.20 Number of TEUs: Full export
- 1.21 Number of TEUs: Empty export

Indicators are presented separately for Brisbane, Sydney, Melbourne, Adelaide and Fremantle, as well as for the five ports as a whole, where applicable.

Container terminal

The movement of containers from/to the container ship takes place on a wharf or pier known as a container terminal. Unlike a traditional wharf, a container terminal needs a large stacking area adjoining the wharf for storing containers. While in the terminal, the containers are at the disposal of a stevedoring company.

Stevedoring

The term stevedore can refer to a company which manages the operation of loading or unloading a ship. In Australia the people who work on the waterfront are referred to as water-side workers or stevedores. A stevedoring company typically owns equipment used in the loading or discharging operation and hires labour for that purpose. A stevedoring company may also contract with a terminal owner to manage all terminal operations. In Australia, there are three major stevedoring companies which handle containers: Patrick, Dubai Ports World and Hutchison Ports Australia.

Wharf-side throughput measures

Measures of throughput at the wharf-side relate only to containers moved by stevedoring companies from/to UCC ships at the container terminals.

Indicator 1.1 UCC ships handled, as reported by stevedores

Only fully cellular ships, or Unitised Cellular Container (UCC) ships, are included in this indicator. Normally these purpose built container ships are equipped with 40-foot cell guides below deck as a minimum requirement.

Indicator 1.2 Total containers handled

This is the total number of containers lifted on/off UCC ships at specialised container berths. These counts are not standardised to account for different container sizes. Thus, one 20-foot container and one 40-foot container are counted as two containers.

Indicator 1.3 Total TEUs handled

This indicator is similar to total containers handled (Indicator 1.2), but measured in 'twenty-foot equivalent units' (TEUs). It accounts for containers of different sizes. The TEU is a

universally-recognised measure which represents containers of different sizes in a standardised way. A 20-foot container equals one TEU, and a 40-foot container equals two TEUs. Less common container sizes may be fractions of a TEU.

Indicator 1.4 40-foot containers as proportion of all containers handled

This is the number of 40-foot containers as a proportion of all containers handled.

Landside throughput measures

Indicator 1.5 Number of trucks used in VBS/TAS operations

This is the count of trucks processed through either the vehicle booking system (VBS) or the truck appointments system (TAS). This count excludes trucks that perform bulk runs of empty containers between the container parks and container terminals. This indicator counts trucks on a round trip. That is, a truck entering a container terminal and the same truck exiting the container terminal is counted as one truck.

Indicator 1.6 Total number of containers transported by trucks and rail

This indicator includes the total number of containers transported in all modes on the landside, either by trucks or by rail. Counts of containers in this indicator are further broken down into Indicator 1.7 (containers moved by trucks) and Indicator 1.8 (containers moved by rail).

Indicator 1.7 Total number of containers transported by trucks

This indicator includes the total number of containers transported by VBS/TAS trucks. This indicator is computed using data provided by stevedores. Up to Waterline 55, this indicator included the trucks undertaking bulk runs; this has been discontinued due to inconsistent data.

Indicator 1.8 Number of containers by rail

The total number of containers carried by rail in or out of container terminals, using data supplied by container port operators.

This indicator includes containers handled through ‘on-dock’ and ‘near-dock’ rail sidings. ‘On-dock’ refers to rail sidings accessible by yard container handling equipment, whereas ‘near-dock’ sidings are those within the port precinct, but accessed via the public road network. Only on-dock rail data is reported for Sydney, as port precinct rail data is not available.

Indicator 1.9 Total number of TEUs transported by trucks and rail

This indicator includes the total number of TEUs transported in all modes on the landside, either by trucks or by rail. Counts of TEUs in this indicator are further broken down into Indicator 1.10 (TEUs moved by trucks) and Indicator 1.11 (TEUs moved by rail).

Indicator 1.10 Total number of TEUs transported by trucks

This indicator includes the total number of TEUs transported by VBS/TAS trucks. Up to Waterline 55, this indicator included the number of TEUs transported by trucks undertaking bulk runs; this has been discontinued due to inconsistent data.

Indicator 1.11 Number of TEUs by rail

The total number of TEUs carried by rail in or out of container terminals, using data supplied by container port operators.

This indicator includes containers handled through ‘on-dock’ and ‘near-dock’ rail sidings. ‘On-dock’ refers to rail sidings accessible by yard container handling equipment, whereas ‘near-dock’ sidings are those within the port precinct, but accessed via the public road network. Only on-dock rail data is reported for Sydney, as port precinct rail data is not available.

Whole of container terminal throughput

Indicator 1.12 Total number of container ship visits

This is a count of all port calls by UCC ships where the vessel visited and exchanged containers at the container terminal. Tables 1.7 and 1.8 summarise ship visits by size of ship and by container port.

Indicator 1.13 Total number of containers (lifts) exchanged

This indicator is estimated using Indicator 1.4 (proportion of 40-foot containers) and the total number of TEUs exchanged with container vessels, as reported by ports.

Indicator 1.14 Ship TEU capacity

A vessel’s TEU capacity is the number of twenty-foot equivalent units it is nominally able to carry. Among other factors, this is affected by vessel draft, length, beam and deadweight tonnage. Depending on the cargoes carried, a vessel may not be able to achieve its nominal capacity on a given voyage. All other things being equal, vessels with larger capacities can carry more TEUs.

Group boundaries correspond to different size classes of containership calling Australian ports: small feeders (<1 500 TEU), large feeders (1 501–3 000 TEU), Panamax (3 000–5 200 TEU), post-Panamax (5 200–7 500 TEU), neo-Panamax (7 500–10 000 TEU) and larger vessels. For vessels in the Australian fleet, the TEU capacity boundary between Panamax and larger vessels is 5 200 TEU. While there is no formal distinction between post- and neo-Panamax vessels, the populations in Australian service are distinct.

Whole of port throughput

Indicator 1.15 Total cargo throughput

This is the weight, measured in tonnes, of all container and non-container general cargoes that passed through the port.

Indicator 1.16 Non-containerised general cargo throughput

This is the weight of non-container general cargoes processed through a port. Non-container general cargo refers to break bulk commodities including machinery, iron and steel products, timber, paper and timber products and other general cargoes. It does not include bulk cargoes.

Indicator 1.17 Total number of TEUs exchanged

This is a count of TEUs, exchanged through the port. This count is further broken down into Indicators 1.18 to 1.21.

Indicator 1.18 Full import TEUs

This is a count of full containers in TEUs imported (unloaded) at the port.

Indicator 1.19 Empty import TEUs

This is a count of empty containers in TEUs imported (unloaded) at the port.

Indicator 1.20 Full export TEUs

This is a count of full containers in TEUs exported (loaded) at the port.

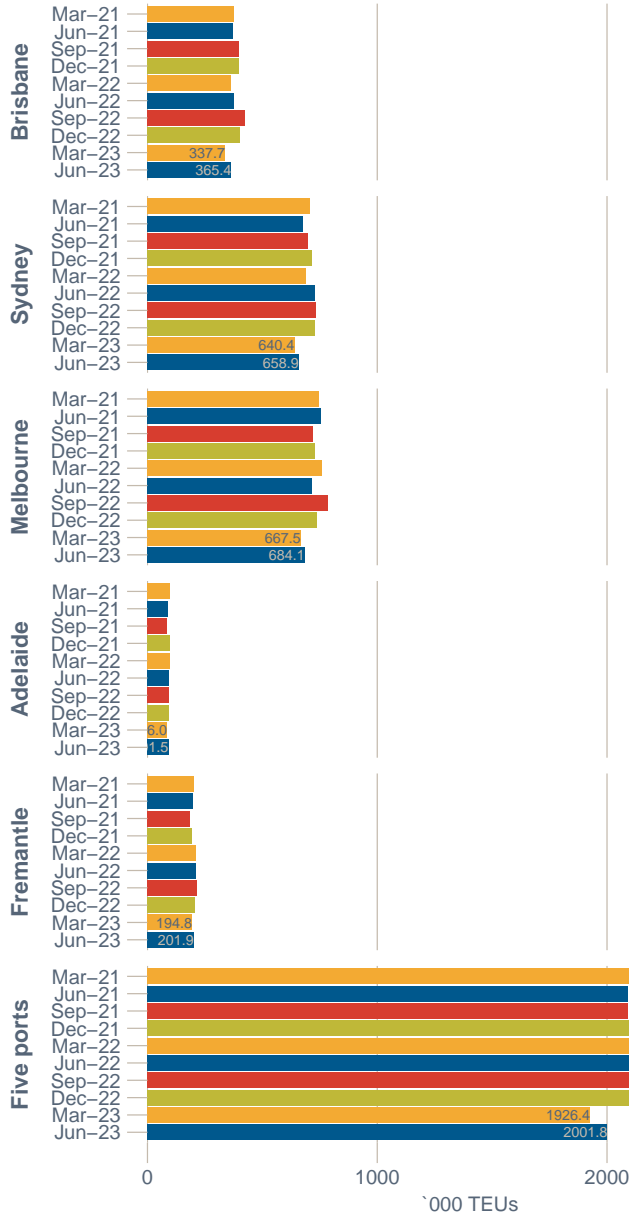
Indicator 1.21 Empty export TEUs

This is a count of empty containers in TEUs exported (loaded) at the port.



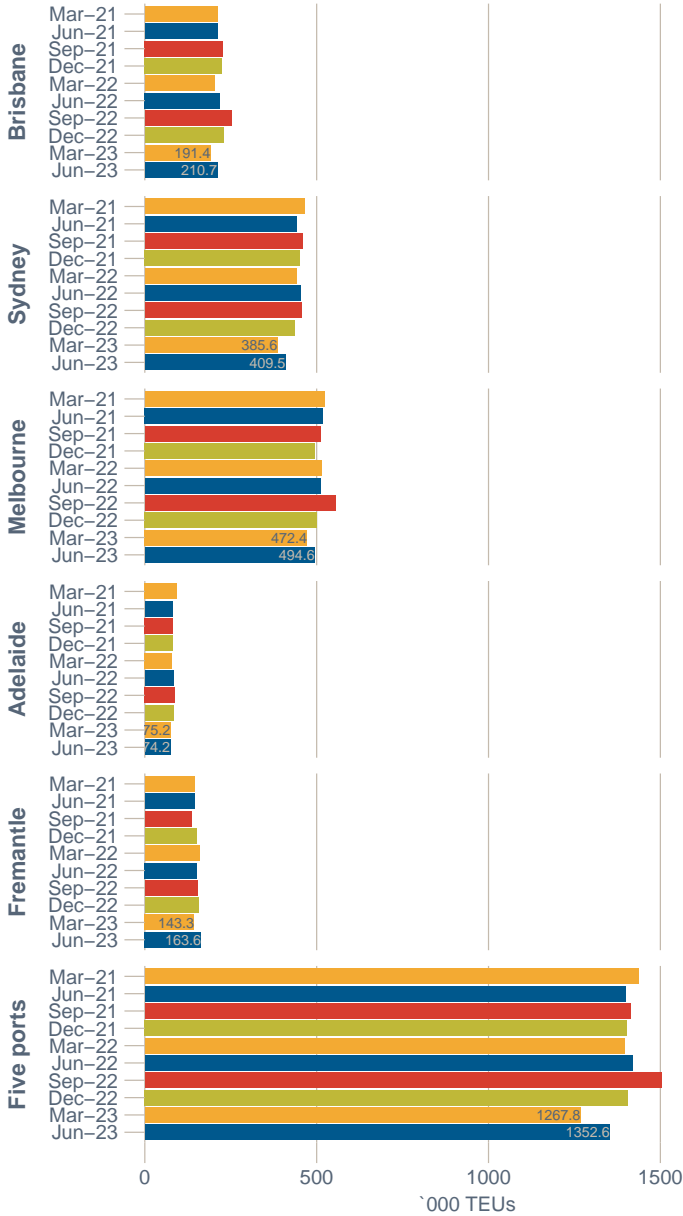
MSC Tomoko entering Fremantle Inner Harbour. Photo courtesy of Fremantle Ports.

Figure 1.1 TEU throughput by container port: wharf-side



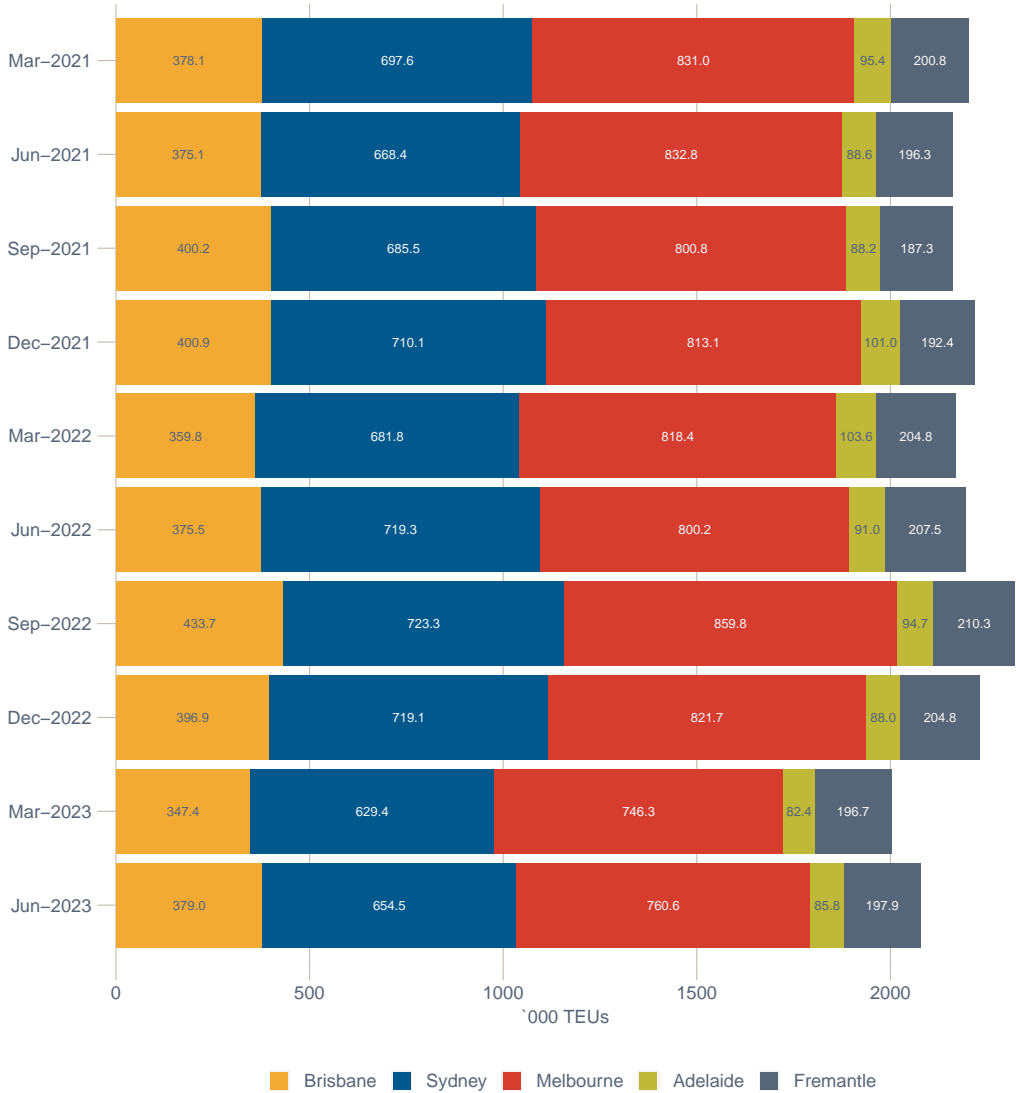
Sources: DP World (2023), Flinders Adelaide Container Terminal (2023), Hutchison Ports Australia (2023), Patrick (2023) and Victoria International Container Terminal (2023)

Figure 1.2 TEU throughput by container port: landside



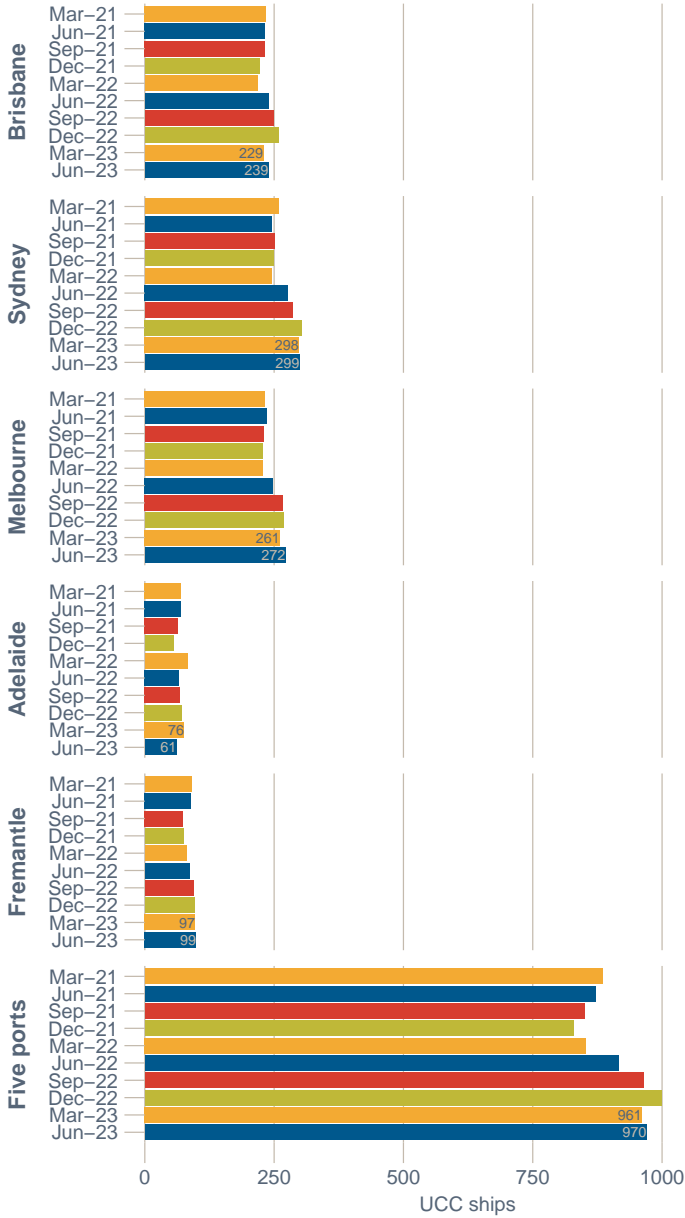
Sources: DP World (2023), Flinders Adelaide Container Terminal (2023), Hutchison Ports Australia (2023), Patrick (2023), Victoria International Container Terminal (2023), Flinders Ports (2023), Port of Brisbane Pty Ltd (2023), Port of Melbourne Operations Pty Ltd (2023) and Fremantle Ports (2023)

Figure 1.3 TEU throughput by container port: whole of port



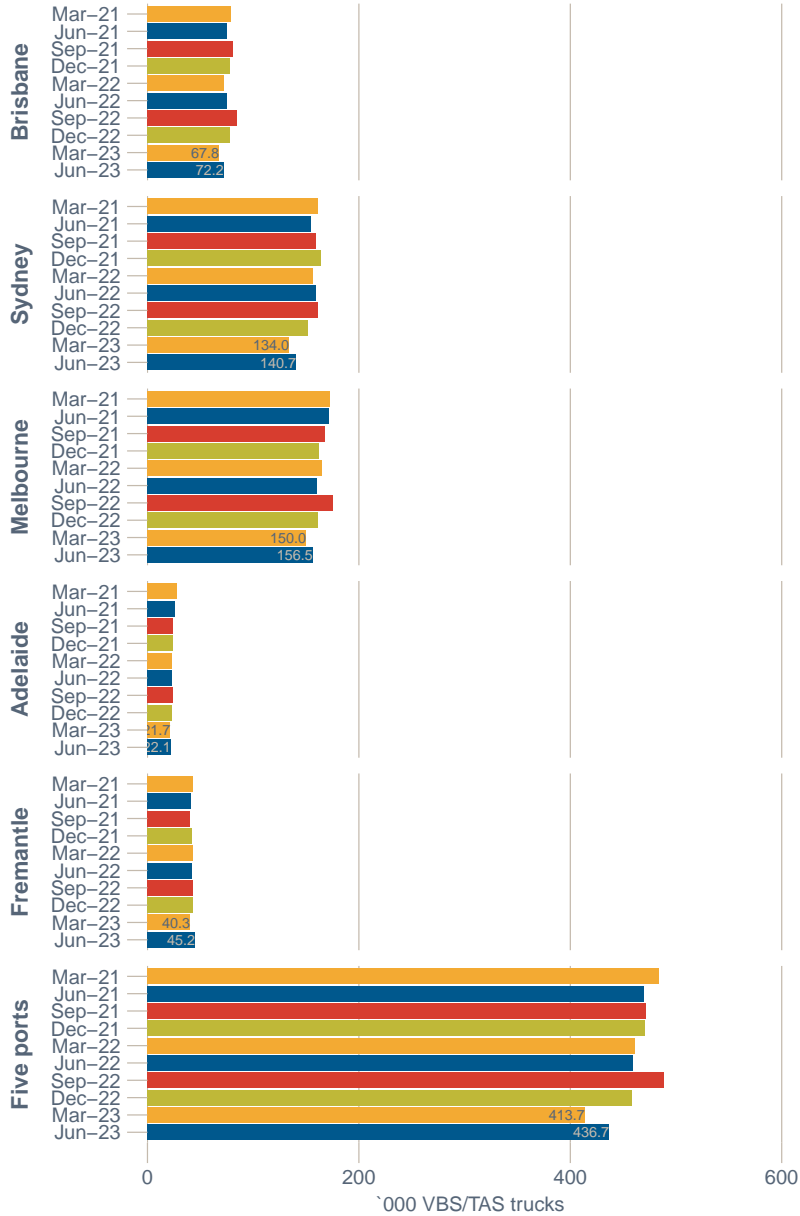
Sources: Port of Brisbane Pty Ltd (2023), NSW Ports (2023), Port of Melbourne Operations Pty Ltd (2023), Flinders Ports (2023) and Fremantle Ports (2023)

Figure 1.4 Container terminal traffic: number of UCC ships handled



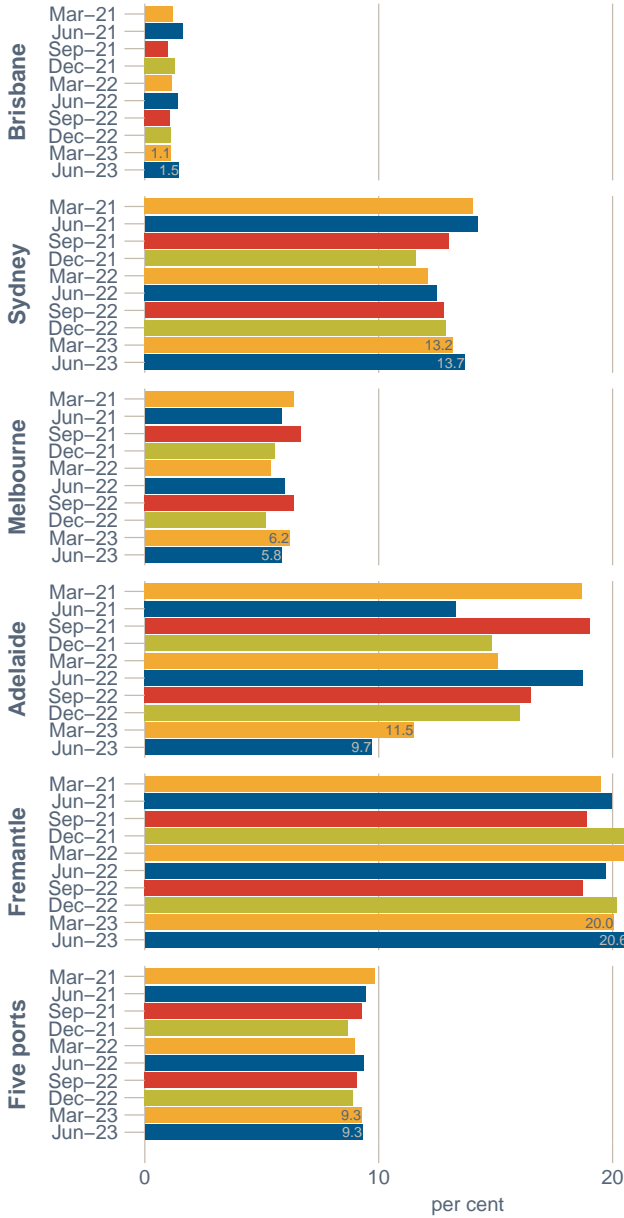
Sources: DP World (2023), Flinders Adelaide Container Terminal (2023), Hutchison Ports Australia (2023), Patrick (2023) and Victoria International Container Terminal (2023)

Figure 1.5 Container terminal traffic: number of trucks used in VBS/TAS operations



Sources: DP World (2023), Flinders Adelaide Container Terminal (2023), Hutchison Ports Australia (2023), Patrick (2023) and Victoria International Container Terminal (2023)

Figure 1.6 Rail share of TEUs handled



Sources: DP World (2023), Flinders Adelaide Container Terminal (2023), Hutchison Ports Australia (2023), Patrick (2023), Flinders Ports (2023), Port of Brisbane Pty Ltd (2023), Port of Melbourne Operations Pty Ltd (2023) and Fremantle Ports (2023)

Table 1.1 Container terminal throughput: Brisbane

	2021						2022						2023		
	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun
Wharfside															
UCC ships handled, as reported by stevedores	234	232	466	232	222	454	218	239	457	249	259	508	229	239	468
Total containers handled ('000)	234.5	234.8	469.3	251.3	249.2	500.5	226.0	235.3	461.2	262.6	248.1	510.8	213.9	229.1	443.0
Total TEUs handled ('000)	375.3	373.3	748.5	398.3	396.8	795.1	361.3	375.8	737.1	423.2	400.7	823.9	337.7	365.4	703.1
40-foot containers as proportion of all containers handled (%)	60.0	58.9	59.5	58.5	59.2	58.9	59.9	59.7	59.8	61.1	61.5	61.3	57.9	59.5	58.7
Landside															
Number of trucks used in VBS/TAS operations ('000)	79.0	75.6	154.7	80.7	78.4	159.1	72.5	74.8	147.3	85.0	78.0	163.0	67.8	72.2	140.0
Total containers transported by VBS/TAS trucks and rail ('000)	140.7	139.3	280.0	149.3	145.0	294.4	133.3	142.9	276.2	159.5	147.1	306.6	126.1	136.8	262.9
Containers by VBS/TAS trucks ('000)	136.7	134.0	270.7	145.8	140.4	286.3	129.4	138.2	267.6	155.5	143.2	298.7	122.8	132.1	254.9
Containers by rail ('000)	4.1	5.3	9.4	3.5	4.6	8.1	3.8	4.8	8.6	4.0	3.9	7.9	3.3	4.7	8.1
Total TEUs transported by VBS/TAS trucks and rail ('000)	211.0	211.1	422.1	227.1	225.0	452.2	201.8	219.1	420.9	252.0	229.7	481.7	191.4	210.7	402.1
TEUs by VBS/TAS trucks ('000)	206.5	205.1	411.6	223.3	219.9	443.2	197.7	213.8	411.5	247.4	225.4	472.8	187.6	205.3	393.0
TEUs by rail ('000)	4.5	6.0	10.5	3.9	5.1	9.0	4.1	5.3	9.5	4.6	4.4	8.9	3.7	5.4	9.1
Whole of container terminal															
Total number of container ship visits	240	237	477	233	222	455	208	223	431	247	264	511	238	250	488
Total number of containers (lifts) exchanged ('000)	227.2	226.1	453.3	245.0	242.5	487.5	202.6	215.1	417.7	256.4	241.1	497.4	213.0	228.3	441.4
Whole of port															
Total cargo throughput (million tonnes)	7.5	7.4	14.9	8.8	7.9	16.7	7.5	8.0	15.4	9.0	8.6	17.5	7.8	8.3	16.1
Non-containerised general cargo throughput (million tonnes)	0.3	0.3	0.6	0.3	0.3	0.6	0.3	0.4	0.7	0.4	0.3	0.7	0.3	0.2	0.5
Total TEUs exchanged ('000)	378.1	375.1	753.2	400.2	400.9	801.1	359.8	375.5	735.3	433.7	396.9	830.6	347.4	379.0	726.4
Full import ('000)	177.5	166.5	344.0	178.1	185.3	363.3	170.1	169.4	339.5	193.8	176.2	369.9	153.6	167.3	320.9
Empty import ('000)	13.2	19.7	32.9	24.6	20.7	45.3	17.1	22.0	39.1	25.7	15.8	41.5	21.1	32.5	53.7
Full export ('000)	74.0	91.2	165.2	112.8	93.1	205.9	71.4	98.1	169.5	130.7	107.3	238.0	85.7	107.8	193.5
Empty export ('000)	113.5	97.6	211.1	84.7	101.8	186.6	101.2	86.0	187.2	83.4	97.6	181.0	86.9	71.4	158.3

Note: Blank cells mean no data were reported in that period.

