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

BUREAU OF INFRASTRUCTURE AND TRANSPORT RESEARCH ECONOMICS
STATISTICAL REPORT

Maritime

Waterline 69

July 2023

Bureau of Infrastructure and Transport Research Economics

Waterline 69

July 2023

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.

ISBN 978-1-922879-00-4
ISSN 2208-9101
July 2023 / INFRA5839

Cover Photo: *CMA CGM Loire* and *APL Danube* berthed at Flinders Adelaide Container Terminal, May 2020. Photo courtesy of Flinders Ports.

An appropriate citation for this report is:

Bureau of Infrastructure and Transport Research Economics 2023, *Waterline 69*, Statistical Report, Canberra, ACT.

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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 2022.

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 phone Thomas Rutherford on (02) 6274 6818, Jack McAuley on (02) 6274 7309 or email maritime_stats@infrastructure.gov.au.

Shona Rosengren
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July 2023

At a glance

Throughput

- The *number of twenty-foot equivalent units (TEUs) handled by stevedores* in the Five ports remained steady at 4.25 million TEUs in January–June 2022; an increase of 0.6 per cent compared to January–June 2021, and 0.5 per cent compared to July–December 2021 (4.23 million TEUs).

  Compared to January–June 2021, slight decreases at Melbourne (1.8 per cent) and Brisbane (1.5 per cent) were offset by an increase at Sydney (2.7 per cent). Throughput at Adelaide and Fremantle increased by 2.5 per cent and 5.6 per cent respectively.

- The Five-port average *lifts per berth visit* increased to a record high of 1557 lifts in July–December 2021, 3.5 per cent above the prior peak in July–December 2020, before declining to 1500 lifts per berth visit in January–June 2022.

  The increase in the second half of 2021 was driven by Fremantle (14.0 per cent) and Brisbane (10.1 per cent), whereas Sydney and Melbourne declined by 1.1 per cent and 1.0 per cent respectively.

- The *number of unitised cellular container (UCC) vessels handled by stevedores* declined slightly (1.5 per cent) in July–December 2022 compared to the same period the previous year, correlating to the increase in throughput and lifts per berth visit.

  The number of vessel calls remained stable in the first half of 2022, with an average increase of 0.7 per cent across the Five ports. Increases occurred in Adelaide (7.3 per cent), Sydney (3.6 per cent) and Melbourne (1.7 per cent), with declines in Fremantle (7.3 per cent) and brisbane (1.9 per cent).

Performance

- Stevedoring velocity again remained low in January–June 2022 compared to historical trends, with the Five-port average *crane rate*, *labour rate* and *ship rate* (measured in containers per hour) down by 4.3 per cent, 12.9 per cent and 10.4 per cent, respectively, compared to January–June 2021.

  In July–December 2021, the Five-port average *crane rate* was steady compared to the same period in 2020; a decline in *labour rate* (-8.8 per cent) drove a similar decrease in *ship rate* (8.9 per cent).

- Average *truck turnaround time* across the Five ports increased by 10.0 per cent (3.2 minutes) in January–June 2022 compared to January–June 2021, only partly offset by *average containers per truck* also increasing (1.7 per cent).

As a result, *container turnaround time* worsened in all five ports relative to January–June 2021: by 2.1 minutes in Sydney, 1.4 minutes in Melbourne, 1.1 minutes in Fremantle, 1.0 minutes in Adelaide and 0.9 minutes in Brisbane.

- Average *lifts per berth hour* across the Five ports decreased by 13.0 per cent in January–June 2022 compared to the first half of 2021, with declines in all ports: Brisbane (17.3 per cent), Melbourne (14.2 per cent), Fremantle (12.9 per cent), Sydney (10.8 per cent) and Adelaide (2.2 per cent).

  Performance in *lifts per berth hour* terms was also lower on average in July–December 2021 compared to July–December 2020, declining 5.8 per cent to 34.3 lifts per berth hour over the Five ports.

- The *number of VBS timeslots actually used* across the Five ports increased by 1.0 per cent in January–June 2022 compared to January–June 2021, at 1.44 million slots.

  Across the same period, the *VTS/TAS timeslots used by trucks in all off-peak periods, as a proportion of total timeslots used* remained steady, declining by 0.1 percentage points to 49.6 per cent.

Port interface costs

- In constant prices, port interface costs for exports decreased for all vessel sizes in July–December 2021, and again in January–June 2022, compared to the immediate prior period:
  - For small ships (5 000 to 20 000 gross tonnes), port interface costs decreased by $1 per TEU in July–December 2021, and by $43 per TEU in January–June 2022.
  - For medium-size ships (35 000 to 50 000 gross tonnes), port interface costs decreased by $3 per TEU in July–December 2021, and by $40 per TEU in January–June 2022.
  - For large ships (65 000 to 80 000 gross tonnes), port interface costs decreased by $1 per TEU in July–December 2021, and by $41 per TEU in January–June 2022.

- In constant-price terms, port interface costs for imports declined in January–June 2022 compared to January–June 2021.
  - For small ships (5 000 to 20 000 gross tonnes), port interface costs increased by $11 per TEU in July–December 2021, then decreased by $43 per TEU in January–June 2022.
  - For medium-size ships (35 000 to 50 000 gross tonnes), port interface costs decreased by $7 per TEU in July–December 2021, and then by $42 per TEU in January–June 2022.
  - For large ships (65 000 to 80 000 gross tonnes), port interface costs decreased by $5 per TEU in July–December 2021, and decreased by $41 per TEU in January–June 2022.

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.

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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 four 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

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

1.14 Total cargo throughput

1.15 Non-containerised general cargo throughput

1.16 Total number of TEUs exchanged

1.17 Number of TEUs: Full import

1.18 Number of TEUs: Empty import

1.19 Number of TEUs: Full export

1.20 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 waterside 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.

Whole of port throughput

Indicator 1.14 Total cargo throughput

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

Indicator 1.15 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 1.16 Total number of TEUs exchanged

This is a count of TEUs, exchanged through the port. This count is further broken down into Indicators 1.17 to 1.20.

Indicator 1.17 Full import TEUs

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

Indicator 1.18 Empty import TEUs

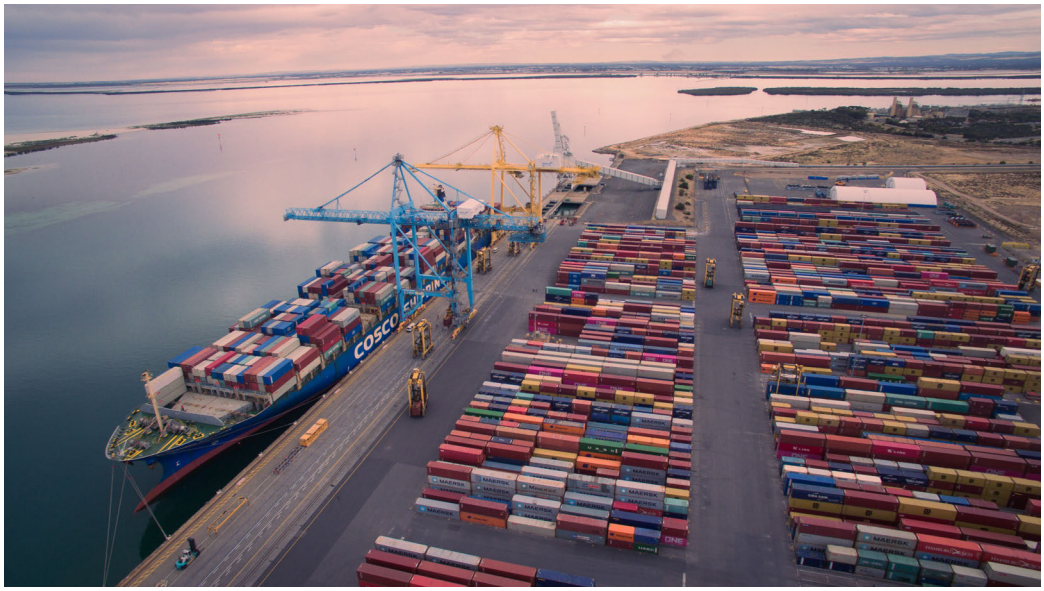
This is a count of empty containers in TEUs imported (unloaded) at the port.

Indicator 1.19 Full export TEUs

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

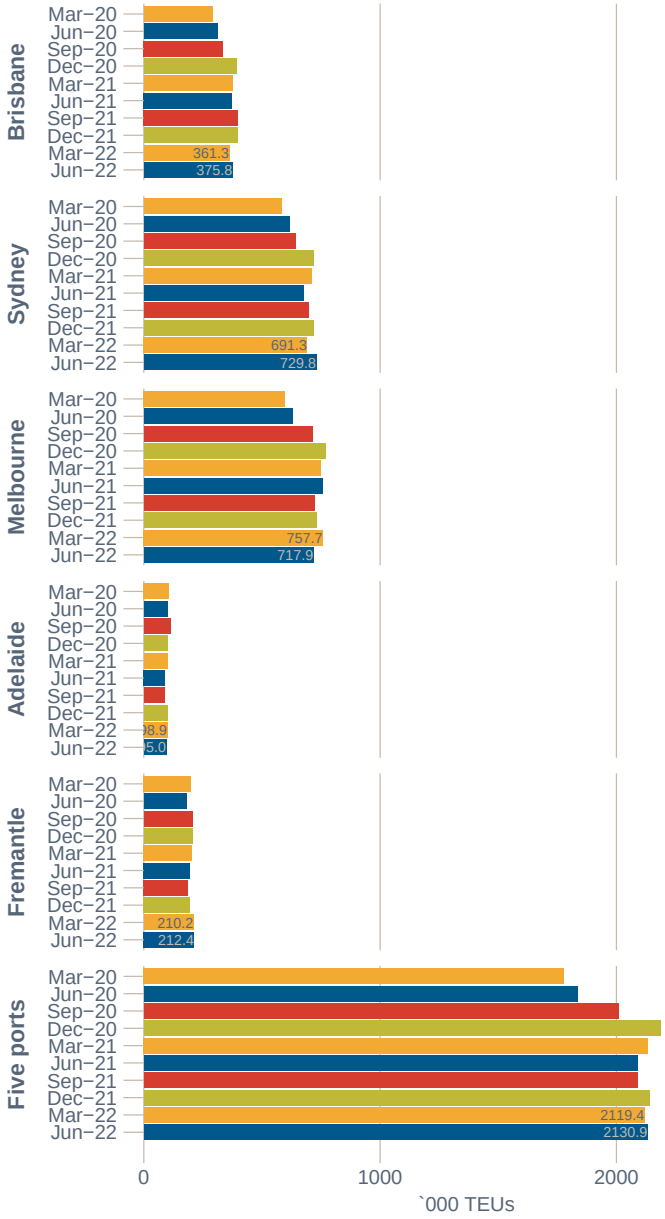
Indicator 1.20 Empty export TEUs

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



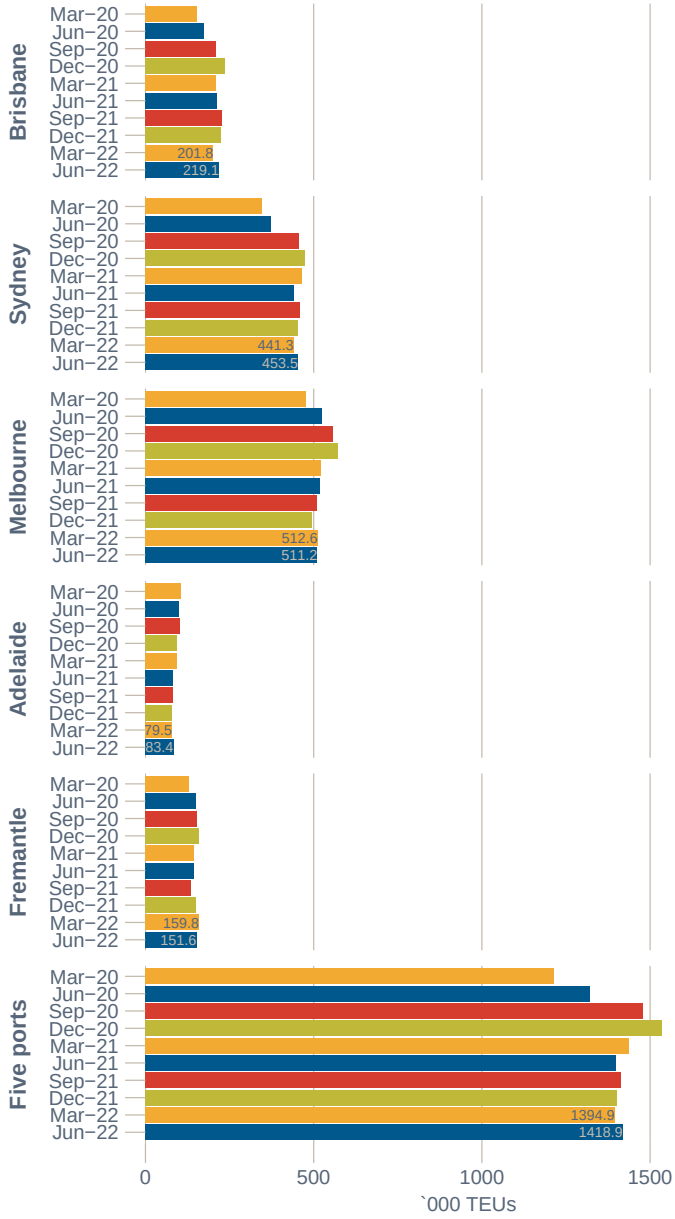
Quay cranes and straddle carriers at Flinders Adelaide Container Terminal work *COSCO Singapore*. Photo courtesy of Flinders Ports.

Figure 1.1 TEU throughput by container port: wharf-side



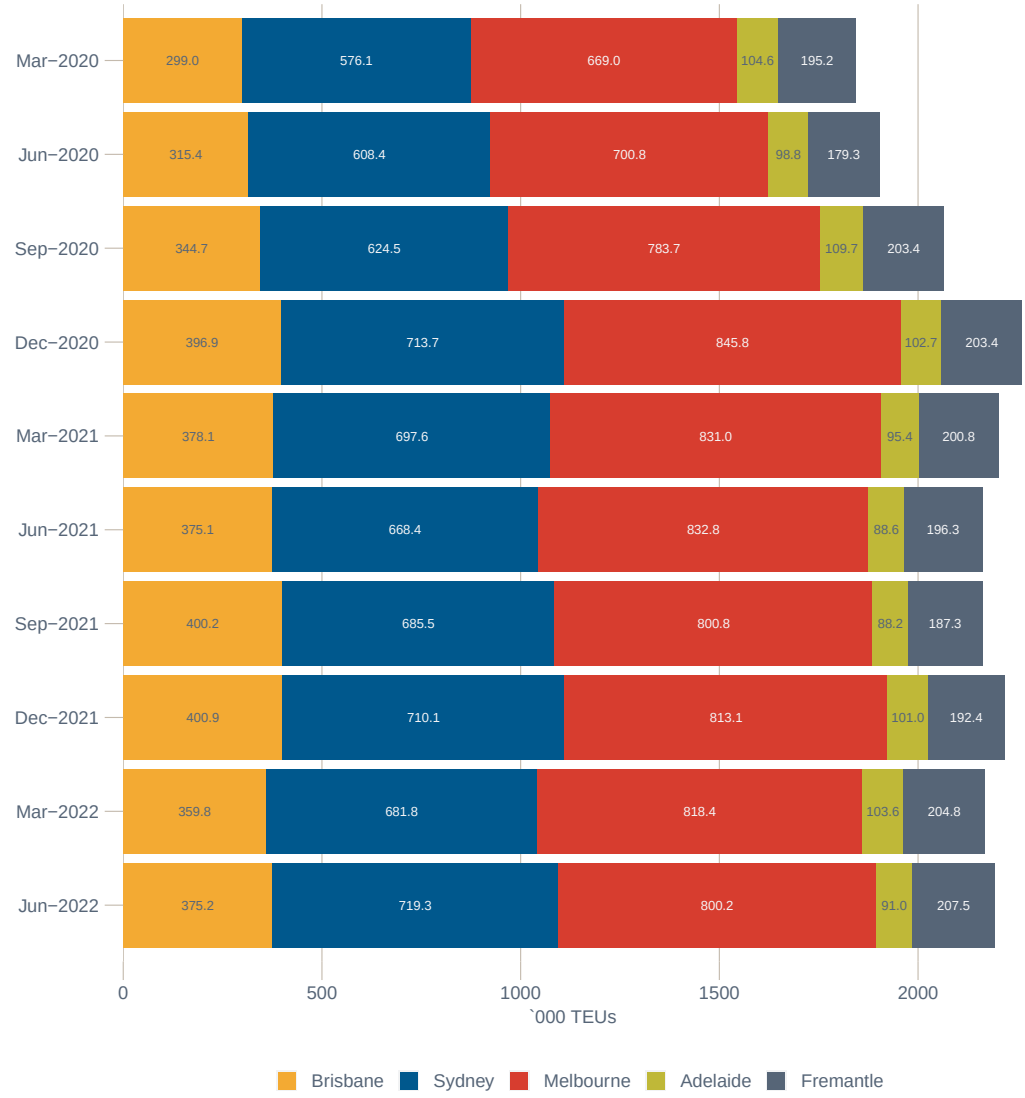
Sources: DP World (2022), Flinders Adelaide Container Terminal (2022), Hutchison Ports Australia (2022), Patrick (2022) and Victoria International Container Terminal (2022)

Figure 1.2 TEU throughput by container port: landside



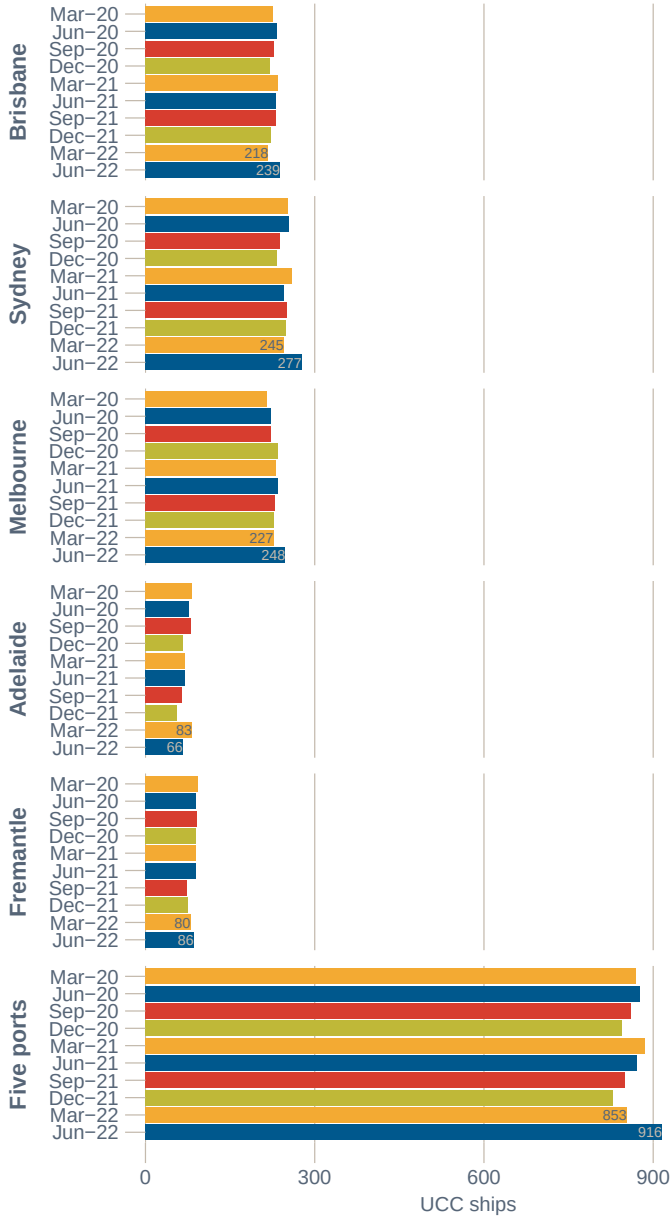
Sources: DP World (2022), Flinders Adelaide Container Terminal (2022), Hutchison Ports Australia (2022), Patrick (2022), Victoria International Container Terminal (2022), Flinders Ports (2022), Port of Brisbane Pty Ltd (2022), Port of Melbourne Operations Pty Ltd (2022) and Fremantle Ports (2022)

Figure 1.3 TEU throughput by container port: whole of port



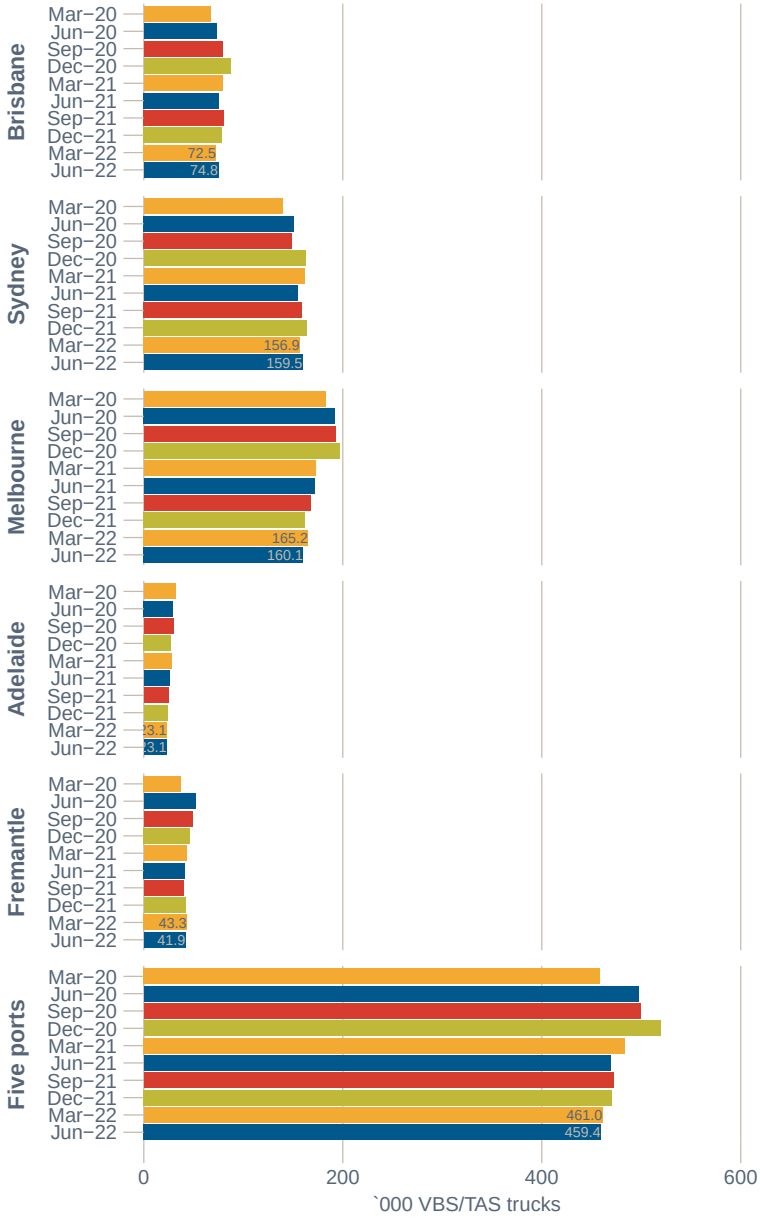
Sources: Port of Brisbane Pty Ltd (2022), NSW Ports (2022), Port of Melbourne Operations Pty Ltd (2022), Flinders Ports (2022) and Fremantle Ports (2022)