Sources: DP World (2023), Hutchison Ports Australia (2023), Patrick (2023) and Port of Brisbane Pty Ltd (2023)

Table 1.2 Container terminal throughput: Sydney

	2021						2022						2023		
	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun
Wharfside															
UCC ships handled, as reported by stevedores	259	245	504	251	249	500	245	277	522	286	304	590	298	299	597
Total containers handled ('000)	437.9	419.6	857.4	433.6	441.4	875.0	424.6	447.5	872.1	448.3	446.2	894.4	395.8	407.6	803.4
Total TEUs handled ('000)	708.6	674.7	1 383.4	697.3	718.0	1 415.3	691.3	729.8	1 421.1	731.3	728.9	1 460.2	640.4	658.9	1 299.3
40-foot containers as proportion of all containers handled (%)	61.8	60.8	61.3	60.8	62.7	61.7	62.8	63.1	63.0	63.1	63.4	63.3	61.8	61.6	61.7
Landside															
Number of trucks used in VBS/TAS operations ('000)	161.2	154.4	315.6	159.2	164.2	323.4	156.9	159.5	316.4	161.5	152.2	313.7	134.0	140.7	274.7
Total containers transported by VBS/TAS trucks and rail ('000)	293.7	280.1	573.8	289.3	282.6	571.9	275.9	284.6	560.4	282.8	270.9	553.7	242.1	256.1	498.2
Containers by VBS/TAS trucks ('000)	226.4	214.6	441.0	228.2	226.3	454.5	219.3	223.2	442.5	221.4	208.8	430.1	185.8	197.4	383.2
Containers by rail ('000)	67.3	65.5	132.7	61.0	56.3	117.4	56.6	61.4	117.9	61.4	62.1	123.6	56.3	58.8	115.0
Total TEUs transported by VBS/TAS trucks and rail ('000)	464.2	441.9	906.1	458.1	452.1	910.2	441.3	453.5	894.8	455.2	435.7	890.9	385.6	409.5	795.2
TEUs by VBS/TAS trucks ('000)	364.8	345.9	710.6	367.4	368.9	736.3	357.6	362.2	719.9	361.8	341.8	703.6	301.3	319.3	620.6
TEUs by rail ('000)	99.4	96.1	195.5	90.7	83.2	173.9	83.7	91.2	174.9	93.4	93.9	187.3	84.4	90.2	174.6
Whole of container terminal															
Total number of container ship visits	256	245	501	246	245	491	239	268	507	282	299	581	293	291	584
Total number of containers (lifts) exchanged ('000)	429.0	415.8	844.8	422.4	435.0	857.4	415.8	436.0	851.8	441.3	434.9	876.1	387.2	397.4	784.7
Whole of port															
Total cargo throughput (million tonnes)	7.7	6.6	14.3	6.3	6.1	12.4	6.4	6.4	12.7	6.3	6.5	12.8	6.3	6.4	12.7
Non-containerised general cargo throughput (million tonnes)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total TEUs exchanged ('000)	697.6	668.4	1 366.0	685.5	710.1	1 395.6	681.8	719.3	1 401.1	723.3	719.1	1 442.4	629.4	654.5	1 283.9
Full import ('000)	340.3	336.1	676.5	341.4	352.2	693.6	345.1	356.7	701.8	359.4	348.8	708.1	308.8	318.7	627.5
Empty import ('000)	2.1	1.7	3.8	4.5	4.6	9.1	7.2	3.8	11.0	4.1	2.5	6.6	6.0	10.9	17.0
Full export ('000)	116.8	125.3	242.1	135.3	133.6	268.9	121.8	132.5	254.2	131.9	133.7	265.6	124.0	134.8	258.8
Empty export ('000)	238.4	205.3	443.6	204.3	219.8	424.1	207.7	226.3	434.0	228.0	234.1	462.1	190.6	190.1	380.7

Note: Blank cells mean no data were reported in that period.

Cells with a value of "0.0" mean that data were reported but rounded to zero.

Sources: DP World (2023), Hutchison Ports Australia (2023), Patrick (2023) and NSW Ports (2023)

Table 1.3 Container terminal throughput: Melbourne

	2021						2022						2023		
	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun
Wharfside															
UCC ships handled, as reported by stevedores	232	235	467	229	227	456	227	248	475	267	268	535	261	272	533
Total containers handled ('000)	468.2	473.0	941.2	450.7	456.8	907.5	471.7	443.2	915.0	486.0	459.0	945.0	417.1	423.2	840.3
Total TEUs handled ('000)	746.9	755.3	1 502.2	721.1	730.3	1 451.4	757.7	717.9	1 475.5	783.6	739.5	1 523.1	667.5	684.1	1 351.5
40-foot containers as proportion of all containers handled (%)	59.5	59.7	59.6	60.0	59.9	59.9	60.6	62.0	61.3	61.2	61.1	61.2	60.0	61.6	60.8
Landside															
Number of trucks used in VBS/TAS operations ('000)	172.6	171.6	344.2	167.7	161.9	329.6	165.2	160.1	325.3	175.7	161.7	337.4	150.0	156.5	306.5
Total containers transported by VBS/TAS trucks and rail ('000)	335.7	331.9	667.6	329.6	316.2	645.7	326.2	322.2	648.4	350.2	318.1	668.2	301.3	312.5	613.8
Containers by VBS/TAS trucks ('000)	305.9	304.3	610.2	299.6	290.8	590.4	300.8	295.7	596.5	319.2	294.4	613.6	275.6	287.8	563.3
Containers by rail ('000)	29.7	27.6	57.3	30.0	25.4	55.3	25.4	26.5	51.9	31.0	23.7	54.7	25.8	24.7	50.5
Total TEUs transported by VBS/TAS trucks and rail ('000)	522.3	518.9	1 041.2	510.5	495.5	1 005.9	513.3	511.7	1 025.0	555.2	500.8	1 056.0	472.4	494.6	967.0
TEUs by VBS/TAS trucks ('000)	474.8	474.9	949.7	462.6	454.9	917.5	472.5	468.8	941.2	505.2	462.7	967.9	431.1	454.6	885.8
TEUs by rail ('000)	47.4	44.0	91.5	47.9	40.6	88.5	40.8	42.9	83.7	50.0	38.1	88.1	41.2	40.0	81.2
Whole of container terminal															
Total number of container ship visits	225	227	452	226	219	445	214	242	456	256	257	513	249	272	521
Total number of containers (lifts) exchanged ('000)	449.2	457.0	906.2	442.9	438.4	881.3	436.8	428.3	865.2	467.5	442.1	909.5	399.7	424.2	824.0
Whole of port															
Total cargo throughput (million tonnes)	9.6	9.9	19.5	9.6	9.6	19.2	9.8	9.7	19.5	10.2	9.5	19.7	9.2	9.5	18.7
Non-containerised general cargo throughput (million tonnes)	0.5	0.6	1.1	0.6	0.6	1.2	0.7	0.7	1.4	0.7	0.6	1.4	0.6	0.6	1.2
Total TEUs exchanged ('000)	831.0	832.8	1 663.8	800.8	813.1	1 613.9	818.4	800.2	1 618.7	859.8	821.7	1 681.5	746.3	760.6	1 506.9
Full import ('000)	381.2	375.5	756.6	365.3	387.5	752.9	387.3	363.1	750.4	397.2	369.7	767.0	341.1	342.5	683.6
Empty import ('000)	37.0	33.7	70.7	34.8	34.3	69.1	28.6	34.4	63.0	35.6	31.4	67.0	32.7	41.1	73.8
Full export ('000)	226.0	229.8	455.8	221.4	218.2	439.6	217.9	218.3	436.2	227.1	217.2	444.3	202.5	205.8	408.4
Empty export ('000)	186.8	193.8	380.7	179.2	173.1	352.3	184.7	184.3	369.0	199.9	203.4	403.3	170.0	171.1	341.1

Note: Blank cells mean no data were reported in that period.

The counts of containers by rail include those handled by Qube Logistics.

Sources: DP World (2023), Patrick (2023), Victoria International Container Terminal (2023) and Port of Melbourne Operations Pty Ltd (2023)

Table 1.4 Container terminal throughput: Adelaide

	2021						2022						2023		
	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun
Wharfside															
UCC ships handled, as reported by stevedores	70	70	140	64	56	120	83	66	149	68	72	140	76	61	137
Total containers handled ('000)	68.5	61.3	129.9	59.2	67.4	126.6	65.9	64.0	129.9	64.9	63.1	128.0	60.5	62.9	123.5
Total TEUs handled ('000)	99.0	90.2	189.2	86.5	99.1	185.6	98.9	95.0	193.9	95.5	91.9	187.4	86.0	91.5	177.5
40-foot containers as proportion of all containers handled (%)	44.5	47.1	45.7	46.1	47.0	46.6	50.2	48.3	49.2	47.0	45.8	46.4	42.2	45.4	43.8
Landside															
Number of trucks used in VBS/TAS operations ('000)	27.6	26.1	53.7	24.6	23.8	48.4	23.1	23.1	46.2	23.8	23.0	46.8	21.7	22.1	43.8
Total containers transported by VBS/TAS trucks and rail ('000)	66.7	56.2	122.9	57.5	56.1	113.6	54.9	58.3	113.2	61.0	58.5	119.5	52.5	50.7	103.1
Containers by VBS/TAS trucks ('000)	52.4	47.4	99.8	44.7	45.2	90.0	44.4	44.9	89.4	49.2	47.5	96.7	45.5	45.4	90.8
Containers by rail ('000)	14.3	8.7	23.0	12.8	10.8	23.6	10.4	13.4	23.8	11.8	11.1	22.9	7.0	5.3	12.3
Total TEUs transported by VBS/TAS trucks and rail ('000)	94.0	81.4	175.4	81.6	80.2	161.8	79.5	83.4	162.9	87.4	83.5	170.9	75.2	74.2	149.4
TEUs by VBS/TAS trucks ('000)	75.5	69.4	144.9	65.1	65.5	130.7	64.5	65.6	130.2	71.7	68.7	140.4	65.3	65.3	130.6
TEUs by rail ('000)	18.5	12.0	30.5	16.4	14.7	31.1	14.9	17.8	32.7	15.8	14.7	30.5	9.9	8.9	18.7
Whole of container terminal															
Total number of container ship visits	69	70	139	66	56	122	63	62	125	65	76	141	74	62	136
Total number of containers (lifts) exchanged ('000)	65.5	59.4	125.0	58.9	63.4	122.3	63.8	58.7	122.6	60.5	62.6	123.1	58.0	60.5	118.5
Whole of port															
Total cargo throughput (million tonnes)	4.2	3.7	8.0	3.4	3.7	7.1	4.0	4.2	8.1	3.7	3.8	7.6	4.2	4.2	8.4
Non-containerised general cargo throughput (million tonnes)	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.3	0.1	0.2	0.2
Total TEUs exchanged ('000)	95.4	88.6	184.0	88.2	101.0	189.2	103.6	91.0	194.6	94.7	88.0	182.7	82.4	85.8	168.2
Full import ('000)	40.4	33.6	74.0	32.0	37.1	69.1	35.0	34.6	69.6	37.9	37.3	75.2	31.7	32.0	63.7
Empty import ('000)	7.0	6.3	13.4	8.5	6.9	15.4	6.6	8.5	15.0	8.5	6.9	15.4	6.6	8.5	15.0
Full export ('000)	38.0	39.0	77.0	37.4	45.0	82.5	45.8	40.3	86.2	37.6	35.8	73.4	34.1	37.9	72.1
Empty export ('000)	9.3	8.9	18.2	8.6	6.8	15.4	9.0	5.7	14.7	8.6	6.8	15.4	9.0	5.7	14.7

Note: Blank cells mean no data were reported in that period.

Cells with a value of "0.0" mean that data were reported but rounded to zero.

Sources: Flinders Adelaide Container Terminal (2023) and Flinders Ports (2023)

Table 1.5 Container terminal throughput: Fremantle

	2021						2022						2023		
	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun
Wharfside															
UCC ships handled, as reported by stevedores	90	89	179	74	75	149	80	86	166	94	96	190	97	99	196
Total containers handled ('000)	133.1	126.8	259.9	122.5	128.4	251.0	138.3	137.9	276.2	138.9	134.4	273.4	127.3	131.9	259.2
Total TEUs handled ('000)	204.2	195.9	400.1	187.2	195.6	382.8	210.2	212.4	422.6	215.4	207.5	422.9	194.8	201.9	396.7
40-foot containers as proportion of all containers handled (%)	53.5	54.5	54.0	52.8	52.3	52.5	51.9	54.1	53.0	55.0	54.4	54.7	53.0	53.1	53.1
Landside															
Number of trucks used in VBS/TAS operations ('000)	43.1	41.5	84.6	39.7	42.2	81.9	43.3	41.9	85.3	42.9	43.4	86.3	40.3	45.2	85.4
Total containers transported by VBS/TAS trucks and rail ('000)	100.3	96.3	196.6	89.0	101.9	190.9	107.0	101.0	208.1	102.2	103.9	206.1	95.3	107.6	202.9
Containers by VBS/TAS trucks ('000)	73.8	71.1	145.0	67.0	75.2	142.1	77.1	74.2	151.3	76.5	76.8	153.4	69.9	80.2	150.1
Containers by rail ('000)	26.5	25.1	51.7	22.0	26.7	48.7	29.9	26.8	56.8	25.6	27.1	52.7	25.4	27.4	52.8
Total TEUs transported by VBS/TAS trucks and rail ('000)	144.9	145.4	290.3	136.3	150.3	286.6	159.8	151.6	311.4	153.7	156.3	310.0	143.3	163.6	306.9
TEUs by VBS/TAS trucks ('000)	105.2	106.2	211.4	101.0	108.1	209.1	113.3	109.8	223.1	113.4	114.5	227.8	104.3	121.9	226.2
TEUs by rail ('000)	39.8	39.1	78.9	35.4	42.1	77.5	46.4	41.9	88.3	40.4	41.8	82.2	39.0	41.7	80.7
Whole of container terminal															
Total number of container ship visits	90	91	181	75	71	146	77	85	162	93	93	186	99	97	196
Total number of containers (lifts) exchanged ('000)	130.1	127.2	257.3	118.2	115.9	234.2	131.9	134.3	266.2	130.8	127.8	258.6	130.7	129.3	260.0
Whole of port															
Total cargo throughput (million tonnes)	7.7	7.6	15.3	6.9	6.7	13.6	7.5	7.2	14.7	7.7	7.7	15.4	8.0	7.9	15.9
Non-containerised general cargo throughput (million tonnes)	0.2	0.3	0.5	0.3	0.3	0.6	0.3	0.3	0.6	0.2	0.2	0.5	0.3	0.3	0.5
Total TEUs exchanged ('000)	200.8	196.3	397.1	187.3	192.4	379.7	204.8	207.5	412.3	210.3	204.8	415.1	196.7	197.9	394.6
Full import ('000)	96.3	94.6	190.8	92.1	100.0	192.0	102.5	100.3	202.8	101.0	101.6	202.6	94.7	94.1	188.8
Empty import ('000)	2.2	2.9	5.1	3.3	2.3	5.5	2.1	2.6	4.7	3.1	2.1	5.2	6.5	7.1	13.6
Full export ('000)	56.1	60.2	116.3	55.5	57.2	112.7	58.2	60.2	118.4	58.3	59.9	118.1	59.5	65.0	124.6
Empty export ('000)	46.2	38.7	84.9	36.5	33.0	69.5	42.0	44.4	86.4	47.9	41.2	89.1	36.0	31.7	67.7

Note: Blank cells mean no data were reported in that period.

Sources: DP World (2023), Patrick (2023) and Fremantle Ports (2023)

Table 1.6 Container terminal throughput: Five ports

	2021						2022						2023		
	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun
Wharfside															
UCC ships handled, as reported by stevedores	885	871	1756	850	829	1679	853	916	1769	964	999	1963	961	970	1931
Total containers handled ('000)	1 342.1	1 315.5	2 657.6	1 317.4	1 343.2	2 660.6	1 326.5	1 327.9	2 654.4	1 400.7	1 350.7	2 751.5	1 214.6	1 254.7	2 469.3
Total TEUs handled ('000)	2 134.0	2 089.4	4 223.4	2 090.4	2 139.8	4 230.2	2 119.4	2 130.9	4 250.3	2 248.9	2 168.6	4 417.5	1 926.4	2 001.8	3 928.2
40-foot containers as proportion of all containers handled (%)	59.0	58.8	58.9	58.7	59.3	59.0	59.8	60.5	60.1	60.6	60.5	60.5	58.6	59.5	59.1
Landside															
Number of trucks used in VBS/TAS operations ('000)	483.6	469.3	952.9	471.9	470.5	942.4	461.0	459.4	920.4	488.8	458.3	947.1	413.7	436.7	850.4
Total containers transported by VBS/TAS trucks and rail ('000)	937.1	903.8	1 840.8	914.7	901.7	1 816.4	897.2	909.0	1 806.3	955.6	898.5	1 854.1	817.3	863.7	1 681.1
Containers by VBS/TAS trucks ('000)	795.2	771.5	1 566.7	785.4	777.9	1 563.2	771.1	776.2	1 547.2	821.8	770.6	1 592.4	699.5	742.8	1 442.3
Containers by rail ('000)	141.9	132.2	274.1	129.3	123.8	253.2	126.2	132.9	259.0	133.9	127.8	261.7	117.8	120.9	238.7
Total TEUs transported by VBS/TAS trucks and rail ('000)	1 436.4	1 398.7	2 835.1	1 413.6	1 403.0	2 816.7	1 395.6	1 419.3	2 814.9	1 503.5	1 406.0	2 909.5	1 267.8	1 352.6	2 620.4
TEUs by VBS/TAS trucks ('000)	1 226.8	1 201.5	2 428.3	1 219.4	1 217.3	2 436.7	1 205.6	1 220.2	2 425.8	1 299.5	1 213.0	2 512.5	1 089.6	1 166.5	2 256.1
TEUs by rail ('000)	209.6	197.2	406.8	194.3	185.7	380.0	190.0	199.1	389.1	204.0	193.0	397.0	178.2	186.1	364.3
Whole of container terminal															
Total number of container ship visits	880	870	1 750	846	813	1 659	801	880	1 681	943	989	1 932	953	972	1 925
Total number of containers (lifts) exchanged ('000)	1 301.2	1 285.5	2 586.7	1 287.4	1 295.8	2 583.2	1 251.1	1 272.7	2 523.8	1 356.8	1 308.4	2 665.2	1 188.4	1 239.9	2 428.4
Whole of port															
Total cargo throughput (million tonnes)	36.8	35.3	72.1	35.0	34.0	69.0	35.1	35.4	70.5	36.8	36.2	73.0	35.4	36.3	71.7
Non-containerised general cargo throughput (million tonnes)	1.1	1.3	2.4	1.3	1.3	2.6	1.4	1.4	2.8	1.5	1.4	2.8	1.2	1.2	2.5
Total TEUs exchanged ('000)	2 203.0	2 161.2	4 364.2	2 162.0	2 217.6	4 379.6	2 168.4	2 193.5	4 362.0	2 321.7	2 230.5	4 552.2	2 002.2	2 077.8	4 080.0
Full import ('000)	1 035.7	1 006.3	2 042.0	1 008.9	1 062.0	2 070.9	1 040.0	1 024.2	2 064.2	1 089.3	1 033.6	2 122.8	930.0	954.5	1 884.5
Empty import ('000)	61.6	64.3	125.9	75.7	68.7	144.4	61.6	71.2	132.8	77.0	58.8	135.8	73.0	100.1	173.1
Full export ('000)	511.0	545.5	1 056.4	562.4	547.1	1 109.6	515.0	549.5	1 064.5	585.6	553.8	1 139.4	505.9	551.4	1 057.3
Empty export ('000)	594.1	544.3	1 138.4	513.4	534.4	1 047.8	544.7	546.7	1 091.4	567.8	583.1	1 150.9	492.4	470.1	962.5

Note: Blank cells mean no data were reported in that period.

Sources: DP World (2023), Patrick (2023), Hutchison Ports Australia (2023), Flinders Adelaide Container Terminal (2023), Victoria International Container Terminal (2023), Port of Brisbane Pty Ltd (2023), NSW Ports (2023), Port of Melbourne Operations Pty Ltd (2023), Flinders Ports (2023) and Fremantle Ports (2023)

Table 1.7 Container ship visits by gross tonnage: January–June 2023

	Brisbane	Sydney	Melbourne	Adelaide	Fremantle	Five ports
<i>Gross Tonnage</i>						
5 000–20 000 GT	82	98	68	2	49	299
20 001–35 000 GT	77	97	93	8	17	292
35 001–50 000 GT	137	151	144	50	42	524
50 001–65 000 GT	49	38	36	5	6	134
65 001–80 000 GT	106	131	105	25	39	406
80 001–95 000 GT	32	52	53	28	26	191
95 001–110 000 GT	4	17	18	16	14	69
All ship sizes	487	584	517	134	193	1 915

Sources: Port of Brisbane Pty Ltd (2023), NSW Ports (2023), Port of Melbourne Operations Pty Ltd (2023), Flinders Ports (2023) and Fremantle Ports (2023)

Table 1.8 Container ship visits by gross tonnage: July–December 2022

	Brisbane	Sydney	Melbourne	Adelaide	Fremantle	Five ports
<i>Gross Tonnage</i>						
5 000–20 000 GT	90	102	63	1	44	300
20 001–35 000 GT	80	84	95	9	12	280
35 001–50 000 GT	130	146	130	49	31	486
50 001–65 000 GT	47	34	36	3	2	122
65 001–80 000 GT	116	142	114	30	46	448
80 001–95 000 GT	35	45	47	21	22	170
95 001–110 000 GT	8	28	26	25	24	111
All ship sizes	506	581	511	138	181	1 917

Sources: Port of Brisbane Pty Ltd (2023), NSW Ports (2023), Port of Melbourne Operations Pty Ltd (2023), Flinders Ports (2023) and Fremantle Ports (2023)

Table 1.9 Container ship visits by gross tonnage: January–June 2022

	Brisbane	Sydney	Melbourne	Adelaide	Fremantle	Five ports
<i>Gross Tonnage</i>						
5 000–20 000 GT	64	90	59	-	41	254
20 001–35 000 GT	94	77	73	5	11	260
35 001–50 000 GT	101	115	110	48	30	404
50 001–65 000 GT	44	29	26	4	1	104
65 001–80 000 GT	91	133	114	31	40	409
80 001–95 000 GT	29	41	43	18	20	151
95 001–110 000 GT	5	22	24	17	18	86
All ship sizes	428	507	449	123	161	1 668

Sources: Port of Brisbane Pty Ltd (2023), NSW Ports (2023), Port of Melbourne Operations Pty Ltd (2023), Flinders Ports (2023) and Fremantle Ports (2023)

Table 1.10 Container ship visits by TEU capacity: January–June 2023

	Brisbane	Sydney	Melbourne	Adelaide	Fremantle	Five ports
<i>TEU capacity</i>						
501–1 500 TEU	48	55	21	-	-	124
1 501–3 000 TEU	115	139	140	10	67	471
3 001–5 200 TEU	155	172	161	57	51	596
5 201–7 500 TEU	133	149	124	23	35	464
7 501–10 000 TEU	36	69	71	44	40	260
10 000 TEU and above	-	-	-	-	-	-
All ship capacities	487	584	517	134	193	1 915

Sources: Port of Brisbane Pty Ltd (2023), NSW Ports (2023), Port of Melbourne Operations Pty Ltd (2023), Flinders Ports (2023) and Fremantle Ports (2023)

Table 1.11 Container ship visits by TEU capacity: July–December 2022

	Brisbane	Sydney	Melbourne	Adelaide	Fremantle	Five ports
<i>TEU capacity</i>						
501–1 500 TEU	46	56	20	-	-	122
1 501–3 000 TEU	127	130	137	10	56	460
3 001–5 200 TEU	153	159	144	52	33	541
5 201–7 500 TEU	137	163	137	30	46	513
7 501–10 000 TEU	43	73	73	46	46	281
10 000 TEU and above	-	-	-	-	-	-
All ship capacities	506	581	511	138	181	1 917

Sources: Port of Brisbane Pty Ltd (2023), NSW Ports (2023), Port of Melbourne Operations Pty Ltd (2023), Flinders Ports (2023) and Fremantle Ports (2023)

Table 1.12 Container ship visits by TEU capacity: January–June 2022

	Brisbane	Sydney	Melbourne	Adelaide	Fremantle	Five ports
<i>TEU capacity</i>						
501–1 500 TEU	30	52	22	-	-	104
1 501–3 000 TEU	133	118	111	5	52	419
3 001–5 200 TEU	123	124	119	52	32	450
5 201–7 500 TEU	108	150	130	31	39	458
7 501–10 000 TEU	34	63	67	35	38	237
10 000 TEU and above	-	-	-	-	-	-
All ship capacities	428	507	449	123	161	1 668

Sources: Port of Brisbane Pty Ltd (2023), NSW Ports (2023), Port of Melbourne Operations Pty Ltd (2023), Flinders Ports (2023) and Fremantle Ports (2023)

CHAPTER 2

Measures of container terminal performance

Overview

Chapter 2 of *Waterline* presents container terminal performance measures. The indicators are in three groups—wharfside, landside and whole of container terminal.

Seven quarterly wharf-side performance indicators are covered:

- 2.1 Crane rate—containers per hour
- 2.2 Elapsed labour rate—containers per hour
- 2.3 Ship rate—containers per hour
- 2.4 Crane rate—TEUs per hour
- 2.5 Elapsed labour rate—TEUs per hour
- 2.6 Ship rate—TEUs per hour

The following five quarterly landside performance indicators are reported for trucks involved in VBS/TAS operations. Bulk run trucks are not included in calculating these indicators:

- 2.7 Containers per truck
- 2.8 TEUs per truck
- 2.9 Per cent of trucks backloaded
- 2.10 Average truck turnaround time
- 2.11 Average container turnaround time

Twelve indicators are reported for whole of container terminal performance.

- 2.12 Median of ship turnaround time
- 2.13 95th percentile of ship turnaround time
- 2.14 Number of ships waiting at anchorage for more than 2 hours
- 2.15 Per cent of ships waiting at anchorage for more than 2 hours
- 2.16 Average waiting time at anchorage
- 2.17 Median waiting time at anchorage

- 2.18 Total time ships spent at berth
- 2.19 Berth occupancy
- 2.20 Average TEUs per ship-hour at berth
- 2.21 Average lifts per ship-hour at berth
- 2.22 Total time ships available to stevedores
- 2.23 Average lifts per hour of stevedoring operation
- 2.24 Average lifts per berth visit

The indicators are presented for Brisbane, Sydney, Melbourne, Adelaide, and Fremantle, as well as aggregates of the five ports, where applicable.

Wharfside performance measures

Measures of performance on the wharf-side of a container terminal relate only to containers moved by stevedoring companies from/to UCC ships at that container terminal.

Indicator 2.1 Crane rate—containers per hour

This is computed as the total number of containers handled divided by the net crane time (see details in Box 2.1).

Indicator 2.2 Elapsed labour rate—containers per hour

This indicator is computed as the number of containers handled divided by the total elapsed labour time (see details in Box 2.2). Sometimes this measure is reported as the “ship working rate”.

Indicator 2.3 Ship rate—containers per hour

This is the average number of containers moved on or off a ship, per net elapsed crane hour. It is equivalent to the crane rate multiplied by the average crane intensity.

Indicator 2.4 Crane rate—TEUs per hour

This is similar to Indicator 2.1 after converting containers to TEUs.

Indicator 2.5 Elapsed labour rate—TEUs per hour

This is similar to Indicator 2.2 after converting containers to TEUs.

Indicator 2.6 Ship rate—TEUs per hour

This is similar to Indicator 2.3 after converting containers to TEUs.

Landside performance measures

These indicators relate to the performance in processing containers through the formal vehicle booking systems (VBS and TAS). They do not include the performance of bulk run trucks.

Indicator 2.7 Containers per truck

Count of containers processed through the VBS/TAS systems divided by the total number of VBS/TAS trucks used.

Box 2.1 Net crane time

This is the crane time allocated by the stevedore to work on a container ship, assuming the container ship is ready for loading or unloading. It is the sum of hours that each quay crane is allocated to a ship, less operational and non-operational delays:

- No labour allocated
- Closed-port holiday
- Port-wide industrial stoppage
- Total crane time spent handling break-bulk cargo and containers that require manual intervention, e.g. use of wires, chains, non-rigid spreaders or other handling gear
- Award or enterprise agreement breaks as applicable
- Adverse weather
- Delays caused by the ship or its agent
- All breakdowns, including spreader changes
- Other equipment breakdowns which stop crane operations
- Booming up for passing ships
- Handling hatch covers
- Cage work and lashing/unlashing where crane operations are affected
- Crane long-travelling between hatches and crossing accommodation
- Labour withdrawn without operator's agreement including enterprise agreement related industrial stoppages
- Over-dimensional containers requiring additional (rigid) spreader
- Spreader changes
- Waiting for export cargo
- Defective ship's gear (e.g. jammed twist-locks, broken cell guides, ballast pumps unable to maintain list/trim).

Indicator 2.8 TEUs per truck

Count of TEUs through the VBS/TAS systems divided by the total number of VBS/TAS trucks used. In contrast to Indicator 2.7, this indicator measures the truck efficiency in a standard unit, a TEU, and thus takes into account the different sizes of containers.

Indicator 2.9 Proportion of trucks backloaded

This indicator shows the number of backloaded trucks as a proportion of the total VBS/TAS trucks. It was published for the first time in Waterline 57.

'Backloaded operations' refers to trucks which haul containers on both the inbound and out-bound legs of a single trip. Such operations make more effective use of trucks and landside

Box 2.2 Elapsed labour time

This is the time elapsed between labour first boarding a container ship and labour last leaving the ship, less any time when the labour has not worked for whatever reasons including non-operational delays such as:

- No labour allocated to ship
- Closed-port holiday
- Industrial stoppages
- Break bulk and containers that require manual interventions, e.g. use of wires, chains, non-rigid spreaders or other handling gear.

In contrast to 'crane time' (Box 2.1), elapsed labour time is not equivalent to the total labour-hours worked.

infrastructure.

Indicator 2.10 Average truck turnaround time

The indicator measures the time elapsed from when the truck enters the gate of a container terminal to the time when the last container is loaded. It does not include the time the truck waits outside the gate of a container terminal.

This is a measure of stevedoring efficiency and shows how quickly a stevedoring company processes trucks at a container terminal.

Indicator 2.11 Average container turnaround time

This indicator is calculated as the 'average truck turnaround time' (Indicator 2.10) divided by 'average containers per truck' (Indicator 2.7). It is a measure of the stevedoring efficiency in handling containers at a container terminal.

Container turnaround time improves (that is, it goes down) if either the truck utilisation rates improve, implying that the number of containers per truck increases, or the container terminal is faster in processing each truck.

Whole of container terminal measures

Indicator 2.12 Median of ship turnaround time

This is the median of the time (in hours) a container ship is in a port. It is the time that elapses from the time a ship enters a port to the time a ship leaves the port.

Indicator 2.13 95th percentile of ship turnaround time

The 95th percentile indicates that for 95 per cent of the ships, the turnaround time is below the value of the indicator. Conversely, for 5 per cent of the ships, the turnaround time is above the value of the indicator.

Indicator 2.14 Number of ships waiting at anchorage for more than 2 hours

This indicator provides the number of container ships, as reported by port authorities, that waited for longer than 2 hours for port entry clearance at the time of the ship's first entry. Delay before entering a port usually results from the geography-specific situation of a port and may also be caused by operational reasons, either at the terminal, the ship, or both.

Indicator 2.15 Proportion of ships waiting at anchorage for more than 2 hours

This is the number of container ships in Indicator 2.14 as a proportion of the total number of container ships that visited the container terminal in the period.

Indicator 2.16 Average waiting time at anchorage

This is the average time (hours) ships have waited in anchorage. Only ships that waited for port entry clearance for two hours or more are included in the calculation.

Indicator 2.17 Median waiting time at anchorage

This is the median of time (hours) ships have waited in anchorage. Only ships that waited for port entry clearance for two hours or more are included in the calculation.

Indicator 2.18 Total time ships spent at berth

This is the total hours spent in berth by all dedicated container ships (UCC) that exchanged containers at that port. The time a ship spends in berth is the elapsed time between the time a ship arrives at berth and the time of its departure from berth. Port authorities report the berth time as a 'gross value' including all times spent by a ship at berth such as time for loading/unloading containers, for maintenance and supply operations, or waiting for labour or suitable weather.

Indicator 2.19 Berth occupancy

The average fraction of specialist container quay occupied by trading vessels. This is computed as time at berth, multiplied by vessel length overall (LOA), divided by the product of quayline length and the period duration.

Indicator 2.20 Average TEUs per ship-hour at berth

This is the total TEUs lifted on/off dedicated container ships (UCC) divided by the total time ship spent in berth (Indicator 2.18). The indicator is strongly influenced by changes in average number of TEUs exchanged per visiting ships and by the mix of ship sizes during the period. The average number of TEUs exchanged also varies seasonally and cyclically.

Indicator 2.21 Average lifts per ship-hour at berth

This indicator is similar to Indicator 2.20 whereas the total crane lifts (containers handled) is used in calculating the indicator rather than the number of TEUs.

Indicator 2.22 Total time ships are available to stevedores

This is the total time (in hours) when ships can be loaded or unloaded.

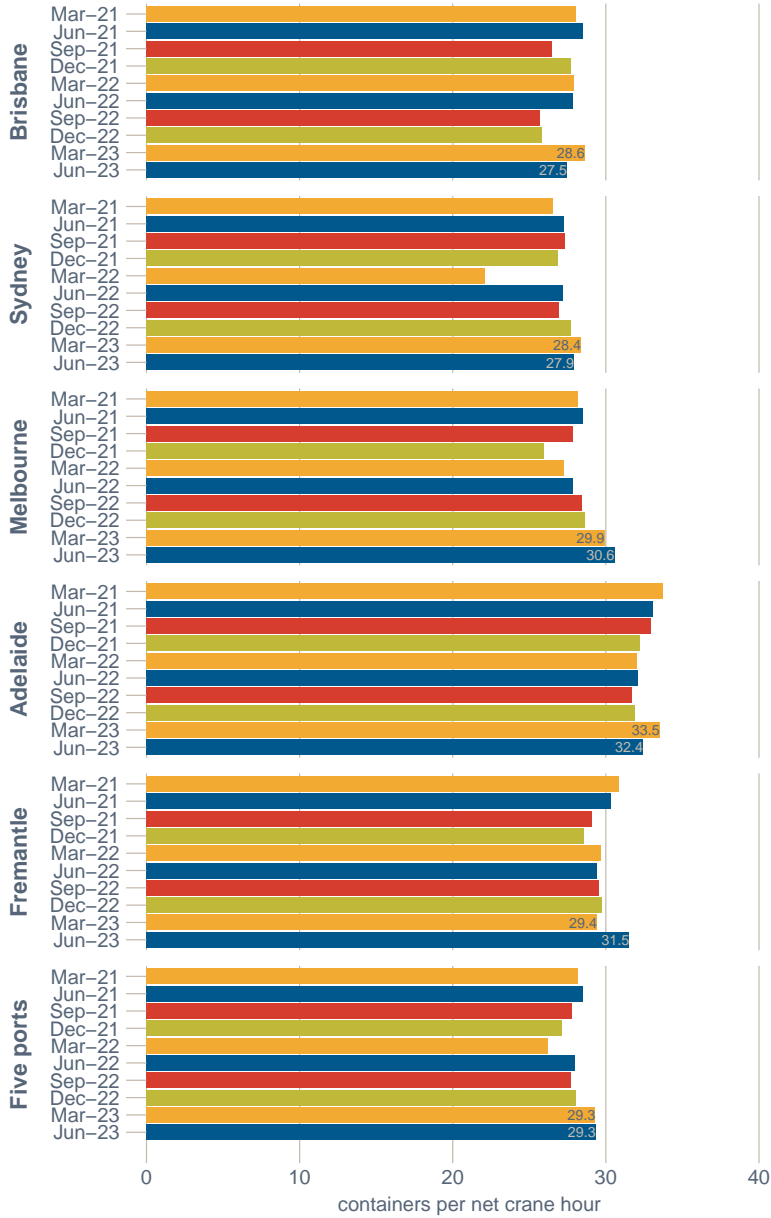
Indicator 2.23 Average lifts per hour of stevedoring operation

This is the total number of crane lifts (containers handled) divided by the total (gross) time available to stevedores for loading and unloading containers.

Indicator 2.24 Average lifts per berth visit

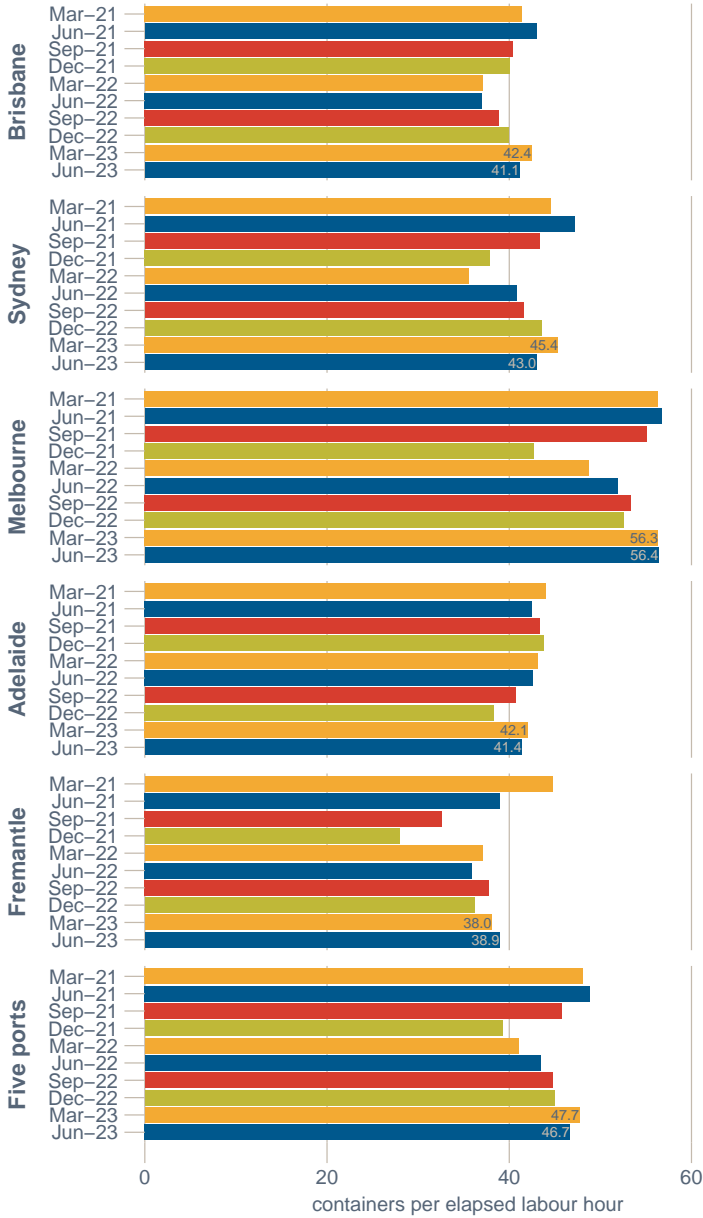
This is the number of crane lifts (containers handled) divided by the number of berth visits of dedicated container ships (UCC).

Figure 2.1 Wharf-side crane rate



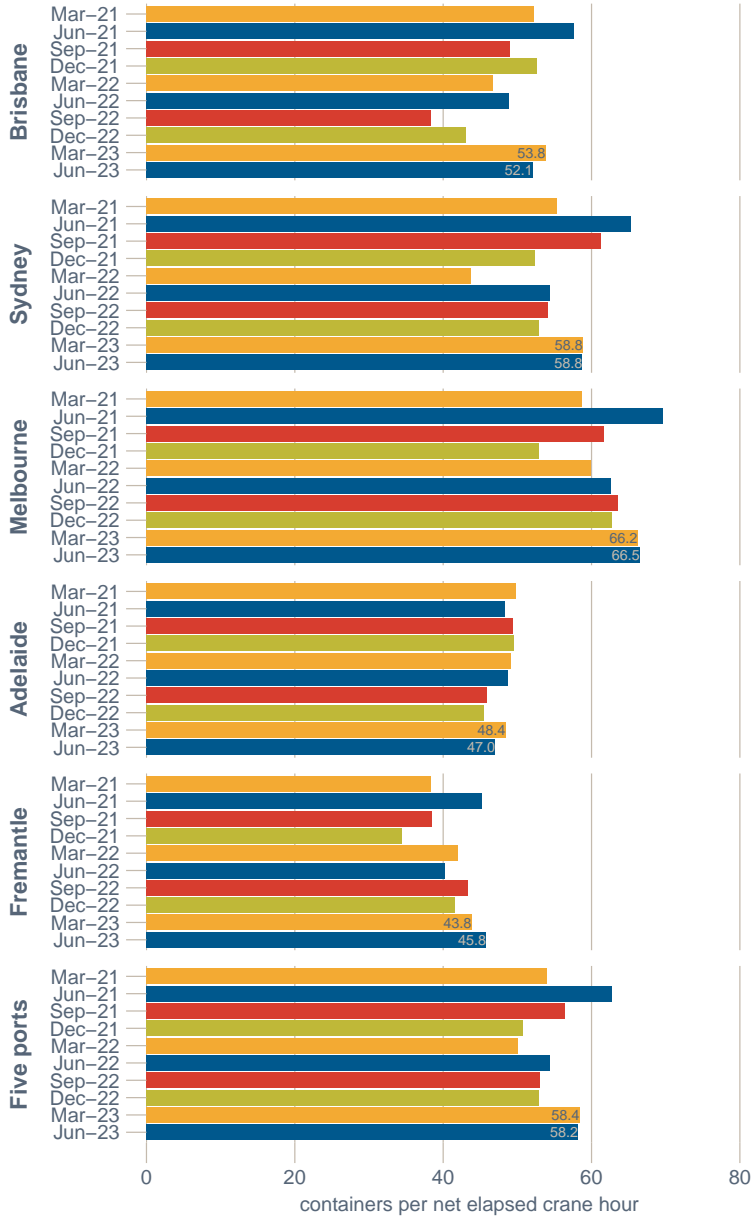
Sources: DP World (2023), Flinders Adelaide Container Terminal (2023), Hutchison Ports Australia (2023), Patrick (2023) and Victoria International Container Terminal (2023)

Figure 2.2 Wharf-side elapsed labour rate



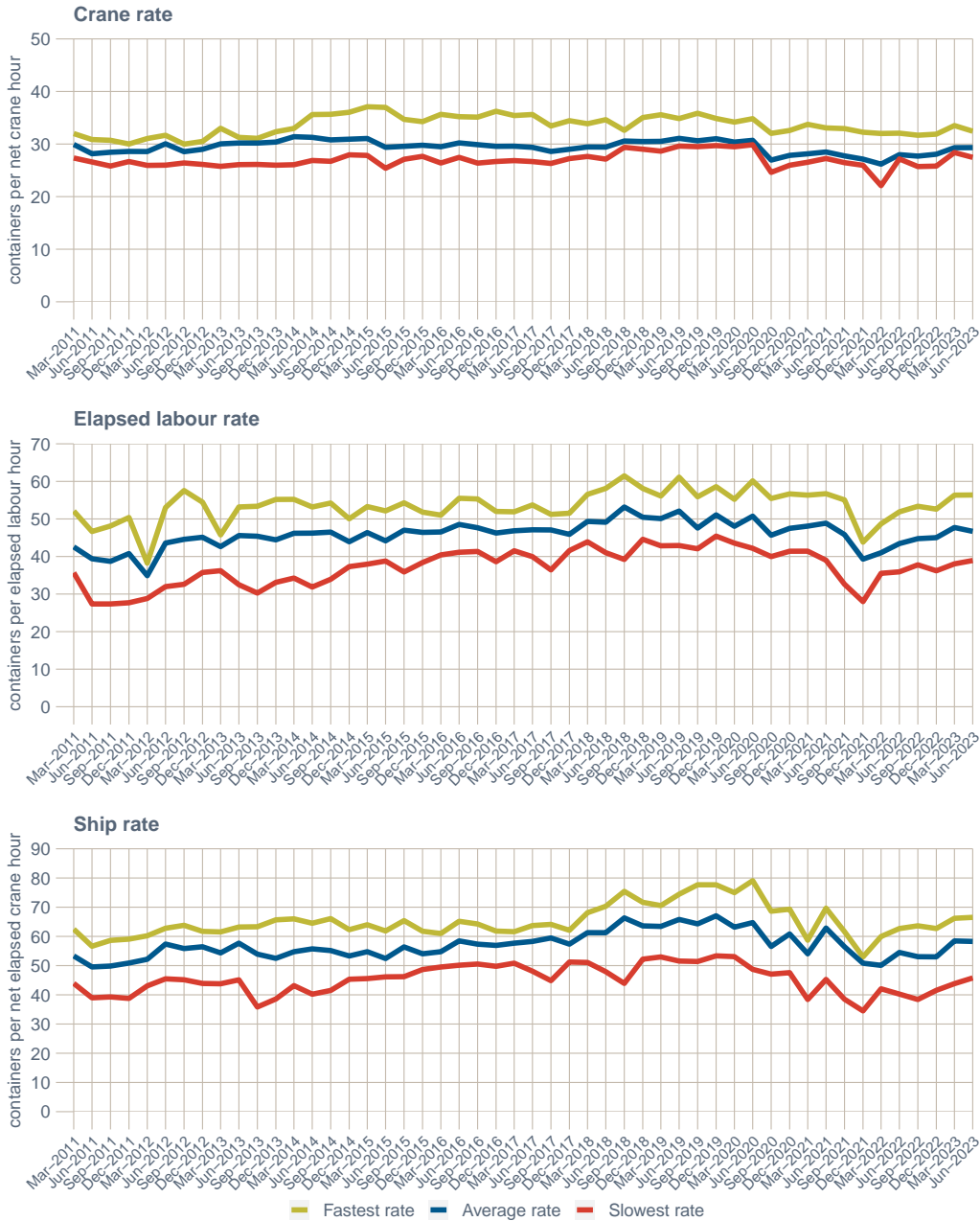
Sources: DP World (2023), Flinders Adelaide Container Terminal (2023), Hutchison Ports Australia (2023), Patrick (2023) and Victoria International Container Terminal (2023)

Figure 2.3 Wharf-side ship rate



Sources: DP World (2023), Flinders Adelaide Container Terminal (2023), Hutchison Ports Australia (2023), Patrick (2023) and Victoria International Container Terminal (2023)

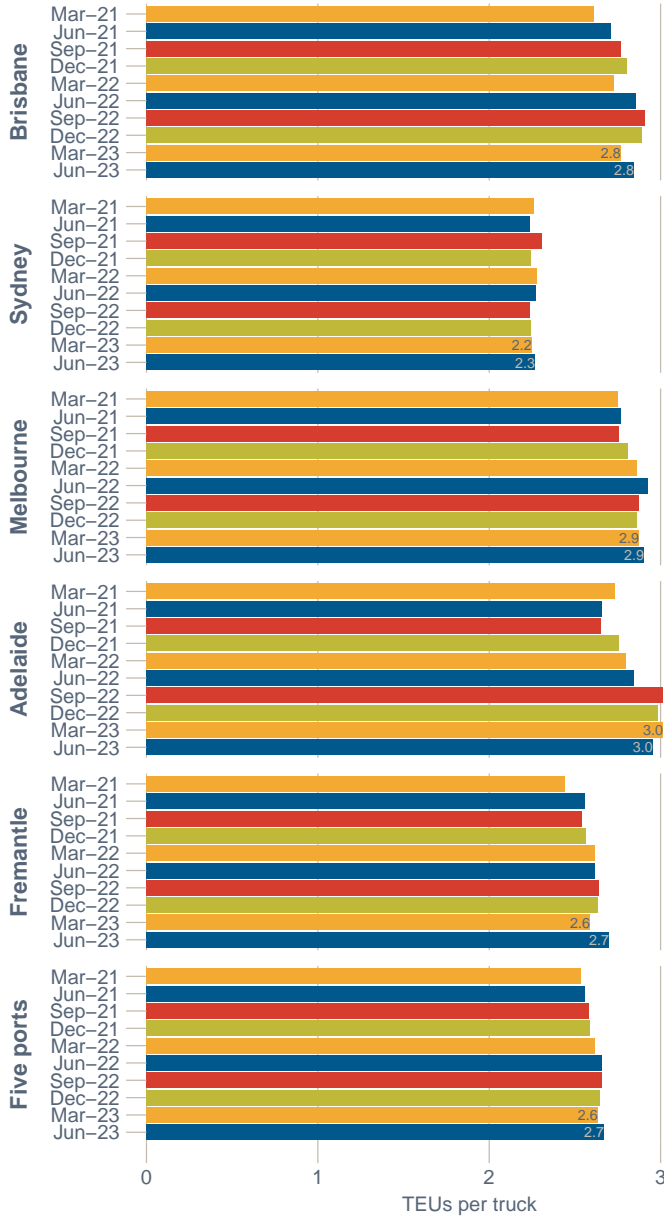
Figure 2.4 Performance in five ports: Comparison of wharfside rates



Note: The wharf-side crane rate, labour rate and ship rate are compared among all five ports and the fastest, average and slowest rates are illustrated. The fastest and slowest rate may correspond to different ports in different periods. The average rate is weighted by the TEU throughput at each port. Crane rate is measured in containers per net crane hour. Labour rate is measured in containers per elapsed labour hour. Ship rate is measured in containers per net elapsed crane hour.

Sources: DP World (2023), Flinders Adelaide Container Terminal (2023), Hutchison Ports Australia (2023), Patrick (2023) and Victoria International Container Terminal (2023)

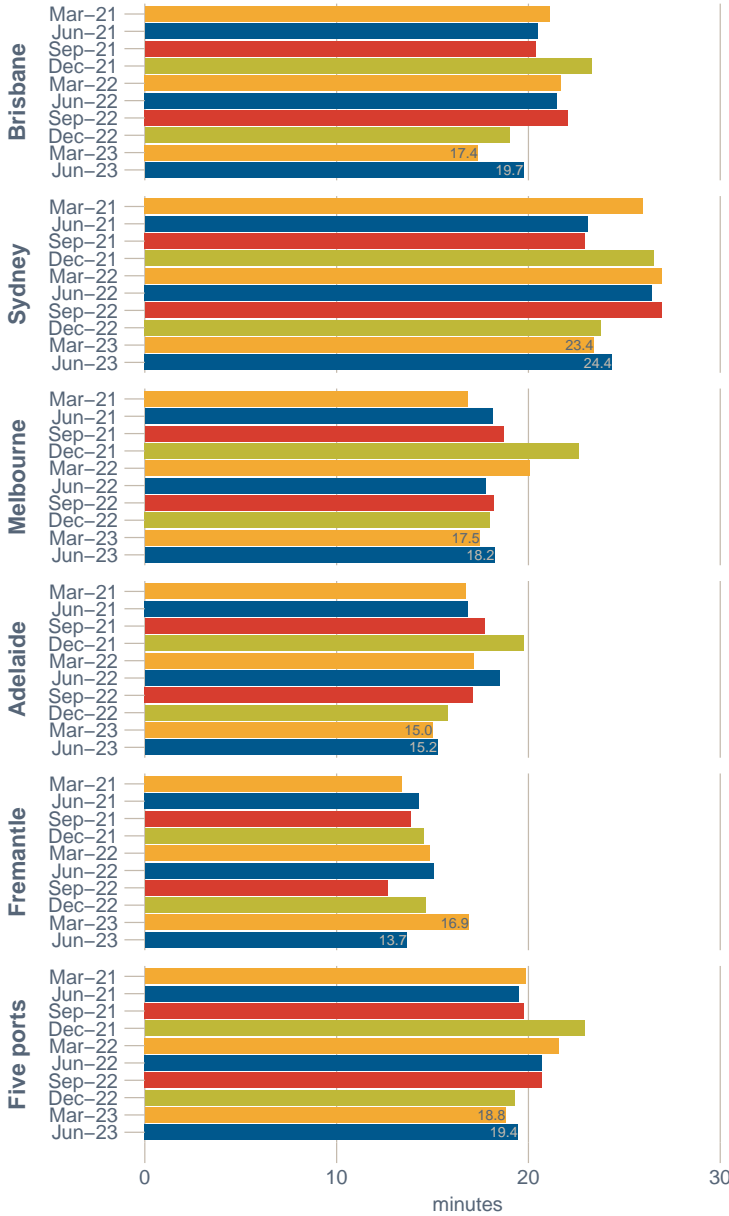
Figure 2.5 Average TEUs per truck on landside of container terminals



Note: This indicator is based on only the trucks that are processed through the VBS/TAS system.

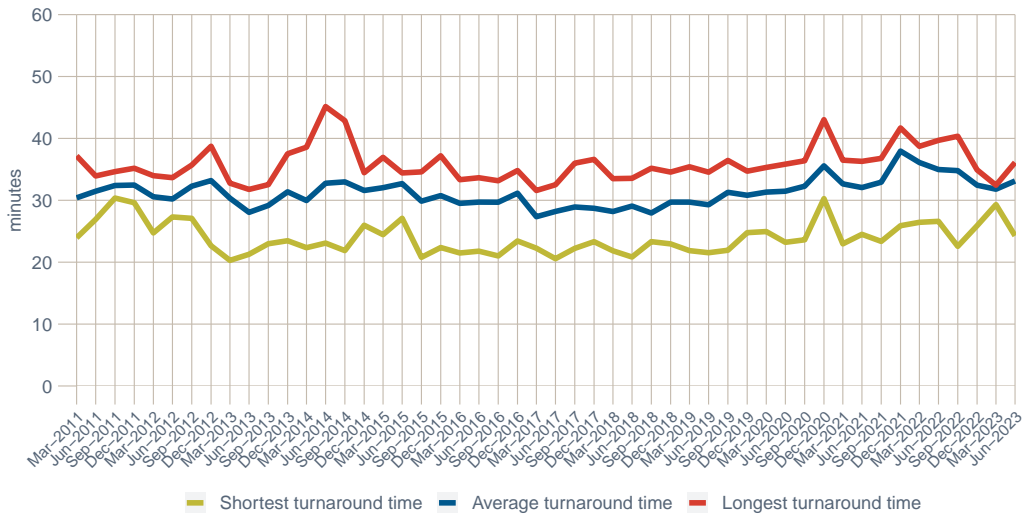
Sources: DP World (2023), Flinders Adelaide Container Terminal (2023), Hutchison Ports Australia (2023), Patrick (2023) and Victoria International Container Terminal (2023)

Figure 2.6 Average container turnaround time on landside of container terminals



Note: This indicator is based on only the trucks that are processed through the VBS/TAS system.
 Sources: DP World (2023), Flinders Adelaide Container Terminal (2023), Hutchison Ports Australia (2023), Patrick (2023) and Victoria International Container Terminal (2023)

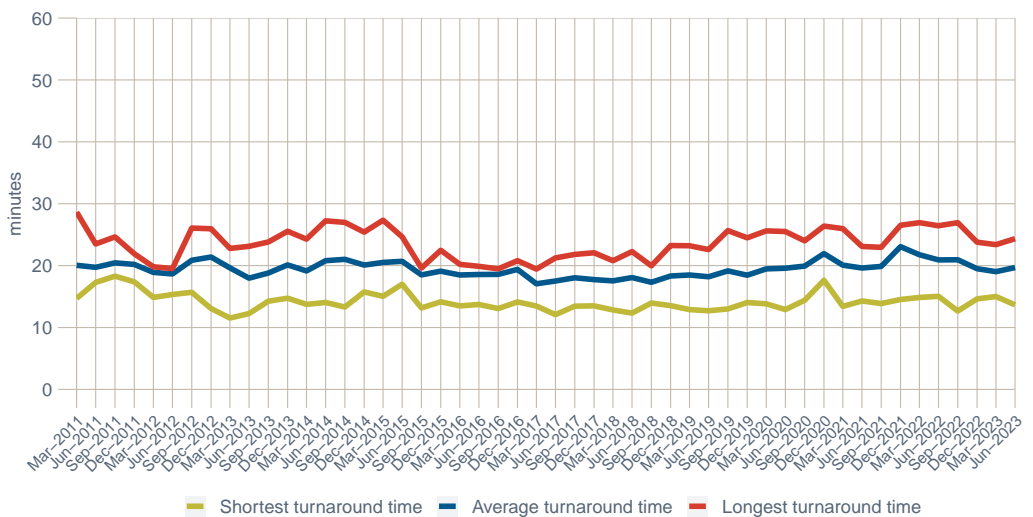
Figure 2.7 Longest and shortest truck turnaround time in five ports



Note: The truck turnaround time is compared among all five ports in each quarter. The longest and shortest truck turnaround time may correspond to different ports in different periods. The average rate is weighted by the TEU throughput at each port.