Figure 1.4 Container terminal traffic: number of UCC ships handled



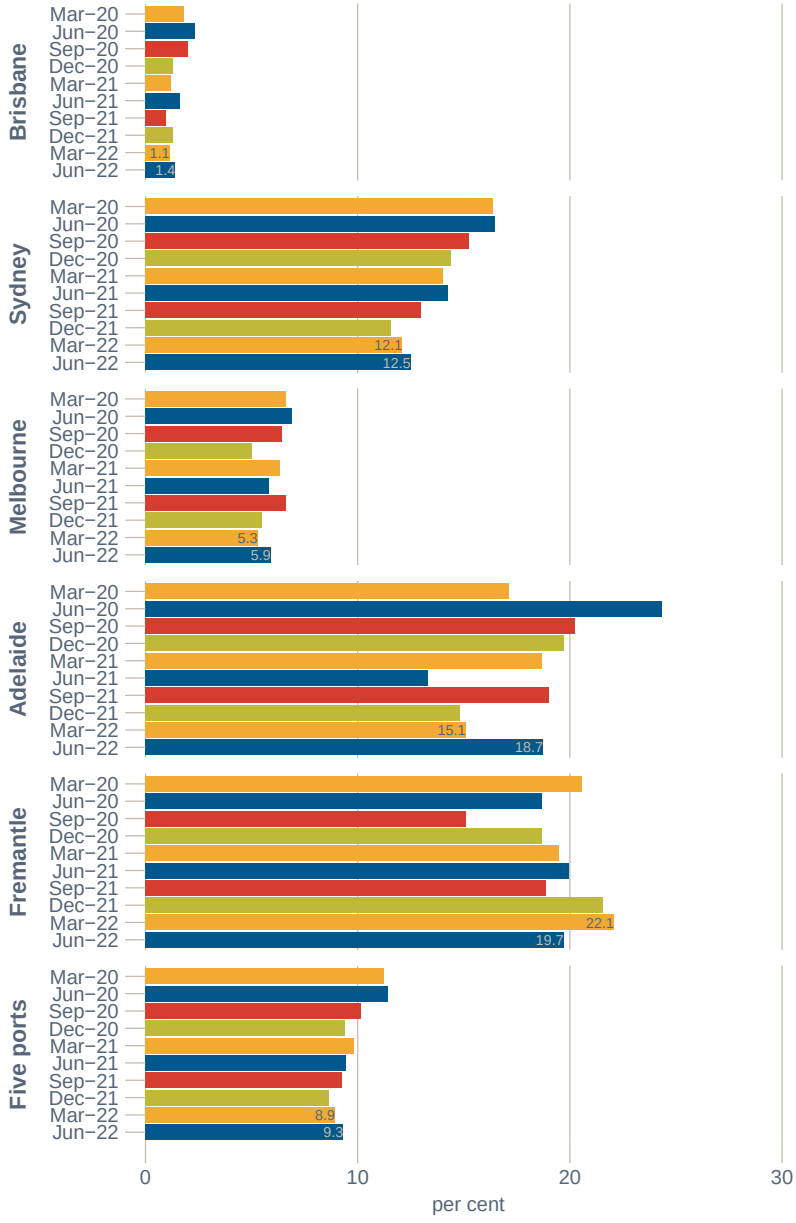
Sources: DP World (2022), Flinders Adelaide Container Terminal (2022), Hutchison Ports Australia (2022), Patrick (2022) and Victoria International Container Terminal (2022)

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



Sources: DP World (2022), Flinders Adelaide Container Terminal (2022), Hutchison Ports Australia (2022), Patrick (2022) and Victoria International Container Terminal (2022)

Figure 1.6 Rail share of TEUs handled



Sources: DP World (2022), Flinders Adelaide Container Terminal (2022), Hutchison Ports Australia (2022), Patrick (2022), Flinders Ports (2022), Port of Brisbane Pty Ltd (2022), Port of Melbourne Operations Pty Ltd (2022) and Fremantle Ports (2022)

Table 1.1 Container terminal throughput: Brisbane

	2020						2021						2022		
	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	226	233	**459**	227	221	**448**	234	232	**466**	232	222	**454**	218	239	**457**
Total containers handled *('000)*	189.1	201.2	**390.3**	212.4	246.0	**458.4**	234.5	234.8	**469.3**	251.3	249.2	**500.5**	226.0	235.3	**461.2**
Total TEUs handled *('000)*	291.9	311.9	**603.7**	334.5	391.5	**726.0**	375.3	373.3	**748.5**	398.3	396.8	**795.1**	361.3	375.8	**737.1**
40-foot containers as proportion of all containers handled *(%)*	54.4	55.0	**54.7**	57.5	59.1	**58.4**	60.0	58.9	**59.5**	58.5	59.2	**58.9**	59.9	59.7	**59.8**
Landside															
Number of trucks used in VBS/TAS operations *('000)*	67.0	73.0	**140.0**	78.9	86.9	**165.9**	79.0	75.6	**154.7**	80.7	78.4	**159.1**	72.5	74.8	**147.3**
Total containers transported by VBS/TAS trucks and rail *('000)*	117.2	128.0	**245.2**	136.1	153.2	**289.3**	140.7	139.3	**280.0**	149.3	145.0	**294.4**	133.3	142.9	**276.2**
Containers by VBS/TAS trucks *('000)*	112.4	121.5	**233.8**	130.2	148.7	**278.9**	136.7	134.0	**270.7**	145.8	140.4	**286.3**	129.4	138.2	**267.6**
Containers by rail *('000)*	4.8	6.5	**11.3**	6.0	4.5	**10.4**	4.1	5.3	**9.4**	3.5	4.6	**8.1**	3.8	4.8	**8.6**
Total TEUs transported by VBS/TAS trucks and rail *('000)*	153.3	173.1	**326.4**	210.4	236.3	**446.8**	211.0	211.1	**422.1**	227.1	225.0	**452.2**	201.8	219.1	**420.9**
TEUs by VBS/TAS trucks *('000)*	148.0	165.8	**313.7**	203.8	231.2	**435.0**	206.5	205.1	**411.6**	223.3	219.9	**443.2**	197.7	213.8	**411.5**
TEUs by rail *('000)*	5.3	7.3	**12.7**	6.7	5.1	**11.7**	4.5	6.0	**10.5**	3.9	5.1	**9.0**	4.1	5.3	**9.5**
Whole of container terminal															
Total number of container ship visits	237	232	**469**	235	224	**459**	240	237	**477**	233	222	**455**	208	223	**431**
Total number of containers (lifts) exchanged *('000)*	190.7	189.7	**380.3**	209.2	237.4	**446.6**	227.2	226.1	**453.3**	245.0	242.5	**487.5**	202.6	215.1	**417.7**
Whole of port															
Total cargo throughput *(million tonnes)*	8.1	6.4	**14.5**	7.1	7.3	**14.4**	7.5	7.4	**14.9**	8.8	7.9	**16.7**	7.5	8.0	**15.4**
Non-containerised general cargo throughput *(million tonnes)*	0.2	0.2	**0.4**	0.2	0.2	**0.4**	0.3	0.3	**0.6**	0.3	0.3	**0.6**	0.3	0.4	**0.7**
Total TEUs exchanged *('000)*	299.0	315.4	**614.4**	344.7	396.9	**741.6**	378.1	375.1	**753.2**	400.2	400.9	**801.1**	359.8	375.2	**735.1**
Full import *('000)*	131.3	145.7	**277.0**	162.1	189.0	**351.1**	177.5	166.5	**344.0**	178.1	185.3	**363.3**	170.1	169.1	**339.3**
Empty import *('000)*	15.1	20.3	**35.4**	16.6	15.4	**32.0**	13.2	19.7	**32.9**	24.6	20.7	**45.3**	17.1	22.0	**39.1**
Full export *('000)*	78.6	86.4	**165.0**	88.6	90.8	**179.3**	74.0	91.2	**165.2**	112.8	93.1	**205.9**	71.4	98.1	**169.5**
Empty export *('000)*	73.9	63.1	**137.0**	77.4	101.7	**179.1**	113.5	97.6	**211.1**	84.7	101.8	**186.6**	101.2	86.0	**187.2**

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

Sources: DP World (2022), Hutchison Ports Australia (2022), Patrick (2022) and Port of Brisbane Pty Ltd (2022)

Table 1.2 Container terminal throughput: Sydney

	2020						2021						2022		
	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	252	254	**506**	238	233	**471**	259	245	**504**	251	249	**500**	245	277	**522**
Total containers handled *('000)*	369.9	389.7	**759.6**	397.1	441.5	**838.5**	437.9	419.6	**857.4**	433.6	441.4	**875.0**	424.6	447.5	**872.1**
Total TEUs handled *('000)*	583.7	616.0	**1 199.7**	641.9	719.0	**1 360.9**	708.6	674.7	**1 383.4**	697.3	718.0	**1 415.3**	691.3	729.8	**1 421.1**
40-foot containers as proportion of all containers handled *(%)*	57.8	58.1	**57.9**	61.7	62.9	**62.3**	61.8	60.8	**61.3**	60.8	62.7	**61.7**	62.8	63.1	**63.0**
Landside															
Number of trucks used in VBS/TAS operations *('000)*	139.4	151.1	**290.5**	148.9	162.4	**311.3**	161.2	154.4	**315.6**	159.2	164.2	**323.4**	156.9	159.5	**316.4**
Total containers transported by VBS/TAS trucks and rail *('000)*	253.1	276.3	**529.5**	285.7	297.0	**582.7**	293.7	280.1	**573.8**	289.3	282.6	**571.9**	275.9	284.6	**560.5**
Containers by VBS/TAS trucks *('000)*	192.1	211.8	**403.9**	223.7	229.7	**453.4**	226.4	214.6	**441.0**	228.2	226.3	**454.5**	219.3	223.2	**442.5**
Containers by rail *('000)*	61.0	64.6	**125.6**	62.0	67.3	**129.3**	67.3	65.5	**132.7**	61.0	56.3	**117.4**	56.6	61.4	**118.0**
Total TEUs transported by VBS/TAS trucks and rail *('000)*	346.7	374.4	**721.2**	457.2	473.3	**930.5**	464.2	441.9	**906.1**	458.1	452.1	**910.2**	441.3	453.5	**894.8**
TEUs by VBS/TAS trucks *('000)*	251.2	272.9	**524.1**	359.5	369.6	**729.1**	364.8	345.9	**710.6**	367.4	368.9	**736.3**	357.6	362.2	**719.9**
TEUs by rail *('000)*	95.5	101.5	**197.1**	97.7	103.7	**201.4**	99.4	96.1	**195.5**	90.7	83.2	**173.9**	83.7	91.3	**175.0**
Whole of container terminal															
Total number of container ship visits	250	253	**503**	236	231	**467**	256	245	**501**	246	245	**491**	239	263	**502**
Total number of containers (lifts) exchanged *('000)*	360.9	387.7	**748.7**	392.7	432.2	**824.9**	429.0	415.8	**844.8**	422.4	435.0	**857.4**	415.8	425.9	**841.7**
Whole of port															
Total cargo throughput *(million tonnes)*	5.4	5.7	**11.1**	5.3	6.7	**12.0**	7.7	6.6	**14.3**	6.3	6.1	**12.4**	6.4	6.4	**12.7**
Non-containerised general cargo throughput *(million tonnes)*	0.1	0.0	**0.1**	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)*	576.1	608.4	**1 184.5**	624.5	713.7	**1 338.2**	697.6	668.4	**1 366.0**	685.5	710.1	**1 395.6**	681.8	719.3	**1 401.1**
Full import *('000)*	283.1	308.6	**591.7**	323.1	362.1	**685.3**	340.3	336.1	**676.5**	341.4	352.2	**693.6**	345.1	356.7	**701.8**
Empty import *('000)*	3.1	3.0	**6.2**	1.2	0.9	**2.1**	2.1	1.7	**3.8**	4.5	4.6	**9.1**	7.2	3.8	**11.0**
Full export *('000)*	113.2	114.0	**227.2**	103.8	109.1	**213.0**	116.8	125.3	**242.1**	135.3	133.6	**268.9**	121.8	132.5	**254.2**
Empty export *('000)*	176.7	182.8	**359.4**	196.4	241.6	**437.9**	238.4	205.3	**443.6**	204.3	219.8	**424.1**	207.7	226.3	**434.0**

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 (2022), Hutchison Ports Australia (2022), Patrick (2022) and NSW Ports (2022)

Table 1.3 Container terminal throughput: Melbourne

	2020						2021						2022		
	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	215	223	**438**	223	234	**457**	232	235	**467**	229	227	**456**	227	248	**475**
Total containers handled *('000)*	384.4	405.8	**790.2**	449.9	482.5	**932.4**	468.2	473.0	**941.2**	450.7	456.8	**907.5**	471.7	443.2	**915.0**
Total TEUs handled *('000)*	597.1	629.3	**1 226.4**	712.8	769.8	**1 482.6**	746.9	755.3	**1 502.2**	721.1	730.3	**1 451.4**	757.7	717.9	**1 475.5**
40-foot containers as proportion of all containers handled *(%)*	55.3	55.1	**55.2**	58.4	59.6	**59.0**	59.5	59.7	**59.6**	60.0	59.9	**59.9**	60.6	62.0	**61.3**
Landside															
Number of trucks used in VBS/TAS operations *('000)*	182.8	192.1	**374.9**	193.0	196.4	**389.4**	172.6	171.6	**344.2**	167.7	161.9	**329.6**	165.2	160.1	**325.3**
Total containers transported by VBS/TAS trucks and rail *('000)*	340.6	359.1	**699.7**	352.8	364.1	**716.9**	335.7	331.9	**667.6**	329.4	315.8	**645.2**	325.8	321.9	**647.7**
Containers by VBS/TAS trucks *('000)*	315.1	331.0	**646.1**	324.0	339.8	**663.8**	305.9	304.3	**610.2**	299.6	290.8	**590.4**	300.8	295.7	**596.5**
Containers by rail *('000)*	25.5	28.1	**53.6**	28.8	24.3	**53.1**	29.7	27.6	**57.3**	29.7	25.1	**54.8**	25.0	26.2	**51.2**
Total TEUs transported by VBS/TAS trucks and rail *('000)*	477.9	523.7	**1 001.6**	557.1	573.5	**1 130.6**	522.3	518.9	**1 041.2**	510.2	495.0	**1 005.1**	512.6	511.2	**1 023.8**
TEUs by VBS/TAS trucks *('000)*	438.2	480.2	**918.4**	511.4	534.7	**1 046.1**	474.8	474.9	**949.7**	462.6	454.9	**917.5**	472.5	468.8	**941.2**
TEUs by rail *('000)*	39.7	43.5	**83.2**	45.7	38.8	**84.5**	47.4	44.0	**91.5**	47.6	40.1	**87.7**	40.1	42.4	**82.5**
Whole of container terminal															
Total number of container ship visits	221	223	**444**	221	234	**455**	225	227	**452**	226	219	**445**	214	242	**456**
Total number of containers (lifts) exchanged *('000)*	382.3	399.5	**781.8**	436.8	472.9	**909.8**	449.2	457.0	**906.2**	442.9	438.4	**881.3**	436.8	428.3	**865.2**
Whole of port															
Total cargo throughput *(million tonnes)*	8.4	9.0	**17.5**	9.3	9.7	**18.9**	9.6	9.9	**19.5**	9.6	9.6	**19.2**	9.8	9.7	**19.5**
Non-containerised general cargo throughput *(million tonnes)*	0.5	0.4	**0.8**	0.4	0.5	**0.9**	0.5	0.6	**1.1**	0.6	0.6	**1.2**	0.7	0.7	**1.4**
Total TEUs exchanged *('000)*	669.0	700.8	**1 369.8**	783.7	845.8	**1 629.6**	831.0	832.8	**1 663.8**	800.8	813.1	**1 613.9**	818.4	800.2	**1 618.7**
Full import *('000)*	299.7	324.2	**623.9**	366.8	406.2	**773.1**	381.2	375.5	**756.6**	365.3	387.5	**752.9**	387.3	363.1	**750.4**
Empty import *('000)*	36.5	35.5	**72.1**	31.6	29.1	**60.8**	37.0	33.7	**70.7**	34.8	34.3	**69.1**	28.6	34.4	**63.0**
Full export *('000)*	206.8	222.0	**428.9**	234.8	236.1	**470.9**	226.0	229.8	**455.8**	221.4	218.2	**439.6**	217.9	218.3	**436.2**
Empty export *('000)*	125.9	119.0	**244.9**	150.5	174.4	**324.9**	186.8	193.8	**380.7**	179.2	173.1	**352.3**	184.7	184.3	**369.0**

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 (2022), Patrick (2022), Victoria International Container Terminal (2022) and Port of Melbourne Operations Pty Ltd (2022)

Table 1.4 Container terminal throughput: Adelaide

	2020						2021						2022		
	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	83	77	**160**	81	67	**148**	70	70	**140**	64	56	**120**	83	66	**149**
Total containers handled *('000)*	76.0	69.9	**145.9**	76.2	70.1	**146.3**	68.5	61.3	**129.9**	59.2	67.4	**126.6**	65.9	64.0	**129.9**
Total TEUs handled *('000)*	106.4	100.0	**206.3**	113.0	101.0	**214.0**	99.0	90.2	**189.2**	86.5	99.1	**185.6**	98.9	95.0	**193.9**
40-foot containers as proportion of all containers handled *(%)*	39.9	43.1	**41.4**	48.2	44.1	**46.2**	44.5	47.1	**45.7**	46.1	47.0	**46.6**	50.2	48.3	**49.2**
Landside															
Number of trucks used in VBS/TAS operations *('000)*	32.0	29.3	**61.3**	29.6	27.2	**56.8**	27.6	26.1	**53.7**	24.6	23.8	**48.4**	23.1	23.1	**46.2**
Total containers transported by VBS/TAS trucks and rail *('000)*	74.5	71.8	**146.3**	72.9	66.1	**139.0**	66.7	56.2	**122.9**	57.5	56.1	**113.6**	54.9	58.3	**113.2**
Containers by VBS/TAS trucks *('000)*	61.5	53.3	**114.7**	55.0	51.0	**106.0**	52.4	47.4	**99.8**	44.7	45.2	**90.0**	44.4	44.9	**89.4**
Containers by rail *('000)*	13.1	18.5	**31.6**	17.9	15.1	**33.0**	14.3	8.7	**23.0**	12.8	10.8	**23.6**	10.4	13.4	**23.8**
Total TEUs transported by VBS/TAS trucks and rail *('000)*	104.6	99.8	**204.4**	103.5	94.0	**197.5**	94.0	81.4	**175.4**	81.6	80.2	**161.8**	79.5	83.4	**162.9**
TEUs by VBS/TAS trucks *('000)*	86.4	75.5	**161.9**	80.6	74.1	**154.8**	75.5	69.4	**144.9**	65.1	65.5	**130.7**	64.5	65.6	**130.2**
TEUs by rail *('000)*	18.2	24.3	**42.5**	22.9	19.9	**42.8**	18.5	12.0	**30.5**	16.4	14.7	**31.1**	14.9	17.8	**32.7**
Whole of container terminal															
Total number of container ship visits	83	77	**160**	82	70	**152**	69	70	**139**	66	56	**122**	63	62	**125**
Total number of containers (lifts) exchanged *('000)*	74.4	67.8	**142.2**	72.1	70.0	**142.1**	65.5	59.4	**125.0**	58.9	63.4	**122.3**	63.8	58.7	**122.6**
Whole of port															
Total cargo throughput *(million tonnes)*	3.1	3.8	**6.9**	3.6	3.7	**7.3**	4.2	3.7	**8.0**	3.4	3.7	**7.1**	4.0	4.2	**8.1**
Non-containerised general cargo throughput *(million tonnes)*	0.1	0.0	**0.1**	0.1	0.1	**0.2**	0.1	0.1	**0.2**	0.1	0.1	**0.2**	0.1	0.1	**0.2**
Total TEUs exchanged *('000)*	104.6	98.8	**203.4**	109.7	102.7	**212.4**	95.4	88.6	**184.0**	88.2	101.0	**189.2**	103.6	91.0	**194.6**
Full import *('000)*	34.5	33.0	**67.5**	41.2	39.4	**80.6**	40.4	33.6	**74.0**	32.0	37.1	**69.1**	35.0	34.6	**69.6**
Empty import *('000)*	15.4	15.1	**30.5**	11.0	11.5	**22.4**	7.0	6.3	**13.4**	8.5	6.9	**15.4**	6.6	8.5	**15.0**
Full export *('000)*	45.4	47.1	**92.5**	49.4	44.0	**93.5**	38.0	39.0	**77.0**	37.4	45.0	**82.5**	45.8	40.3	**86.2**
Empty export *('000)*	8.5	2.6	**11.1**	5.4	6.0	**11.4**	9.3	8.9	**18.2**	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 (2022) and Flinders Ports (2022)