Sources: DP World (2023), Flinders Adelaide Container Terminal (2023), Hutchison Ports Australia (2023), Patrick (2023) and Victoria International Container Terminal (2023)

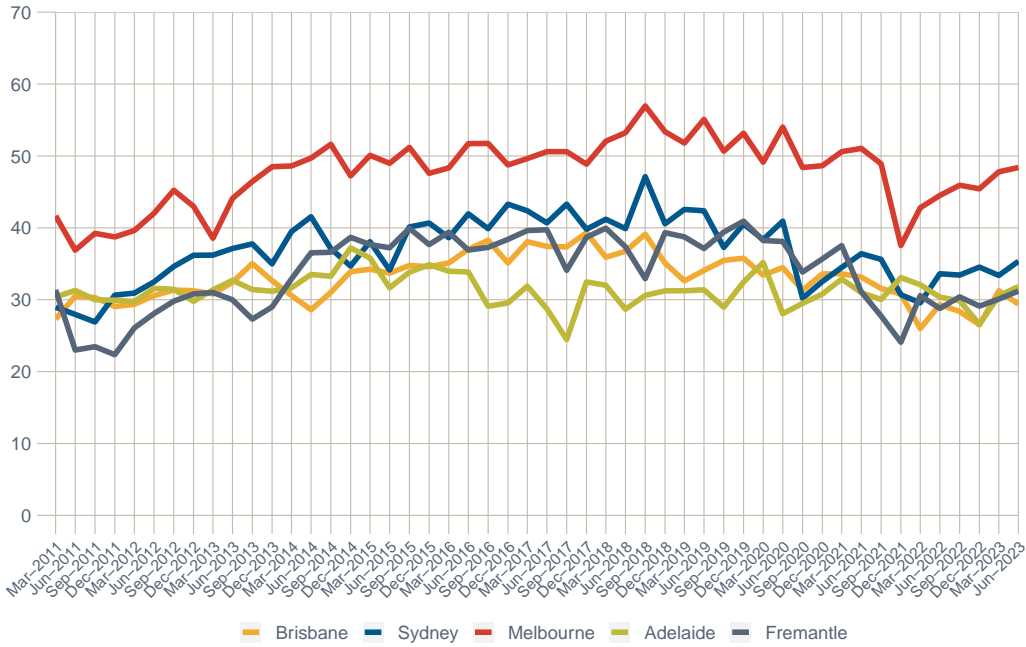
Figure 2.8 Longest and shortest container turnaround time in five ports



Note: The container turnaround time is compared among all five ports in each quarter. The longest and shortest container turnaround time may correspond to different ports in different periods. The average rate is weighted by the TEU throughput at each port.

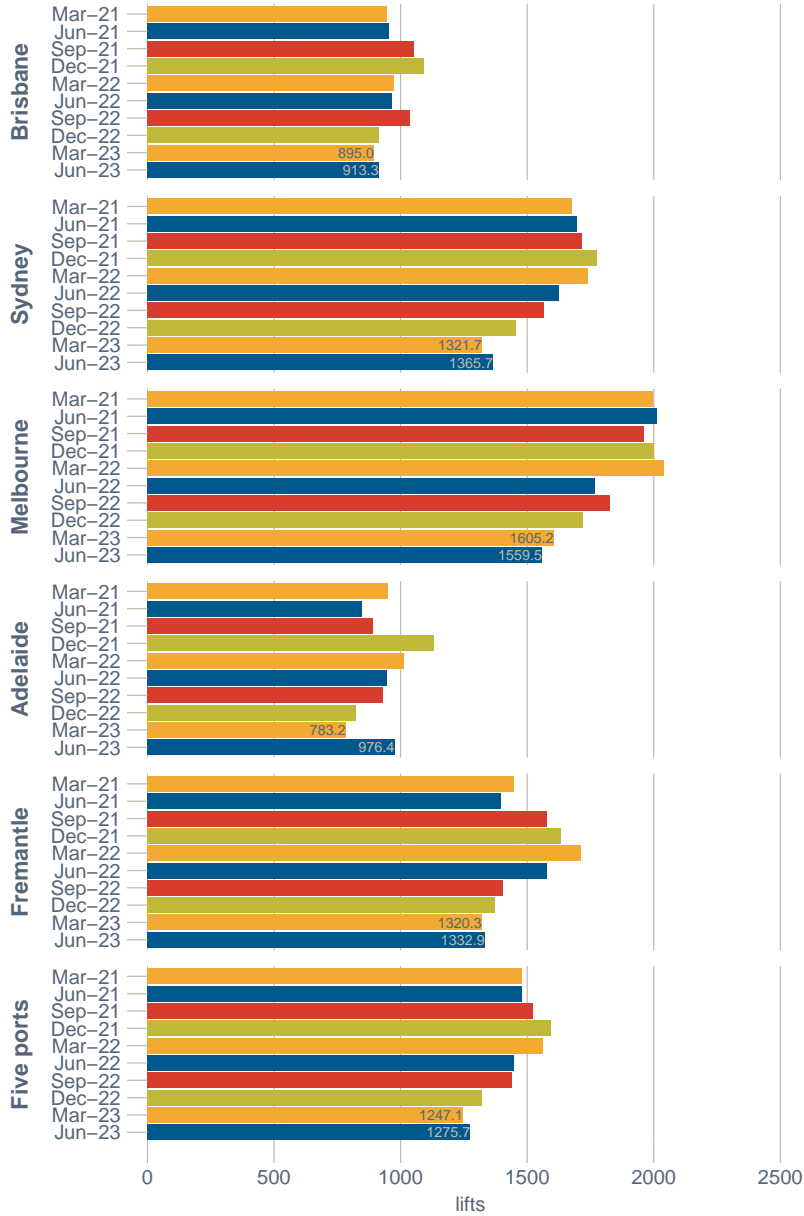
Sources: DP World (2023), Flinders Adelaide Container Terminal (2023), Hutchison Ports Australia (2023), Patrick (2023) and Victoria International Container Terminal (2023)

Figure 2.9 Average number of lifts per hour a ship spent at berth



Sources: BITRE estimates based on data from Port of Brisbane Pty Ltd (2023), NSW Ports (2023), Port of Melbourne Operations Pty Ltd (2023), Flinders Ports (2023) and Fremantle Ports (2023)

Figure 2.10 Average number of lifts per berth visit



Sources: BITRE estimates based on data from Port of Brisbane Pty Ltd (2023), NSW Ports (2023), Port of Melbourne Operations Pty Ltd (2023), Flinders Ports (2023) and Fremantle Ports (2023)

Table 2.1 Container terminal performance: Brisbane

	2021						2022						2023		
	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun
Wharfside															
Containers per hour															
Crane rate	28.1	28.5	28.3	26.5	27.7	27.1	27.9	27.9	27.9	25.7	25.8	25.8	28.6	27.5	28.0
Elapsed labour rate	41.4	43.0	42.2	40.4	40.1	40.3	37.1	37.0	37.0	38.9	40.0	39.4	42.4	41.1	41.8
Ship rate	52.2	57.6	54.9	49.0	52.6	50.8	46.6	48.9	47.8	38.4	43.0	40.7	53.8	52.1	52.9
TEUs per hour															
Crane rate	45.0	45.4	45.2	42.1	44.1	43.1	44.7	44.6	44.6	41.5	41.7	41.6	45.2	43.7	44.4
Elapsed labour rate	66.2	68.1	67.1	63.9	63.8	63.9	59.3	59.0	59.1	62.6	64.6	63.6	66.9	65.9	66.4
Ship rate	83.3	91.2	87.2	77.3	83.8	80.6	74.6	77.8	76.2	61.9	69.7	65.7	84.8	83.6	84.2
Landside															
Containers per truck	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
TEUs per truck	2.6	2.7	2.7	2.8	2.8	2.8	2.7	2.9	2.8	2.9	2.9	2.9	2.8	2.8	2.8
Per cent of trucks backloaded (%)	10.8	11.9	11.3	12.8	13.1	13.0	9.9	12.8	11.3	13.8	13.6	13.7	12.4	13.8	13.1
Average truck turnaround time (mins)	36.5	36.3	36.4	36.8	41.7	39.2	38.7	39.7	39.2	40.4	34.9	37.8	31.5	36.1	33.9
Average container turnaround time (mins)	21.1	20.5	20.8	20.4	23.3	21.8	21.7	21.5	21.6	22.1	19.0	20.6	17.4	19.7	18.6
Whole of container terminal															
Ship turnaround time															
Median of ship turnaround time (hours)	38.0	36.5	37.2	41.3	44.1	42.9	49.2	45.5	47.3	49.5	44.0	45.6	38.0	39.1	38.4
95th percentile of ship turnaround time (hours)	104.7	75.9	81.8	105.7	109.0	109.0	144.0	153.3	152.3	121.8	108.8	118.1	88.6	93.6	88.6
Port congestion															
Number of ships waiting at anchorage for more than 2 hours	12	4	16	56	49	105	71	81	152	59	59	118	33	37	70
Per cent of ships waiting at anchorage for more than 2 hours (%)	5.0	1.7	3.4	24.0	22.1	23.1	34.1	36.3	35.3	23.9	22.3	23.1	13.9	14.8	14.3
Average waiting time at anchorage (hours)	41.2	13.1	34.2	24.5	26.2	25.3	33.6	36.1	34.9	40.7	45.1	42.9	44.6	23.0	33.2
Median waiting time at anchorage (hours)	17.1	5.2	15.7	17.0	19.7	18.9	27.3	30.5	29.3	28.9	23.3	25.6	24.0	17.6	19.2
Total time ships spent at berth ('000 hours)	6.8	6.8	13.6	7.8	7.9	15.6	7.8	7.3	15.1	9.0	9.1	18.1	6.8	7.8	14.6
Berth occupancy (%)	32.2	31.5	31.9	35.6	34.6	35.1	34.3	33.3	33.8	40.6	38.4	39.5	30.3	33.3	31.8
Average TEUs per ship-hour at berth (TEUs per hour)	53.8	52.7	53.2	50.0	49.0	49.5	41.6	46.8	44.1	45.7	42.8	44.2	49.3	46.9	48.0
Average lifts per ship-hour at berth (lifts per hour)	33.6	33.1	33.4	31.6	30.8	31.2	26.0	29.3	27.6	28.4	26.5	27.4	31.2	29.4	30.3
Total time ships are available to stevedores ('000 hours)	5.7	5.6	11.3	6.3	6.2	12.5	6.2	6.4	12.6	6.8	6.3	13.1	5.1	5.8	10.9
Average lifts per hour of stevedoring operation (lifts per hour)	40.0	40.6	40.3	38.9	38.8	38.9	32.9	33.6	33.3	37.8	38.3	38.1	41.5	39.5	40.5
Average lifts per berth visit (lifts)	946.7	954.0	950.3	1 051.5	1 092.5	1 071.5	974.0	964.6	969.1	1 038.0	913.1	973.5	895.0	913.3	904.4

Note: Cells may not sum to totals due to rounding.

Sources: DP World (2023), Hutchison Ports Australia (2023), Patrick (2023), Port of Brisbane Pty Ltd (2023) and Maritime Safety Queensland (2023)

Table 2.2 Container terminal performance: Sydney

	2021						2022						2023		
	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun
Wharfside															
Containers per hour															
Crane rate	26.5	27.3	26.9	27.3	26.9	27.1	22.1	27.2	24.7	27.0	27.7	27.3	28.4	27.9	28.1
Elapsed labour rate	44.5	47.2	45.8	43.4	37.9	40.6	35.5	40.8	38.2	41.5	43.6	42.5	45.4	43.0	44.1
Ship rate	55.3	65.4	60.2	61.3	52.4	56.8	43.7	54.4	49.2	54.1	53.0	53.5	58.8	58.8	58.8
TEUs per hour															
Crane rate	42.8	43.8	43.3	43.9	43.6	43.7	36.1	44.3	40.3	43.9	45.1	44.5	45.9	45.1	45.5
Elapsed labour rate	72.4	76.0	74.2	69.8	61.9	65.8	58.1	66.8	62.6	67.9	71.4	69.7	73.8	69.8	71.8
Ship rate	90.0	105.4	97.5	98.7	85.6	92.1	71.8	89.0	80.6	88.5	86.5	87.5	95.8	95.3	95.5
Landside															
Containers per truck	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
TEUs per truck	2.3	2.2	2.3	2.3	2.2	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.3	2.3
Per cent of trucks backloaded (%)	5.2	4.9	5.0	4.9	4.7	4.8	4.6	4.8	4.7	4.6	4.9	4.7	5.1	5.9	5.5
Average truck turnaround time (mins)	36.5	32.1	34.3	32.9	36.5	34.8	37.6	37.0	37.3	36.9	32.6	34.8	32.4	34.1	33.3
Average container turnaround time (mins)	26.0	23.1	24.6	23.0	26.5	24.7	26.9	26.4	26.7	26.9	23.8	25.4	23.4	24.4	23.9
Whole of container terminal															
Ship turnaround time															
Median of ship turnaround time (hours)	44.3	42.0	43.5	45.3	54.2	49.0	53.1	44.9	48.8	44.4	39.6	41.3	34.5	36.4	35.5
95th percentile of ship turnaround time (hours)	91.6	89.8	89.8	94.0	107.3	101.6	110.4	80.5	96.5	75.0	74.0	74.0	70.5	67.5	67.5
Port congestion															
Number of ships waiting at anchorage for more than 2 hours	104	68	172	74	99	173	86	104	190	118	82	200	80	46	126
Per cent of ships waiting at anchorage for more than 2 hours (%)	40.6	27.8	34.3	30.1	40.4	35.2	36.0	38.8	37.5	41.8	27.4	34.4	27.3	15.8	21.6
Average waiting time at anchorage (hours)	881.0	108.6	575.6	22.6	36.1	30.3	147.3	211.1	182.2	38.4	27.6	34.0	132.3	20.5	91.5
Median waiting time at anchorage (hours)	23.6	13.8	19.9	18.2	22.4	18.6	30.1	25.2	27.2	23.8	13.0	18.2	10.7	15.8	14.3
Total time ships spent at berth ('000 hours)	12.4	11.4	23.9	11.9	14.2	26.0	14.1	13.0	27.0	13.2	12.6	25.8	11.6	11.2	22.8
Berth occupancy (%)	52.9	47.6	50.3	47.5	56.8	52.2	57.7	52.7	55.2	52.2	50.2	51.2	45.7	44.8	45.2
Average TEUs per ship-hour at berth (TEUs per hour)	55.8	58.5	57.1	57.3	49.9	53.3	48.2	54.8	51.4	54.5	56.4	55.5	54.0	57.1	55.5
Average lifts per ship-hour at berth (lifts per hour)	34.5	36.4	35.4	35.6	30.7	32.9	29.6	33.6	31.5	33.4	34.5	34.0	33.4	35.3	34.3
Total time ships are available to stevedores ('000 hours)	10.1	9.2	19.2	10.1	11.9	22.1	12.3	11.3	23.7	10.9	10.3	21.2	9.0	10.1	19.1
Average lifts per hour of stevedoring operation (lifts per hour)	42.6	45.4	43.9	41.6	36.5	38.8	33.7	38.5	36.0	40.7	42.1	41.4	43.0	39.4	41.1
Average lifts per berth visit (lifts)	1 675.8	1 697.3	1 686.3	1 717.0	1 775.3	1 746.2	1 739.9	1 626.9	1 680.1	1 564.8	1 454.5	1 508.0	1 321.7	1 365.7	1 343.6

Note: Cells may not sum to totals due to rounding.

Sources: DP World (2023), Hutchison Ports Australia (2023), Patrick (2023), NSW Ports (2023) and Port Authority of New South Wales (2023)

Table 2.3 Container terminal performance: Melbourne

	2021						2022						2023		
	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun
Wharfside															
Containers per hour															
Crane rate	28.2	28.5	28.3	27.8	26.0	26.9	27.3	27.9	27.5	28.4	28.7	28.5	29.9	30.6	30.2
Elapsed labour rate	56.3	56.7	56.5	55.1	42.7	48.8	48.7	51.9	50.2	53.4	52.6	53.0	56.3	56.4	56.4
Ship rate	58.7	69.7	64.2	61.6	53.0	57.3	60.0	62.7	61.3	63.6	62.7	63.2	66.2	66.5	66.4
TEUs per hour															
Crane rate	44.9	45.5	45.2	44.7	41.5	43.1	43.8	45.0	44.4	45.8	46.1	45.9	47.8	49.4	48.6
Elapsed labour rate	89.9	90.6	90.2	88.0	68.3	78.1	78.2	84.1	81.1	86.1	84.8	85.4	90.2	91.2	90.7
Ship rate	93.5	111.3	102.5	98.7	84.8	91.7	96.3	101.6	98.9	102.7	101.1	101.9	106.0	107.6	106.8
Landside															
Containers per truck	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
TEUs per truck	2.8	2.8	2.8	2.8	2.8	2.8	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
Per cent of trucks backloaded (%)	18.6	19.5	19.0	20.4	19.5	19.9	19.2	19.6	19.4	18.2	18.2	18.2	18.0	18.6	18.3
Average truck turnaround time (mins)	29.9	32.1	31.0	33.4	40.7	37.0	36.5	32.8	34.7	33.1	32.8	32.9	32.1	33.5	32.8
Average container turnaround time (mins)	16.9	18.1	17.5	18.7	22.6	20.6	20.0	17.8	18.9	18.2	18.0	18.1	17.5	18.2	17.9
Whole of container terminal															
Ship turnaround time															
Median of ship turnaround time (hours)	46.1	44.5	45.4	47.6	67.3	57.1	63.2	46.6	54.1	48.3	45.5	46.6	42.2	39.5	40.7
95th percentile of ship turnaround time (hours)	86.6	91.5	89.0	94.7	176.0	154.9	124.0	98.5	113.9	111.8	105.1	108.4	74.0	91.5	87.4
Port congestion															
Number of ships waiting at anchorage for more than 2 hours	3	4	7	1	6	7	6	1	7	0	1	1	1	1	2
Per cent of ships waiting at anchorage for more than 2 hours (%)	1.3	1.8	1.5	0.4	2.7	1.6	2.8	0.4	1.5	0.0	0.4	0.2	0.4	0.4	0.4
Average waiting time at anchorage (hours)	55.1	35.9	44.1	17.5	66.5	59.5	46.7	99.1	54.2		2.3	2.3	17.4	39.0	28.2
Median waiting time at anchorage (hours)	70.6	12.7	17.1	17.5	77.3	72.5	30.8	99.1	39.6		2.3	2.3	17.4	39.0	28.2
Total time ships spent at berth ('000 hours)	8.9	9.0	17.8	9.1	11.7	20.7	10.2	9.6	19.8	10.2	9.7	19.9	8.4	8.8	17.1
Berth occupancy (%)	45.0	44.5	44.8	44.4	56.5	50.5	51.2	46.8	49.0	48.8	46.3	47.6	40.9	42.1	41.5
Average TEUs per ship-hour at berth (TEUs per hour)	80.7	81.5	81.1	78.2	60.0	68.0	68.7	72.1	70.4	74.0	73.2	73.6	76.5	78.2	77.4
Average lifts per ship-hour at berth (lifts per hour)	50.6	51.1	50.8	48.9	37.5	42.5	42.8	44.5	43.6	45.9	45.4	45.7	47.8	48.4	48.1
Total time ships are available to stevedores ('000 hours)	8.4	8.4	16.7	8.2	10.8	19.0	9.7	8.6	18.3	9.1	8.7	17.9	7.4	7.6	15.0
Average lifts per hour of stevedoring operation (lifts per hour)	53.6	54.7	54.1	54.0	40.5	46.3	44.9	49.9	47.2	51.2	50.6	50.9	53.8	56.1	54.9
Average lifts per berth visit (lifts)	1996.6	2013.1	2004.9	1959.8	2001.6	1980.4	2041.3	1769.7	1897.3	1826.0	1720.1	1772.9	1605.2	1559.5	1581.5

Note: Cells may not sum to totals due to rounding.

Whole of container terminal refers to East and West Swanson Docks and Webb Dock East.

Sources: DP World (2023), Patrick (2023), Port of Melbourne Operations Pty Ltd (2023) and Victoria International Container Terminal (2023)

Table 2.4 Container terminal performance: Adelaide

	2021						2022						2023		
	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun
Wharfside															
Containers per hour															
Crane rate	33.7	33.1	33.4	32.9	32.2	32.6	32.0	32.1	32.0	31.7	31.9	31.8	33.5	32.4	33.0
Elapsed labour rate	44.0	42.5	43.3	43.3	43.8	43.6	43.1	42.6	42.9	40.7	38.3	39.5	42.1	41.4	41.7
Ship rate	49.8	48.4	49.1	49.4	49.5	49.5	49.1	48.8	48.9	45.9	45.5	45.7	48.4	47.0	47.7
TEUs per hour															
Crane rate	48.7	48.6	48.7	48.1	47.4	47.7	48.1	47.5	47.8	46.6	46.5	46.5	47.7	47.2	47.4
Elapsed labour rate	63.6	62.5	63.1	63.3	64.4	63.9	64.7	63.2	64.0	59.8	55.9	57.9	59.8	60.1	60.0
Ship rate	71.9	71.2	71.6	72.2	72.8	72.5	73.7	72.3	73.0	67.5	66.4	67.0	68.8	68.3	68.6
Landside															
Containers per truck	1.9	1.8	1.9	1.8	1.9	1.9	1.9	1.9	1.9	2.1	2.1	2.1	2.1	2.1	2.1
TEUs per truck	2.7	2.7	2.7	2.7	2.8	2.7	2.8	2.8	2.8	3.0	3.0	3.0	3.0	3.0	3.0
Per cent of trucks backloaded (%)	21.2	19.0	20.1												
Average truck turnaround time (mins)	31.8	30.6	31.2	32.2	37.6	34.9	33.0	36.0	34.5	35.4	32.6	34.0	31.5	31.3	31.4
Average container turnaround time (mins)	16.7	16.9	16.8	17.7	19.8	18.7	17.1	18.5	17.8	17.1	15.8	16.5	15.0	15.2	15.1
Whole of container terminal															
Ship turnaround time															
Median of ship turnaround time (hours)	25.9	26.7	26.1	29.1	33.3	30.1	31.5	27.4	30.0	29.6	29.1	29.2	24.5	29.3	26.0
95th percentile of ship turnaround time (hours)	60.6	41.7	48.4	48.3	73.3	61.9	52.9	51.0	52.9	56.6	59.7	59.6	42.6	53.8	50.0
Port congestion															
Number of ships waiting at anchorage for more than 2 hours	9	3	12	5	5	10	7	5	12	8	4	12	5	4	9
Per cent of ships waiting at anchorage for more than 2 hours (%)	13.0	4.3	8.6	7.6	8.9	8.2	11.1	8.1	9.6	12.3	5.3	8.5	6.8	6.5	6.6
Average waiting time at anchorage (hours)	44.9	18.9	38.4	30.8	25.6	28.2	18.2	27.1	21.9	20.4	33.0	24.6	22.4	39.7	30.1
Median waiting time at anchorage (hours)	40.7	22.5	33.8	21.8	24.3	23.3	12.0	18.4	14.8	14.0	28.1	19.1	17.4	33.0	26.8
Total time ships spent at berth ('000 hours)	2.0	1.9	3.9	2.0	1.9	3.9	2.0	1.9	3.9	2.0	2.4	4.4	1.9	1.9	3.8
Berth occupancy (%)	40.2	38.1	39.1	38.4	38.0	38.2	39.7	38.8	39.2	40.1	46.2	43.2	37.8	38.7	38.2
Average TEUs per ship-hour at berth (TEUs per hour)	47.5	45.6	46.6	43.9	48.6	46.2	48.2	45.0	46.6	43.9	38.8	41.1	43.4	46.3	44.8
Average lifts per ship-hour at berth (lifts per hour)	32.9	31.0	32.0	30.0	33.1	31.5	32.1	30.4	31.2	29.9	26.6	28.1	30.5	31.8	31.2
Total time ships are available to stevedores ('000 hours)	1.6	1.4	3.0	1.4	1.5	2.9	1.5	1.5	3.0	1.6	1.6	3.2	1.4	1.5	3.0
Average lifts per hour of stevedoring operation (lifts per hour)	42.1	41.2	41.7	43.1	41.2	42.1	41.8	39.1	40.4	37.9	38.1	38.0	40.3	39.8	40.0
Average lifts per berth visit (lifts)	949.9	849.2	899.3	892.1	1 132.0	1 002.1	1 013.4	946.5	980.4	930.5	823.9	872.9	783.2	976.4	871.3

Note: Cells may not sum to totals due to rounding.
Blank cells mean no data was reported for the period.

Sources: Flinders Adelaide Container Terminal (2023) and Flinders Ports (2023)

Table 2.5 Container terminal performance: Fremantle

	2021						2022						2023		
	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun
Wharfside															
Containers per hour															
Crane rate	30.8	30.3	30.6	29.1	28.5	28.8	29.7	29.4	29.6	29.6	29.7	29.6	29.4	31.5	30.5
Elapsed labour rate	44.7	39.0	41.9	32.6	28.0	30.2	37.1	35.9	36.5	37.8	36.2	37.0	38.0	38.9	38.5
Ship rate	38.4	45.3	41.8	38.5	34.5	36.5	42.1	40.3	41.2	43.3	41.5	42.4	43.8	45.8	44.8
TEUs per hour															
Crane rate	46.8	46.4	46.6	44.1	43.2	43.6	44.9	44.9	44.9	45.5	45.6	45.6	44.8	48.5	46.7
Elapsed labour rate	68.5	60.2	64.5	49.9	42.5	46.1	56.3	55.3	55.8	58.5	55.9	57.2	58.1	59.7	58.9
Ship rate	57.8	69.9	63.7	58.9	52.3	55.5	63.9	62.2	63.0	67.1	64.2	65.6	67.1	70.2	68.6
Landside															
Containers per truck	1.7	1.7	1.7	1.7	1.8	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.7	1.8	1.8
TEUs per truck	2.4	2.6	2.5	2.5	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.7	2.6
Per cent of trucks backloaded (%)	7.7	8.3	8.0	4.9	5.4	5.2	7.3	7.6	7.4	7.6	7.6	7.6	7.1	8.9	8.0
Average truck turnaround time (mins)	23.0	24.5	23.7	23.4	25.9	24.7	26.4	26.6	26.5	22.6	25.9	24.2	29.3	24.3	26.6
Average container turnaround time (mins)	13.4	14.3	13.8	13.9	14.5	14.2	14.9	15.0	14.9	12.7	14.6	13.6	16.9	13.7	15.2
Whole of container terminal															
Ship turnaround time															
Median of ship turnaround time (hours)	44.5	48.2	46.8	76.4	76.0	76.4	68.8	62.3	66.4	53.7	53.2	53.5	46.8	51.1	50.1
95th percentile of ship turnaround time (hours)	84.3	93.5	93.5	136.3	198.0	175.4	120.3	139.0	122.1	120.8	114.2	114.2	134.7	133.4	134.6
Port congestion															
Number of ships waiting at anchorage for more than 2 hours	9	5	14	13	16	29	12	13	25	7	8	15	14	20	34
Per cent of ships waiting at anchorage for more than 2 hours (%)	10.0	5.5	7.7	17.3	22.5	19.9	15.6	15.3	15.4	7.5	8.6	8.1	14.1	20.6	17.3
Average waiting time at anchorage (hours)	26.9	24.0	25.9	45.6	54.3	50.4	31.8	22.5	26.9	26.4	28.7	27.6	30.1	31.2	30.7
Median waiting time at anchorage (hours)	18.5	18.6	18.6	47.0	41.0	46.0	24.3	22.0	23.4	19.0	23.2	19.5	20.1	22.0	21.2
Total time ships spent at berth ('000 hours)	3.5	4.1	7.6	4.3	4.8	9.1	4.3	4.7	9.0	4.3	4.4	8.7	4.3	4.1	8.5
Berth occupancy (%)	31.8	37.6	34.7	39.5	43.6	41.5	40.2	43.8	42.0	39.4	40.6	40.0	40.4	37.5	38.9
Average TEUs per ship-hour at berth (TEUs per hour)	57.6	48.0	52.4	42.4	36.7	39.4	46.5	44.4	45.4	47.1	44.9	46.0	46.0	47.8	46.9
Average lifts per ship-hour at berth (lifts per hour)	37.5	31.1	34.0	27.7	24.1	25.8	30.6	28.8	29.6	30.4	29.1	29.7	30.1	31.2	30.6
Total time ships are available to stevedores ('000 hours)	3.0	3.3	6.2	3.8	4.6	8.4	3.7	3.8	7.6	3.7	3.7	7.4	3.4	3.4	6.7
Average lifts per hour of stevedoring operation (lifts per hour)	43.6	39.1	41.3	31.4	25.0	27.9	35.2	35.0	35.1	35.4	34.4	34.9	39.0	38.1	38.5
Average lifts per berth visit (lifts)	1 445.8	1 397.3	1 421.5	1 576.3	1 632.6	1 603.8	1 713.1	1 579.9	1 643.3	1 406.0	1 374.5	1 390.2	1 320.3	1 332.9	1 326.6

Note: Cells may not sum to totals due to rounding.