Table 1.5 Container terminal throughput: Fremantle

	2020						2021						2022		
	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	93	89	**182**	91	89	**180**	90	89	**179**	74	75	**149**	80	86	**166**
Total containers handled *('000)*	132.2	118.8	**251.0**	131.4	132.6	**264.0**	133.1	126.8	**259.9**	122.5	128.4	**251.0**	138.3	137.9	**276.2**
Total TEUs handled *('000)*	199.0	179.3	**378.3**	205.5	205.5	**411.0**	204.2	195.9	**400.1**	187.2	195.6	**382.8**	210.2	212.4	**422.6**
40-foot containers as proportion of all containers handled *(%)*	50.5	50.9	**50.7**	56.4	54.9	**55.7**	53.5	54.5	**54.0**	52.8	52.3	**52.5**	51.9	54.1	**53.0**
Landside															
Number of trucks used in VBS/TAS operations *('000)*	37.5	51.8	**89.3**	48.8	46.5	**95.3**	43.1	41.5	**84.6**	39.7	42.2	**81.9**	43.3	41.9	**85.3**
Total containers transported by VBS/TAS trucks and rail *('000)*	96.7	116.8	**213.5**	102.3	105.4	**207.7**	100.3	96.3	**196.6**	89.0	101.9	**190.9**	106.7	100.4	**207.1**
Containers by VBS/TAS trucks *('000)*	67.7	93.2	**160.9**	80.1	79.7	**159.8**	73.8	71.1	**145.0**	67.0	75.2	**142.1**	77.1	74.2	**151.3**
Containers by rail *('000)*	29.0	23.6	**52.6**	22.2	25.6	**47.9**	26.5	25.1	**51.7**	22.0	26.7	**48.7**	29.6	26.2	**55.8**
Total TEUs transported by VBS/TAS trucks and rail *('000)*	130.4	150.7	**281.1**	151.7	158.8	**310.6**	144.9	145.4	**290.3**	136.3	150.3	**286.6**	159.8	151.6	**311.4**
TEUs by VBS/TAS trucks *('000)*	89.5	117.2	**206.6**	120.7	120.5	**241.2**	105.2	106.2	**211.4**	101.0	108.1	**209.1**	113.3	109.8	**223.1**
TEUs by rail *('000)*	41.0	33.5	**74.5**	31.0	38.4	**69.4**	39.8	39.1	**78.9**	35.4	42.1	**77.5**	46.4	41.9	**88.3**
Whole of container terminal															
Total number of container ship visits	92	88	**180**	94	90	**184**	90	91	**181**	75	71	**146**	77	85	**162**
Total number of containers (lifts) exchanged *('000)*	125.5	115.5	**240.9**	130.2	128.8	**259.0**	130.1	127.2	**257.3**	118.2	115.9	**234.2**	131.9	134.3	**266.2**
Whole of port															
Total cargo throughput *(million tonnes)*	8.3	7.4	**15.7**	7.2	7.9	**15.1**	7.7	7.6	**15.3**	6.9	6.7	**13.6**	7.5	7.2	**14.7**
Non-containerised general cargo throughput *(million tonnes)*	0.2	0.2	**0.5**	0.2	0.3	**0.5**	0.2	0.3	**0.5**	0.3	0.3	**0.6**	0.3	0.3	**0.6**
Total TEUs exchanged *('000)*	195.2	179.3	**374.5**	203.4	203.4	**406.8**	200.8	196.3	**397.1**	187.3	192.4	**379.7**	204.8	207.5	**412.3**
Full import *('000)*	89.3	91.5	**180.8**	97.8	100.8	**198.7**	96.3	94.6	**190.8**	92.1	100.0	**192.0**	102.5	100.3	**202.8**
Empty import *('000)*	5.1	4.4	**9.5**	4.2	5.2	**9.4**	2.2	2.9	**5.1**	3.3	2.3	**5.5**	2.1	2.6	**4.7**
Full export *('000)*	55.9	52.4	**108.3**	51.3	55.2	**106.5**	56.1	60.2	**116.3**	55.5	57.2	**112.7**	58.2	60.2	**118.4**
Empty export *('000)*	44.9	31.1	**75.9**	50.1	42.2	**92.3**	46.2	38.7	**84.9**	36.5	33.0	**69.5**	42.0	44.4	**86.4**

Note: Blank cells mean no data were reported in that period.
Sources: DP World (2022), Patrick (2022) and Fremantle Ports (2022)

Table 1.6 Container terminal throughput: Five ports

	2020						2021						2022		
	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	869	876	**1 745**	860	844	**1 704**	885	871	**1 756**	850	829	**1 679**	853	916	**1 769**
Total containers handled *('000)*	1 151.6	1 185.4	**2 337.0**	1 267.0	1 372.7	**2 639.7**	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**
Total TEUs handled *('000)*	1 778.1	1 836.4	**3 614.5**	2 007.7	2 186.8	**4 194.5**	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**
40-foot containers as proportion of all containers handled *(%)*	54.4	54.9	**54.7**	58.5	59.3	**58.9**	59.0	58.8	**58.9**	58.7	59.3	**59.0**	59.8	60.5	**60.1**
Landside															
Number of trucks used in VBS/TAS operations *('000)*	458.6	497.3	**956.0**	499.2	519.4	**1 018.6**	483.6	469.3	**952.9**	471.9	470.5	**942.4**	461.0	459.4	**920.4**
Total containers transported by VBS/TAS trucks and rail *('000)*	882.2	951.9	**1 834.1**	949.9	985.7	**1 935.6**	937.1	903.8	**1 840.8**	914.5	901.4	**1 815.9**	896.5	908.1	**1 804.6**
Containers by VBS/TAS trucks *('000)*	748.7	810.7	**1 559.5**	812.9	848.9	**1 661.8**	795.2	771.5	**1 566.7**	785.4	777.9	**1 563.2**	771.1	776.2	**1 547.2**
Containers by rail *('000)*	133.5	141.2	**274.7**	137.0	136.8	**273.8**	141.9	132.2	**274.1**	129.1	123.5	**252.7**	125.4	131.9	**257.4**
Total TEUs transported by VBS/TAS trucks and rail *('000)*	1 212.9	1 321.8	**2 534.7**	1 480.0	1 536.0	**3 016.1**	1 436.4	1 398.7	**2 835.1**	1 413.3	1 402.5	**2 815.9**	1 394.9	1 418.9	**2 813.8**
TEUs by VBS/TAS trucks *('000)*	1 013.2	1 111.5	**2 124.8**	1 276.0	1 330.2	**2 606.2**	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**
TEUs by rail *('000)*	199.7	210.3	**409.9**	204.0	205.8	**409.8**	209.6	197.2	**406.8**	193.9	185.2	**379.1**	189.3	198.7	**388.0**
Whole of container terminal															
Total number of container ship visits	883	873	**1 756**	868	849	**1 717**	880	870	**1 750**	846	813	**1 659**	801	875	**1 676**
Total number of containers (lifts) exchanged *('000)*	1 133.9	1 160.4	**2 294.2**	1 241.3	1 341.2	**2 582.5**	1 301.2	1 285.5	**2 586.7**	1 287.4	1 295.8	**2 583.2**	1 251.1	1 262.4	**2 513.5**
Whole of port															
Total cargo throughput *(million tonnes)*	33.3	32.3	**65.6**	32.5	35.2	**67.8**	36.8	35.3	**72.1**	35.0	34.0	**69.0**	35.1	35.4	**70.5**
Non-containerised general cargo throughput *(million tonnes)*	1.1	0.8	**1.9**	0.9	1.2	**2.1**	1.1	1.3	**2.4**	1.3	1.3	**2.6**	1.4	1.4	**2.8**
Total TEUs exchanged *('000)*	1 843.8	1 902.8	**3 746.6**	2 066.0	2 262.6	**4 328.6**	2 203.0	2 161.2	**4 364.2**	2 162.0	2 217.6	**4 379.6**	2 168.4	2 193.2	**4 361.7**
Full import *('000)*	838.0	902.9	**1 740.9**	991.1	1 097.6	**2 088.7**	1 035.7	1 006.3	**2 042.0**	1 008.9	1 062.0	**2 070.9**	1 040.0	1 023.9	**2 064.0**
Empty import *('000)*	75.3	78.4	**153.6**	64.6	62.1	**126.6**	61.6	64.3	**125.9**	75.7	68.7	**144.4**	61.6	71.2	**132.8**
Full export *('000)*	499.9	522.0	**1 021.9**	527.9	535.2	**1 063.1**	511.0	545.5	**1 056.4**	562.4	547.1	**1 109.6**	515.0	549.5	**1 064.5**
Empty export *('000)*	429.8	398.5	**828.4**	479.7	565.9	**1 045.6**	594.1	544.3	**1 138.4**	513.4	534.4	**1 047.8**	544.7	546.7	**1 091.4**

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

Sources: DP World (2022), Patrick (2022), Hutchison Ports Australia (2022), Flinders Adelaide Container Terminal (2022), Victoria International Container Terminal (2022), Port of Brisbane Pty Ltd (2022), NSW Ports (2022), Port of Melbourne Operations Pty Ltd (2022), Flinders Ports (2022) and Fremantle Ports (2022)

Table 1.7 Container ship visits by port: January–June 2022

	Brisbane	Sydney	Melbourne	Adelaide	Fremantle	Five ports
Gross Tonnage						
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	113	110	48	30	402
50 001–65 000 GT	44	29	26	4	1	104
65 001–80 000 GT	91	131	114	31	40	407
80 001–95 000 GT	29	40	43	18	20	150
95 001–110 000 GT	5	22	24	17	18	86
All ship sizes	428	502	449	123	161	1 663

Sources: Port of Brisbane Pty Ltd (2022), NSW Ports (2022), Port of Melbourne Operations Pty Ltd (2022), Flinders Ports (2022) and Fremantle Ports (2022)

Table 1.8 Container ship visits by port: July–December 2021

	Brisbane	Sydney	Melbourne	Adelaide	Fremantle	Five ports
Gross Tonnage						
5 000–20 000 GT	58	83	54	-	37	232
20 001–35 000 GT	67	68	67	9	9	220
35 001–50 000 GT	120	108	103	38	19	388
50 001–65 000 GT	44	27	28	3	2	104
65 001–80 000 GT	122	142	121	35	39	459
80 001–95 000 GT	32	37	40	13	14	136
95 001–110 000 GT	7	26	25	22	20	100
All ship sizes	450	491	438	120	140	1 639

Sources: Port of Brisbane Pty Ltd (2022), NSW Ports (2022), Port of Melbourne Operations Pty Ltd (2022), Flinders Ports (2022) and Fremantle Ports (2022)

Table 1.9 Container ship visits by port: January–June 2021

	Brisbane	Sydney	Melbourne	Adelaide	Fremantle	Five ports
Gross Tonnage						
5 000–20 000 GT	55	69	38	-	44	206
20 001–35 000 GT	60	64	62	6	10	202
35 001–50 000 GT	120	117	114	51	32	434
50 001–65 000 GT	52	34	38	2	2	128
65 001–80 000 GT	129	142	122	35	44	472
80 001–95 000 GT	39	45	47	17	18	166
95 001–110 000 GT	11	29	29	28	28	125
All ship sizes	466	500	450	139	178	1 733

Sources: Port of Brisbane Pty Ltd (2022), NSW Ports (2022), Port of Melbourne Operations Pty Ltd (2022), Flinders Ports (2022) and Fremantle Ports (2022)

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

2.7 Throughput pbm (containers per berth metre)

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:

2.1 Containers per truck

2.2 TEUs per truck

2.3 Per cent of trucks backloaded

2.4 Average truck turnaround time

2.5 Average container turnaround time

Twelve indicators are reported for whole of container terminal performance.

2.1 Median of ship turnaround time

2.2 95th percentile of ship turnaround time

2.3 Number of ships waiting at anchorage for more than 2 hours

2.4 Per cent of ships waiting at anchorage for more than 2 hours

2.5 Average waiting time at anchorage

2.6 Median waiting time at anchorage

2.7 Total time ships spent at berth

2.8 Average TEUs per ship-hour at berth

2.9 Average lifts per ship-hour at berth

2.10 Total time ships available to stevedores

2.11 Average lifts per hour of stevedoring operation

2.12 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.

Indicator 2.7 Throughput pbm (containers per berth metre)

This is the number of containers through a container terminal divided by the length (in metres) of berths. At a container terminal it measures the intensity of use of the terminal container handling facility. The six month figure is a weighted average of the corresponding quarterly throughput.

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).

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 2.8 Containers per truck

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

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.

Indicator 2.9 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 2.8, this indicator measures the truck efficiency in a standard unit, a TEU, and thus takes into account the different sizes of containers.

Indicator 2.10 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 outbound legs of a single trip. Such operations make more effective use of trucks and landside infrastructure.

Indicator 2.11 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 2.12 Average container turnaround time

This indicator is calculated as the 'average truck turnaround time' (Indicator 2.11) divided by 'average containers per truck' (Indicator 2.8). 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 2.13 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 2.14 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 2.15 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 2.16 Proportion of ships waiting at anchorage for more than 2 hours

This is the number of container ships in Indicator 2.15 as a proportion of the total number of container ships that visited the container terminal in the period.

Indicator 2.17 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 2.18 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 2.19 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 2.20 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 2.19). 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.

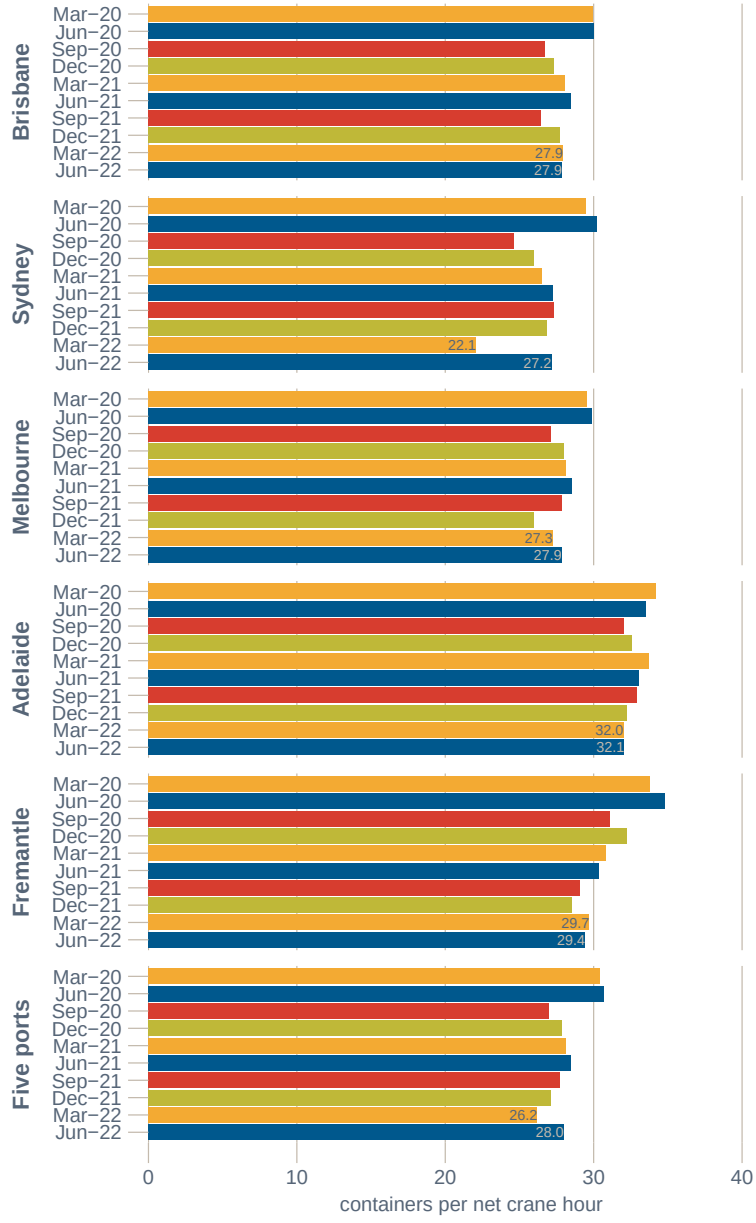
Indicator 2.23 Average lifts per hour of stevedoring operation

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

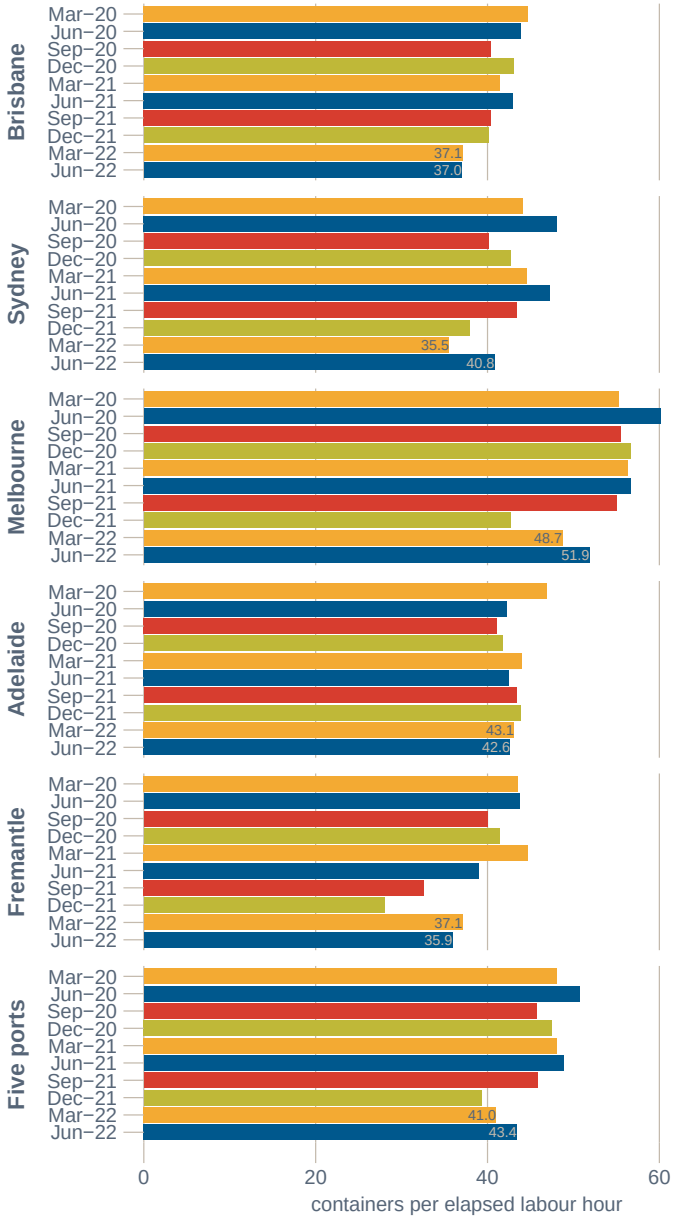
This is the number of crane lifts (containers handled) divided by the number of berth visits of dedicated container ships (UCC).

Figure 2.1 Wharf-side crane rate



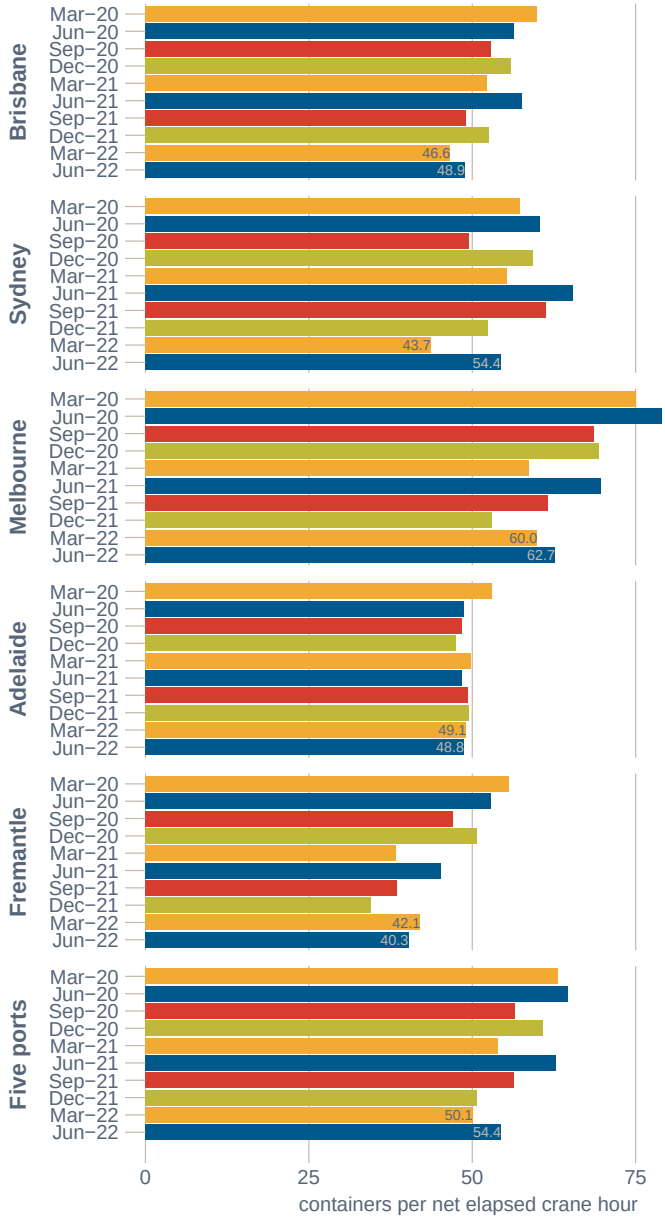
Sources: DP World (2022), Flinders Adelaide Container Terminal (2022), Hutchison Ports Australia (2022), Patrick (2022) and Victoria International Container Terminal (2022)

Figure 2.2 Wharf-side elapsed labour rate



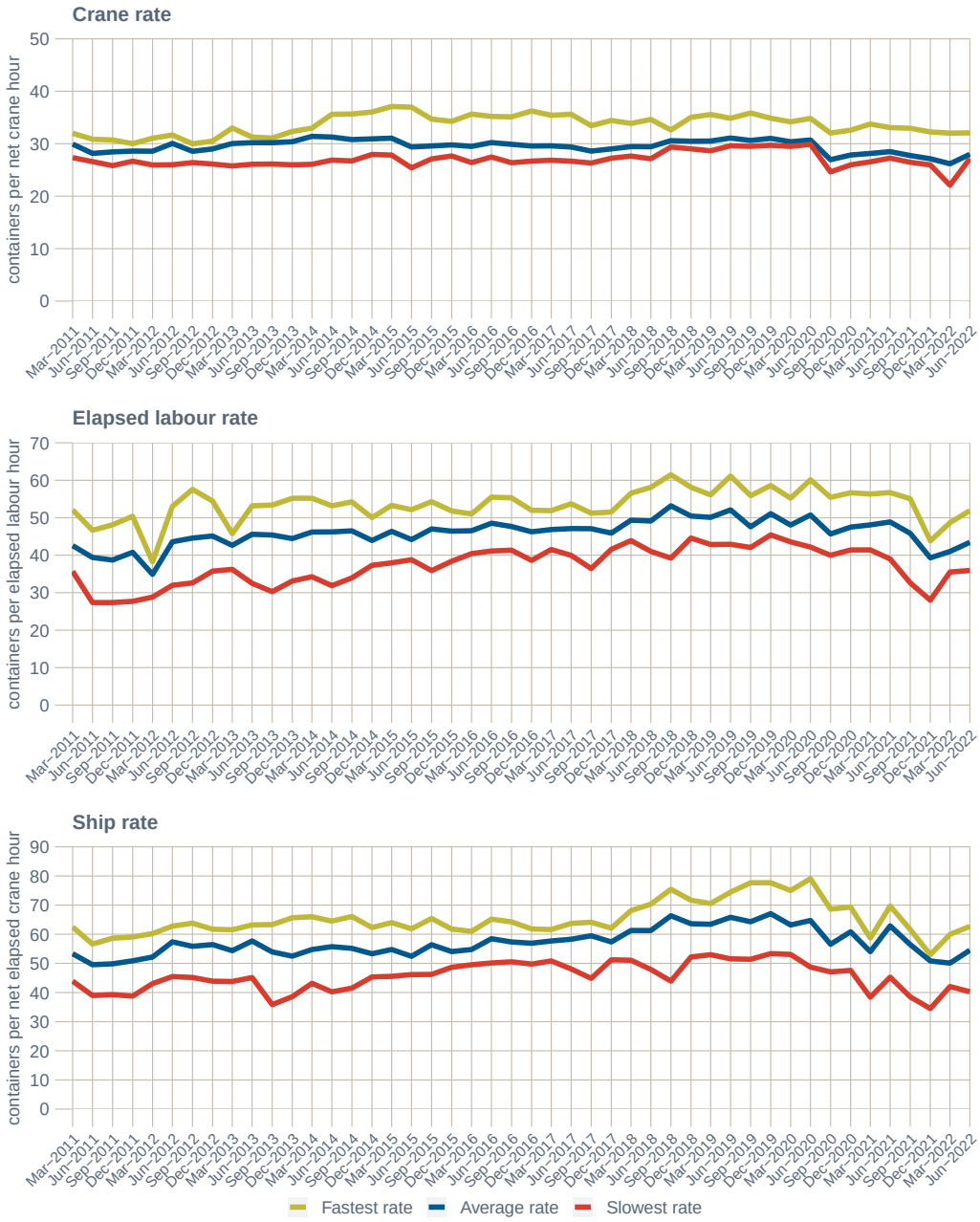
Sources: DP World (2022), Flinders Adelaide Container Terminal (2022), Hutchison Ports Australia (2022), Patrick (2022) and Victoria International Container Terminal (2022)

Figure 2.3 Wharf-side ship rate



Sources: DP World (2022), Flinders Adelaide Container Terminal (2022), Hutchison Ports Australia (2022), Patrick (2022) and Victoria International Container Terminal (2022)

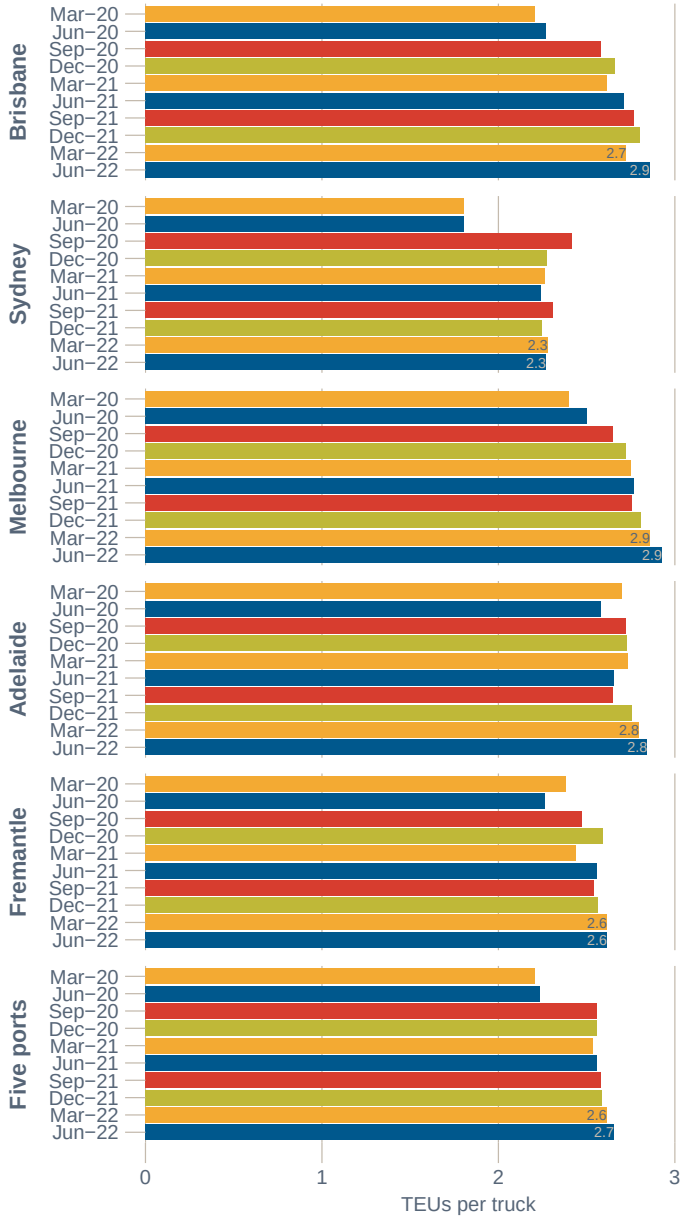
Figure 2.4 Performance in five ports: Comparison of wharfside rates



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.

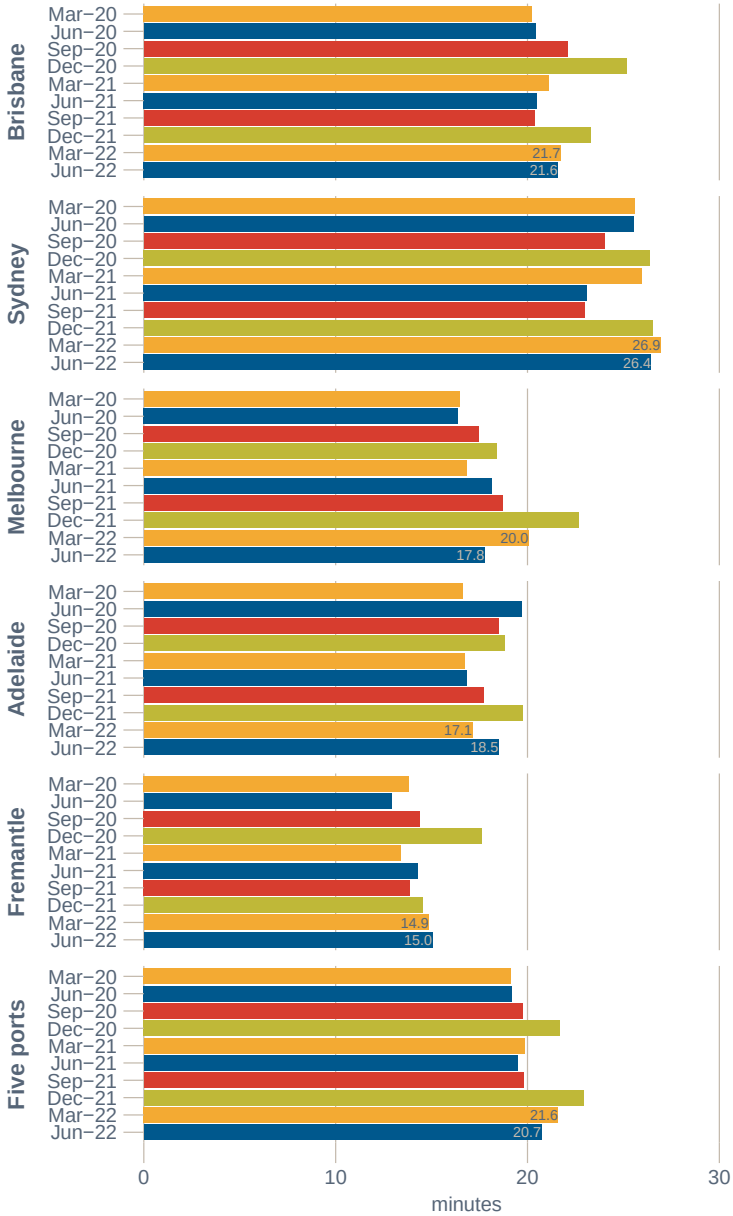
Sources: DP World (2022), Flinders Adelaide Container Terminal (2022), Hutchison Ports Australia (2022), Patrick (2022) and Victoria International Container Terminal (2022)

Figure 2.5 Average TEUs per truck on landside of container terminals



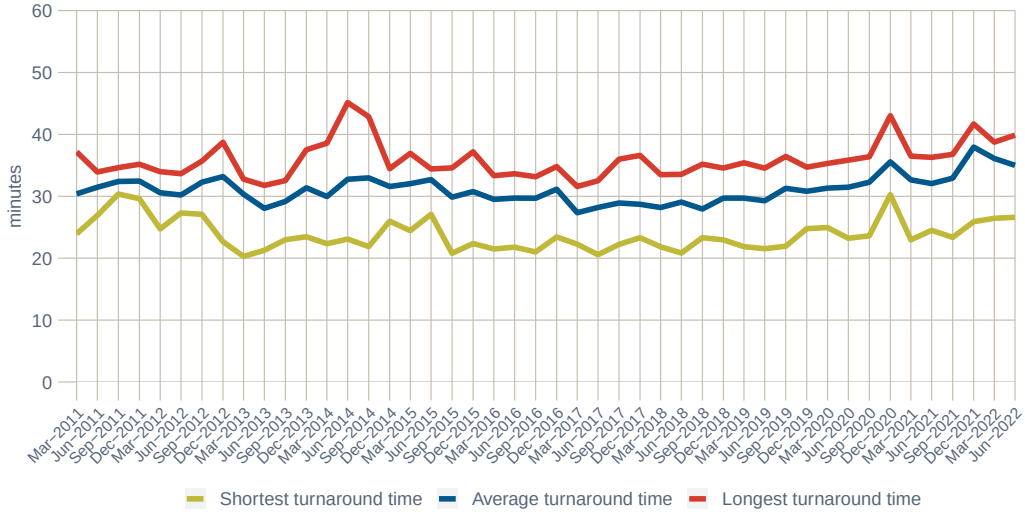
Note: This indicator is based on only the trucks that are processed through the VBS/TAS system.
Sources: DP World (2022), Flinders Adelaide Container Terminal (2022), Hutchison Ports Australia (2022), Patrick (2022) and Victoria International Container Terminal (2022)

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 (2022), Flinders Adelaide Container Terminal (2022), Hutchison Ports Australia (2022), Patrick (2022) and Victoria International Container Terminal (2022)

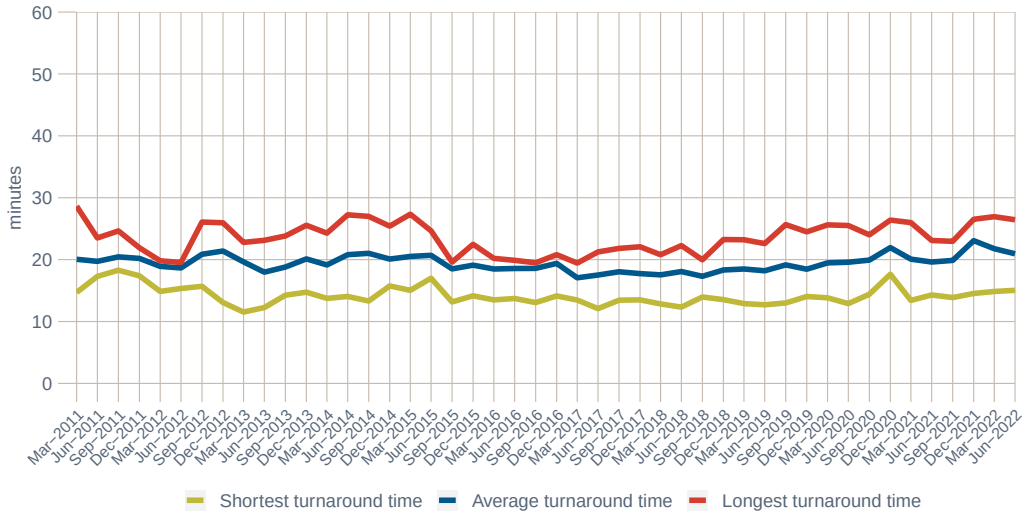
Figure 2.7 Longest and shortest truck turnaround time in five ports



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 (2022), Flinders Adelaide Container Terminal (2022), Hutchison Ports Australia (2022), Patrick (2022) and Victoria International Container Terminal (2022)

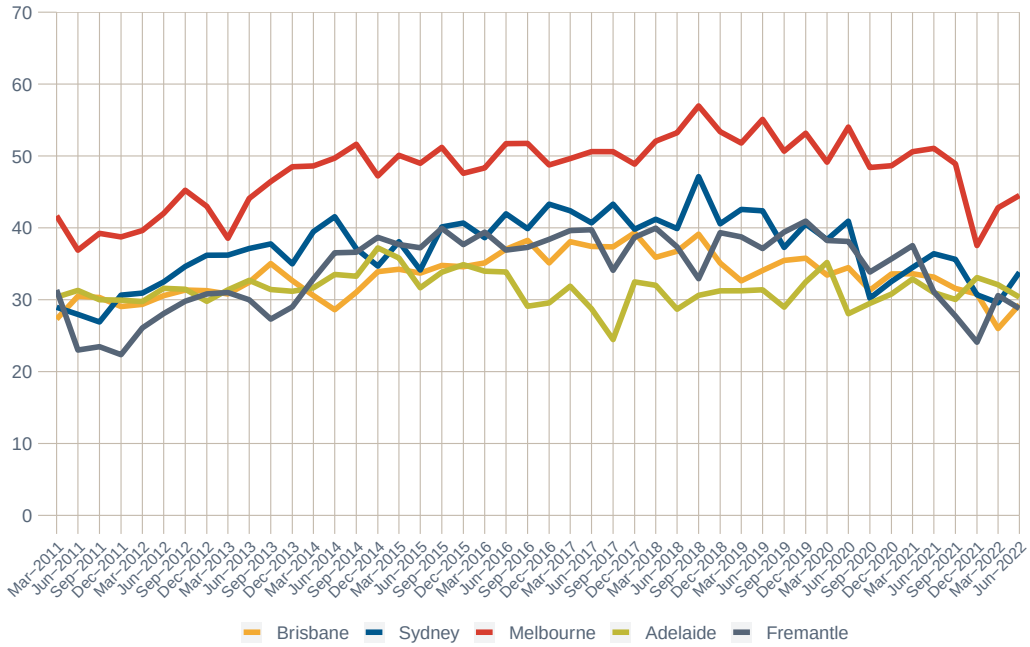
Figure 2.8 Longest and shortest container turnaround time in five ports



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.

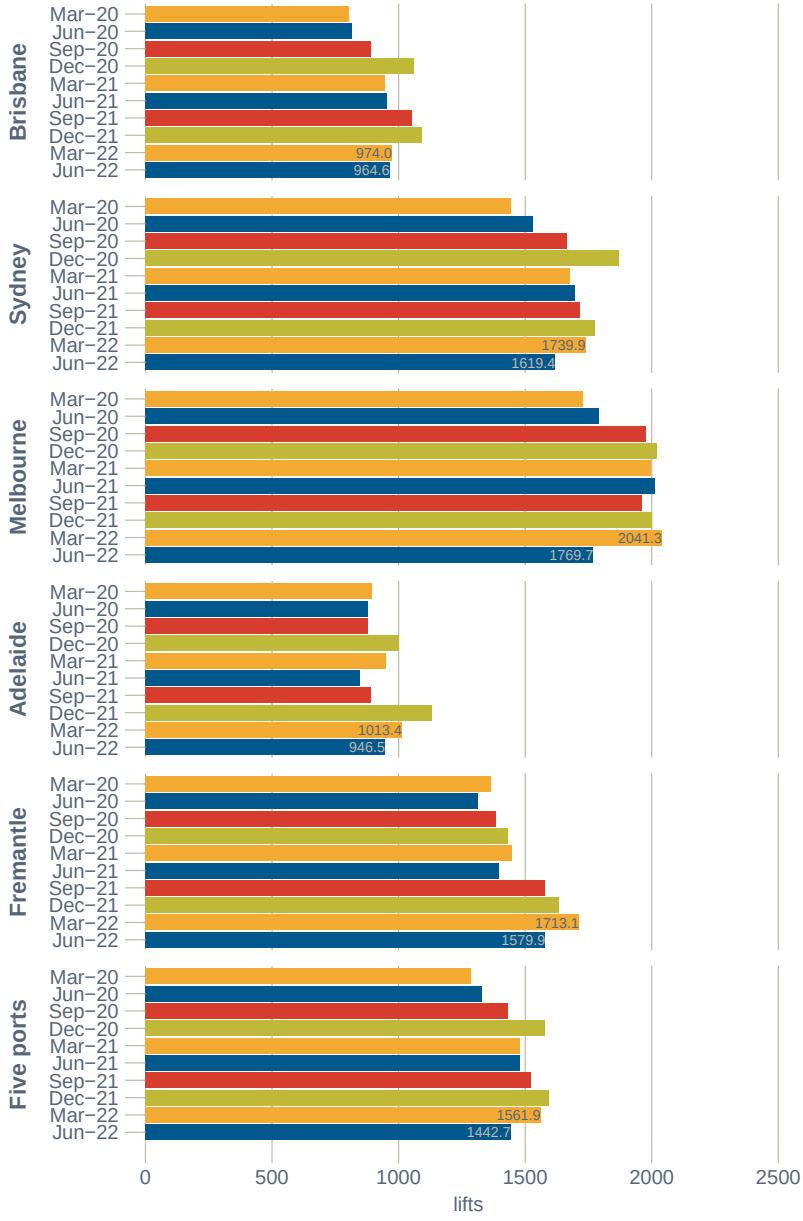
Sources: DP World (2022), Flinders Adelaide Container Terminal (2022), Hutchison Ports Australia (2022), Patrick (2022) and Victoria International Container Terminal (2022)

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 (2022), NSW Ports (2022), Port of Melbourne Operations Pty Ltd (2022), Flinders Ports (2022) and Fremantle Ports (2022)

Figure 2.10 Average number of lifts per berth visit



Sources: BITRE estimates based on data from Port of Brisbane Pty Ltd (2022), NSW Ports (2022), Port of Melbourne Operations Pty Ltd (2022), Flinders Ports (2022) and Fremantle Ports (2022)

Table 2.1 Container terminal performance: Brisbane

	2020						2021						2022		
	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	30.0	30.1	**30.0**	26.7	27.3	**27.0**	28.1	28.5	**28.3**	26.5	27.7	**27.1**	27.9	27.9	**27.9**
Elapsed labour rate	44.7	43.9	**44.3**	40.4	43.0	**41.8**	41.4	43.0	**42.2**	40.4	40.1	**40.3**	37.1	37.0	**37.0**
Ship rate	59.9	56.5	**58.1**	52.9	56.0	**54.6**	52.2	57.6	**54.9**	49.0	52.6	**50.8**	46.6	48.9	**47.8**
TEUs per hour															
Crane rate	46.4	46.6	**46.5**	42.1	43.5	**42.9**	45.0	45.4	**45.2**	42.1	44.1	**43.1**	44.7	44.6	**44.6**
Elapsed labour rate	69.1	68.1	**68.6**	63.8	68.5	**66.3**	66.2	68.1	**67.1**	63.9	63.8	**63.9**	59.3	59.0	**59.1**
Ship rate	92.6	87.7	**90.1**	83.8	89.2	**86.7**	83.3	91.2	**87.2**	77.3	83.8	**80.6**	74.6	77.8	**76.2**
Containers per berth metre	75.8	80.7	**78.3**	85.2	98.7	**91.9**	94.1	94.2	**94.1**	100.8	100.0	**100.4**	90.6	94.4	**92.5**
Landside															
Containers per truck	1.7	1.7	**1.7**	1.6	1.7	**1.7**	1.7	1.8	**1.8**	1.8	1.8	**1.8**	1.8	1.8	**1.8**
TEUs per truck	2.2	2.3	**2.2**	2.6	2.7	**2.6**	2.6	2.7	**2.7**	2.8	2.8	**2.8**	2.7	2.9	**2.8**
Per cent of trucks backloaded *(%)*	10.9	10.9	**10.9**	11.0	11.9	**11.5**	10.8	11.9	**11.3**	12.8	13.1	**13.0**	9.9	12.8	**11.3**
Average truck turnaround time *(mins)*	34.0	34.0	**34.0**	36.4	43.0	**39.9**	36.5	36.3	**36.4**	36.8	41.7	**39.2**	38.8	39.9	**39.3**
Average container turnaround time *(mins)*	20.2	20.4	**20.3**	22.1	25.1	**23.7**	21.1	20.5	**20.8**	20.4	23.3	**21.8**	21.7	21.6	**21.6**
Whole of container terminal															
Ship turnaround time															
Median of ship turnaround time *(hours)*	30.7	29.7	**30.4**	34.6	39.8	**37.6**	38.0	36.5	**37.2**	41.3	44.1	**42.9**	49.2	45.5	**47.3**
95th percentile of ship turnaround time *(hours)*	63.2	57.8	**61.5**	68.4	100.4	**91.2**	104.7	75.9	**81.8**	105.7	109.0	**109.0**	144.0	153.3	**152.3**
Port congestion															
Number of ships waiting at anchorage for more than 2 hours	24	16	**40**	30	43	**73**	14	4	**18**	56	49	**105**	71	76	**147**
Per cent of ships waiting at anchorage for more than 2 hours *(%)*	10.1	6.9	**8.5**	12.8	19.2	**15.9**	5.8	1.7	**3.8**	24.0	22.1	**23.1**	34.1	34.1	**34.1**
Average waiting time at anchorage *(hours)*	15.4	21.0	**17.7**	24.1	28.2	**26.5**	38.3	13.1	**32.7**	24.5	26.2	**25.3**	33.6	32.2	**32.9**
Median waiting time at anchorage *(hours)*	9.6	16.1	**12.2**	14.8	14.6	**14.6**	17.3	5.2	**16.7**	17.0	19.7	**18.9**	27.3	29.7	**28.7**
Total time ships spent at berth *('000 hours)*	5.7	5.5	**11.2**	6.7	7.1	**13.7**	6.8	6.8	**13.6**	7.8	7.9	**15.6**	7.8	7.3	**15.1**
Average TEUs per ship-hour at berth *(TEUs per hour)*	51.6	53.4	**52.5**	49.3	53.4	**51.4**	53.8	52.7	**53.2**	50.0	49.0	**49.5**	41.6	46.8	**44.1**
Average lifts per ship-hour at berth *(lifts per hour)*	33.4	34.5	**33.9**	31.3	33.6	**32.5**	33.6	33.1	**33.4**	31.6	30.8	**31.2**	26.0	29.3	**27.6**
Total time ships are available to stevedores *('000 hours)*	4.2	4.6	**8.8**	5.3	5.7	**11.1**	5.7	5.6	**11.3**	6.3	6.2	**12.5**	6.2	6.4	**12.6**
Average lifts per hour of stevedoring operation *(lifts per hour)*	45.0	41.3	**43.1**	39.2	41.4	**40.3**	40.0	40.6	**40.3**	38.9	38.8	**38.9**	32.9	33.6	**33.3**
Average lifts per berth visit *(lifts)*	804.5	817.6	**810.9**	890.3	1 059.7	**972.9**	946.7	954.0	**950.3**	1 051.5	1 092.5	**1 071.5**	974.0	964.6	**969.1**