Sources: DP World (2023), Patrick (2023) and Fremantle Ports (2023)

Table 2.6 Container terminal performance: Five ports

	2021						2022						2023		
	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun
Wharfside															
Containers per hour															
Crane rate	28.2	28.5	28.3	27.8	27.1	27.5	26.2	28.0	27.1	27.7	28.1	27.9	29.3	29.3	29.3
Elapsed labour rate	48.1	48.9	48.5	45.8	39.3	42.5	41.0	43.4	42.2	44.7	45.0	44.9	47.7	46.7	47.2
Ship rate	54.0	62.8	58.3	56.4	50.8	53.6	50.1	54.4	52.3	53.0	53.0	53.0	58.4	58.2	58.3
TEUs per hour															
Crane rate	44.6	45.2	44.9	44.0	43.1	43.5	41.7	44.8	43.3	44.3	44.9	44.6	46.4	46.7	46.6
Elapsed labour rate	76.6	77.8	77.2	72.9	62.8	67.8	65.6	70.0	67.8	72.0	72.6	72.3	76.1	75.0	75.5
Ship rate	86.1	100.2	93.1	89.9	81.4	85.6	80.3	87.9	84.1	85.5	85.4	85.4	93.3	93.6	93.4
Landside															
Containers per truck	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
TEUs per truck	2.5	2.6	2.5	2.6	2.6	2.6	2.6	2.7	2.6	2.7	2.6	2.7	2.6	2.7	2.7
Per cent of trucks backloaded (%)	11.5	12.0	11.7	11.9	11.5	11.7	10.8	11.3	11.0	11.2	11.1	11.1	11.0	12.0	11.5
Average truck turnaround time (mins)	32.6	32.0	32.3	32.9	37.9	35.4	36.1	35.0	35.5	34.8	32.4	33.7	31.8	33.1	32.5
Average container turnaround time (mins)	19.9	19.5	19.7	19.8	22.9	21.3	21.6	20.7	21.1	20.7	19.3	20.0	18.8	19.4	19.1
Whole of container terminal															
Ship turnaround time															
Median of ship turnaround time (hours)	41.5	40.0	40.9	45.1	55.4	48.8	54.9	45.8	49.6	46.1	42.5	43.9	37.8	38.9	38.4
95th percentile of ship turnaround time (hours)	88.8	87.3	87.8	106.4	148.5	123.2	124.0	110.2	120.5	103.9	93.9	100.0	84.0	84.6	84.6
Port congestion															
Number of ships waiting at anchorage for more than 2 hours	137	84	221	149	175	324	182	204	386	192	154	346	133	108	241
Per cent of ships waiting at anchorage for more than 2 hours (%)	15.6	9.7	12.6	17.6	21.5	19.5	22.7	23.2	23.0	20.4	15.6	17.9	14.0	11.1	12.5
Average waiting time at anchorage (hours)	678.3	92.3	455.6	25.6	35.7	31.1	87.1	124.5	106.9	37.9	34.3	36.3	94.8	24.2	63.2
Median waiting time at anchorage (hours)	24.2	15.7	20.4	20.4	23.1	21.8	26.7	27.4	27.2	23.5	18.5	20.4	17.2	18.7	17.9
Total time ships spent at berth ('000 hours)	33.5	33.2	66.7	34.9	40.5	75.4	38.4	36.5	74.9	38.7	38.2	76.9	33.0	33.8	66.8
Berth occupancy (%)	42.1	40.8	41.4	42.1	48.2	45.1	46.6	44.2	45.4	45.9	44.7	45.3	39.4	39.8	39.6
Average TEUs per ship-hour at berth (TEUs per hour)	61.7	61.5	61.6	58.5	51.0	54.5	52.1	55.9	54.0	56.2	55.0	55.6	57.1	58.5	57.8
Average lifts per ship-hour at berth (lifts per hour)	38.8	38.7	38.8	36.9	32.0	34.3	32.6	34.8	33.7	35.0	34.3	34.7	36.0	36.7	36.3
Total time ships are available to stevedores ('000 hours)	28.7	27.8	56.5	29.8	35.2	64.9	33.5	31.7	65.1	32.0	30.7	62.8	26.4	28.3	54.7
Average lifts per hour of stevedoring operation (lifts per hour)	45.4	46.3	45.8	43.2	36.9	39.8	37.4	40.2	38.7	42.4	42.6	42.5	45.1	43.7	44.4
Average lifts per berth visit (lifts)	1 478.7	1 477.6	1 478.1	1 521.7	1 593.9	1 557.1	1 561.9	1 446.2	1 501.4	1 438.8	1 323.0	1 379.5	1 247.1	1 275.7	1 261.5

Note: Cells may not sum to totals due to rounding.

Sources: DP World (2023), Patrick (2023), Hutchison Ports Australia (2023), Flinders Adelaide Container Terminal (2023), Victoria International Container Terminal (2023), Port of Brisbane Pty Ltd (2023), Maritime Safety Queensland (2023), Port Authority of New South Wales (2023), NSW Ports (2023), Port of Melbourne Operations Pty Ltd (2023), Flinders Ports (2023) and Fremantle Ports (2023)

CHAPTER 3

Vehicle booking system and empty container park operations

Overview

This chapter reports on three main indicator types:

1. The number of truck booking or appointment timeslots available at a container terminal
2. The number of truck booking or appointment timeslots used at a container terminal
3. The volume of container traffic through empty container parks

The data is derived from the vehicle booking systems used by the stevedores. An important use of these statistics is to monitor the time of day and week when trucks access the container terminals to pick up or deliver containers. For this reason the count of slots available and used are provided for the following windows:

Monday to Friday Day: 6:01 AM to 6:00 PM

Monday to Friday Evening: 6:01 PM to 12:00 Midnight

Monday to Friday Night: 12:01 Midnight to 6:00 AM

Saturday Day: 6:01 AM to 6:00 PM

Saturday Evening: 6:01 PM to 12:00 Midnight

Saturday Night: 12:01 Midnight to 6:00 AM

Sunday Day: 6:01 AM to 6:00 PM

Sunday Evening: 6:01 PM to 12:00 Midnight

Sunday Night: 12:01 Midnight to 6:00 AM

The stevedores at the five container terminals do not have identical day, evening and night shifts. Thus data has been adjusted to fit into these standardised work shifts for comparative purposes.

Indicator 3.1 Number of truck timeslots available

The total number of standard VBS/TAS timeslots made available for container receipt/delivery. Bulk runs are excluded. See Box 3.1 for information on factors affecting slot availability.

Box 3.1 Container timeslots

Stevedoring companies make available a number of container timeslots at various times in each day, based on the deployment of container handling equipment. The main factors affecting the availability of timeslots are the volume of containers to be processed, and terminal resources available to process containers. When shipping schedules and container volumes demand extra resources, additional labour and extra equipment can be deployed to the landside of a container terminal to increase slot availability. Such extra timeslots are normally advertised one or two days in advance.

Indicator 3.2 Number of timeslots actually used

This is the count of VBS/TAS timeslots actually used by trucks. As for Indicator 3.1, containers moved by bulk runs are excluded.

Indicator 3.3 Timeslots used by trucks in all off-peak periods as proportion of total timeslots used at container terminals

This indicator, derived from Indicator 3.2, gives the count of timeslots used by trucks during the off-peak period as a proportion of all timeslots used. The off-peak period is defined as all time periods except Monday to Friday 6:01 AM to 6:00 PM.

Results for this indicator are presented in Figure 3.1. The indicator is further divided up into Monday to Friday off-peak (Indicator 3.4) and weekend usage (Indicator 3.5).

Indicator 3.4 Timeslots used by trucks in Monday to Friday off-peak periods as proportion of total timeslots used

This indicator, derived from Indicator 3.2, gives a count of timeslots used by trucks during the Monday to Friday off-peak period as a proportion of all timeslots used. Results for this indicator are presented in Figure 3.2.

Indicator 3.5 Timeslots used by trucks on Saturday and Sunday as proportion of total timeslots used

This indicator, derived from Indicator 3.2, gives a count of timeslots used by trucks during the Weekend (Saturday to Sunday) as a proportion of all timeslots used. Results for this indicator are presented in Figure 3.3.

Indicator 3.6 Average TEUs handled per VBS/TAS truck timeslot

This indicator is a measure of the intensity of usage of timeslots. The indicator increases as opportunities for out/return load carrying trips in one job increase. Results for this indicator are presented in Figure 3.4.

Indicator 3.7 Number of containers moved through empty container parks

This indicator is a measure of the usage of empty container parks. It shows the number of notifications of container movements to empty container parks in the vicinity of each port.

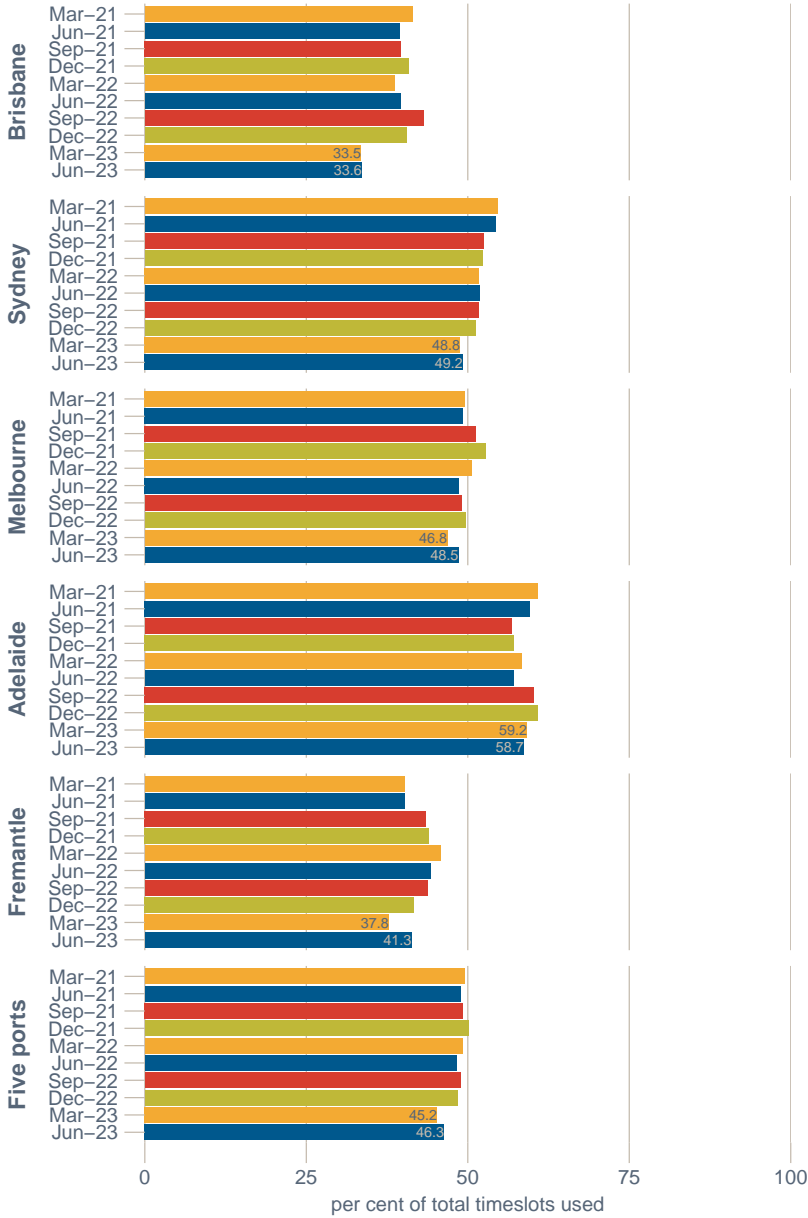
Indicator 3.8 Number of TEUs moved through empty container parks

This indicator is a measure of the usage of empty container parks. It shows the number of TEUs moved in the operations shown by Indicator 3.7.



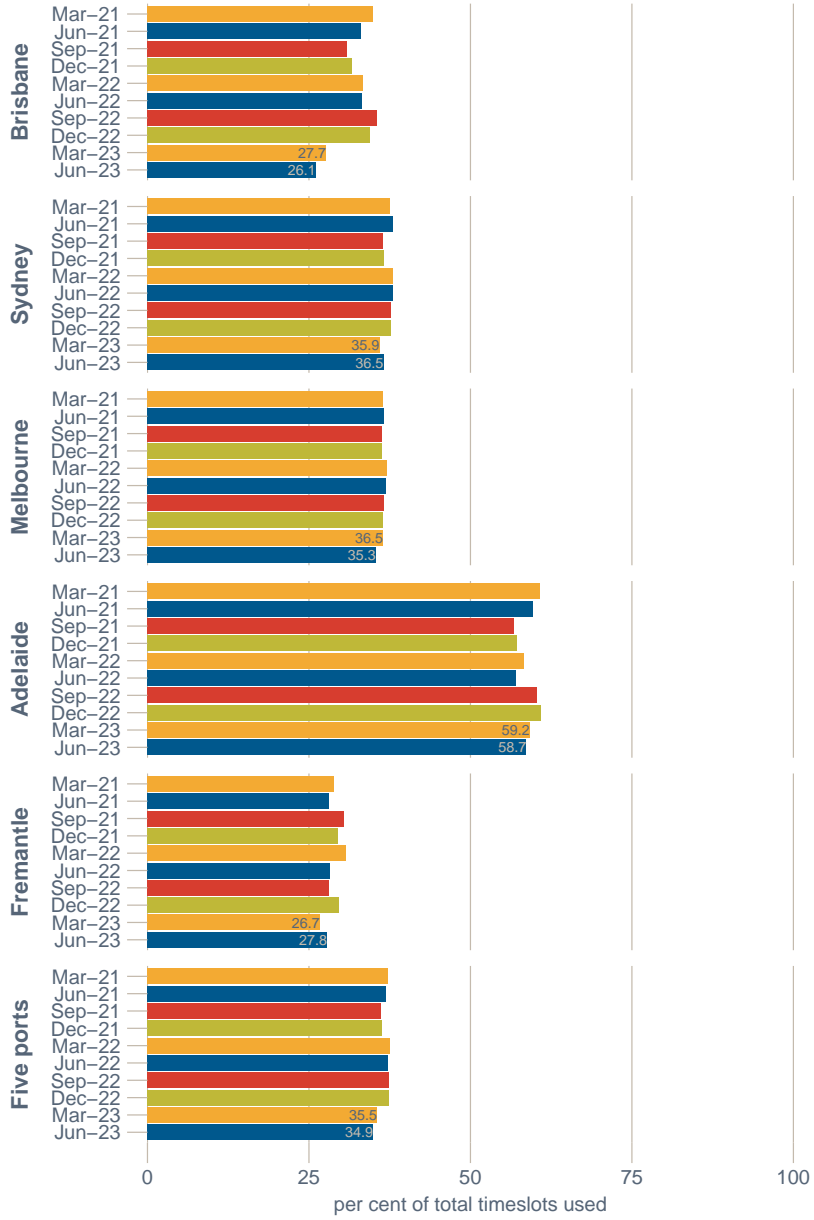
Aerial view of the North Quay container berths at Fremantle Inner Harbour, September 2024. Photo courtesy of Fremantle Ports.

Figure 3.1 Timeslots used by trucks in all off-peak periods



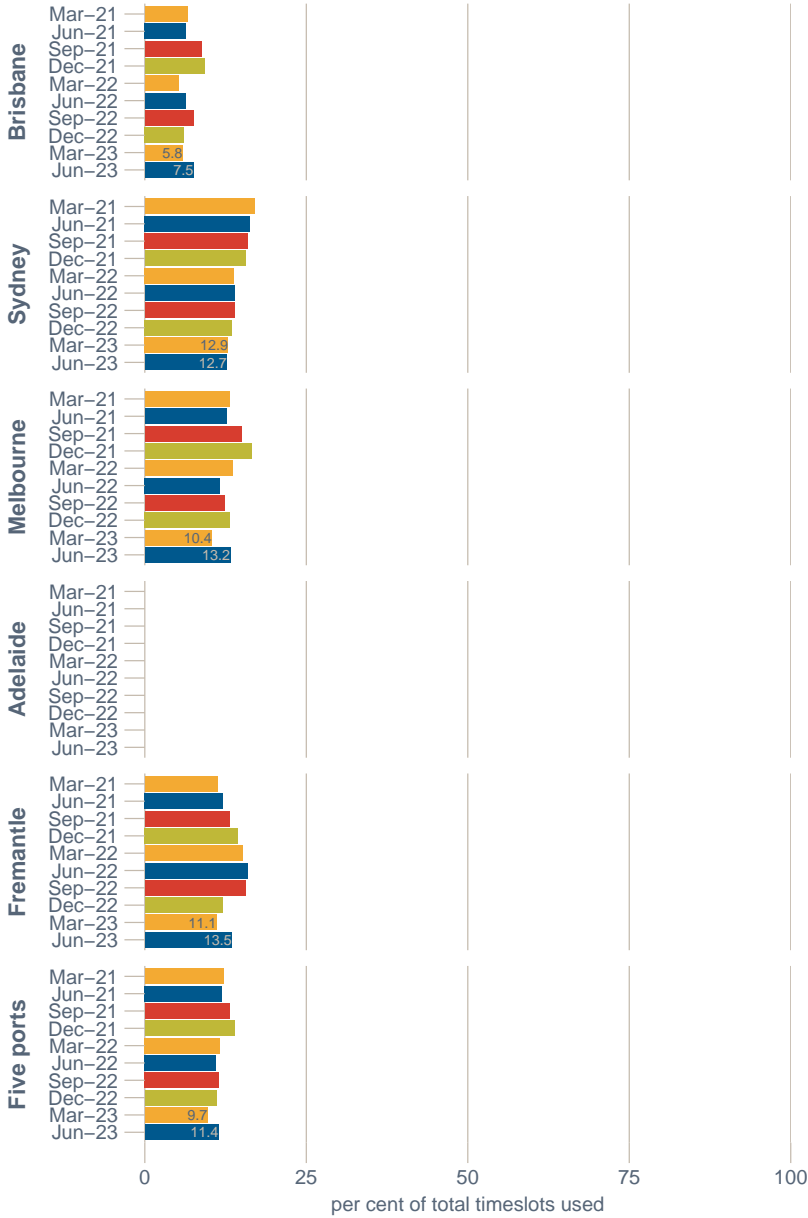
Sources: DP World (2023), Flinders Adelaide Container Terminal (2023), Hutchison Ports Australia (2023), Patrick (2023) and Victoria International Container Terminal (2023)

Figure 3.2 Timeslots used by trucks in off-peak periods Monday to Friday



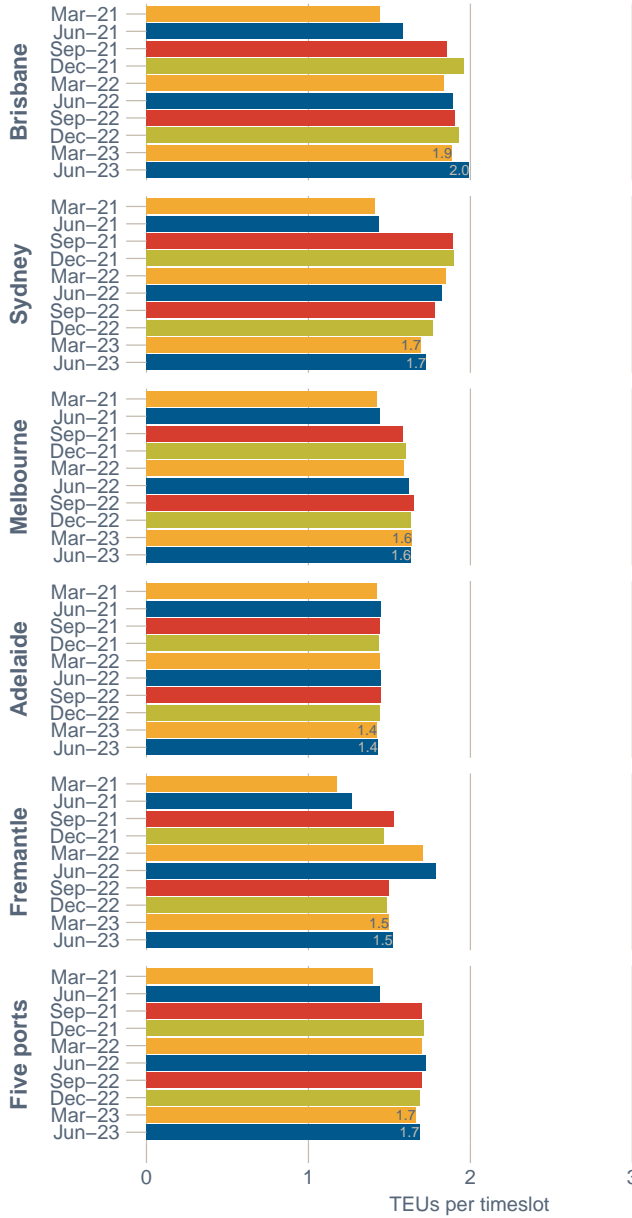
Sources: DP World (2023), Flinders Adelaide Container Terminal (2023), Hutchison Ports Australia (2023), Patrick (2023) and Victoria International Container Terminal (2023)

Figure 3.3 Timeslots used by trucks on Saturday and Sunday



Sources: DP World (2023), Flinders Adelaide Container Terminal (2023), Hutchison Ports Australia (2023), Patrick (2023) and Victoria International Container Terminal (2023)

Figure 3.4 TEUs processed per VBS timeslot used at container terminals



Sources: DP World (2023), Flinders Adelaide Container Terminal (2023), Hutchison Ports Australia (2023), Patrick (2023) and Victoria International Container Terminal (2023)

Table 3.1 Timeslots available and actually used by trucks: Brisbane

Weekday	Shift	2021				2022				2023			
		Mar Qtr	Jun Qtr	Sep Qtr	Dec Qtr	Mar Qtr	Jun Qtr	Sep Qtr	Dec Qtr	Mar Qtr	Jun Qtr		
Available ('000)	Monday–Friday	Day	119.4	110.3	103.1	99.4	99.2	102.0	108.3	101.1	99.8	97.9	
		Evening	45.9	40.2	36.2	34.1	37.2	38.3	44.9	41.6	32.0	28.8	
		Night	27.9	24.7	22.1	22.4	22.3	21.4	32.8	31.1	14.0	9.6	
		Sub-total	193.1	175.2	161.5	155.9	158.7	161.7	185.9	173.8	145.8	136.3	
	Saturday	Day	11.9	9.9	6.6	7.1	6.1	8.0	9.5	7.8	5.5	6.6	
		Evening	0.2	0.0	0.2	0.3	0.0	0.1	0.1	0.1	0.1	0.1	
		Night	1.9	0.9	3.5	2.4	2.3	2.4	2.5	2.2	1.7	1.0	
		Sub-total	14.0	10.8	10.4	9.8	8.4	10.5	12.2	10.1	7.4	7.7	
	Sunday	Day	1.0	1.0	3.5	3.3	0.2	0.1	0.4	0.2	0.5	0.9	
		Evening	0.8	0.6	1.8	2.0	1.0	0.6	1.1	1.1	0.8	0.5	
		Night	0.8	0.8	1.1	1.0	0.9	1.0	1.1	1.1	1.2	1.2	
		Sub-total	2.6	2.4	6.4	6.4	2.1	1.7	2.6	2.4	2.4	2.7	
	Total timeslots available		209.8	188.3	178.3	172.0	169.3	173.9	200.7	186.3	155.6	146.7	
	Used ('000)	Monday–Friday	Day	83.7	78.4	72.7	66.4	66.0	68.3	74.0	69.4	66.2	68.4
			Evening	31.8	27.5	23.9	22.1	23.2	25.1	30.0	27.1	21.0	20.6
Night			18.2	15.3	13.4	13.4	12.7	12.5	16.3	13.1	6.5	6.2	
Sub-total			133.7	121.2	109.9	102.0	101.8	105.9	120.2	109.7	93.7	95.2	
Saturday		Day	6.7	5.9	3.1	3.2	2.8	4.8	6.3	4.1	2.6	4.2	
		Evening	0.1	0.0	0.2	0.3	0.0	0.0	0.1	0.0	0.1	0.1	
		Night	1.0	0.6	1.7	1.3	1.3	1.0	1.6	1.3	1.1	1.0	
		Sub-total	7.7	6.5	5.0	4.8	4.1	5.8	7.9	5.4	3.8	5.3	
Sunday		Day	0.4	0.6	3.2	3.2	0.2	0.1	0.4	0.2	0.3	0.9	
		Evening	0.4	0.3	1.3	1.4	0.4	0.2	0.4	0.4	0.5	0.4	
		Night	0.8	0.8	1.1	1.0	0.9	0.9	1.1	1.0	1.1	1.2	
		Sub-total	1.7	1.7	5.6	5.6	1.5	1.3	1.9	1.6	2.0	2.5	
Total timeslots used		143.1	129.4	120.5	112.3	107.4	113.0	130.1	116.8	99.5	103.0		

Note: Data are rounded to the nearest 1000. Cells with an entry of “0.0” mean that data were reported but rounded to zero.

Sources: DP World (2023), Hutchison Ports Australia (2023) and Patrick (2023)

Table 3.2 Timeslots available and actually used by trucks: Sydney

Weekday	Shift	2021				2022				2023		
		Mar Qtr	Jun Qtr	Sep Qtr	Dec Qtr	Mar Qtr	Jun Qtr	Sep Qtr	Dec Qtr	Mar Qtr	Jun Qtr	
Available ('000)	Monday–Friday	Day	177.3	165.9	147.4	147.2	152.8	161.4	165.8	158.6	153.6	154.8
		Evening	77.0	72.4	61.7	61.3	63.7	68.9	72.1	68.6	62.5	61.1
		Night	68.1	60.6	51.3	53.1	53.4	55.5	58.0	55.5	52.7	54.4
		Sub-total	322.4	298.9	260.4	261.5	269.9	285.9	295.9	282.8	268.7	270.3
	Saturday	Day	20.4	18.3	13.6	13.3	14.0	16.1	14.8	15.9	13.8	14.5
		Evening	3.1	3.1	3.1	2.6	1.6	1.6	1.6	1.5	1.4	1.3
		Night	8.4	7.9	8.5	6.6	6.7	6.5	6.5	7.1	6.8	7.2
		Sub-total	31.9	29.3	25.2	22.5	22.3	24.2	22.9	24.6	22.0	23.0
	Sunday	Day	16.8	15.1	14.4	14.0	11.8	11.2	12.2	10.7	11.6	12.2
		Evening	8.5	7.1	7.2	8.0	6.9	5.8	6.0	5.1	5.4	5.5
		Night	4.0	3.7	3.4	2.7	3.0	2.9	3.1	2.7	2.8	2.7
		Sub-total	29.4	25.9	25.0	24.7	21.8	19.9	21.3	18.5	19.7	20.4
Total timeslots available		383.7	354.1	310.6	308.7	314.0	329.9	340.2	325.9	310.4	313.7	
Used ('000)	Monday–Friday	Day	117.6	110.4	92.3	92.5	93.4	95.5	98.3	94.3	90.9	93.9
		Evening	53.0	50.6	41.1	40.1	42.7	43.8	44.3	41.9	36.7	38.1
		Night	44.3	41.0	29.6	31.1	30.7	31.5	32.4	30.9	27.1	29.5
		Sub-total	214.9	202.0	163.0	163.7	166.9	170.8	175.1	167.0	154.8	161.4
	Saturday	Day	14.1	12.9	7.3	7.9	8.8	10.4	9.1	9.7	8.1	8.0
		Evening	2.2	2.1	1.6	1.4	0.4	0.5	0.5	0.4	0.3	0.2
		Night	4.2	4.3	4.3	4.1	4.0	3.9	4.3	4.5	3.8	4.0
		Sub-total	20.4	19.4	13.1	13.4	13.2	14.8	13.8	14.6	12.2	12.2
	Sunday	Day	13.6	11.7	10.4	9.5	7.8	7.5	8.2	6.4	6.0	6.3
		Evening	6.5	5.0	5.0	5.0	3.4	2.9	3.4	2.8	2.7	2.6
		Night	3.5	3.2	2.5	2.4	2.4	2.4	2.7	2.4	2.1	2.3
		Sub-total	23.6	20.0	17.9	17.0	13.5	12.7	14.4	11.5	10.7	11.3
Total timeslots used		259.0	241.3	193.9	194.0	193.6	198.3	203.3	193.1	177.7	184.9	

Sources: DP World (2023), Hutchison Ports Australia (2023) and Patrick (2023)

Table 3.3 Timeslots available and actually used by trucks: Melbourne

	Weekday	Shift	2021				2022				2023		
			Mar Qtr	Jun Qtr	Sep Qtr	Dec Qtr	Mar Qtr	Jun Qtr	Sep Qtr	Dec Qtr	Mar Qtr	Jun Qtr	
Available ('000)	Monday–Friday	Day	194.6	193.0	164.7	154.7	172.9	173.8	181.8	166.9	166.2	177.5	
		Evening	90.4	89.1	76.4	76.7	84.1	81.1	80.4	79.3	78.9	81.2	
		Night	64.1	64.7	57.9	51.4	60.2	58.3	60.0	56.5	50.1	57.8	
		Sub-total	349.1	346.8	299.0	282.8	317.2	313.2	322.2	302.6	295.2	316.5	
	Saturday	Day	23.6	21.9	16.2	19.8	18.7	16.8	18.0	18.1	14.7	20.6	
		Evening	0.1	0.1	2.2	2.5	0.0	0.0	0.0	0.0	0.0	0.4	
		Night	9.8	9.4	5.2	5.5	5.1	4.5	5.3	5.1	4.2	6.0	
		Sub-total	33.5	31.4	23.7	27.9	23.8	21.3	23.4	23.2	18.9	26.9	
	Sunday	Day	17.4	17.7	20.7	18.1	14.8	14.0	14.6	12.6	13.7	20.9	
		Evening	11.7	11.4	11.3	11.0	9.5	9.8	10.7	10.4	9.6	12.6	
		Night	2.1	1.5	9.0	6.8	9.0	8.7	9.3	8.4	8.3	8.3	
		Sub-total	31.3	30.6	41.1	35.9	33.3	32.5	34.6	31.4	31.5	41.8	
	Total timeslots available			413.9	408.8	363.7	346.6	374.3	367.0	380.2	357.2	345.7	385.2
	Used ('000)	Monday–Friday	Day	168.4	167.4	142.4	133.8	146.7	148.6	156.2	142.7	139.8	143.2
			Evening	76.2	74.9	64.5	64.1	69.3	67.8	70.4	66.0	62.7	64.0
Night			45.3	46.0	41.4	39.0	41.1	39.3	41.7	37.2	33.2	34.3	
Sub-total			289.9	288.3	248.3	236.9	257.1	255.7	268.3	245.8	235.7	241.5	
Saturday		Day	18.9	17.3	11.3	15.3	15.2	13.1	12.9	14.1	10.0	13.1	
		Evening	0.1	0.1	2.1	2.4	0.0	0.0	0.0	0.0	0.0	0.1	
		Night	5.2	5.2	4.7	4.4	4.5	3.8	4.7	4.3	3.6	5.2	
		Sub-total	24.2	22.7	18.2	22.1	19.7	16.8	17.6	18.4	13.7	18.4	
Sunday		Day	9.6	10.4	13.4	12.9	9.9	7.1	8.3	7.3	4.8	9.1	
		Evening	7.9	7.1	7.9	8.4	6.3	6.0	7.4	7.2	4.9	6.2	
		Night	2.0	1.4	4.3	3.5	4.5	3.8	4.6	4.3	3.8	3.1	
		Sub-total	19.6	19.0	25.6	24.8	20.6	16.9	20.3	18.8	13.6	18.4	
Total timeslots used			333.7	330.1	292.2	283.8	297.4	289.4	306.2	283.1	262.9	278.2	

Note: VICT 'Used timeslots' are included from March quarter 2017, however VICT 'Available timeslots' are counted only from September quarter 2018.