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

Sources: DP World (2022), Hutchison Ports Australia (2022), Patrick (2022), Port of Brisbane Pty Ltd (2022) and Maritime Safety Queensland (2022)

Table 2.2 Container terminal performance: Sydney

	2020						2021						2022		
	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	29.5	30.2	**29.9**	24.6	26.0	**25.3**	26.5	27.3	**26.9**	27.3	26.9	**27.1**	22.1	27.2	**24.7**
Elapsed labour rate	44.1	48.1	**46.2**	40.1	42.7	**41.5**	44.5	47.2	**45.8**	43.4	37.9	**40.6**	35.5	40.8	**38.2**
Ship rate	57.3	60.4	**58.9**	49.5	59.3	**54.6**	55.3	65.4	**60.2**	61.3	52.4	**56.8**	43.7	54.4	**49.2**
TEUs per hour															
Crane rate	46.5	47.7	**47.1**	39.9	42.3	**41.1**	42.8	43.8	**43.3**	43.9	43.6	**43.7**	36.1	44.3	**40.3**
Elapsed labour rate	69.8	76.0	**73.0**	64.8	69.6	**67.3**	72.4	76.0	**74.2**	69.8	61.9	**65.8**	58.1	66.8	**62.6**
Ship rate	90.5	95.5	**93.1**	80.0	96.4	**88.7**	90.0	105.4	**97.5**	98.7	85.6	**92.1**	71.8	89.0	**80.6**
Containers per berth metre	101.7	107.2	**104.4**	109.2	121.4	**115.3**	120.4	115.4	**117.9**	119.2	121.4	**120.3**	116.7	123.0	**119.9**
Landside															
Containers per truck	1.4	1.4	**1.4**	1.5	1.4	**1.5**	1.4	1.4	**1.4**	1.4	1.4	**1.4**	1.4	1.4	**1.4**
TEUs per truck	1.8	1.8	**1.8**	2.4	2.3	**2.3**	2.3	2.2	**2.3**	2.3	2.2	**2.3**	2.3	2.3	**2.3**
Per cent of trucks backloaded *(%)*	6.1	6.4	**6.2**	6.3	5.0	**5.6**	5.2	4.9	**5.0**	4.9	4.7	**4.8**	4.6	4.8	**4.7**
Average truck turnaround time *(mins)*	35.3	35.8	**35.5**	36.1	37.3	**36.7**	36.5	32.1	**34.3**	32.9	36.5	**34.8**	37.6	37.0	**37.3**
Average container turnaround time *(mins)*	25.6	25.5	**25.6**	24.0	26.4	**25.2**	26.0	23.1	**24.6**	23.0	26.5	**24.7**	26.9	26.4	**26.7**
Whole of container terminal															
Ship turnaround time															
Median of ship turnaround time *(hours)*	35.5	34.0	**34.8**	46.1	49.5	**48.7**	44.3	42.0	**43.5**	45.3	54.2	**49.0**	53.1	45.4	**48.8**
95th percentile of ship turnaround time *(hours)*	68.8	66.8	**68.8**	126.0	116.6	**116.6**	91.6	89.8	**89.8**	94.0	107.3	**101.6**	110.4	79.6	**96.2**
Port congestion															
Number of ships waiting at anchorage for more than 2 hours	51	69	**120**	92	123	**215**	104	68	**172**	74	99	**173**	86	102	**188**
Per cent of ships waiting at anchorage for more than 2 hours *(%)*	20.4	27.3	**23.9**	39.0	53.2	**46.0**	40.6	27.8	**34.3**	30.1	40.4	**35.2**	36.0	38.8	**37.5**
Average waiting time at anchorage *(hours)*	16.9	31.1	**25.0**	35.6	55.1	**46.8**	881.0	108.6	**575.6**	22.6	36.1	**30.3**	147.3	215.1	**184.1**
Median waiting time at anchorage *(hours)*	9.9	12.5	**10.4**	25.2	31.2	**28.9**	23.6	13.8	**19.9**	18.2	22.4	**18.6**	30.1	25.9	**27.7**
Total time ships spent at berth *('000 hours)*	9.4	9.5	**18.9**	13.0	13.3	**26.3**	12.4	11.4	**23.9**	11.9	14.2	**26.0**	14.1	12.6	**26.7**
Average TEUs per ship-hour at berth *(TEUs per hour)*	60.5	64.7	**62.6**	48.8	53.0	**50.9**	55.8	58.5	**57.1**	57.3	49.9	**53.3**	48.2	55.1	**51.5**
Average lifts per ship-hour at berth *(lifts per hour)*	38.4	40.9	**39.6**	30.2	32.5	**31.4**	34.5	36.4	**35.4**	35.6	30.7	**32.9**	29.6	33.8	**31.6**
Total time ships are available to stevedores *('000 hours)*	8.6	8.2	**16.8**	10.3	10.7	**20.9**	10.1	9.2	**19.2**	10.1	11.9	**22.1**	12.3	11.3	**23.7**
Average lifts per hour of stevedoring operation *(lifts per hour)*	42.0	47.0	**44.4**	38.2	40.6	**39.4**	42.6	45.4	**43.9**	41.6	36.5	**38.8**	33.7	37.6	**35.6**
Average lifts per berth visit *(lifts)*	1 443.7	1 532.5	**1 488.4**	1 663.9	1 871.0	**1 766.3**	1 675.8	1 697.3	**1 686.3**	1 717.0	1 775.3	**1 746.2**	1 739.9	1 619.4	**1 676.7**

Note: Cells may not sum to totals due to rounding.
Sources: DP World (2022), Hutchison Ports Australia (2022), Patrick (2022), NSW Ports (2022) and Port Authority of New South Wales (2022)

Table 2.3 Container terminal performance: Melbourne

	2020						2021						2022		
	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	29.6	29.9	**29.7**	27.1	28.0	**27.6**	28.2	28.5	**28.3**	27.8	26.0	**26.9**	27.3	27.9	**27.5**
Elapsed labour rate	55.2	60.1	**57.7**	55.5	56.7	**56.1**	56.3	56.7	**56.5**	55.1	42.7	**48.8**	48.7	51.9	**50.2**
Ship rate	75.0	79.1	**77.1**	68.6	69.3	**69.0**	58.7	69.7	**64.2**	61.6	53.0	**57.3**	60.0	62.7	**61.3**
TEUs per hour															
Crane rate	45.8	46.1	**46.0**	42.7	44.5	**43.7**	44.9	45.5	**45.2**	44.7	41.5	**43.1**	43.8	45.0	**44.4**
Elapsed labour rate	85.9	93.3	**89.7**	88.0	90.6	**89.4**	89.9	90.6	**90.2**	88.0	68.3	**78.1**	78.2	84.1	**81.1**
Ship rate	116.7	122.7	**119.8**	109.0	110.9	**110.0**	93.5	111.3	**102.5**	98.7	84.8	**91.7**	96.3	101.6	**98.9**
Containers per berth metre	134.7	142.2	**138.5**	157.7	169.1	**163.4**	164.1	165.8	**164.9**	158.0	160.1	**159.0**	165.4	155.4	**160.4**
Landside															
Containers per truck	1.7	1.7	**1.7**	1.7	1.7	**1.7**	1.8	1.8	**1.8**	1.8	1.8	**1.8**	1.8	1.8	**1.8**
TEUs per truck	2.4	2.5	**2.4**	2.7	2.7	**2.7**	2.8	2.8	**2.8**	2.8	2.8	**2.8**	2.9	2.9	**2.9**
Per cent of trucks backloaded *(%)*	16.9	17.0	**16.9**	17.5	17.4	**17.5**	18.6	19.5	**19.0**	20.4	19.5	**19.9**	19.2	19.6	**19.4**
Average truck turnaround time *(mins)*	28.4	28.2	**28.3**	29.3	31.8	**30.6**	29.9	32.1	**31.0**	33.4	40.7	**37.0**	36.5	32.8	**34.7**
Average container turnaround time *(mins)*	16.4	16.4	**16.4**	17.5	18.4	**18.0**	16.9	18.1	**17.5**	18.7	22.6	**20.6**	20.0	17.8	**18.9**
Whole of container terminal															
Ship turnaround time															
Median of ship turnaround time *(hours)*	42.4	40.5	**41.3**	48.8	48.0	**48.3**	46.1	44.5	**45.4**	47.6	67.3	**57.1**	63.2	55.6	**58.7**
95th percentile of ship turnaround time *(hours)*	76.4	77.4	**77.4**	104.8	134.9	**119.0**	86.6	91.5	**89.0**	94.7	176.0	**154.9**	124.0	94.6	**110.7**
Port congestion															
Number of ships waiting at anchorage for more than 2 hours	9	12	**21**	20	21	**41**	3	4	**7**	1	6	**7**	6	1	**7**
Per cent of ships waiting at anchorage for more than 2 hours *(%)*	4.1	5.4	**4.7**	9.0	9.0	**9.0**	1.3	1.8	**1.5**	0.4	2.7	**1.6**	2.8	0.4	**1.5**
Average waiting time at anchorage *(hours)*	24.0	32.6	**28.9**	30.1	45.5	**38.0**	55.1	35.9	**44.1**	17.5	66.5	**59.5**	46.7	99.1	**54.2**
Median waiting time at anchorage *(hours)*	14.4	37.3	**26.1**	26.1	36.2	**26.5**	70.6	12.7	**17.1**	17.5	77.3	**72.5**	30.8	99.1	**39.6**
Total time ships spent at berth *('000 hours)*	7.8	7.4	**15.2**	9.0	9.7	**18.7**	8.9	9.0	**17.8**	9.1	11.7	**20.7**	10.2	9.6	**19.8**
Average TEUs per ship-hour at berth *(TEUs per hour)*	76.3	83.8	**79.9**	76.7	77.6	**77.2**	80.7	81.5	**81.1**	78.2	60.0	**68.0**	68.7	72.1	**70.4**
Average lifts per ship-hour at berth *(lifts per hour)*	49.1	54.0	**51.5**	48.4	48.6	**48.5**	50.6	51.1	**50.8**	48.9	37.5	**42.5**	42.8	44.5	**43.6**
Total time ships are available to stevedores *('000 hours)*	7.0	6.8	**13.8**	8.2	8.6	**16.8**	8.4	8.4	**16.7**	8.2	10.8	**19.0**	9.7	8.6	**18.3**
Average lifts per hour of stevedoring operation *(lifts per hour)*	54.3	59.1	**56.7**	53.5	55.0	**54.2**	53.6	54.7	**54.1**	54.0	40.5	**46.3**	44.9	49.9	**47.2**
Average lifts per berth visit *(lifts)*	1 729.7	1 791.5	**1 760.7**	1 976.7	2 021.0	**1 999.5**	1 996.6	2 013.1	**2 004.9**	1 959.8	2 001.6	**1 980.4**	2 041.3	1 769.7	**1 897.3**

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 (2022), Patrick (2022), Port of Melbourne Operations Pty Ltd (2022) and Victoria International Container Terminal (2022)

Table 2.4 Container terminal performance: Adelaide

	2020						2021						2022		
	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	34.2	33.5	**33.9**	32.0	32.6	**32.3**	33.7	33.1	**33.4**	32.9	32.2	**32.6**	32.0	32.1	**32.0**
Elapsed labour rate	46.9	42.2	**44.6**	41.1	41.7	**41.4**	44.0	42.5	**43.3**	43.3	43.8	**43.6**	43.1	42.6	**42.9**
Ship rate	53.1	48.7	**51.0**	48.5	47.6	**48.0**	49.8	48.4	**49.1**	49.4	49.5	**49.5**	49.1	48.8	**48.9**
TEUs per hour															
Crane rate	47.8	47.9	**47.9**	47.5	46.9	**47.2**	48.7	48.6	**48.7**	48.1	47.4	**47.7**	48.1	47.5	**47.8**
Elapsed labour rate	65.6	60.3	**63.1**	60.9	60.1	**60.6**	63.6	62.5	**63.1**	63.3	64.4	**63.9**	64.7	63.2	**64.0**
Ship rate	74.3	69.7	**72.1**	71.8	68.6	**70.3**	71.9	71.2	**71.6**	72.2	72.8	**72.5**	73.7	72.3	**73.0**
Containers per berth metre	126.7	116.5	**121.6**	127.1	116.8	**122.0**	114.2	102.2	**108.2**	98.7	112.4	**105.5**	109.8	106.7	**108.3**
Landside															
Containers per truck	1.9	1.8	**1.9**	1.9	1.9	**1.9**	1.9	1.8	**1.9**	1.8	1.9	**1.9**	1.9	1.9	**1.9**
TEUs per truck	2.7	2.6	**2.6**	2.7	2.7	**2.7**	2.7	2.7	**2.7**	2.7	2.8	**2.7**	2.8	2.8	**2.8**
Per cent of trucks backloaded *(%)*	25.8	22.1	**24.0**	22.6	23.2	**22.9**	21.2	19.0	**20.1**						
Average truck turnaround time *(mins)*	31.9	35.8	**33.8**	34.3	35.3	**34.8**	31.8	30.6	**31.2**	32.2	37.6	**34.9**	33.0	36.0	**34.5**
Average container turnaround time *(mins)*	16.6	19.7	**18.1**	18.5	18.8	**18.6**	16.7	16.9	**16.8**	17.7	19.8	**18.7**	17.1	18.5	**17.8**
Whole of container terminal															
Ship turnaround time															
Median of ship turnaround time *(hours)*	24.6	29.4	**26.3**	27.7	32.0	**29.3**	25.9	26.7	**26.1**	29.1	33.3	**30.1**	31.5	27.3	**29.9**
95th percentile of ship turnaround time *(hours)*	38.9	68.2	**47.9**	49.8	63.0	**60.5**	60.6	41.7	**48.4**	48.3	73.3	**61.9**	52.9	52.4	**52.9**
Port congestion															
Number of ships waiting at anchorage for more than 2 hours	5	6	**11**	7	9	**16**	9	3	**12**	5	5	**10**	7	5	**12**
Per cent of ships waiting at anchorage for more than 2 hours *(%)*	6.0	7.8	**6.9**	8.5	12.9	**10.5**	13.0	4.3	**8.6**	7.6	8.9	**8.2**	11.1	8.1	**9.6**
Average waiting time at anchorage *(hours)*	12.5	34.3	**24.4**	30.7	21.5	**25.5**	44.9	18.9	**38.4**	30.8	25.6	**28.2**	18.2	27.1	**21.9**
Median waiting time at anchorage *(hours)*	9.7	23.8	**16.8**	29.9	18.3	**24.8**	40.7	22.5	**33.8**	21.8	24.3	**23.3**	12.0	18.4	**14.8**
Total time ships spent at berth *('000 hours)*	2.1	2.4	**4.5**	2.4	2.3	**4.7**	2.0	1.9	**3.9**	2.0	1.9	**3.9**	2.0	1.9	**3.9**
Average TEUs per ship-hour at berth *(TEUs per hour)*	49.2	40.1	**44.4**	43.7	44.4	**44.0**	47.5	45.6	**46.6**	43.9	48.6	**46.2**	48.2	45.0	**46.6**
Average lifts per ship-hour at berth *(lifts per hour)*	35.2	28.1	**31.4**	29.5	30.8	**30.1**	32.9	31.0	**32.0**	30.0	33.1	**31.5**	32.1	30.4	**31.2**
Total time ships are available to stevedores *('000 hours)*	1.6	1.7	**3.3**	1.9	1.7	**3.5**	1.6	1.4	**3.0**	1.4	1.5	**2.9**	1.5	1.5	**3.0**
Average lifts per hour of stevedoring operation *(lifts per hour)*	45.9	40.9	**43.4**	38.9	41.7	**40.2**	42.1	41.2	**41.7**	43.1	41.2	**42.1**	41.8	39.1	**40.4**
Average lifts per berth visit *(lifts)*	896.2	880.3	**888.5**	879.7	1 000.7	**935.1**	949.9	849.2	**899.3**	892.1	1 132.0	**1 002.1**	1 013.4	946.5	**980.4**

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 (2022) and Flinders Ports (2022)

Table 2.5 Container terminal performance: Fremantle

	2020						2021						2022		
	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	33.8	34.8	**34.3**	31.1	32.3	**31.7**	30.8	30.3	**30.6**	29.1	28.5	**28.8**	29.7	29.4	**29.6**
Elapsed labour rate	43.6	43.7	**43.6**	40.0	41.4	**40.7**	44.7	39.0	**41.9**	32.6	28.0	**30.2**	37.1	35.9	**36.5**
Ship rate	55.6	52.9	**54.3**	47.1	50.8	**48.9**	38.4	45.3	**41.8**	38.5	34.5	**36.5**	42.1	40.3	**41.2**
TEUs per hour															
Crane rate	50.5	52.2	**51.3**	48.1	49.6	**48.8**	46.8	46.4	**46.6**	44.1	43.2	**43.6**	44.9	44.9	**44.9**
Elapsed labour rate	65.5	65.9	**65.7**	62.4	63.9	**63.2**	68.5	60.2	**64.5**	49.9	42.5	**46.1**	56.3	55.3	**55.8**
Ship rate	83.7	79.9	**81.9**	73.5	78.3	**75.9**	57.8	69.9	**63.7**	58.9	52.3	**55.5**	63.9	62.2	**63.0**
Containers per berth metre	102.4	91.9	**97.1**	101.7	102.7	**102.2**	103.0	98.2	**100.6**	94.8	99.4	**97.1**	107.1	106.7	**106.9**
Landside															
Containers per truck	1.8	1.8	**1.8**	1.6	1.7	**1.7**	1.7	1.7	**1.7**	1.7	1.8	**1.7**	1.8	1.8	**1.8**
TEUs per truck	2.4	2.3	**2.3**	2.5	2.6	**2.5**	2.4	2.6	**2.5**	2.5	2.6	**2.6**	2.6	2.6	**2.6**
Per cent of trucks backloaded *(%)*	7.7	7.3	**7.5**	8.3	8.1	**8.2**	7.7	8.3	**8.0**	4.9	5.4	**5.2**	7.3	7.6	**7.4**
Average truck turnaround time *(mins)*	25.0	23.2	**23.9**	23.6	30.3	**26.9**	23.0	24.5	**23.7**	23.4	25.9	**24.7**	26.4	26.6	**26.5**
Average container turnaround time *(mins)*	13.8	12.9	**13.3**	14.4	17.6	**16.0**	13.4	14.3	**13.8**	13.9	14.5	**14.2**	14.9	15.0	**14.9**
Whole of container terminal															
Ship turnaround time															
Median of ship turnaround time *(hours)*	40.6	38.1	**38.8**	43.9	44.2	**44.1**	44.5	48.2	**46.8**	76.4	76.0	**76.4**	68.8	62.3	**66.4**
95th percentile of ship turnaround time *(hours)*	74.5	66.5	**74.1**	89.5	88.9	**89.5**	84.3	93.5	**93.5**	136.3	198.0	**175.4**	120.3	139.0	**122.1**
Port congestion															
Number of ships waiting at anchorage for more than 2 hours	6	7	**13**	8	4	**12**	9	5	**14**	13	16	**29**	12	13	**25**
Per cent of ships waiting at anchorage for more than 2 hours *(%)*	6.5	8.0	**7.2**	8.5	4.4	**6.5**	10.0	5.5	**7.7**	17.3	22.5	**19.9**	15.6	15.3	**15.4**
Average waiting time at anchorage *(hours)*	22.8	18.8	**20.7**	33.6	21.7	**29.6**	26.9	24.0	**25.9**	45.6	54.3	**50.4**	31.8	22.5	**26.9**
Median waiting time at anchorage *(hours)*	22.4	16.3	**16.3**	28.5	17.3	**18.3**	18.5	18.6	**18.6**	47.0	41.0	**46.0**	24.3	22.0	**23.4**
Total time ships spent at berth *('000 hours)*	3.3	3.0	**6.3**	3.8	3.6	**7.5**	3.5	4.1	**7.6**	4.3	4.8	**9.1**	4.3	4.7	**9.0**
Average TEUs per ship-hour at berth *(TEUs per hour)*	57.6	57.5	**57.5**	52.9	55.3	**54.1**	57.6	48.0	**52.4**	42.4	36.7	**39.4**	46.5	44.4	**45.4**
Average lifts per ship-hour at berth *(lifts per hour)*	38.2	38.1	**38.2**	33.9	35.7	**34.7**	37.5	31.1	**34.0**	27.7	24.1	**25.8**	30.6	28.8	**29.6**
Total time ships are available to stevedores *('000 hours)*	3.0	2.7	**5.8**	3.3	3.2	**6.5**	3.0	3.3	**6.2**	3.8	4.6	**8.4**	3.7	3.8	**7.6**
Average lifts per hour of stevedoring operation *(lifts per hour)*	41.3	42.4	**41.8**	39.5	39.8	**39.7**	43.6	39.1	**41.3**	31.4	25.0	**27.9**	35.2	35.0	**35.1**
Average lifts per berth visit *(lifts)*	1 364.0	1 312.0	**1 338.6**	1 385.0	1 430.6	**1 407.4**	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**

Note: Cells may not sum to totals due to rounding.
Sources: DP World (2022), Patrick (2022) and Fremantle Ports (2022)

Table 2.6 Container terminal performance: Five ports

	2020						2021						2022		
	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	30.4	30.7	**30.6**	27.0	27.9	**27.4**	28.2	28.5	**28.3**	27.8	27.1	**27.5**	26.2	28.0	**27.1**
Elapsed labour rate	48.0	50.7	**49.4**	45.7	47.5	**46.6**	48.1	48.9	**48.5**	45.8	39.3	**42.5**	41.0	43.4	**42.2**
Ship rate	63.1	64.7	**63.9**	56.6	60.8	**58.8**	54.0	62.8	**58.3**	56.4	50.8	**53.6**	50.1	54.4	**52.3**
TEUs per hour															
Crane rate	46.8	47.4	**47.1**	42.5	44.2	**43.4**	44.6	45.2	**44.9**	44.0	43.1	**43.5**	41.7	44.8	**43.3**
Elapsed labour rate	74.4	78.7	**76.6**	72.4	75.8	**74.2**	76.6	77.8	**77.2**	72.9	62.8	**67.8**	65.6	70.0	**67.8**
Ship rate	97.9	100.6	**99.3**	89.8	97.3	**93.7**	86.1	100.2	**93.1**	89.9	81.4	**85.6**	80.3	87.9	**84.1**
Containers per berth metre	105.9	109.0	**107.4**	116.5	126.2	**121.4**	123.4	121.0	**122.2**	121.1	123.5	**122.3**	122.0	122.1	**122.0**
Landside															
Containers per truck	1.6	1.6	**1.6**	1.6	1.6	**1.6**	1.6	1.6	**1.6**	1.7	1.7	**1.7**	1.7	1.7	**1.7**
TEUs per truck	2.2	2.2	**2.2**	2.6	2.6	**2.6**	2.5	2.6	**2.5**	2.6	2.6	**2.6**	2.6	2.7	**2.6**
Per cent of trucks backloaded *(%)*	11.7	11.6	**11.6**	11.9	11.5	**11.7**	11.5	12.0	**11.7**	11.9	11.5	**11.7**	10.8	11.3	**11.0**
Average truck turnaround time *(mins)*	31.3	31.3	**31.3**	32.2	35.5	**33.9**	32.6	32.0	**32.3**	32.9	37.9	**35.4**	36.1	35.0	**35.6**
Average container turnaround time *(mins)*	19.1	19.2	**19.2**	19.8	21.7	**20.8**	19.9	19.5	**19.7**	19.8	22.9	**21.3**	21.6	20.7	**21.2**
Whole of container terminal															
Ship turnaround time															
Median of ship turnaround time *(hours)*	35.1	34.7	**34.9**	41.0	44.3	**42.8**	41.5	40.0	**40.9**	45.1	55.4	**48.8**	54.9	48.9	**51.5**
95th percentile of ship turnaround time *(hours)*	71.0	67.4	**69.2**	101.2	113.3	**105.1**	88.8	87.3	**87.8**	106.4	148.5	**123.2**	124.0	109.9	**119.0**
Port congestion															
Number of ships waiting at anchorage for more than 2 hours	95	110	**205**	157	200	**357**	139	84	**223**	149	175	**324**	182	197	**379**
Per cent of ships waiting at anchorage for more than 2 hours *(%)*	10.8	12.6	**11.7**	18.1	23.6	**20.8**	15.8	9.7	**12.7**	17.6	21.5	**19.5**	22.7	22.5	**22.6**
Average waiting time at anchorage *(hours)*	17.3	29.2	**23.7**	32.4	46.1	**40.1**	668.9	92.3	**451.7**	25.6	35.7	**31.1**	87.1	126.5	**107.5**
Median waiting time at anchorage *(hours)*	10.7	15.0	**12.9**	24.0	24.9	**24.3**	24.2	15.7	**20.4**	20.4	23.1	**21.8**	26.7	27.2	**26.9**
Total time ships spent at berth *('000 hours)*	28.3	27.8	**56.1**	35.0	36.0	**71.0**	33.5	33.2	**66.7**	34.9	40.5	**75.4**	38.4	36.2	**74.5**
Average TEUs per ship-hour at berth *(TEUs per hour)*	61.9	64.6	**63.2**	56.2	59.4	**57.8**	61.7	61.5	**61.6**	58.5	51.0	**54.5**	52.1	56.0	**54.0**
Average lifts per ship-hour at berth *(lifts per hour)*	40.1	41.7	**40.9**	35.5	37.3	**36.4**	38.8	38.7	**38.8**	36.9	32.0	**34.3**	32.6	34.9	**33.7**
Total time ships are available to stevedores *('000 hours)*	24.5	24.0	**48.5**	28.9	29.9	**58.8**	28.7	27.8	**56.5**	29.8	35.2	**64.9**	33.5	31.7	**65.1**
Average lifts per hour of stevedoring operation *(lifts per hour)*	46.2	48.4	**47.3**	42.9	44.8	**43.9**	45.4	46.3	**45.8**	43.2	36.9	**39.8**	37.4	39.9	**38.6**
Average lifts per berth visit *(lifts)*	1 284.1	1 329.2	**1 306.5**	1 430.1	1 579.7	**1 504.1**	1 478.7	1 477.6	**1 478.1**	1 521.7	1 593.9	**1 557.1**	1 561.9	1 442.7	**1 499.7**

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

Sources: DP World (2022), Patrick (2022), Hutchison Ports Australia (2022), Flinders Adelaide Container Terminal (2022), Victoria International Container Terminal (2022), Port of Brisbane Pty Ltd (2022), Maritime Safety Queensland (2022), Port Authority of New South Wales (2022), NSW Ports (2022), Port of Melbourne Operations Pty Ltd (2022), Flinders Ports (2022) and Fremantle Ports (2022)

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 receival/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

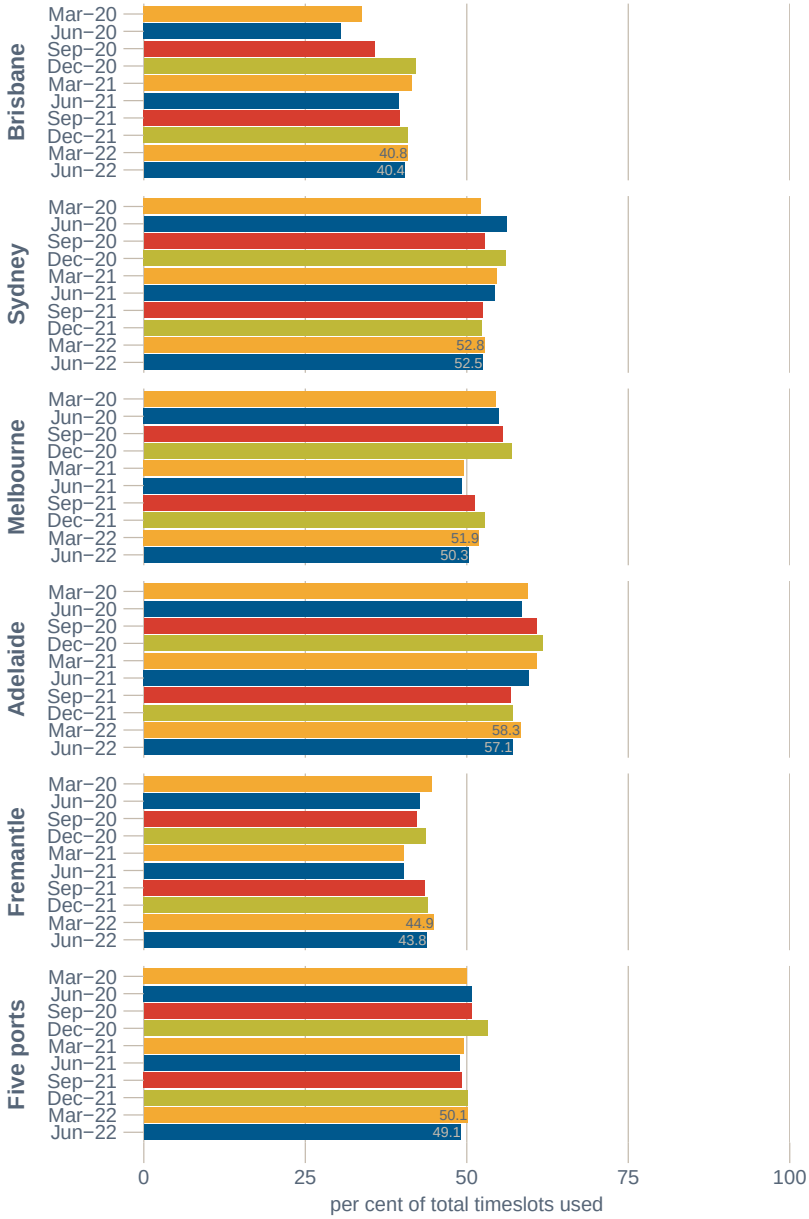
This indicator is a measure of the usage of empty container parks. It shows the number of notifications of container movements to empty container parks in the vicinity of each port.

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.

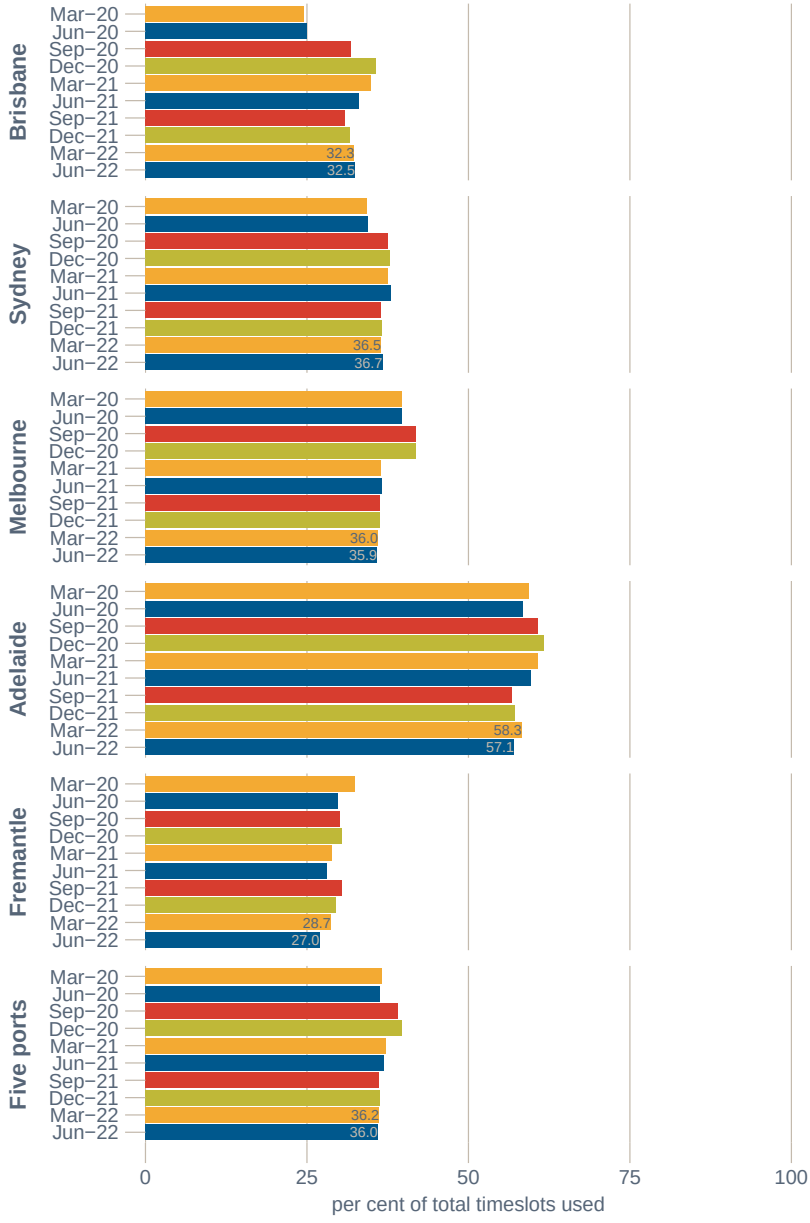
Straddle carriers and a quay crane in operation at Flinders Adelaide Container Terminal. Photo courtesy of Flinders Ports.

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



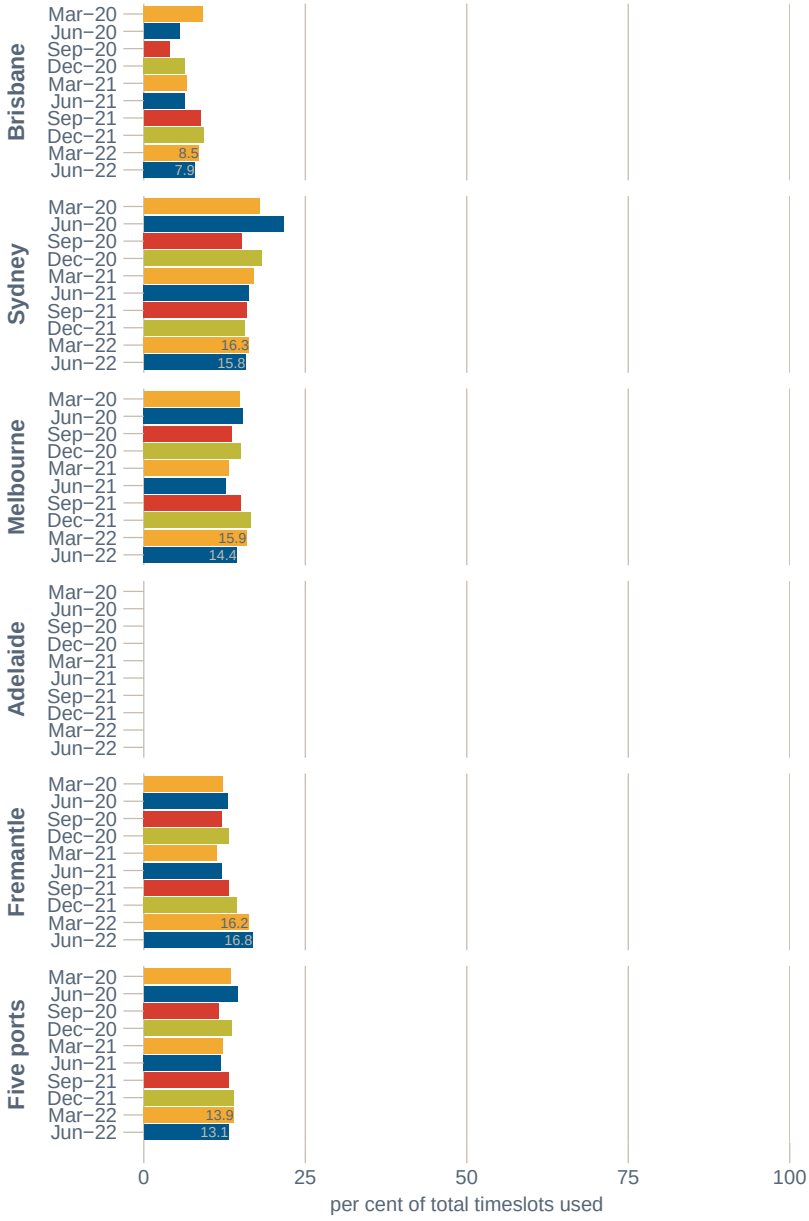
Sources: DP World (2022), Flinders Adelaide Container Terminal (2022), Hutchison Ports Australia (2022), Patrick (2022) and Victoria International Container Terminal (2022)

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



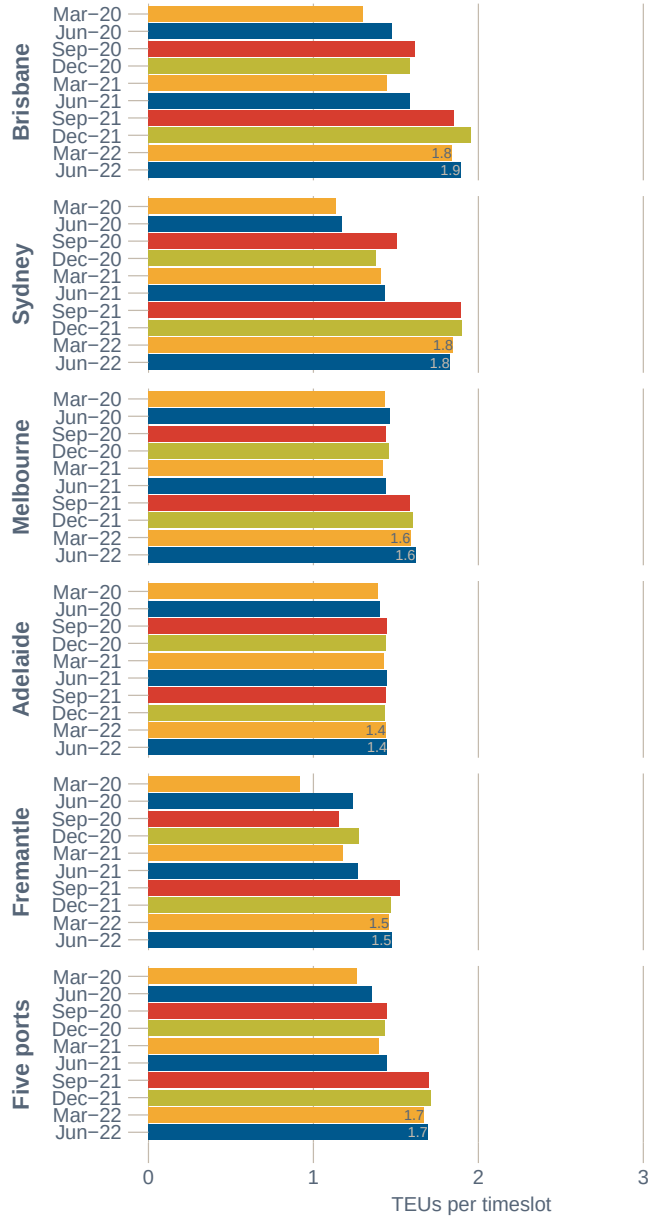
Sources: DP World (2022), Flinders Adelaide Container Terminal (2022), Hutchison Ports Australia (2022), Patrick (2022) and Victoria International Container Terminal (2022)

Figure 3.3 Timeslots used by trucks on Saturday and Sunday



Sources: DP World (2022), Flinders Adelaide Container Terminal (2022), Hutchison Ports Australia (2022), Patrick (2022) and Victoria International Container Terminal (2022)

Figure 3.4 TEUs processed per VBS timeslot used at container terminals



Sources: DP World (2022), Flinders Adelaide Container Terminal (2022), Hutchison Ports Australia (2022), Patrick (2022) and Victoria International Container Terminal (2022)

Table 3.1 Timeslots available and actually used by trucks: Brisbane

	Weekday	Shift	2020				2021				2022	
			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	109.7	109.7	114.2	115.0	119.4	110.3	103.1	99.4	96.7	101.1
		Evening	31.7	31.6	36.4	41.8	45.9	40.2	36.2	34.1	36.1	37.4
		Night	11.4	8.7	21.3	30.4	27.9	24.7	22.1	22.4	22.3	21.4
		Sub-total	152.8	150.0	171.9	187.3	193.1	175.2	161.5	155.9	155.2	159.9
	Saturday	Day	7.7	1.2	5.3	9.5	11.9	9.9	6.6	7.1	5.4	6.8
		Evening	0.1	0.1	0.0	0.2	0.2	0.0	0.2	0.3	0.2	0.2
		Night	1.5	0.7	0.3	1.6	1.9	0.9	3.5	2.4	2.3	2.4
		Sub-total	9.4	2.0	5.5	11.3	14.0	10.8	10.4	9.8	8.0	9.4
	Sunday	Day	2.9	2.9	0.4	0.6	1.0	1.0	3.5	3.3	3.3	2.3
		Evening	0.8	0.9	0.7	1.3	0.8	0.6	1.8	2.0	2.0	1.4
		Night	1.0	1.0	0.6	0.6	0.8	0.8	1.1	1.0	0.9	1.0
		Sub-total	4.7	4.8	1.7	2.5	2.6	2.4	6.4	6.4	6.2	4.6
		Total timeslots available	166.8	156.8	179.2	201.1	209.8	188.3	178.3	172.0	169.3	173.9
Used *('000)*	Monday–Friday	Day	75.4	78.0	81.0	84.5	83.7	78.4	72.7	66.4	63.6	67.4
		Evening	20.5	21.8	25.3	30.0	31.8	27.5	23.9	22.1	22.1	24.2
		Night	7.6	6.3	14.7	21.9	18.2	15.3	13.4	13.4	12.7	12.5
		Sub-total	103.5	106.1	121.0	136.4	133.7	121.2	109.9	102.0	98.3	104.1
	Saturday	Day	4.5	0.7	3.7	6.4	6.7	5.9	3.1	3.2	2.2	3.7
		Evening	0.1	0.1	0.0	0.1	0.1	0.0	0.2	0.3	0.2	0.1
		Night	1.2	0.7	0.2	1.1	1.0	0.6	1.7	1.3	1.3	1.0
		Sub-total	5.9	1.5	3.9	7.6	7.7	6.5	5.0	4.8	3.6	4.8
	Sunday	Day	2.8	2.8	0.1	0.5	0.4	0.6	3.2	3.2	3.2	2.2
		Evening	0.7	0.9	0.5	0.7	0.4	0.3	1.3	1.4	1.4	1.0
		Night	1.0	1.0	0.6	0.5	0.8	0.8	1.1	1.0	0.9	0.9
		Sub-total	4.6	4.7	1.1	1.7	1.7	1.7	5.6	5.6	5.5	4.2
		Total timeslots used	113.9	112.2	126.0	145.7	143.1	129.4	120.5	112.3	107.4	113.0

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 (2022), Hutchison Ports Australia (2022) and Patrick (2022)

Table 3.2 Timeslots available and actually used by trucks: Sydney

	Weekday	Shift	2020				2021				2022	
			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	176.9	166.9	177.1	180.7	177.3	165.9	147.4	147.2	150.9	160.2
		Evening	68.5	70.1	76.8	83.3	77.0	72.4	61.7	61.3	60.5	65.9
		Night	54.0	55.8	62.9	69.9	68.1	60.6	51.3	53.1	53.4	55.5
		Sub-total	299.4	292.8	316.8	333.9	322.4	298.9	260.4	261.5	264.8	281.7
	Saturday	Day	16.6	19.0	15.2	22.4	20.4	18.3	13.6	13.3	12.5	14.1
		Evening	2.3	3.2	2.2	4.3	3.1	3.1	3.1	2.6	2.7	2.7
		Night	9.7	10.2	8.0	8.8	8.4	7.9	8.5	6.6	6.7	6.5
		Sub-total	28.5	32.4	25.5	35.6	31.9	29.3	25.2	22.5	21.8	23.3
	Sunday	Day	18.5	20.5	14.7	19.5	16.8	15.1	14.4	14.0	15.3	14.3
		Evening	9.4	9.5	6.9	8.7	8.5	7.1	7.2	8.0	9.1	7.7
		Night	2.4	3.7	4.3	4.7	4.0	3.7	3.4	2.7	3.0	2.9
		Sub-total	30.3	33.7	25.9	32.9	29.4	25.9	25.0	24.7	27.4	25.0
		Total timeslots available	358.2	358.9	368.2	402.3	383.7	354.1	310.6	308.7	314.0	330.0
Used *('000)*	Monday–Friday	Day	105.7	102.3	112.9	117.7	117.6	110.4	92.3	92.5	91.5	94.3
		Evening	42.6	45.0	50.0	55.6	53.0	50.6	41.1	40.1	39.9	41.2
		Night	33.2	35.3	39.7	45.7	44.3	41.0	29.6	31.1	30.7	31.5
		Sub-total	181.5	182.5	202.6	218.9	214.9	202.0	163.0	163.7	162.1	167.1
	Saturday	Day	10.4	13.7	10.0	15.4	14.1	12.9	7.3	7.9	7.7	8.7
		Evening	1.6	2.8	1.7	3.3	2.2	2.1	1.6	1.4	1.4	1.5
		Night	5.2	6.4	3.7	4.2	4.2	4.3	4.3	4.1	4.0	3.9
		Sub-total	17.1	22.9	15.4	22.8	20.4	19.4	13.1	13.4	13.0	14.0
	Sunday	Day	13.9	17.1	11.8	15.4	13.6	11.7	10.4	9.5	10.8	10.3
		Evening	6.8	7.2	5.3	6.4	6.5	5.0	5.0	5.0	5.3	4.5
		Night	1.7	3.3	3.8	4.3	3.5	3.2	2.5	2.4	2.4	2.4
		Sub-total	22.4	27.6	20.9	26.0	23.6	20.0	17.9	17.0	18.5	17.2
		Total timeslots used	221.1	233.1	238.9	267.8	259.0	241.3	193.9	194.0	193.6	198.3