Sources: DP World (2023), Patrick (2023) and Victoria International Container Terminal (2023)

Table 3.4 Timeslots available and actually used by trucks: Adelaide

Weekday	Shift	2021				2022				2023			
		Mar Qtr	Jun Qtr	Sep Qtr	Dec Qtr	Mar Qtr	Jun Qtr	Sep Qtr	Dec Qtr	Mar Qtr	Jun Qtr		
Available ('000)	Monday–Friday	Day	22.2	21.0	21.4	21.6	21.0	21.2	21.0	20.0	20.4	19.9	
		Evening	17.7	16.5	15.9	15.9	15.5	15.0	16.2	15.7	15.6	15.1	
		Night	19.3	18.6	18.8	18.2	17.8	17.8	19.5	18.6	18.1	17.8	
		Sub-total	59.2	56.2	56.2	55.8	54.3	54.0	56.7	54.3	54.1	52.8	
	Saturday	Day											
		Evening											
		Night											
		Sub-total											
	Sunday	Day											
		Evening											
		Night											
		Sub-total											
			Total timeslots available		59.2	56.2	56.2	55.8	54.3	54.0	56.7	54.3	54.1
Used ('000)	Monday–Friday	Day	20.8	19.4	19.5	19.6	18.7	19.5	19.7	18.6	18.7	18.9	
		Evening	16.4	14.9	14.0	13.6	13.4	13.8	15.1	14.6	14.5	14.3	
		Night	15.8	13.7	11.6	12.5	12.7	12.1	14.8	14.4	12.6	12.5	
		Sub-total	53.0	48.0	45.2	45.7	44.8	45.4	49.6	47.6	45.8	45.7	
	Saturday	Day											
		Evening											
		Night											
		Sub-total											
	Sunday	Day											
		Evening											
		Night											
		Sub-total											
			Total timeslots used		53.0	48.0	45.2	45.7	44.8	45.4	49.6	47.6	45.8

Note: Blank cells mean no data was reported for the categories.

Sources: Flinders Adelaide Container Terminal (2023)

Table 3.5 Timeslots available and actually used by trucks: Fremantle

Weekday	Shift	2021				2022				2023			
		Mar Qtr	Jun Qtr	Sep Qtr	Dec Qtr	Mar Qtr	Jun Qtr	Sep Qtr	Dec Qtr	Mar Qtr	Jun Qtr		
Available ('000)	Monday–Friday	Day	64.0	60.2	48.9	52.3	45.8	42.7	50.9	54.5	52.4	55.4	
		Evening	21.6	20.8	17.5	19.4	17.7	15.2	18.6	19.5	17.5	18.0	
		Night	10.0	9.4	9.9	9.6	8.7	7.6	9.5	10.8	7.7	9.6	
		Sub-total	95.6	90.5	76.3	81.3	72.2	65.4	78.9	84.8	77.6	83.1	
	Saturday	Day	6.3	6.3	4.7	6.6	6.0	7.2	7.1	6.0	5.6	7.1	
		Evening	0.0	0.2	0.0	0.4	0.4	0.4	0.1	0.0	0.1	0.0	
		Night	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	
		Sub-total	6.5	6.6	4.7	7.1	6.3	7.6	7.3	6.1	5.8	7.1	
	Sunday	Day	5.0	5.6	4.9	5.5	5.6	5.2	6.0	4.4	3.9	5.2	
		Evening	0.3	0.3	0.7	0.6	0.3	0.3	0.8	0.3	0.2	0.3	
		Night	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.2	0.1	0.1	
		Sub-total	5.3	6.0	5.6	6.1	5.9	5.5	6.9	4.9	4.3	5.6	
	Total timeslots available		107.4	103.1	86.7	94.5	84.4	78.4	93.2	95.8	87.7	95.8	
	Used ('000)	Monday–Friday	Day	53.5	50.0	37.4	41.3	36.0	34.2	42.6	45.0	43.3	47.1
			Evening	17.7	16.5	13.1	14.8	13.7	11.7	14.4	14.9	13.4	15.2
Night			8.2	7.0	7.0	7.0	6.7	5.6	6.9	8.0	5.2	7.1	
Sub-total			79.3	73.5	57.5	63.0	56.3	51.6	63.9	67.8	61.9	69.4	
Saturday		Day	5.4	5.2	3.8	5.2	4.9	5.4	6.1	5.1	4.7	6.0	
		Evening	0.0	0.0	0.0	0.3	0.2	0.1	0.1	0.0	0.0	0.0	
		Night	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	
		Sub-total	5.5	5.2	3.8	5.6	5.1	5.5	6.3	5.2	4.9	6.0	
Sunday		Day	4.3	4.5	4.2	4.6	4.7	4.0	4.9	3.6	2.6	4.4	
		Evening	0.2	0.3	0.6	0.4	0.3	0.3	0.5	0.2	0.1	0.2	
		Night	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.1	
		Sub-total	4.6	5.0	4.8	5.0	4.9	4.3	5.5	4.0	2.9	4.7	
Total timeslots used		89.4	83.7	66.2	73.7	66.4	61.4	75.7	77.1	69.6	80.2		

Note: Data are rounded to the nearest 1000. Cells with an entry of “0.0” mean that data were reported but rounded to zero.

Sources: DP World (2023) and Patrick (2023)

Table 3.6 Timeslots available and actually used by trucks: Five ports

Weekday	Shift	2021				2022				2023			
		Mar Qtr	Jun Qtr	Sep Qtr	Dec Qtr	Mar Qtr	Jun Qtr	Sep Qtr	Dec Qtr	Mar Qtr	Jun Qtr		
Available ('000)	Monday–Friday	Day	577.5	550.5	485.5	475.2	491.7	501.1	527.8	501.0	492.3	505.6	
		Evening	252.5	239.0	207.8	207.4	218.2	218.6	232.2	224.7	206.5	204.2	
		Night	189.4	178.0	160.1	154.7	162.4	160.4	179.7	172.6	142.6	149.3	
		Sub-total	1 019.4	967.5	853.4	837.3	872.4	880.1	939.7	898.3	841.5	859.0	
	Saturday	Day	62.3	56.4	41.1	46.8	44.7	48.2	49.4	47.9	39.7	48.8	
		Evening	3.4	3.4	5.5	5.9	2.0	2.1	1.9	1.7	1.6	1.8	
		Night	20.2	18.3	17.3	14.6	14.1	13.3	14.5	14.4	12.8	14.2	
		Sub-total	85.9	78.1	64.0	67.2	60.8	63.6	65.8	64.0	54.1	64.8	
	Sunday	Day	40.2	39.3	43.5	40.9	32.4	30.4	33.2	28.0	29.6	39.2	
		Evening	21.4	19.4	21.0	21.6	17.8	16.6	18.6	16.9	15.9	18.9	
		Night	7.0	6.1	13.6	10.5	12.9	12.6	13.7	12.3	12.3	12.3	
		Sub-total	68.6	64.8	78.1	73.0	63.0	59.6	65.5	57.2	57.9	70.4	
	Total timeslots available		1 173.9	1 110.5	995.4	977.6	996.2	1 003.3	1 071.0	1 019.5	953.4	994.2	
	Used ('000)	Monday–Friday	Day	443.9	425.5	364.2	353.7	360.8	366.1	390.8	370.0	358.9	371.4
			Evening	195.1	184.4	156.6	154.6	162.3	162.2	174.3	164.5	148.3	152.2
Night			131.8	123.0	103.1	103.1	103.8	101.1	112.1	103.5	84.7	89.6	
Sub-total			770.8	733.0	623.9	611.3	627.0	629.4	677.1	638.0	591.9	613.3	
Saturday		Day	45.0	41.4	25.5	31.7	31.8	33.6	34.3	33.0	25.5	31.3	
		Evening	2.3	2.2	4.0	4.5	0.6	0.6	0.7	0.4	0.4	0.3	
		Night	10.5	10.2	10.7	9.8	9.7	8.6	10.6	10.3	8.6	10.3	
		Sub-total	57.9	53.8	40.1	45.9	42.1	42.9	45.6	43.7	34.5	41.9	
Sunday		Day	28.0	27.4	31.2	30.2	22.5	18.7	21.7	17.5	13.8	20.8	
		Evening	15.0	12.8	14.8	15.2	10.4	9.4	11.8	10.6	8.2	9.5	
		Night	6.4	5.5	7.9	6.9	7.8	7.1	8.6	7.9	7.1	6.6	
		Sub-total	49.4	45.7	53.9	52.4	40.6	35.2	42.1	36.0	29.1	36.9	
Total timeslots used		878.2	832.4	717.9	709.6	709.7	707.5	764.8	717.8	655.5	692.0		

Note: VICT 'Used timeslots' are included from March quarter 2017, however VICT 'Available timeslots' are counted only from September quarter 2018.

Sources: DP World (2023), Flinders Adelaide Container Terminal (2023), Hutchison Ports Australia (2023), Patrick (2023) and Victoria International Container Terminal (2023)

Table 3.7 Empty container park operations

	Port	2018				2019				2020	
		Mar Qtr	Jun Qtr	Sep Qtr	Dec Qtr	Mar Qtr	Jun Qtr	Sep Qtr	Dec Qtr	Mar Qtr	Jun Qtr
Number of containers ('000)	Brisbane	129.9	150.8	148.6	142.0	135.6	140.7	169.5	198.1	164.4	174.2
	Sydney	175.7	187.1	212.9	225.1	219.2	212.8	258.6	324.1	286.3	289.6
	Melbourne	348.3	355.9	369.9	364.6	335.3	335.6	345.3	384.9	348.1	356.4
	Adelaide	27.8	25.4	25.3	24.7	27.2	25.2	28.4	30.7	33.9	30.7
	Fremantle	94.0	96.3	97.4	109.0	103.4	104.6	114.2	126.1	120.6	112.0
	Five ports	775.7	815.4	854.0	865.3	820.7	819.0	916.0	1 063.9	953.2	962.9
Number of TEUs ('000)	Brisbane	184.5	219.0	218.7	206.7	198.8	206.5	252.0	299.2	244.2	258.4
	Sydney	267.7	281.6	321.7	344.7	337.7	330.1	398.9	507.4	447.1	451.1
	Melbourne	517.9	533.5	556.6	554.3	514.8	515.7	529.3	594.2	536.4	547.5
	Adelaide	37.9	36.8	36.8	35.0	38.5	36.6	40.7	42.7	48.3	44.6
	Fremantle	134.6	138.5	138.8	155.7	147.0	148.2	163.1	188.7	178.4	167.2
	Five ports	1 142.5	1 209.4	1 272.5	1 296.4	1 236.8	1 237.1	1 384.1	1 632.3	1 454.4	1 468.8

Sources: Containerchain Pty Ltd (2020)
Data currently available to June 2020.

CHAPTER 4

Port interface cost index

Overview

The port interface cost index (PICI) provides a measure of shore-based shipping charges which approximate costs of carting containers through Australia's mainland major city ports. PICI is based on an indicative approach; that is, the index is not an average of all charges, but is based on typical charges levied by service providers. In particular, note that PICI uses scheduled service prices and does not account for specific commercial arrangements.

PICI is computed as a national average in current (Table 4.6) and constant prices (Table 4.7), taking into account the port fees and charges for imports and exports of containers at the five major container ports (Tables 4.1 to 4.5).

Box 4.1 Changes to PICI

Prior to *Waterline 67*, PICI was calculated for three vessel size classes (5,000–20,000 gross tonnes, 35,000–40,000 gross tonnes and 50,000–55,000 gross tonnes). However, the shift in fleet profile towards larger vessels means these groups are no longer appropriate, with most vessels' tonnage exceeding the largest class.

The new size classes are all of even width (15,000 gross tonnes), beginning with 5,000–20,000 gross tonnes:

- **5,000–20,000 gross tonnes**
- 20,000–35,000 gross tonnes
- **35,000–50,000 gross tonnes**
- 50,000–65,000 gross tonnes
- **65,000–80,000 gross tonnes**
- 80,000–95,000 gross tonnes
- 95,000–110,000 gross tonnes

The three size classes in bold are enumerated in Tables 4.1 to 4.5. The national PICI is computed over all size classes.

Calculations for several components, particularly those under 'Other charges', have been updated to reflect costs per average TEU, rather than per twenty-foot container.

What PICI measures

PICI is a measure of shore-based shipping costs or charges for containers moved through mainland capital city ports. These are “shore-based” in that they are the subset of charges paid by importers and exporters of containers which are directly related to the activity which occurs in the port and on the wharf. PICI does not include the charges applicable to the ocean freight service itself, nor does it cover all ancillary charges paid by shippers to customs brokers, freight forwarders and other service providers.

The index is a measure of the movements in costs to users of waterfront and related services, and signals whether the cost is increasing or decreasing. The waterfront is defined as the interface between seaports and land transport, hence the term port interface cost index. Port interface costs are estimated for standard representative ships.

PICI is based on twenty-one indicators which fall in four main groups:

1. Parameters used in computing the index;
2. Ship-based charges;
3. Cargo-based charges; and
4. Other charges, namely: stevedoring costs; customs brokers' fees; road transport costs.

Parameters used in computing the index

These parameters enable the PICI charges to be estimated on a per TEU basis for these typical ships.

Indicator 4.1 Ship size

Port interface costs vary by ship size. To calculate PICI, ships are divided into size ranges (based on ‘gross tonnage’, or GT) which are represented by a ‘typical’ vessel within that size range. The vessel’s other parameters, such as length and draft, are used as necessary.

All size groups are used to calculate the national Port Interface Cost Index (Indicator 4.25). A breakdown of charges is provided in Tables 4.1 to 4.5 for 5 000–20 000 GT, 35 000– 50 000 GT and 65 000–80 000 GT.

Indicator 4.2 Average TEUs exchanged

The total TEUs exchanged by ships in the size range, averaged over the number of visits made by those ships. Equivalent to the sum of Indicator 4.3 and Indicator 4.6.

Indicator 4.3 Average full (loaded) TEUs exchanged

The total loaded TEUs exchanged by ships in the size range, averaged over the number of visits made by those ships. Equivalent to the sum of Indicator 4.4 and Indicator 4.5.

Indicator 4.4 Average full import TEUs

The sum of full (loaded) import containers moved into a port by ships in the size range, averaged over the number of visits made by those ships during the specified period.

Indicator 4.5 Average full export TEUs

The sum of full (loaded) export containers moved out of a port by ships in the size range, averaged over the number of visits made by those ships during the specified period.

Indicator 4.6 Empty TEUs

The sum of empty import and export containers exchanged by ships in the size range, averaged over the number of visits made by those ships.

Indicator 4.7 Number of port calls

The average number of port calls made by ships in the size range, to a given port, during the period.

Indicator 4.8 Average elapsed berth time

The total elapsed berth time for ships in the size range, divided by the number of ship visits (by ships in the size range) during the period. A ship's elapsed berth time is the time between a ship's arrival at berth, and its departure.

Ship-based charges (per ship visit)**Indicator 4.9 Total ship-based charges by ship visit**

The total ship-based charges paid by the size range's representative vessel, given the parameters in Indicators 4.1 to 4.8.

Indicator 4.10 Total ship-based charges for handling empty containers

The total charges paid on empty containers, given the parameters in Indicators 4.1 to 4.8.

This is the sum of wharfage, harbour dues, berth charges and channel fees levied per empty TEU, multiplied by the average number of empty TEUs exchanged (Indicator 4.6).

Ship-based charges (per TEU)**Indicator 4.11 Conservancy**

Conservancy charges are navigation service charges levied by the government of the state in which the port is situated.

Indicator 4.12 Tonnage

Tonnage charges are port service charges levied by the port authority, based on the Gross Tonnage of the ship.

Indicator 4.13 Pilotage

Pilotage charges cover services for piloting the ship. A pilot is a mariner who guides ships through dangerous or congested waters, such as harbors or river mouths. Pilots are expert ship handlers who possess detailed knowledge of local waterways.

Indicator 4.14 Towage

Towage charges are levied by the operator of a tugboat—a boat that manoeuvres vessels by pushing or towing them. Charges are typically levied per tug, with higher charges for larger vessels.

Depending on ship's equipment, larger vessels may also require additional tugs. For PICI, the standard towage requirements published in port information handbooks are used.

Indicator 4.15 Mooring, unmooring charges

Mooring charges relate to the services of linesmen and related line and launch hire. (Un)mooring is the making fast (loosening) of a ship to (from) moorings or anchorage by means of lines, cables and/or anchors. Depending on local arrangements for lines services, mooring charges may be levied by the port authority, stevedore or another service provider.

Indicator 4.16 Total ship-based charges per TEU

The sum of the charges in Indicators 4.11 to 4.15 or, equivalently, the total ship-based charges (Indicator 4.9) divided by the total TEUs exchanged (Indicator 4.2).

Cargo-based charges (per TEU)

Each of these fees and charges are discussed only once in the text below. They are however, listed separately for imports and exports in Tables 4.1 to 4.5.

Some charge schedules levy a different fee for a forty-foot container than for a twenty-foot container. Where this occurs, PICI uses the fee charged per twenty-foot container.

Indicator 4.17 Wharfage

Wharfage is a charge assessed against cargo or merchandise, vessel's stores, fuel and supplies for passage on, over, under or through any wharf, pier, or bank controlled by a port authority. Wharfage is also charged for cargo passing between ships or overside ships (to or from barge, lighter or water) when berthed at a wharf, pier or bank controlled by the port authority.

Indicator 4.18 Harbour dues

These are monies that a ship owner must pay to a port authority for keeping a ship in a harbour. The amount charged is usually based on the volume of cargo the ship is carrying.

Other charges (per TEU)

Indicator 4.19 Stevedoring charge (wharfside)

Charges levied by stevedoring companies for container handling at the wharf. The charge is estimated on an annual, per-lift basis from the ACCC *Container Stevedoring Monitoring Report* series. A price per TEU is then calculated using the proportion of 40-foot containers transferred at the port (Indicator 1.4).

Indicator 4.20 Stevedoring charge (landside)

Typical landside and ancillary service charges levied by stevedoring companies for container handling, excluding terminal access charges. The charge is calculated from stevedoring landside revenue per lift reported in the ACCC *Container Stevedoring Monitoring Report*, less a

BITRE estimate of total terminal access charges. A price per TEU is then calculated using the proportion of 40-foot containers transferred at the port (Indicator 1.4).

Indicator 4.21 Terminal access charges

Terminal access charges (formerly infrastructure charges) are levied by terminal operators on all full containers.

Indicator 4.22 Customs broker fees

These are the fees charged by customs brokers for the administrative costs associated with organising the import and export of containers for a representative consignment.

Indicator 4.23 Total fees and charges

This is the sum of ship-based charges per TEU, the cargo-based charges per TEU, and the other cargo-based charges per TEU. These costs enable the calculation of the national PICI measured in current and constant prices in dollars per TEU. These are computed separately for imports and exports in Tables 4.1 to 4.5.

Indicator 4.24 Port's share in national index

These shares are used in computing the national PICI and they are computed for exports and imports separately.

Indicator 4.25 National Port Interface Cost Index

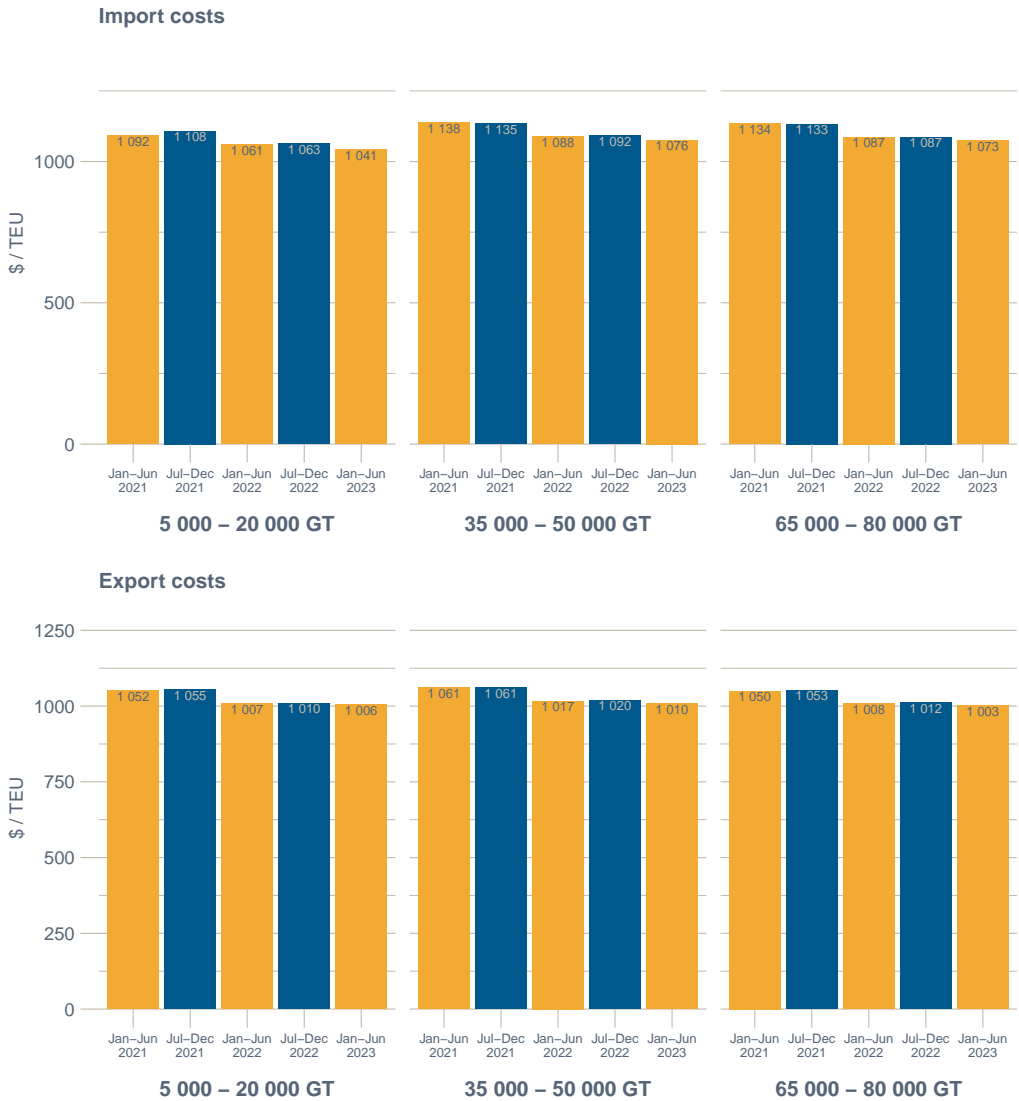
The national port interface cost indexes are the main outputs of the PICI calculations. These indexes are computed separately for imports and exports and for each of the ship size ranges monitored in *Waterline*.

The national PICI for ships in a GT range is the national average cost per TEU. From BTCE (1993), this is a weighted average of individual port estimates.



Fremantle Inner Harbour. Photo courtesy of Fremantle Ports.

Figure 4.1 Port interface costs, constant prices (January–June 2023), by ship size



Sources: BITRE estimates based on data in Tables 4.1 to 4.5 and ABS (2023).

Table 4.1 Port interface costs by ship type—parameters and estimates: Brisbane

	5 000 to 20 000 GT ships					35 000 to 50 000 GT ships					65 000 to 80 000 GT ships				
	2021		2022		2023	2021		2022		2023	2021		2022		2023
	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun
Port call parameters^a															
Total TEUs exchanged	426	601	636	575	561	1 235	1 509	1 429	1 520	1 284	2 090	2 491	2 403	2 331	2 246
Loaded	302	434	477	479	469	979	1 205	1 100	1 153	974	1 434	1 702	1 630	1 742	1 570
Loaded inwards	181	245	280	267	229	649	789	753	753	637	1 029	1 121	1 154	1 108	1 010
Loaded outwards	121	189	196	212	240	330	416	347	399	337	405	581	476	635	560
Empty ^b	124	167	159	96	92	255	304	329	367	309	656	789	773	589	676
Number of port calls	8	5	3	5	5	4	4	3	4	3	4	3	3	3	4
Elapsed berth time (hours)	21	30	33	35	27	25	31	32	32	28	35	39	44	40	34
Charges per ship visit (\$)															
Total ship-based charges	38 715	39 177	39 527	40 290	41 236	61 375	62 150	62 653	63 916	65 216	71 104	72 023	72 560	74 047	75 424
Empty	2 167	3 152	3 257	1 932	1 636	5 360	6 264	7 071	8 278	6 665	13 662	16 787	16 398	12 808	14 726
Ship-based charges (\$/TEU)															
Conservancy	9	7	6	7	7	8	7	7	7	8	8	7	7	7	8
Tonnage	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pilotage	30	21	20	23	24	17	14	15	14	17	10	9	9	10	10
Towage	46	33	32	36	38	23	19	20	19	24	14	12	13	14	15
Mooring, unmooring ^c	6	4	4	4	5	2	2	2	2	2	1	1	1	1	1
Total ship-based charges (\$/TEU)	91	65	62	70	73	50	41	44	42	51	34	29	30	32	34
Fees and charges for imports															
Total ship-based charges (\$/TEU)	91	65	62	70	73	50	41	44	42	51	34	29	30	32	34
Cargo-based charges															
Wharfage	39	40	40	42	42	39	40	40	42	42	39	40	40	42	42
Harbour dues	69	72	72	75	75	69	72	72	75	75	69	72	72	75	75
Other charges															
Stevedoring—wharfside	151	154	153	154	155	151	154	153	154	155	151	154	153	154	155
Stevedoring—landside	34	44	43	50	51	34	44	43	50	51	34	44	43	50	51
Terminal access charges ^d	72	78	83	88	94	72	78	83	88	94	72	78	83	88	94
Road transport charges ^e	434	436	438	444	449	434	436	438	444	449	434	436	438	444	449
Customs broker fees	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122
Total fees and charges (\$ / import TEU)	1 012	1 010	1 014	1 045	1 061	971	986	996	1 017	1 038	955	974	982	1 007	1 021
Port's share in national index^f (%)	12	12	14	18	19	20	24	19	21	20	19	19	16	20	20

(cont.)

Table 4.1 Port interface costs by ship type—parameters and estimates: Brisbane (*continued*)

	5 000 to 20 000 GT ships					35 000 to 50 000 GT ships					65 000 to 80 000 GT ships				
	2021		2022		2023	2021		2022		2023	2021		2022		2023
	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun
Fees and charges for exports															
Total ship-based charges (\$/TEU)	91	65	62	70	73	50	41	44	42	51	34	29	30	32	34
Cargo-based charges															
Wharfage	39	40	40	42	42	39	40	40	42	42	39	40	40	42	42
Harbour dues	69	72	72	75	75	69	72	72	75	75	69	72	72	75	75
Other charges															
Stevedoring—wharfside	151	154	153	154	155	151	154	153	154	155	151	154	153	154	155
Stevedoring—landside	34	44	43	50	51	34	44	43	50	51	34	44	43	50	51
Terminal access charges ^d	59	65	72	76	82	59	65	72	76	82	59	65	72	76	82
Road transport charges ^e	433	435	437	443	448	433	435	437	443	448	433	435	437	443	448
Customs broker fees	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113
Total fees and charges (\$ / export TEU)	989	986	992	1 023	1 039	948	962	974	995	1 016	932	950	960	985	999
Port's share in national index^f (%)	9	12	14	19	25	20	25	19	25	21	16	20	14	22	21

Note: Estimates of charges are rounded to the nearest whole dollar. A value of zero indicates that the charge per TEU is less than fifty cents.

a The average TEUs exchanged and the ship call parameters are mean values for ships in the size category for the given period.

b Sum of wharfage, harbour, berth and channel fees levied per empty TEU, multiplied by the average number of empty TEUs exchanged.

c BITRE estimates.

d Charges as levied by container terminal operators. These were reported separately for the first time in *Waterline 63*.

e BITRE estimates based on a survey of road transport operators. Survey responses from July–December 2017 onwards are not directly comparable to earlier results.

f Estimated as the TEUs imported through the port by ships in the size class, as a fraction of TEUs imported through the five ports by ships in the size class.

g Estimated as the TEUs exported through the port by ships in the size class, as a fraction of TEUs exported through the five ports by ships in the size class.

Sources: BITRE estimates based on ship call data from Port of Brisbane Pty Ltd (2023) and other sources (see text).

Table 4.2 Port interface costs by ship type—parameters and estimates: Sydney

	5 000 to 20 000 GT ships					35 000 to 50 000 GT ships					65 000 to 80 000 GT ships				
	2021		2022		2023	2021		2022		2023	2021		2022		2023
	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun
Port call parameters^a															
Total TEUs exchanged	650	997	868	831	542	2 164	2 485	2 415	2 419	1 951	3 459	3 560	3 510	3 185	3 120
Loaded	565	764	669	617	388	1 605	1 727	1 648	1 544	1 330	2 380	2 526	2 498	2 325	2 222
Loaded inwards	227	374	345	327	168	1 160	1 257	1 271	1 202	974	1 848	1 902	1 912	1 711	1 605
Loaded outwards	338	390	324	289	220	446	469	377	342	357	531	624	585	614	617
Empty ^b	85	233	199	214	153	558	758	767	875	621	1 080	1 034	1 013	860	898
Number of port calls	10	7	8	8	6	3	3	3	3	3	4	4	3	3	3
Elapsed berth time (hours)	31	43	40	38	39	46	52	51	42	36	52	53	55	49	41
Charges per ship visit (\$)															
Total ship-based charges	32 831	33 553	33 792	34 611	35 160	66 717	68 213	68 643	70 358	71 349	87 770	89 803	90 262	92 605	93 663
Empty	1 287	7 682	6 645	7 322	5 130	8 461	25 941	26 266	30 580	21 627	16 366	35 443	34 702	30 055	31 321
Ship-based charges (\$/TEU)															
Conservancy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tonnage	16	11	12	13	20	12	11	11	12	15	13	13	13	15	15
Pilotage	9	6	7	8	12	5	5	5	5	6	3	3	4	4	4
Towage	20	14	16	17	27	11	10	10	10	13	7	7	8	8	9
Mooring, unmooring ^c	5	3	3	4	6	2	2	2	2	3	2	2	2	2	2
Total ship-based charges (\$/TEU)	51	34	39	42	65	31	27	28	29	37	25	25	26	29	30
Fees and charges for imports															
Total ship-based charges (\$/TEU)	51	34	39	42	65	31	27	28	29	37	25	25	26	29	30
Cargo-based charges															
Wharfage	146	147	147	152	152	146	147	147	152	152	146	147	147	152	152
Harbour dues	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other charges															
Stevedoring—wharfside	150	152	152	153	154	150	152	152	153	154	150	152	152	153	154
Stevedoring—landside	34	43	42	49	50	34	43	42	49	50	34	43	42	49	50
Terminal access charges ^d	72	78	83	88	94	72	78	83	88	94	72	78	83	88	94
Road transport charges ^e	480	481	484	491	495	480	481	484	491	495	480	481	484	491	495
Customs broker fees	136	136	135	135	136	136	136	135	135	136	136	136	135	135	136
Total fees and charges (\$ / import TEU)	1 068	1 071	1 082	1 111	1 146	1 048	1 065	1 072	1 099	1 117	1 043	1 063	1 069	1 099	1 111
Port's share in national index^f (%)	16	25	24	24	16	34	33	36	38	33	38	38	40	38	39

(cont.)

Table 4.2 Port interface costs by ship type—parameters and estimates: Sydney (*continued*)

	5 000 to 20 000 GT ships					35 000 to 50 000 GT ships					65 000 to 80 000 GT ships				
	2021		2022		2023	2021		2022		2023	2021		2022		2023
	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun
Fees and charges for exports															
Total ship-based charges (\$/TEU)	51	34	39	42	65	31	27	28	29	37	25	25	26	29	30
Cargo-based charges															
Wharfage	99	100	100	104	104	99	100	100	104	104	99	100	100	104	104
Harbour dues	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other charges															
Stevedoring—wharfside	150	152	152	153	154	150	152	152	153	154	150	152	152	153	154
Stevedoring—landside	34	43	42	49	50	34	43	42	49	50	34	43	42	49	50
Terminal access charges ^d	59	64	70	75	81	59	64	70	75	81	59	64	70	75	81
Road transport charges ^e	478	480	482	490	494	478	480	482	490	494	478	480	482	490	494
Customs broker fees	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106
Total fees and charges (\$ / export TEU)	977	979	992	1 019	1 054	957	973	981	1 006	1 025	952	971	978	1 006	1 019
Port's share in national index^f (%)	27	33	32	29	27	27	26	24	24	25	23	26	26	26	28

Note: Estimates of charges are rounded to the nearest whole dollar. A value of zero indicates that the charge per TEU is less than fifty cents.

a The average TEUs exchanged and the ship call parameters are mean values for ships in the size category for the given period.

b Sum of wharfage, harbour, berth and channel fees levied per empty TEU, multiplied by the average number of empty TEUs exchanged.

c BITRE estimates.

d Charges as levied by container terminal operators. These were reported separately for the first time in *Waterline 63*.

e BITRE estimates based on a survey of road transport operators. Survey responses from July–December 2017 onwards are not directly comparable to earlier results.

f Estimated as the TEUs imported through the port by ships in the size class, as a fraction of TEUs imported through the five ports by ships in the size class.

g Estimated as the TEUs exported through the port by ships in the size class, as a fraction of TEUs exported through the five ports by ships in the size class.

Sources: BITRE estimates based on ship call data from NSW Ports (2023) and other sources (see text).

Table 4.3 Port interface costs by ship type—parameters and estimates: Melbourne

	5 000 to 20 000 GT ships					35 000 to 50 000 GT ships					65 000 to 80 000 GT ships				
	2021		2022		2023	2021		2022		2023	2021		2022		2023
	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun
Port call parameters^a															
Total TEUs exchanged	903	1 104	983	918	497	2 589	2 754	2 694	2 422	2 100	3 970	3 998	3 918	4 028	3 636
Loaded	772	891	718	673	341	1 909	2 046	1 979	1 777	1 552	2 971	3 019	2 887	2 926	2 659
Loaded inwards	319	464	426	390	207	1 240	1 348	1 257	1 181	1 002	1 914	1 997	1 901	1 930	1 694
Loaded outwards	454	427	292	283	134	669	699	722	596	550	1 057	1 023	986	996	965
Empty ^b	130	213	264	245	157	680	707	715	645	549	999	979	1 031	1 102	977
Number of port calls	4	5	4	3	4	3	3	3	3	3	4	3	3	3	3
Elapsed berth time (hours)	27	34	30	29	24	35	43	42	36	29	44	51	48	46	38
Charges per ship visit (\$)															
Total ship-based charges	42 188	45 262	45 594	47 127	47 892	64 895	67 629	68 021	70 578	71 482	89 450	92 070	92 467	96 269	97 182
Empty	2 584	4 278	5 309	5 179	3 305	13 507	14 213	14 370	13 616	11 584	19 848	19 666	20 707	23 272	20 625
Ship-based charges (\$/TEU)															
Conservancy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tonnage	11	9	10	11	21	10	9	10	11	13	12	12	12	13	14
Pilotage	12	12	14	16	29	6	6	6	7	8	4	5	5	5	5
Towage	21	17	19	21	41	9	8	8	9	11	6	6	6	6	7
Mooring, unmooring ^c	3	3	3	3	6	1	1	1	1	1	1	1	1	1	1
Total ship-based charges (\$/TEU)	47	41	46	51	96	25	25	25	29	34	23	23	24	24	27
Fees and charges for imports															
Total ship-based charges (\$/TEU)	47	41	46	51	96	25	25	25	29	34	23	23	24	24	27
Cargo-based charges															
Wharfage	135	137	137	144	144	135	137	137	144	144	135	137	137	144	144
Harbour dues	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other charges															
Stevedoring—wharfside	151	153	153	154	154	151	153	153	154	154	151	153	153	154	154
Stevedoring—landside	34	43	43	50	50	34	43	43	50	50	34	43	43	50	50
Terminal access charges ^d	81	86	89	95	100	81	86	89	95	100	81	86	89	95	100
Road transport charges ^e	466	467	469	476	480	466	467	469	476	480	466	467	469	476	480
Customs broker fees	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126
Total fees and charges (\$ / import TEU)	1 040	1 053	1 064	1 097	1 150	1 019	1 037	1 042	1 075	1 088	1 016	1 035	1 041	1 070	1 081
Port's share in national index^f (%)	12	20	20	18	14	36	35	34	33	33	34	34	35	34	33

(cont.)

Table 4.3 Port interface costs by ship type—parameters and estimates: Melbourne (*continued*)

	5 000 to 20 000 GT ships					35 000 to 50 000 GT ships					65 000 to 80 000 GT ships				
	2021		2022		2023	2021		2022		2023	2021		2022		2023
	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun
Fees and charges for exports															
Total ship-based charges (\$/TEU)	47	41	46	51	96	25	25	25	29	34	23	23	24	24	27
Cargo-based charges															
Wharfage	105	106	106	112	112	105	106	106	112	112	105	106	106	112	112
Harbour dues	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other charges															
Stevedoring—wharfside	151	153	153	154	154	151	153	153	154	154	151	153	153	154	154
Stevedoring—landside	34	43	43	50	50	34	43	43	50	50	34	43	43	50	50
Terminal access charges ^d	62	66	71	76	83	62	66	71	76	83	62	66	71	76	83
Road transport charges ^e	464	465	467	474	478	464	465	467	474	478	464	465	467	474	478
Customs broker fees	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110
Total fees and charges (\$ / export TEU)	973	985	997	1 028	1 083	951	969	975	1 006	1 021	949	967	974	1 000	1 013
Port's share in national index^f (%)	20	24	19	17	11	39	37	44	37	37	40	36	38	34	36

Note: Estimates of charges are rounded to the nearest whole dollar. A value of zero indicates that the charge per TEU is less than fifty cents.

a The average TEUs exchanged and the ship call parameters are mean values for ships in the size category for the given period.

b Sum of wharfage, harbour, berth and channel fees levied per empty TEU, multiplied by the average number of empty TEUs exchanged.

c BITRE estimates.

d Charges as levied by container terminal operators. These were reported separately for the first time in *Waterline 63*.

e BITRE estimates based on a survey of road transport operators. Survey responses from July–December 2017 onwards are not directly comparable to earlier results.

f Estimated as the TEUs imported through the port by ships in the size class, as a fraction of TEUs imported through the five ports by ships in the size class.

g Estimated as the TEUs exported through the port by ships in the size class, as a fraction of TEUs exported through the five ports by ships in the size class.

Sources: BITRE estimates based on ship call data from Port of Melbourne Operations Pty Ltd (2023) and other sources (see text).

Table 4.4 Port interface costs by ship type—parameters and estimates: Adelaide

	5 000 to 20 000 GT ships					35 000 to 50 000 GT ships					65 000 to 80 000 GT ships				
	2021		2022		2023	2021		2022		2023	2021		2022		2023
	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun
Port call parameters^a															
Total TEUs exchanged	-	-	-	306	598	914	1 135	1 042	1 050	869	1 478	1 498	1 417	1 343	1 285
Loaded	-	-	-	306	493	740	923	817	856	679	1 217	1 197	1 273	1 050	1 074
Loaded inwards	-	-	-	264	267	380	496	456	448	382	463	522	565	430	528
Loaded outwards	-	-	-	42	226	360	427	361	408	297	754	675	708	621	546
Empty ^b	-	-	-	0	105	174	211	225	194	190	261	301	144	293	212
Number of port calls	-	-	-	1	1	3	3	3	4	3	4	4	3	4	3
Elapsed berth time (hours)	-	-	-	16	22	24	28	26	28	23	30	30	31	30	28
Charges per ship visit (\$)															
Total ship-based charges	28 873	29 302	29 577	37 563	38 932	58 634	59 632	59 572	62 511	63 373	68 958	70 183	70 994	73 345	75 656
Empty	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0
Ship-based charges (\$/TEU)															
Conservancy	-	-	-	14	7	7	5	5	6	8	6	6	6	7	8
Tonnage	-	-	-	24	13	13	12	12	14	14	13	13	14	16	16
Pilotage	-	-	-	29	15	9	7	8	9	10	5	6	6	7	7
Towage	-	-	-	56	30	35	28	31	32	40	22	22	24	26	28
Mooring, unmooring ^c	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total ship-based charges (\$/TEU)	-	-	-	123	65	64	53	57	60	73	47	47	50	55	59
Fees and charges for imports															
Total ship-based charges (\$/TEU)	-	-	-	123	65	64	53	57	60	73	47	47	50	55	59
Cargo-based charges															
Wharfage	94	97	97	105	105	94	97	97	105	105	94	97	97	105	105
Harbour dues	30	31	31	32	32	30	31	31	32	32	30	31	31	32	32
Other charges															
Stevedoring—wharfside	-	-	-	161	162	157	159	158	161	162	157	159	158	161	162
Stevedoring—landside	-	-	-	55	56	37	47	46	55	56	37	47	46	55	56
Terminal access charges ^d	-	-	-	77	90	20	51	50	77	90	20	51	50	77	90
Road transport charges ^e	-	-	-	393	398	379	383	383	393	398	379	383	383	393	398
Customs broker fees	-	-	-	129	130	129	129	129	130	130	129	129	129	129	130
Total fees and charges (\$ / import TEU)	-	-	-	1 075	1 038	911	950	951	1 012	1 046	894	944	944	1 007	1 032
Port's share in national index^f (%)	-	-	-	0	1	5	5	6	5	4	2	3	3	2	2

(cont.)

Table 4.4 Port interface costs by ship type—parameters and estimates: Adelaide (*continued*)

	5 000 to 20 000 GT ships					35 000 to 50 000 GT ships					65 000 to 80 000 GT ships				
	2021		2022		2023	2021		2022		2023	2021		2022		2023
	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun
Fees and charges for exports															
Total ship-based charges (\$/TEU)	-	-	-	123	65	64	53	57	60	73	47	47	50	55	59
Cargo-based charges															
Wharfage	94	97	97	105	105	94	97	97	105	105	94	97	97	105	105
Harbour dues	30	31	31	32	32	30	31	31	32	32	30	31	31	32	32
Other charges															
Stevedoring—wharfside	-	-	-	161	162	157	159	158	161	162	157	159	158	161	162
Stevedoring—landside	-	-	-	55	56	37	47	46	55	56	37	47	46	55	56
Terminal access charges ^d	-	-	-	54	64	20	51	50	54	64	20	51	50	54	64
Road transport charges ^e	-	-	-	391	395	379	383	383	391	395	379	383	383	391	395
Customs broker fees	-	-	-	88	89	88	88	88	88	89	88	88	88	88	89
Total fees and charges (\$ / export TEU)	-	-	-	1 009	968	870	909	910	946	976	852	903	903	941	962
Port's share in national index^f (%)	-	-	-	0	1	9	8	10	10	7	8	7	7	6	5

Note: Estimates of charges are rounded to the nearest whole dollar. A value of zero indicates that the charge per TEU is less than fifty cents.

a The average TEUs exchanged and the ship call parameters are mean values for ships in the size category for the given period.

b Sum of wharfage, harbour, berth and channel fees levied per empty TEU, multiplied by the average number of empty TEUs exchanged.

c BITRE estimates.

d Charges as levied by container terminal operators. These were reported separately for the first time in *Waterline 63*.

e BITRE estimates based on a survey of road transport operators. Survey responses from July–December 2017 onwards are not directly comparable to earlier results.

f Estimated as the TEUs imported through the port by ships in the size class, as a fraction of TEUs imported through the five ports by ships in the size class.

g Estimated as the TEUs exported through the port by ships in the size class, as a fraction of TEUs exported through the five ports by ships in the size class.

Sources: BITRE estimates based on ship call data from Flinders Ports (2023) and other sources (see text).

Table 4.5 Port interface costs by ship type—parameters and estimates: Fremantle

	5 000 to 20 000 GT ships					35 000 to 50 000 GT ships					65 000 to 80 000 GT ships				
	2021		2022		2023	2021		2022		2023	2021		2022		2023
	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun
Port call parameters^a															
Total TEUs exchanged	2 707	2 660	2 759	2 426	2 067	1 097	1 275	1 270	1 032	1 779	2 385	2 750	2 569	2 341	2 218
Loaded	2 135	2 137	2 139	1 953	1 630	875	1 101	936	806	1 538	1 837	2 211	2 046	1 720	1 636
Loaded inwards	1 314	1 361	1 324	1 175	1 033	597	731	685	553	1 020	952	1 253	985	903	921
Loaded outwards	821	776	814	778	597	278	370	251	252	518	884	958	1 061	818	715
Empty ^b	573	523	620	473	437	223	173	334	226	241	548	539	523	621	582
Number of port calls	10	9	10	10	6	5	7	6	7	4	6	4	4	5	6
Elapsed berth time (hours)	43	65	55	47	46	27	43	37	31	36	44	61	55	49	43
Charges per ship visit (\$)															
Total ship-based charges	24 963	25 110	25 478	26 070	26 472	44 015	44 285	44 911	45 972	46 615	68 446	68 834	69 872	71 477	72 650
Empty	7 342	6 768	8 090	6 340	5 857	2 857	2 243	4 353	3 031	3 230	7 029	6 971	6 830	8 325	7 804
Ship-based charges (\$/TEU)															
Conservancy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tonnage	2	2	2	2	2	10	8	9	11	6	7	7	7	8	8
Pilotage	2	2	2	3	3	10	8	9	11	6	4	4	4	5	5
Towage	5	5	5	6	7	19	17	17	21	13	16	14	15	17	19
Mooring, unmooring ^c	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1
Total ship-based charges (\$/TEU)	9	9	9	11	13	40	35	35	45	26	29	25	27	31	33
Fees and charges for imports															
Total ship-based charges (\$/TEU)	9	9	9	11	13	40	35	35	45	26	29	25	27	31	33
Cargo-based charges															
Wharfage	85	86	86	89	89	85	86	86	89	89	85	86	86	89	89
Harbour dues	40	40	41	42	42	40	40	41	42	42	40	40	41	42	42
Other charges															
Stevedoring—wharfside	153	156	156	157	158	153	156	156	157	158	153	156	156	157	158
Stevedoring—landside	35	45	45	52	53	35	45	45	52	53	35	45	45	52	53
Terminal access charges ^d	31	31	33	33	35	31	31	33	33	35	31	31	33	33	35
Road transport charges ^e	418	419	421	427	430	418	419	421	427	430	418	419	421	427	430
Customs broker fees	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150
Total fees and charges (\$ / import TEU)	921	938	942	960	969	952	963	968	994	983	941	954	960	980	989
Port's share in national index^f (%)	60	43	42	40	50	5	3	5	4	10	6	7	6	7	7

(cont.)

Table 4.5 Port interface costs by ship type—parameters and estimates: Fremantle (*continued*)

	5 000 to 20 000 GT ships					35 000 to 50 000 GT ships					65 000 to 80 000 GT ships				
	2021		2022		2023	2021		2022		2023	2021		2022		2023
	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun
Fees and charges for exports															
Total ship-based charges (\$/TEU)	9	9	9	11	13	40	35	35	45	26	29	25	27	31	33
Cargo-based charges															
Wharfage	85	86	86	89	89	85	86	86	89	89	85	86	86	89	89
Harbour dues	40	40	41	42	42	40	40	41	42	42	40	40	41	42	42
Other charges															
Stevedoring—wharfside	153	156	156	157	158	153	156	156	157	158	153	156	156	157	158
Stevedoring—landside	35	45	45	52	53	35	45	45	52	53	35	45	45	52	53
Terminal access charges ^d	22	23	24	24	25	22	23	24	24	25	22	23	24	24	25
Road transport charges ^e	417	419	420	426	429	417	419	420	426	429	417	419	420	426	429
Customs broker fees	117	117	117	117	117	117	117	117	117	117	117	117	117	117	117
Total fees and charges (\$ / export TEU)	878	895	899	917	925	909	920	925	950	939	898	911	917	936	945
Port's share in national index^f (%)	43	31	36	35	36	5	4	4	4	10	12	11	14	12	10

Note: Estimates of charges are rounded to the nearest whole dollar. A value of zero indicates that the charge per TEU is less than fifty cents.

a The average TEUs exchanged and the ship call parameters are mean values for ships in the size category for the given period.

b Sum of wharfage, harbour, berth and channel fees levied per empty TEU, multiplied by the average number of empty TEUs exchanged.

c BITRE estimates.

d Charges as levied by container terminal operators. These were reported separately for the first time in *Waterline 63*.

e BITRE estimates based on a survey of road transport operators. Survey responses from July–December 2017 onwards are not directly comparable to earlier results.

f Estimated as the TEUs imported through the port by ships in the size class, as a fraction of TEUs imported through the five ports by ships in the size class.

g Estimated as the TEUs exported through the port by ships in the size class, as a fraction of TEUs exported through the five ports by ships in the size class.

Sources: BITRE estimates based on ship call data from Fremantle Ports (2023) and other sources (see text).

Table 4.6 National port interface costs, by size of ship (current prices)

Port interface costs (\$/TEU)		2021		2022		2023
		Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun
Import	5,000–20,000 GT	970	1 004	1 010	1 037	1 041
	20,000–35,000 GT	1 022	1 030	1 037	1 068	1 092
	35,000–50,000 GT	1 011	1 028	1 035	1 066	1 076
	50,000–65,000 GT	1 011	1 033	1 037	1 067	1 071
	65,000–80,000 GT	1 007	1 026	1 034	1 061	1 073
	80,000–95,000 GT	1 001	1 021	1 025	1 056	1 072
	95,000–110,000 GT	1 003	1 031	1 029	1 062	1 081
Export	5,000–20,000 GT	934	955	959	986	1 006
	20,000–35,000 GT	958	969	976	1 007	1 026
	35,000–50,000 GT	943	961	968	995	1 010
	50,000–65,000 GT	946	965	972	1 001	1 001
	65,000–80,000 GT	933	954	960	987	1 003
	80,000–95,000 GT	935	954	961	991	997
	95,000–110,000 GT	932	955	952	986	997

Sources: BITRE estimates based on data in Tables 4.1 to 4.5.

Table 4.7 National port interface costs, by size of ship (constant prices)

Port interface costs (\$/TEU)		2021		2022		2023
		Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun
ABS non-farm GDP deflator		88.8	90.6	95.2	97.6	100.0
Import	5,000–20,000 GT	1 092	1 108	1 061	1 063	1 041
	20,000–35,000 GT	1 150	1 137	1 089	1 095	1 092
	35,000–50,000 GT	1 138	1 135	1 088	1 092	1 076
	50,000–65,000 GT	1 138	1 140	1 089	1 094	1 071
	65,000–80,000 GT	1 134	1 133	1 087	1 087	1 073
	80,000–95,000 GT	1 127	1 127	1 077	1 082	1 072
	95,000–110,000 GT	1 129	1 138	1 081	1 088	1 081
Export	5,000–20,000 GT	1 052	1 055	1 007	1 010	1 006
	20,000–35,000 GT	1 078	1 069	1 026	1 032	1 026
	35,000–50,000 GT	1 061	1 061	1 017	1 020	1 010
	50,000–65,000 GT	1 065	1 065	1 021	1 026	1 001
	65,000–80,000 GT	1 050	1 053	1 008	1 012	1 003
	80,000–95,000 GT	1 053	1 054	1 010	1 015	997
	95,000–110,000 GT	1 049	1 054	1 000	1 010	997

Notes: Values in constant prices are derived using the ABS non-farm GDP deflator, with January–June 2023 as the base period.

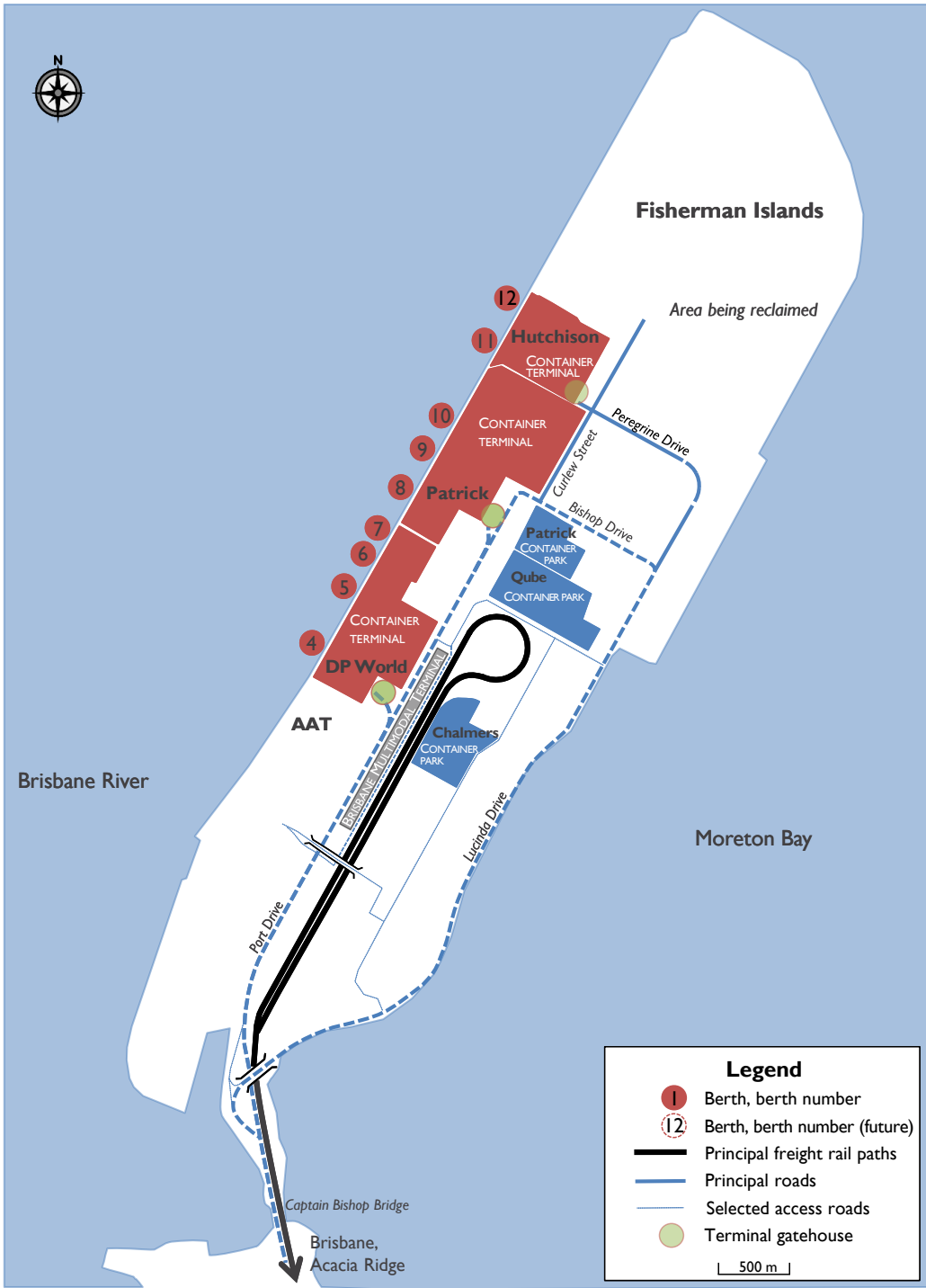
Sources: BITRE estimates based on data in Tables 4.1 to 4.5 and ABS (2023).