Sources: DP World (2022), Hutchison Ports Australia (2022) and Patrick (2022)

Table 3.3 Timeslots available and actually used by trucks: Melbourne

	Weekday	Shift	2020				2021				2022	
			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	152.6	154.3	157.3	165.5	194.6	193.0	164.7	154.7	169.2	168.9
		Evening	84.3	83.0	84.8	93.8	90.4	89.1	76.4	76.7	80.8	77.7
		Night	60.1	56.5	58.8	71.2	64.1	64.7	57.9	51.4	60.2	58.3
		Sub-total	297.0	293.8	300.9	330.5	349.1	346.8	299.0	282.8	310.2	304.9
	Saturday	Day	17.9	18.6	20.1	22.2	23.6	21.9	16.2	19.8	19.4	16.0
		Evening	3.1	2.6	0.5	0.4	0.1	0.1	2.2	2.5	2.4	2.4
		Night	9.1	8.0	7.1	9.3	9.8	9.4	5.2	5.5	5.1	4.5
		Sub-total	30.1	29.2	27.7	31.9	33.5	31.4	23.7	27.9	26.9	22.8
	Sunday	Day	15.8	14.9	10.9	13.2	17.4	17.7	20.7	18.1	17.9	19.7
		Evening	11.3	11.9	11.6	12.5	11.7	11.4	11.3	11.0	10.4	10.8
		Night	3.8	4.3	4.4	4.2	2.1	1.5	9.0	6.8	9.0	8.7
		Sub-total	30.9	31.0	27.0	29.9	31.3	30.6	41.1	35.9	37.2	39.3
		Total timeslots available	358.0	354.0	355.5	392.3	413.9	408.8	363.7	346.6	374.3	367.0
Used *('000)*	Monday–Friday	Day	139.1	147.4	158.0	158.1	168.4	167.4	142.4	133.8	143.0	143.9
		Evening	76.6	81.7	91.5	92.0	76.2	74.9	64.5	64.1	66.1	64.5
		Night	44.5	48.2	57.5	61.6	45.3	46.0	41.4	39.0	41.1	39.3
		Sub-total	260.2	277.3	307.0	311.8	289.9	288.3	248.3	236.9	250.2	247.7
	Saturday	Day	15.3	18.3	18.0	20.0	18.9	17.3	11.3	15.3	15.9	12.2
		Evening	1.8	2.3	2.1	3.5	0.1	0.1	2.1	2.4	2.3	2.3
		Night	5.7	5.5	4.4	6.1	5.2	5.2	4.7	4.4	4.5	3.8
		Sub-total	22.8	26.2	24.5	29.7	24.2	22.7	18.2	22.1	22.7	18.3
	Sunday	Day	13.0	13.7	9.9	11.1	9.6	10.4	13.4	12.9	12.9	12.7
		Evening	6.9	7.7	10.4	10.5	7.9	7.1	7.9	8.4	7.2	7.0
		Night	2.6	2.8	3.7	3.9	2.0	1.4	4.3	3.5	4.5	3.8
		Sub-total	22.5	24.2	24.0	25.5	19.6	19.0	25.6	24.8	24.6	23.4
		Total timeslots used	305.4	327.6	355.6	367.0	333.7	330.1	292.2	283.8	297.4	289.4

Note: VICT 'Used timeslots' are included from March quarter 2017, however VICT 'Available timeslots' are counted only from September quarter 2018.
Sources: DP World (2022), Patrick (2022) and Victoria International Container Terminal (2022)

Table 3.4 Timeslots available and actually used by trucks: Adelaide

	Weekday	Shift	2020				2021				2022	
			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	25.5	23.2	23.2	22.1	22.2	21.0	21.4	21.6	21.0	21.2
		Evening	20.2	17.6	18.6	17.0	17.7	16.5	15.9	15.9	15.5	15.0
		Night	20.1	18.8	20.4	19.8	19.3	18.6	18.8	18.2	17.8	17.8
		Sub-total	65.8	59.6	62.2	58.8	59.2	56.2	56.2	55.8	54.3	54.0
	Saturday	Day										
		Evening										
		Night										
		Sub-total										
	Sunday	Day										
		Evening										
		Night										
		Sub-total										
		Total timeslots available	65.8	59.6	62.2	58.8	59.2	56.2	56.2	55.8	54.3	54.0
Used *('000)*	Monday–Friday	Day	25.2	22.4	21.9	19.7	20.8	19.4	19.5	19.6	18.7	19.5
		Evening	19.8	16.7	17.1	15.6	16.4	14.9	14.0	13.6	13.4	13.8
		Night	17.1	14.8	16.8	16.3	15.8	13.7	11.6	12.5	12.7	12.1
		Sub-total	62.1	53.8	55.7	51.6	53.0	48.0	45.2	45.7	44.8	45.4
	Saturday	Day										
		Evening										
		Night										
		Sub-total										
	Sunday	Day										
		Evening										
		Night										
		Sub-total										
		Total timeslots used	62.1	53.8	55.7	51.6	53.0	48.0	45.2	45.7	44.8	45.4

Note: Blank cells mean no data was reported for the categories.
Sources: Flinders Adelaide Container Terminal (2022)

Table 3.5 Timeslots available and actually used by trucks: Fremantle

	Weekday	Shift	2020				2021				2022	
			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	66.4	63.5	70.3	64.3	64.0	60.2	48.9	52.3	53.0	50.6
		Evening	23.2	22.0	25.2	23.4	21.6	20.8	17.5	19.4	19.5	17.7
		Night	14.2	11.8	12.8	11.0	10.0	9.4	9.9	9.6	9.0	8.0
		Sub-total	103.8	97.3	108.3	98.7	95.6	90.5	76.3	81.3	81.4	76.2
	Saturday	Day	7.1	5.1	7.2	6.6	6.3	6.3	4.7	6.6	6.5	8.0
		Evening	0.0	0.0	0.2	0.4	0.0	0.2	0.0	0.4	0.4	0.4
		Night	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1
		Sub-total	7.1	5.1	7.4	7.1	6.5	6.6	4.7	7.1	6.9	8.5
	Sunday	Day	6.3	7.9	6.5	6.4	5.0	5.6	4.9	5.5	7.1	6.6
		Evening	0.5	0.8	0.4	0.5	0.3	0.3	0.7	0.6	0.8	0.8
		Night	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1
		Sub-total	6.9	8.8	6.9	6.9	5.3	6.0	5.6	6.1	8.0	7.5
		Total timeslots available	117.7	111.2	122.6	112.8	107.4	103.1	86.7	94.5	96.3	92.2
Used *('000)*	Monday–Friday	Day	53.9	54.0	60.5	53.3	53.5	50.0	37.4	41.3	42.8	41.9
		Evening	19.6	18.0	21.3	19.1	17.7	16.5	13.1	14.8	15.3	14.1
		Night	11.9	10.0	10.3	9.6	8.2	7.0	7.0	7.0	6.9	6.0
		Sub-total	85.4	82.0	92.1	82.1	79.3	73.5	57.5	63.0	65.1	62.0
	Saturday	Day	6.0	4.3	6.3	5.8	5.4	5.2	3.8	5.2	5.4	6.1
		Evening	0.0	0.0	0.2	0.3	0.0	0.0	0.0	0.3	0.2	0.1
		Night	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1
		Sub-total	6.0	4.4	6.5	6.2	5.5	5.2	3.8	5.6	5.6	6.3
	Sunday	Day	5.3	7.1	5.8	5.8	4.3	4.5	4.2	4.6	6.2	5.5
		Evening	0.5	0.8	0.4	0.5	0.2	0.3	0.6	0.4	0.7	0.7
		Night	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1
		Sub-total	5.8	7.9	6.2	6.3	4.6	5.0	4.8	5.0	6.9	6.2
		Total timeslots used	97.2	94.3	104.7	94.5	89.4	83.7	66.2	73.7	77.6	74.5

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 (2022) and Patrick (2022)

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

	Weekday	Shift	2020				2021				2022	
			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	531.1	517.7	542.1	547.6	577.5	550.5	485.5	475.2	490.8	502.0
		Evening	227.8	224.3	241.8	259.3	252.5	239.0	207.8	207.4	212.3	213.8
		Night	159.8	151.6	176.2	202.3	189.4	178.0	160.1	154.7	162.7	160.9
		Sub-total	918.7	893.6	960.1	1 009.2	1 019.4	967.5	853.4	837.3	865.8	876.7
	Saturday	Day	49.3	44.0	47.8	60.8	62.3	56.4	41.1	46.8	43.8	44.9
		Evening	5.5	6.0	2.9	5.4	3.4	3.4	5.5	5.9	5.6	5.7
		Night	20.3	18.8	15.3	19.7	20.2	18.3	17.3	14.6	14.1	13.4
		Sub-total	75.1	68.7	66.1	85.9	85.9	78.1	64.0	67.2	63.6	64.0
	Sunday	Day	43.5	46.2	32.5	39.7	40.2	39.3	43.5	40.9	43.5	42.9
		Evening	22.0	23.1	19.7	22.9	21.4	19.4	21.0	21.6	22.3	20.8
		Night	7.3	9.1	9.3	9.5	7.0	6.1	13.6	10.5	13.0	12.7
		Sub-total	72.7	78.3	61.6	72.2	68.6	64.8	78.1	73.0	78.8	76.4
		Total timeslots available	1 066.5	1 040.6	1 087.8	1 167.3	1 173.9	1 110.5	995.4	977.6	1 008.1	1 017.1
Used *('000)*	Monday–Friday	Day	399.4	403.9	434.3	433.3	443.9	425.5	364.2	353.7	359.6	367.0
		Evening	179.1	183.1	205.0	212.4	195.1	184.4	156.6	154.6	156.8	157.7
		Night	114.2	114.7	139.1	155.2	131.8	123.0	103.1	103.1	104.1	101.5
		Sub-total	692.7	701.7	778.4	800.8	770.8	733.0	623.9	611.3	620.4	626.2
	Saturday	Day	36.2	37.1	38.0	47.6	45.0	41.4	25.5	31.7	31.1	30.6
		Evening	3.5	5.3	4.0	7.2	2.3	2.2	4.0	4.5	4.1	4.0
		Night	12.1	12.6	8.3	11.5	10.5	10.2	10.7	9.8	9.7	8.7
		Sub-total	51.8	54.9	50.2	66.3	57.9	53.8	40.1	45.9	44.9	43.3
	Sunday	Day	35.0	40.8	27.6	32.8	28.0	27.4	31.2	30.2	33.2	30.7
		Evening	14.9	16.5	16.5	18.0	15.0	12.8	14.8	15.2	14.6	13.2
		Night	5.3	7.1	8.1	8.7	6.4	5.5	7.9	6.9	7.8	7.2
		Sub-total	55.2	64.4	52.3	59.5	49.4	45.7	53.9	52.4	55.6	51.1
		Total timeslots used	799.7	821.0	880.9	926.6	878.2	832.4	717.9	709.6	721.0	720.6

Note: VICT 'Used timeslots' are included from March quarter 2017, however VICT 'Available timeslots' are counted only from September quarter 2018.
Sources: DP World (2022), Flinders Adelaide Container Terminal (2022), Hutchison Ports Australia (2022), Patrick (2022) and Victoria International Container Terminal (2022)

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 (2022)
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, 35,000-40,0000 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.

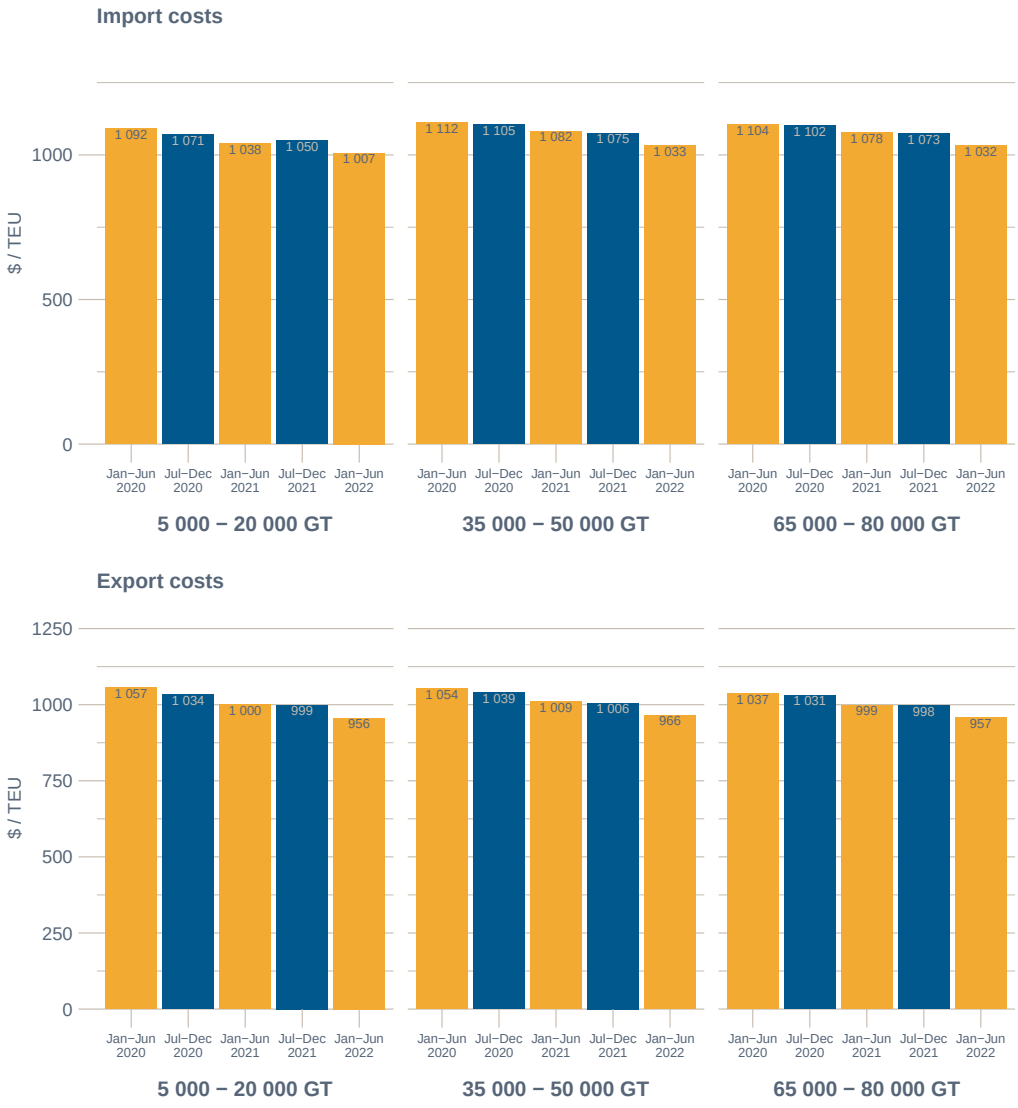
Indicator 4.25 National Port Interface Cost Index

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.

Northern Javelin departs from Outer Harbor. Photo courtesy of Flinders Ports.

Figure 4.1 Port interface costs, constant prices (January–June 2022), by ship size



Sources: BITRE estimates based on data in Tables 4.1 to 4.5 and ABS (2022).

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				
	2020		2021		2022	2020		2021		2022	2020		2021		2022
	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	398	525	426	601	636	1 116	1 374	1 235	1 509	1 429	1 646	1 901	2 090	2 491	2 403
Loaded	292	386	302	434	477	888	1 093	979	1 205	1 100	1 217	1 402	1 434	1 702	1 630
Loaded inwards	124	238	181	245	280	596	773	649	789	753	821	983	1 029	1 121	1 154
Loaded outwards	168	148	121	189	196	292	320	330	416	347	396	419	405	581	476
Empty[b]	107	138	124	167	159	228	281	255	304	329	429	499	656	789	773
Number of port calls	7	8	8	5	3	4	3	4	4	3	4	4	4	3	3
Elapsed berth time *(hours)*	28	28	21	30	33	21	27	25	31	32	25	33	35	39	44
Charges per ship visit *($)*															
Total ship-based charges	37 959	38 528	38 715	39 177	39 527	60 160	61 106	61 375	62 150	62 653	69 692	70 818	71 104	72 023	72 560
Empty	1 688	2 548	2 167	3 152	3 257	4 677	5 863	5 360	6 264	7 071	8 626	10 340	13 662	16 787	16 398
Ship-based charges *($/TEU)*															
Conservancy	10	7	9	7	6	9	7	8	7	7	10	9	8	7	7
Tonnage	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pilotage	31	24	30	21	20	18	15	17	14	15	13	12	10	9	9
Towage	48	37	46	33	32	25	20	23	19	20	18	16	14	12	13
Mooring, unmooring[c]	6	5	6	4	4	2	2	2	2	2	2	1	1	1	1
Total ship-based charges *($/TEU)*	95	73	91	65	62	54	44	50	41	44	42	37	34	29	30
Fees and charges for imports															
Total ship-based charges *($/TEU)*	95	73	91	65	62	54	44	50	41	44	42	37	34	29	30
Cargo-based charges															
Wharfage	39	39	39	40	40	39	39	39	40	40	39	39	39	40	40
Harbour dues	69	69	69	72	72	69	69	69	72	72	69	69	69	72	72
Other charges															
Stevedoring—wharfside	151	152	151	154	153	151	152	151	154	153	151	152	151	154	153
Stevedoring—landside	33	35	34	44	43	33	35	34	44	43	33	35	34	44	43
Terminal access charges[d]	52	65	72	78	83	52	65	72	78	83	52	65	72	78	83
Road transport charges[e]	433	434	434	435	435	433	434	434	435	435	433	434	434	435	435
Customs broker fees	123	122	122	122	122	123	122	122	122	122	123	122	122	122	122
Total fees and charges *($ / import TEU)*	996	988	1 012	1 009	1 011	954	959	971	985	993	943	952	956	973	979
Port's share in national index[f] *(%)*	11	16	12	12	14	20	21	20	24	19	16	18	19	19	16

(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				
	2020		2021		2022	2020		2021		2022	2020		2021		2022
	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 *($/TEU)*	95	73	91	65	62	54	44	50	41	44	42	37	34	29	30
Cargo-based charges															
Wharfage	39	39	39	40	40	39	39	39	40	40	39	39	39	40	40
Harbour dues	69	69	69	72	72	69	69	69	72	72	69	69	69	72	72
Other charges															
Stevedoring—wharfside	151	152	151	154	153	151	152	151	154	153	151	152	151	154	153
Stevedoring—landside	33	35	34	44	43	33	35	34	44	43	33	35	34	44	43
Terminal access charges[d]	46	53	59	65	72	46	53	59	65	72	46	53	59	65	72
Road transport charges[e]	433	432	433	434	434	433	432	433	434	434	433	432	433	434	434
Customs broker fees	113	113	113	113	113	113	113	113	113	113	113	113	113	113	113
Total fees and charges *($ / export TEU)*	979	966	989	985	989	938	937	948	961	971	927	929	933	949	957
Port's share in national index[g] *(%)*	13	12	9	12	14	19	20	20	25	19	14	17	16	20	14

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 (2022) 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				
	2020		2021		2022	2020		2021		2022	2020		2021		2022
	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	523	686	650	997	868	2 139	2 516	2 164	2 485	2 406	3 078	3 394	3 459	3 560	3 521
Loaded	418	527	565	764	669	1 538	1 747	1 605	1 727	1 644	2 168	2 398	2 380	2 526	2 507
Loaded inwards	169	239	227	374	345	1 141	1 320	1 160	1 257	1 267	1 595	1 874	1 848	1 902	1 919
Loaded outwards	249	288	338	390	324	397	428	446	469	376	573	524	531	624	588
Empty[b]	105	159	85	233	199	601	768	558	758	763	910	995	1 080	1 034	1 014
Number of port calls	12	9	10	7	8	3	3	3	3	3	4	4	4	4	3
Elapsed berth time *(hours)*	27	37	31	43	40	-	55	46	52	52	43	62	52	53	55
Charges per ship visit *($)*															
Total ship-based charges	32 362	32 605	32 831	33 553	33 792	65 903	66 329	66 717	68 213	68 643	86 902	87 368	87 770	89 803	90 262
Empty	1 545	2 338	1 287	7 682	6 645	8 849	11 310	8 461	25 941	26 099	13 393	14 651	16 366	35 443	34 750
Ship-based charges *($/TEU)*															
Conservancy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tonnage	20	15	16	11	12	13	11	12	11	11	14	13	13	13	13
Pilotage	12	9	9	6	7	5	4	5	5	5	4	4	3	3	3
Towage	25	19	20	14	16	11	9	11	10	10	8	7	7	7	8
Mooring, unmooring[c]	5	4	5	3	3	2	2	2	2	2	2	2	2	2	2
Total ship-based charges *($/TEU)*	62	48	51	34	39	31	26	31	27	29	28	26	25	25	26
Fees and charges for imports															
Total ship-based charges *($/TEU)*	62	48	51	34	39	31	26	31	27	29	28	26	25	25	26
Cargo-based charges															
Wharfage	142	142	146	147	147	142	142	146	147	147	142	142	146	147	147
Harbour dues	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other charges															
Stevedoring—wharfside	150	150	150	153	152	150	150	150	153	152	150	150	150	153	152
Stevedoring—landside	32	34	34	43	43	32	34	34	43	43	32	34	34	43	43
Terminal access charges[d]	54	58	72	78	83	54	58	72	78	83	54	58	72	78	83
Road transport charges[e]	478	477	480	481	481	478	477	480	481	481	478	477	480	481	481
Customs broker fees	135	136	136	136	135	135	136	136	136	135	135	136	136	136	135
Total fees and charges *($ / import TEU)*	1 053	1 044	1 068	1 071	1 080	1 021	1 023	1 049	1 065	1 069	1 019	1 022	1 043	1 062	1 067
Port's share in national index[f] *(%)*	22	16	16	25	24	35	33	34	33	36	37	37	38	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				
	2020		2021		2022	2020		2021		2022	2020		2021		2022
	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 *($/TEU)*	62	48	51	34	39	31	26	31	27	29	28	26	25	25	26
Cargo-based charges															
Wharfage	96	96	99	100	100	96	96	99	100	100	96	96	99	100	100
Harbour dues	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other charges															
Stevedoring—wharfside	150	150	150	153	152	150	150	150	153	152	150	150	150	153	152
Stevedoring—landside	32	34	34	43	43	32	34	34	43	43	32	34	34	43	43
Terminal access charges[d]	50	52	59	64	70	50	52	59	64	70	50	52	59	64	70
Road transport charges[e]	478	477	478	479	480	478	477	478	479	480	478	477	478	479	480
Customs broker fees	107	106	106	106	106	107	106	106	106	106	107	106	106	106	106
Total fees and charges *($ / export TEU)*	974	962	977	979	989	943	941	957	972	979	940	940	952	970	976
Port's share in national index[g] *(%)*	29	24	27	33	32	24	24	27	26	23	25	22	23	26	26