APPENDIX A

Maps of five major Australian container ports

This appendix presents maps of container terminals and supplementary information about facilities and port services available at the five major Australian container ports as at June 2023.

Figure A.1 Brisbane (Fisherman Islands terminals)



(Last updated: September 2016)

Brisbane (Fisherman Islands terminals)

The Port of Brisbane is managed and developed by the Port of Brisbane Pty Ltd, under a 99-year lease from the Queensland Government.

Dockside

Stevedores. The map shows the DP World, Patrick and Hutchison Ports Australia terminals. Some containers are also handled by Australian Amalgamated Terminals (AAT), who provide a multi-purpose, multi-user facility that is based at Berths 1–3, to the west of the DP World container yard.

Berths. DP World operates from container berths 4–7. The Patrick container berths are 8–10. Hutchison operates berths 11 and 12.

Equipment. DP World has 5 post-Panamax quay cranes, of which 4 are twin-lift and 1 single-lift. DP World’s semi-automated terminal has 16 automated stacking cranes. Patrick has 4 post-Panamax cranes, with a fifth post-Panamax crane being commissioned; in addition, Patrick has 35 automated straddle carriers (AutoStrads). Hutchison’s Brisbane Container Terminals includes 4 post-Panamax cranes and 6 automated stacking cranes.

Road

Road access to the area is via the bridge to Fisherman Islands, over the Captain Bishop Bridge. Access to the DP World and Patrick terminals is via Port Drive or Lucinda Drive / Bishop Drive / Curlew Street; access to the Hutchison terminal is via Curlew Street.

Rail

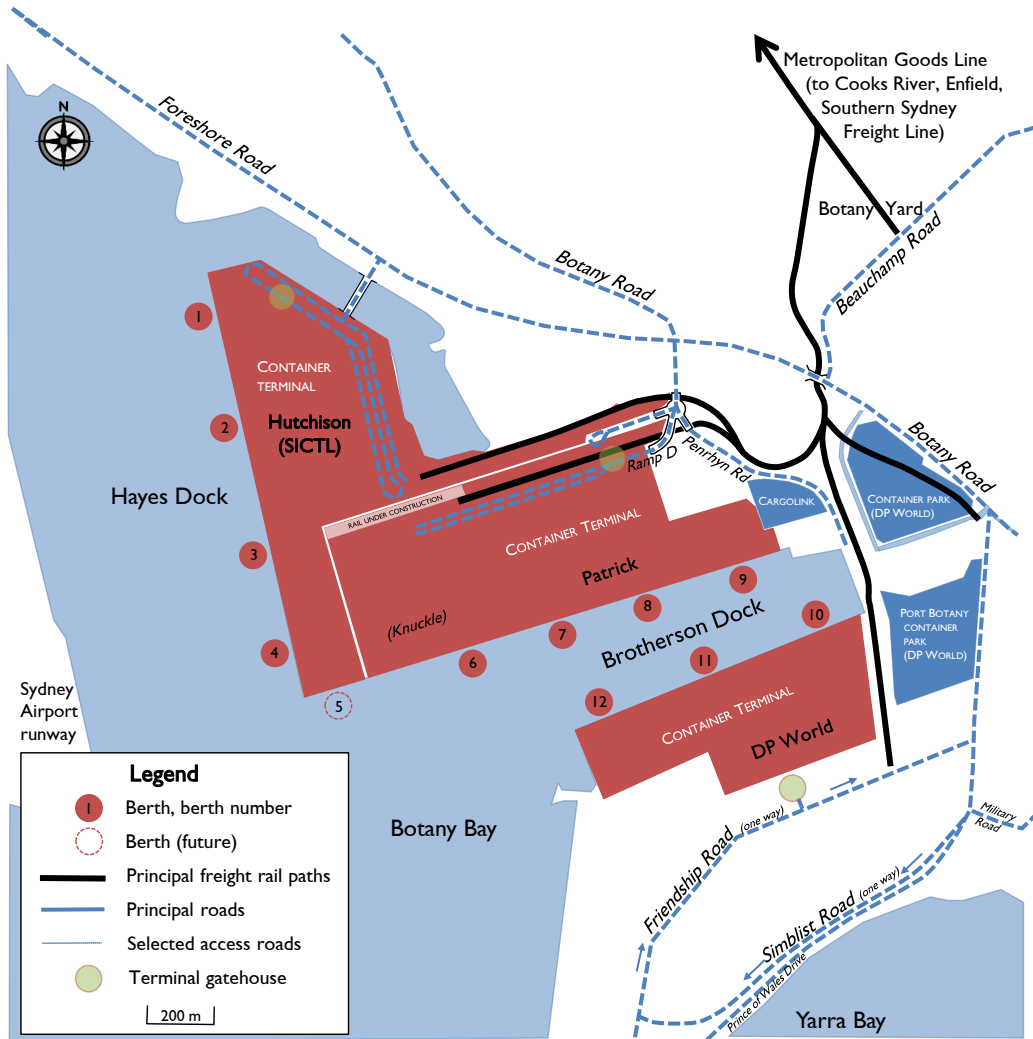
Facilities. Brisbane Multimodal Terminal provides “near-dock” intermodal rail facilities at Fisherman Islands. Train lengths of up to 850 metres are permitted. Containers are moved on public roads between the container terminals and the intermodal rail terminal.

Services. Scheduled rail services to the Brisbane Multimodal Terminal include long haul:

- bulk coal from West Moreton and grain from western Queensland, both via narrow gauge;
- reefer containers containing meat from Rockhampton, by narrow-gauge trains;
- some containers are taken from Fisherman Islands—the presumption is that they are mainly empty containers; and
- there are no scheduled standard-gauge container trains.

National rail connections. Dual narrow- and (national) standard-gauge tracks are installed between Fisherman Islands and the inter-/intra-state intermodal terminal at Acacia Ridge.

Figure A.2 Sydney (Port Botany terminals)



(Last updated: November 2021)

Sydney (Port Botany terminals)

Port Botany is managed by the NSW Ports Consortium, which has a 99-year lease of the State-owned assets at the port.

Dockside

Stevedores. The three container terminals at Port Botany are served by the stevedores Patrick, DP World and Hutchison (Sydney International Container Terminals Limited, SICTL).

Berths. Patrick operates four berths, numbers 6–9. DP World’s three berths are numbered 10–12. Hutchison has four operational berths (1–4).

Equipment. DP World equipment includes 6 twin-lift quay cranes and 1 single-lift quay crane.

Patrick operates 9 twin-lift quay cranes. The Patrick container yard is automated, with 59 automated straddle carriers (AutoStrads). Automatic operations commenced on 2 April 2015.

The Hutchison terminal operates 4 post-Panamax quay cranes and 12 automated stacking cranes (ASCs). 10 (manned) shuttle carriers move containers between the quay line and the ASCs.

Road

Access to the DP World terminal is via Friendship Road (one-way). The Patrick terminal is accessed from Penrhyn Road. Hutchison’s terminal is accessed via a bridge from Fore-shore Road.

Rail

Facilities. Each stevedore has on-dock rail facilities. DP World has 3 sidings of 340 metre length.

Patrick are investing jointly with NSW Ports to significantly upgrade on-dock rail capacity. Two new 300 metre sidings have been completed, along with commissioning of three (3) Automated Rail-Mounted Gantries (ARMGs). Upon completion, the rail terminal will have four 600 metre sidings.

Hutchison’s terminal has 2 rail sidings of 680 metres; these are parallel to the Patrick sidings.

Services. Scheduled short haul and long haul rail container services between Botany and the hinterland include:

- Short-haul services from Yennora, Cooks River, Minto and Enfield.
- processed meat, grain and other agricultural products from Dubbo (Fletcher Export International / Southern Shorthaul Railroad);
- wheat, barley, oilseeds and pulses from Narrabri (Crawfords Freightlines / Southern Shorthaul Railroad);
- specialised grain transport from Forbes, Narrabri, Dubbo, Coonamble and Narromine (Qube Logistics);

- cotton and agricultural produce from Nevertire, Warren, Warren South, Trangie South, Narrabri and Wee Waa (Qube Logistics; Sydney Rail Services);
- paper products and grain from Harefield (Qube Logistics);
- aluminium and agricultural produce from Walsh Point, Carrington and Sandgate [Newcastle] (Qube Logistics and Crawford's Freightlines / Sydney Rail Services);
- grain, meat and other agricultural produce from Werris Creek (Crawford's Freightlines / Sydney Rail Services).

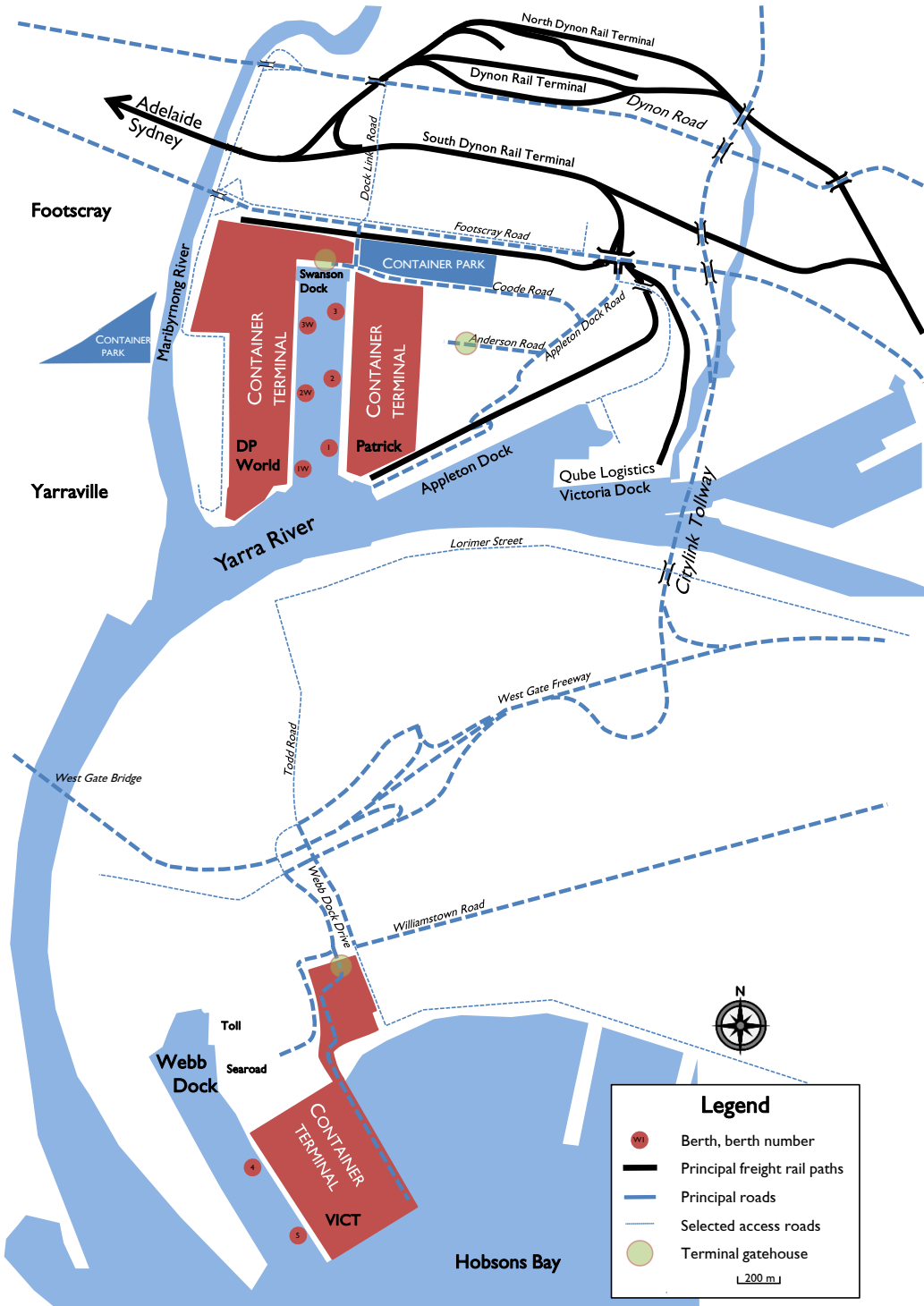
Rail access. Railway sidings at Botany Yard are used to regulate train entry to the port; to split trains, where necessary, for onwards movements to the port, and to re-form trains from port-terminal wagon rakes for movements to Cooks River, Enfield and beyond.

National and regional rail connections. The port is linked to the intrastate and interstate rail network, including the Southern Sydney Freight Line, and via the Metropolitan Freight Network (including the Port Botany Goods Line).



Tugs manoeuvre *MSC Tomoko* on arrival at Fremantle Inner Harbour. Photo courtesy of Fremantle Ports.

Figure A.3 Melbourne (Swanson and Webb Dock terminals)



(Last updated: November 2021)

Melbourne (Swanson and Webb Dock terminals)

The Port of Melbourne is operated by Port of Melbourne Operations Pty Ltd on behalf of the Lonsdale Consortium, which holds a 50-year lease of the State-owned assets at the port.

Dockside

Stevedores. DP World’s container terminal is at Swanson Dock West. Patrick has a container terminal across the dock at Swanson Dock East. Victoria International Container Terminal (VICT) operates on Webb Dock East.

Logistics. Qube Logistics has a container and general cargo terminal at Victoria Dock, with one berth.

Equipment. The Patrick terminal has 7 post-Panamax cranes, with the latest two ZPMC cranes replacing older Panamax hardware in early 2020. The DP World terminal has 7 quay cranes, including 6 post-Panamax, twin-lift cranes and one single-lift crane.

VICT has 5 remotely-operated, neo-Panamax quay cranes. Patrick has 40 straddle carriers, DP World has 48 straddle carriers and VICT has 11 automated container carriers and 20 automated stacking cranes (ASCs).

Berths. There are 3 container berths at Patrick’s Swanson Dock East—berths 1–3. There are 3 berths at DP World’s Swanson Dock West—berths 1W–3W. There are two berths at Webb Dock East operated by VICT. There is one general cargo berth at Victoria Dock (berth 24) which handles containers.

Road

Access to the DP World terminal is via Coode Road. Access to the Patrick terminal is via Appleton Dock Road; an access road leads to the Qube terminal from Appleton Dock Road. Access to VICT is from Webb Dock Road.

Rail

Facilities. Import and export containers are rail-served to near the dockside. Containers are also railed through the Dynon rail terminals (to the north of the docks) and conveyed by road between those terminals and the on-dock container stacks.

- West Swanson Intermodal Terminal serves DP World. This is a single dual-gauge (standard and broad) siding of 510 metres, running just to the south of Footscray Road; there is also a locomotive run-around track;
- ACFS Port Logistics operates the Appleton Rail Terminal, providing near-dock rail facilities to Swanson and Appleton Docks. The yard has two dual (standard and broad) gauge tracks of 640 metres in length and a locomotive run-around track;
- A new on-dock rail terminal is under development adjacent to the Patrick container terminal at East Swanson Dock. The rail terminal is planned to be operational in 2023. Once operational, the terminal will have two 600-metre rail sidings.
- Qube’s Victoria Dock sidings have two dual-gauge (standard and broad) sidings, with 630 metre lengths, plus a locomotive run-around track.

Services. Scheduled long-haul rail services shifting containers include:

- rice from Deniliquin to Victoria Dock sidings (Qube Logistics, broad gauge);
- paper products from Maryvale to Victoria Dock sidings (Qube Logistics, broad gauge);
- cotton from Barnawartha to Appleton Dock (SCT, standard gauge);
- grain, hay and pulses from Dooen to Appleton Dock (SCT / Wimmera Container Line, standard gauge);
- meat and milk products from Warrnambool to Appleton Dock (Westvic Container Export Services; Pacific National, broad gauge);
- grain, hay and rice from Tocumwal to Appleton Dock (Pacific National and Qube Logistics, broad gauge);
- wine and agricultural products, including fruit in reefer containers, from Merbein / Mildura to Appleton Dock (Pacific National, standard gauge);
- grain and peas from Donald to Appleton Dock (Pacific National, standard gauge);
- cotton, beverages, meat and agricultural products from Griffith, Wumbulgal, Leeton and Ettamogah to Appleton Dock (Pacific National, standard gauge);
- paper products and bottled water from Ettamogah to Appleton Dock (Pacific National, standard gauge);
- hay, grain and wine from Ultima to Victoria Dock (Qube, broad gauge).

Port rail containers also arrive by road shuttles from the Dynon railway terminals.

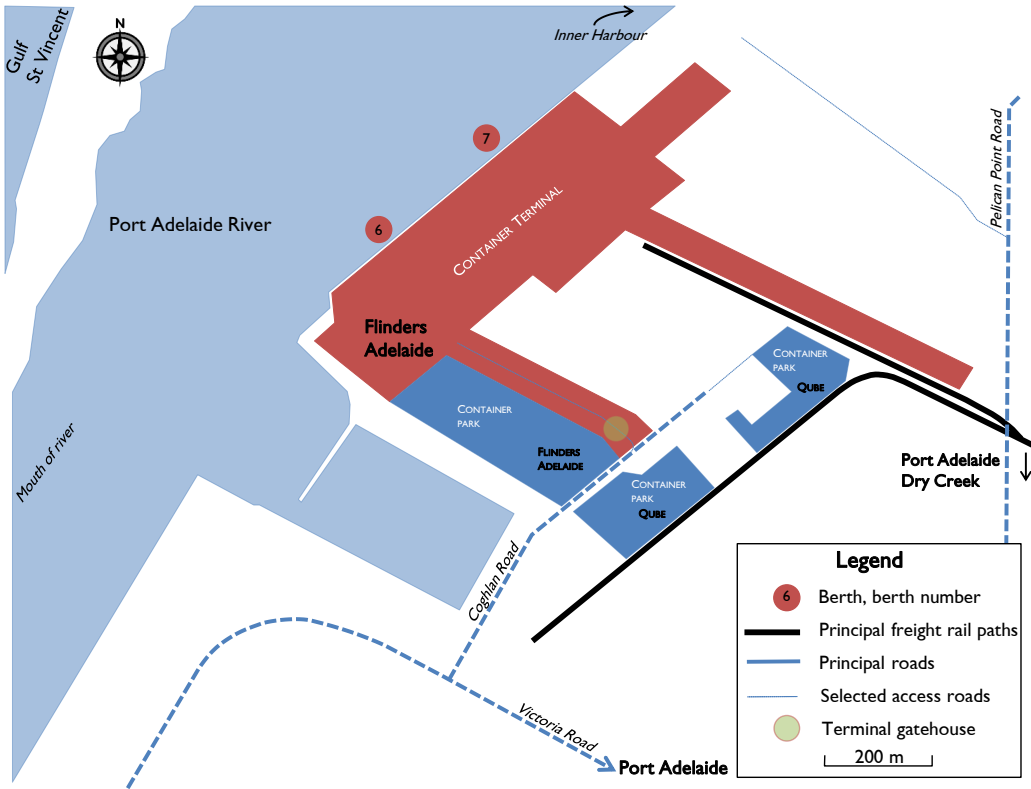
Rail linkages. The dock area consists of rail facilities near the docks and the nearby intermodal container terminals at South Dynon, Dynon and North Dynon. Although there is an eastern link from the Dynon terminals towards the east (Southern Cross and Flinders Street), the container movements are to and from the west via the Tottenham–Dynon line. Of the five container ports represented here, the Port of Melbourne is unique in the proximity of intermodal terminals near to the docks as well as the on- / near-dock facilities.

National rail connections. Principal freight rail paths are shown; most tracks (including dockside tracks) are dual gauge (namely, broad- and standard-gauge tracks). Access to the interstate network is via the dual-gauge track to the west, via Tottenham.



Container facilities at Fremantle Inner Harbour, September 2024. Photo courtesy of Fremantle Ports.

Figure A.4 Adelaide (Outer Harbor / Pelican Point)



(Last updated: October 2018)

Adelaide (Flinders Adelaide Container Terminal)

Flinders Ports manages the port facilities in Adelaide; these are at Outer Harbor and the Inner Harbour (up the Port Adelaide River). The Outer Harbor shipping channel was widened in late 2019, enabling post-Panamax ships to call at the port.

Container services are provided by Flinders Adelaide Container Terminal at Outer Harbor.

Dockside

Stevedores. Port Adelaide’s Outer Harbor Container Terminal is operated by Flinders Adelaide, using two berths.

Berths. The map shows the container terminal located in the outer harbour (at Outer Harbor) of Port Adelaide; the Inner Harbour at Port Adelaide is not shown. The Flinders Adelaide container facilities use berths 6 and 7.

Equipment. The terminal has three post-Panamax container-handling cranes. A fourth, Panamax-sized crane was decommissioned in December 2017.

Road

Flinders Adelaide Container Terminal is accessed via Coghlan Road.

Rail

Facilities. The Outer Harbor terminal has two sets of standard-gauge rail sidings. Two sidings, each of 640 metre length, serve the Flinders Adelaide Container Terminal. The other set of sidings serve the Qube Logistics terminal and container park.

In October 2018, Flinders Ports upgraded the rail facility to increase the staging area for rail containers.

Services. Scheduled railed movements to the dockside include:

Short-haul:

- Penfield (Direk) to Flinders Adelaide (SCT Logistics).

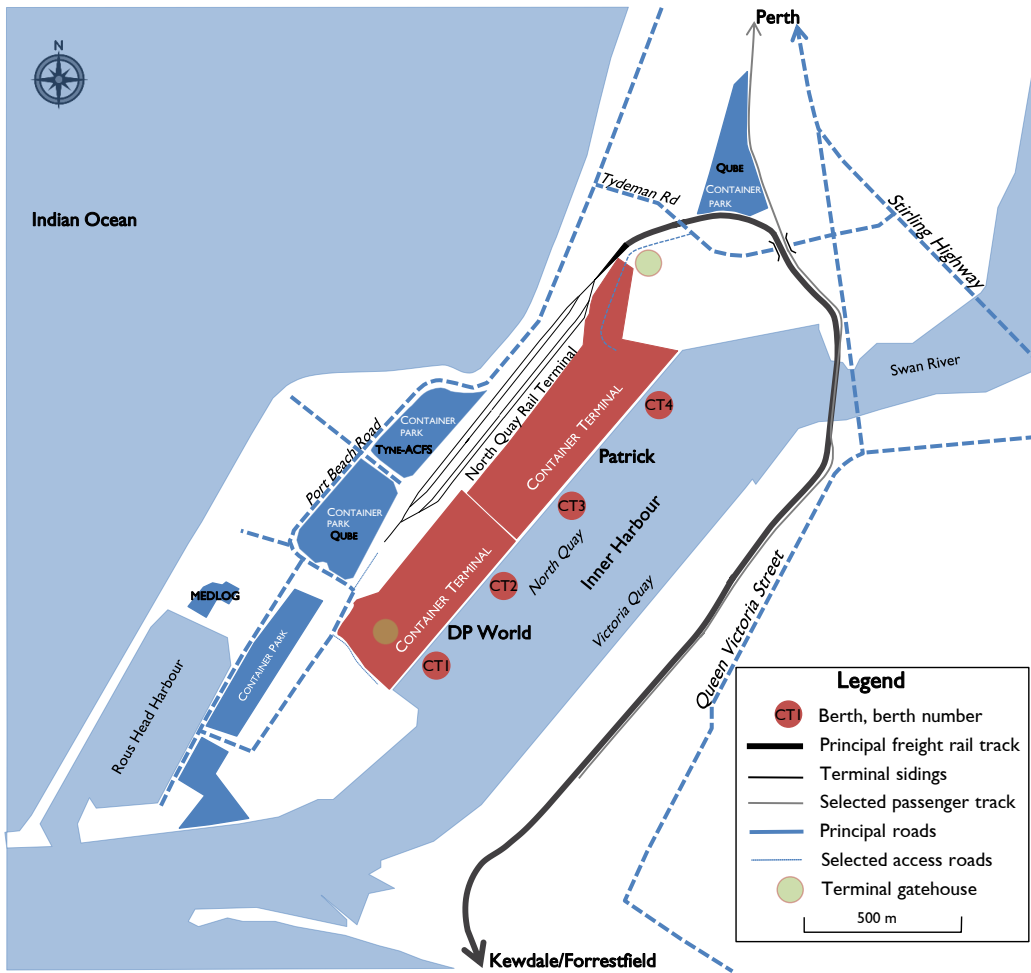
Long-haul:

- containerised lead from Port Pirie, agricultural products from Bowmans Intermodal Terminal, via Port Flat (Bowmans Rail);
- containerised wine from Penfield (SCT Logistics);
- bulk grain from various producers. Some of this is containerised for export by Viterra’s ‘inverter’ grain loader at Inner Harbour.

Rail linkages. The Outer Harbor facility is at the extremity of a freight-only railway between Outer Harbor, Port Adelaide and Dry Creek.

National rail connections. The Outer Harbor – Dry Creek line connects with the interstate network at Dry Creek. Nearby intermodal terminals include the One Rail Australia terminal at Dry Creek, the Pacific National terminal at Islington (including the Northline logistics facility) and the SCT Logistics terminal at Penfield.

Figure A.5 Fremantle (North Quay terminals in the Inner Harbour)



(Last updated: July 2023)

Fremantle (North Quay terminals)

Fremantle Ports, a Western Australian Government trading enterprise, manages the port.

Dockside

Stevedores. Container stevedoring is undertaken at North Quay in the Inner Harbour by Patrick and DP World. Patrick and DP World each operate from two berths.

Berths. DP World operates two berths, numbers CT01 and CT02. Patrick operates from berths CT03 and CT04.

Equipment. The Patrick terminal has 4 post-Panamax cranes, the latest of which was commissioned in early 2020. The DP World terminal has 4 cranes, including 3 post-Panamax. DP World received its third post-Panamax crane in September 2018.

Road

The principal roads on this peninsula are Tydeman Road (from the Stirling Highway) and Port Beach Road / Rudderham Drive. The DP World terminal is accessed via Rudderham Drive while the Patrick terminal is accessed via Tydeman Road.

Rail

Facilities. North Quay Rail Terminal, to the west of the Patrick terminal, serves both Patrick and DP World container terminals. The sidings at that location are around 690 metres in length, accommodating blocks of 600 metre-length trains. The rail terminal has dual-gauge tracks.

Services. Scheduled rail services to the port include the following (standard-gauge) trains:

- containers between Kewdale / Forrestfield and North Quay Rail Terminal (Intermodal Link Services, Pacific National);
- a container shuttle service between Kwinana and North Quay Rail Terminal (Aurizon);
- containers from Kalgoorlie, via the Kwinana service (Aurizon).
- Long-haul:
 - lead and nickel matte from Leonora and Kalgoorlie to Kwinana. (Aurizon)

Rail linkages. Trains access the Rail Terminal on a dual narrow- and standard-gauge, freight-only line from Midland. Freight and passenger trains share a track on the bridge over the Swan River.

National rail connections. The rail link to Midland, on the interstate network, includes spur tracks to interstate intermodal terminals at Kewdale and Forrestfield.

References

- Australian Bureau of Statistics (ABS) 2023. *Australian National Accounts: National Income, Expenditure and Product, Jun 2023*, 'Table 24. Selected Analytical Series', time series spreadsheet, cat. no. 5206.0.
- Australian Competition and Consumer Commission (ACCC) 2023. *Container stevedoring monitoring report 2022–23*, December 2023, Canberra.
- Bureau of Transport and Communications Economics (BTCE) 1993. *Port Interface Cost Index*, Report 84, BTCE, Australian Government Publishing Service, Canberra.
- Containerchain Pty Ltd 2020. (unpublished data).
- DP World 2023. (unpublished data).
- Flinders Adelaide Container Terminal 2023. (unpublished data).
- Flinders Ports 2023. (unpublished data).
- Fremantle Ports 2023. (unpublished data).
- Hutchison Ports Australia 2023. (unpublished data).
- Maritime Safety Queensland 2023. (unpublished data).
- NSW Ports 2023. (unpublished data).
- Patrick 2023. (unpublished data).
- Port Authority of New South Wales 2023. (unpublished data).
- Port of Brisbane Pty Ltd 2023. (unpublished data).
- Port of Melbourne Operations Pty Ltd 2023. (unpublished data).
- Ports Australia 2015. (unpublished data).
- SA Track and Signal 2014. Australian railway track and signal drawings and signal locations (online railway and port maps). <http://www.sa-trackandsignal.net>.
- Victoria International Container Terminal 2023. (unpublished data).

Connecting Australia



www.bitre.gov.au