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 (2022) 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				
	2020		2021		2022	2020		2021		2022	2020		2021		2022
	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	836	852	903	1 104	983	2 148	2 591	2 589	2 754	2 694	3 736	3 939	3 970	3 998	3 918
Loaded	720	729	772	891	718	1 703	2 028	1 909	2 046	1 979	2 896	3 042	2 971	3 019	2 887
Loaded inwards	277	291	319	464	426	1 043	1 350	1 240	1 348	1 257	1 844	1 946	1 914	1 997	1 901
Loaded outwards	443	438	454	427	292	660	678	669	699	722	1 051	1 096	1 057	1 023	986
Empty[b]	117	123	130	213	264	444	563	680	707	715	840	898	999	979	1 031
Number of port calls	6	5	4	5	4	4	3	3	3	3	4	4	4	3	3
Elapsed berth time *(hours)*	26	28	27	34	30	29	38	35	43	42	41	44	44	51	48
Charges per ship visit *($)*															
Total ship-based charges	41 545	42 011	42 188	45 262	45 594	63 838	64 686	64 895	67 629	68 021	87 921	89 239	89 450	92 070	92 467
Empty	2 268	2 435	2 584	4 278	5 309	8 637	11 190	13 507	14 213	14 370	16 326	17 841	19 848	19 666	20 707
Ship-based charges *($/TEU)*															
Conservancy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tonnage	12	12	11	9	10	12	10	10	9	10	13	12	12	12	12
Pilotage	13	13	12	12	14	7	6	6	6	6	4	4	4	5	5
Towage	22	22	21	17	19	10	8	9	8	8	6	6	6	6	6
Mooring, unmooring[c]	3	3	3	3	3	1	1	1	1	1	1	1	1	1	1
Total ship-based charges *($/TEU)*	50	49	47	41	46	30	25	25	25	25	24	23	23	23	24
Fees and charges for imports															
Total ship-based charges *($/TEU)*	50	49	47	41	46	30	25	25	25	25	24	23	23	23	24
Cargo-based charges															
Wharfage	124	135	135	137	137	124	135	135	137	137	124	135	135	137	137
Harbour dues	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other charges															
Stevedoring—wharfside	151	151	151	153	153	151	151	151	153	153	151	151	151	153	153
Stevedoring—landside	33	34	34	43	43	33	34	34	43	43	33	34	34	43	43
Terminal access charges[d]	71	72	81	86	89	71	72	81	86	89	71	72	81	86	89
Road transport charges[e]	465	464	466	467	467	465	464	466	467	467	465	464	466	467	467
Customs broker fees	127	126	126	126	126	127	126	126	126	126	127	126	126	126	126
Total fees and charges *($ / import TEU)*	1 019	1 033	1 041	1 053	1 062	999	1 009	1 019	1 037	1 041	993	1 007	1 016	1 035	1 039
Port's share in national index[f] *(%)*	17	14	12	20	20	35	38	36	35	35	32	34	34	34	35

(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				
	2020		2021		2022	2020		2021		2022	2020		2021		2022
	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 *($/TEU)*	50	49	47	41	46	30	25	25	25	25	24	23	23	23	24
Cargo-based charges															
Wharfage	103	105	105	106	106	103	105	105	106	106	103	105	105	106	106
Harbour dues	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other charges															
Stevedoring—wharfside	151	151	151	153	153	151	151	151	153	153	151	151	151	153	153
Stevedoring—landside	33	34	34	43	43	33	34	34	43	43	33	34	34	43	43
Terminal access charges[d]	65	63	62	66	71	65	63	62	66	71	65	63	62	66	71
Road transport charges[e]	464	463	464	465	466	464	463	464	465	466	464	463	464	465	466
Customs broker fees	111	110	110	110	110	111	110	110	110	110	111	110	110	110	110
Total fees and charges *($ / export TEU)*	976	977	973	985	995	956	953	952	968	974	950	950	949	967	972
Port's share in national index[g] *(%)*	24	25	20	24	19	43	42	39	37	44	34	41	40	36	38

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 (2022) 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				
	2020		2021		2022	2020		2021		2022	2020		2021		2022
	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	-	861	-	-	-	813	878	914	1 135	1 042	1 370	1 374	1 478	1 498	1 417
Loaded	-	182	-	-	-	637	748	740	923	817	1 028	1 112	1 217	1 197	1 273
Loaded inwards	-	0	-	-	-	307	337	380	496	456	340	463	463	522	565
Loaded outwards	-	182	-	-	-	330	410	360	427	361	688	649	754	675	708
Empty[b]	-	679	-	-	-	176	130	174	211	225	342	262	261	301	144
Number of port calls	-	1	-	-	-	3	3	3	3	3	4	4	4	4	3
Elapsed berth time *(hours)*	-	29	-	-	-	23	27	24	28	26	30	31	30	30	31
Charges per ship visit *($)*															
Total ship-based charges	28 213	36 556	28 873	29 302	29 577	56 111	59 508	58 634	59 632	59 572	67 347	69 386	68 958	70 183	70 994
Empty	-	0	-	-	-	0	0	0	0	0	0	0	0	0	0
Ship-based charges *($/TEU)*															
Conservancy	-	4	-	-	-	6	7	7	5	5	6	6	6	6	6
Tonnage	-	10	-	-	-	14	15	13	12	12	14	15	13	13	14
Pilotage	-	9	-	-	-	10	9	9	7	8	6	6	5	6	6
Towage	-	19	-	-	-	39	36	35	28	31	24	24	22	22	24
Mooring, unmooring[c]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total ship-based charges *($/TEU)*	-	42	-	-	-	69	68	64	53	57	49	51	47	47	50
Fees and charges for imports															
Total ship-based charges *($/TEU)*	-	42	-	-	-	69	68	64	53	57	49	51	47	47	50
Cargo-based charges															
Wharfage	91	94	94	97	97	91	94	94	97	97	91	94	94	97	97
Harbour dues	30	30	30	31	31	30	30	30	31	31	30	30	30	31	31
Other charges															
Stevedoring—wharfside	-	157	-	-	-	157	157	157	159	158	157	157	157	159	158
Stevedoring—landside	-	37	-	-	-	36	37	38	47	47	36	37	38	47	47
Terminal access charges[d]	-	20	-	-	-	20	20	20	51	50	20	20	20	51	50
Road transport charges[e]	-	379	-	-	-	382	379	379	381	380	382	379	379	381	380
Customs broker fees	-	129	-	-	-	130	129	129	129	129	130	129	129	129	129
Total fees and charges *($ / import TEU)*	-	889	-	-	-	915	915	911	949	948	895	897	894	943	941
Port's share in national index[f] *(%)*	-	0	-	-	-	4	4	5	5	6	3	3	2	3	3

(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				
	2020		2021		2022	2020		2021		2022	2020		2021		2022
	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 *($/TEU)*	-	42	-	-	-	69	68	64	53	57	49	51	47	47	50
Cargo-based charges															
Wharfage	91	94	94	97	97	91	94	94	97	97	91	94	94	97	97
Harbour dues	30	30	30	31	31	30	30	30	31	31	30	30	30	31	31
Other charges															
Stevedoring—wharfside	-	157	-	-	-	157	157	157	159	158	157	157	157	159	158
Stevedoring—landside	-	37	-	-	-	36	37	38	47	47	36	37	38	47	47
Terminal access charges[d]	-	20	-	-	-	20	20	20	51	50	20	20	20	51	50
Road transport charges[e]	-	379	-	-	-	382	379	379	381	380	382	379	379	381	380
Customs broker fees	-	88	-	-	-	89	88	88	88	88	89	88	88	88	88
Total fees and charges *($ / export TEU)*	-	848	-	-	-	873	873	870	908	907	853	856	853	902	900
Port's share in national index[g] *(%)*	-	0	-	-	-	8	10	9	8	10	10	9	8	7	8

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 (2022) 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				
	2020		2021		2022	2020		2021		2022	2020		2021		2022
	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	2 574	2 876	2 707	2 660	2 759	1 134	1 146	1 097	1 275	1 270	2 509	2 433	2 385	2 750	2 569
Loaded	2 105	2 218	2 135	2 137	2 139	923	934	875	1 101	936	1 796	1 707	1 837	2 211	2 046
Loaded inwards	1 165	1 391	1 314	1 361	1 324	631	667	597	731	685	1 018	988	952	1 253	985
Loaded outwards	939	826	821	776	814	292	267	278	370	251	778	719	884	958	1 061
Empty[b]	469	658	573	523	620	211	211	223	173	334	713	726	548	539	523
Number of port calls	12	10	10	9	10	4	5	5	7	6	6	5	6	4	4
Elapsed berth time *(hours)*	34	44	43	65	55	26	24	27	43	37	39	43	44	61	55
Charges per ship visit *($)*															
Total ship-based charges	24 515	24 803	24 963	25 110	25 478	43 219	43 719	44 015	44 285	44 911	67 227	68 024	68 446	68 834	69 872
Empty	5 899	8 353	7 342	6 768	8 090	2 655	2 682	2 857	2 243	4 353	8 968	9 224	7 029	6 971	6 830
Ship-based charges *($/TEU)*															
Conservancy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tonnage	2	1	2	2	2	9	9	10	8	9	7	7	7	7	7
Pilotage	2	2	2	2	2	9	9	10	8	9	4	4	4	4	4
Towage	5	5	5	5	5	18	18	19	17	17	15	16	16	14	15
Mooring, unmooring[c]	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total ship-based charges *($/TEU)*	10	9	9	9	9	38	38	40	35	35	27	28	29	25	27
Fees and charges for imports															
Total ship-based charges *($/TEU)*	10	9	9	9	9	38	38	40	35	35	27	28	29	25	27
Cargo-based charges															
Wharfage	83	84	85	86	86	83	84	85	86	86	83	84	85	86	86
Harbour dues	39	40	40	40	41	39	40	40	40	41	39	40	40	40	41
Other charges															
Stevedoring—wharfside	153	153	153	156	156	153	153	153	156	156	153	153	153	156	156
Stevedoring—landside	34	35	36	46	45	34	35	36	46	45	34	35	36	46	45
Terminal access charges[d]	26	31	31	31	33	26	31	31	31	33	26	31	31	31	33
Road transport charges[e]	419	418	418	418	417	419	418	418	418	417	419	418	418	418	417
Customs broker fees	151	150	150	150	150	151	150	150	150	150	151	150	150	150	150
Total fees and charges *($ / import TEU)*	915	918	921	937	938	944	948	952	962	964	932	937	941	952	956
Port's share in national index[f] *(%)*	49	54	60	43	42	6	5	5	3	5	12	8	6	7	6

(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				
	2020		2021		2022	2020		2021		2022	2020		2021		2022
	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 *($/TEU)*	10	9	9	9	9	38	38	40	35	35	27	28	29	25	27
Cargo-based charges															
Wharfage	83	84	85	86	86	83	84	85	86	86	83	84	85	86	86
Harbour dues	39	40	40	40	41	39	40	40	40	41	39	40	40	40	41
Other charges															
Stevedoring—wharfside	153	153	153	156	156	153	153	153	156	156	153	153	153	156	156
Stevedoring—landside	34	35	36	46	45	34	35	36	46	45	34	35	36	46	45
Terminal access charges[d]	21	22	22	23	24	21	22	22	23	24	21	22	22	23	24
Road transport charges[e]	419	417	417	417	416	419	417	417	417	416	419	417	417	417	416
Customs broker fees	118	117	117	117	117	118	117	117	117	117	118	117	117	117	117
Total fees and charges *($ / export TEU)*	876	876	879	894	895	905	905	910	919	921	893	895	898	909	913
Port's share in national index[g] *(%)*	34	39	43	31	36	6	4	5	4	4	17	12	12	11	14

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 (2022) and other sources (see text).

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

Port interface costs *($ / TEU)*		2020		2021		2022
		Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun
Import	5,000–20,000 GT	973	966	970	1 003	1 007
	20,000–35,000 GT	1 015	1 016	1 022	1 029	1 034
	35,000–50,000 GT	991	997	1 011	1 027	1 033
	50,000–65,000 GT	992	998	1 011	1 032	1 035
	65,000–80,000 GT	984	994	1 007	1 025	1 032
	80,000–95,000 GT	983	990	1 002	1 020	1 022
	95,000–110,000 GT	985	987	1 003	1 030	1 027
Export	5,000–20,000 GT	942	933	935	954	956
	20,000–35,000 GT	966	958	958	968	974
	35,000–50,000 GT	940	937	943	961	966
	50,000–65,000 GT	940	942	946	964	970
	65,000–80,000 GT	925	930	933	953	957
	80,000–95,000 GT	927	932	935	954	959
	95,000–110,000 GT	922	922	932	954	950

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)*		2020		2021		2022
		Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun
	ABS non-farm GDP deflator	89.1	90.2	93.4	95.5	100.0
Import	5,000–20,000 GT	1 092	1 071	1 038	1 050	1 007
	20,000–35,000 GT	1 139	1 127	1 094	1 077	1 034
	35,000–50,000 GT	1 112	1 105	1 082	1 075	1 033
	50,000–65,000 GT	1 113	1 107	1 082	1 080	1 035
	65,000–80,000 GT	1 104	1 102	1 078	1 073	1 032
	80,000–95,000 GT	1 103	1 098	1 072	1 068	1 022
	95,000–110,000 GT	1 106	1 095	1 074	1 079	1 027
Export	5,000–20,000 GT	1 057	1 034	1 000	999	956
	20,000–35,000 GT	1 084	1 063	1 025	1 013	974
	35,000–50,000 GT	1 054	1 039	1 009	1 006	966
	50,000–65,000 GT	1 055	1 045	1 013	1 010	970
	65,000–80,000 GT	1 037	1 031	999	998	957
	80,000–95,000 GT	1 040	1 033	1 001	998	959
	95,000–110,000 GT	1 034	1 022	997	999	950

Notes: Values in constant prices are derived using the ABS non-farm GDP deflator, with January–June 2022 as the base period.

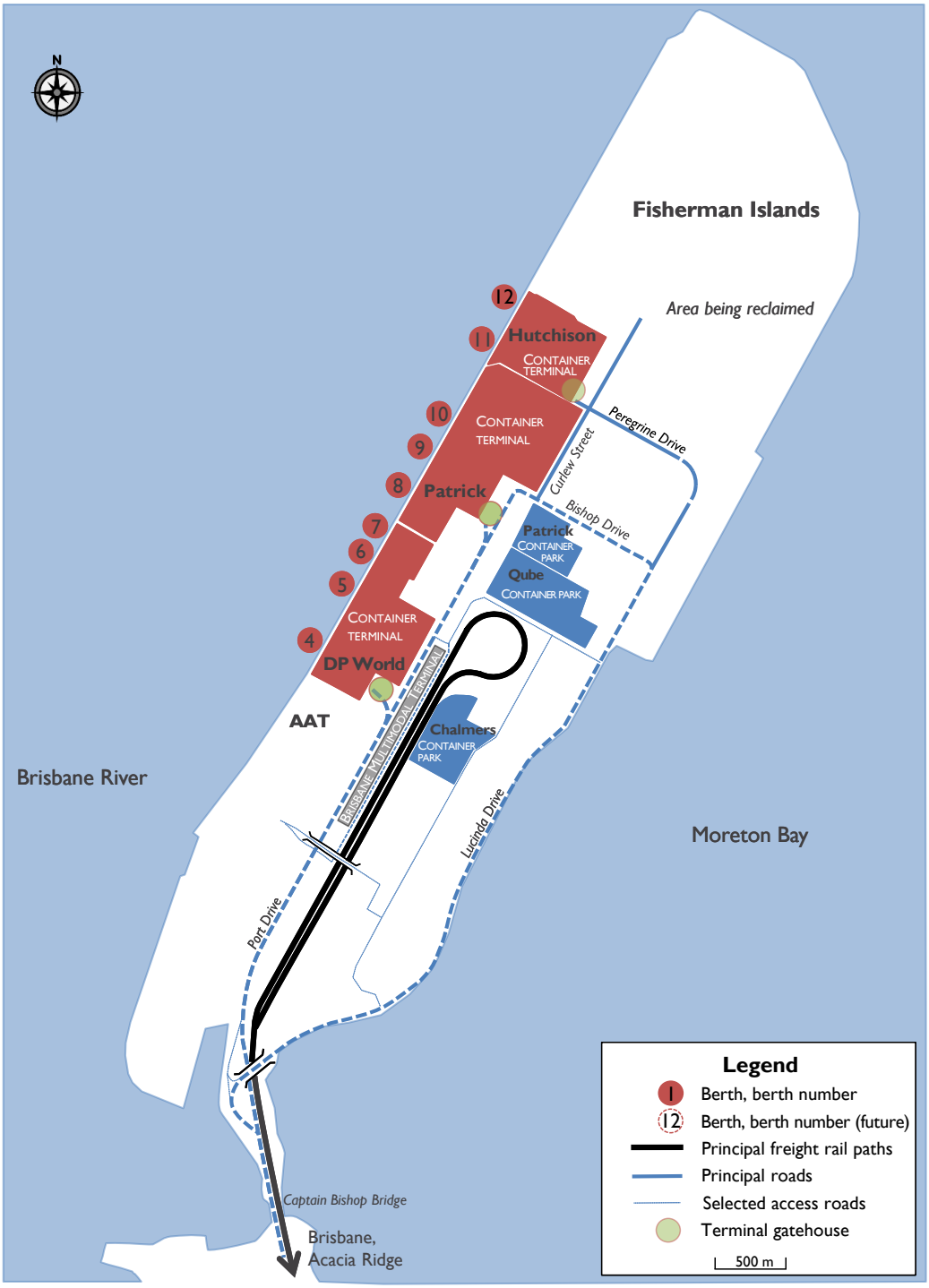
Sources: BITRE estimates based on data in Tables 4.1 to 4.5 and ABS (2022).

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 2022.

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

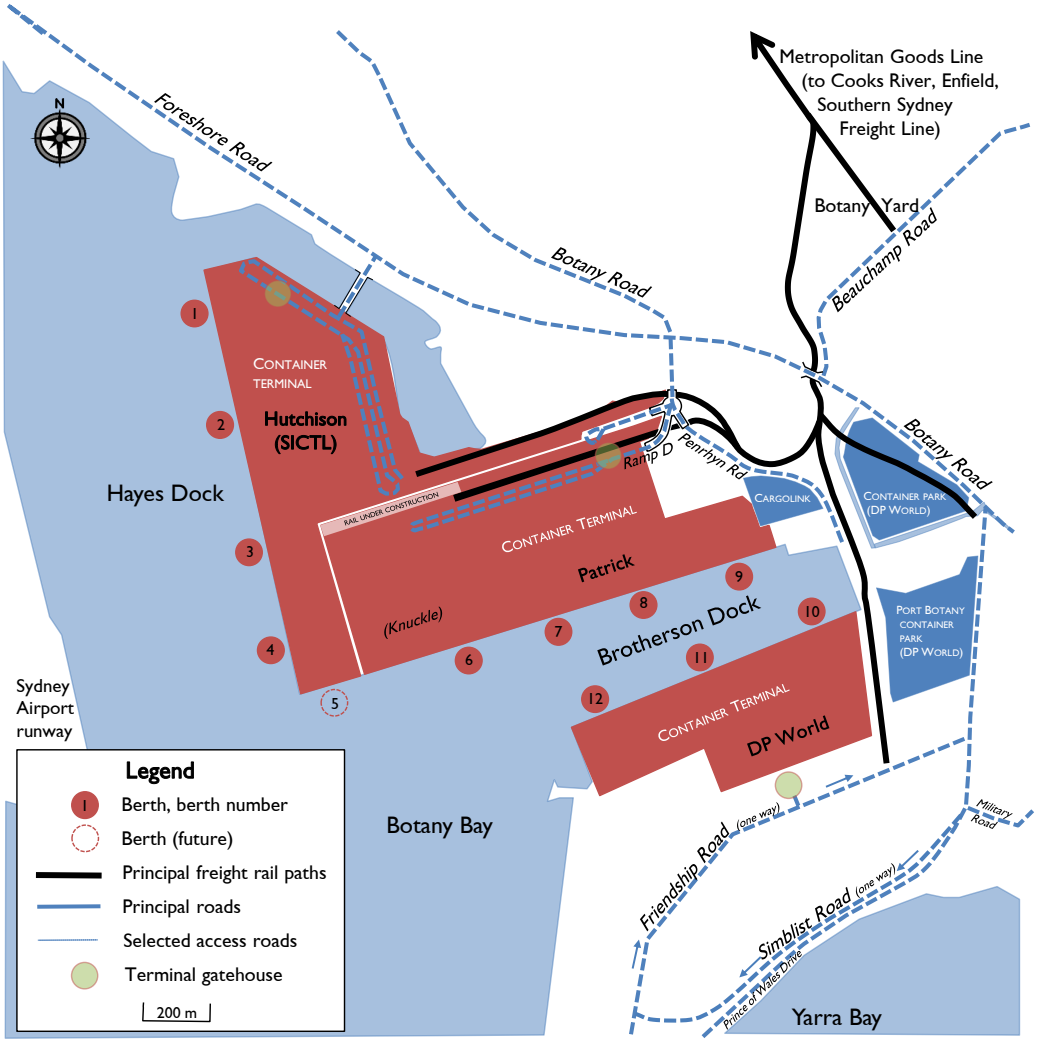
Facilities. Brisbane Multimodal Terminal provides ''near-dock'' intermodal rail facilities at Fisherman Islands. Train lengths of up to 850 metres are permitted. Containers are moved on public roads between the container terminals and the intermodal rail terminal.

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 56 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 Foreshore 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);

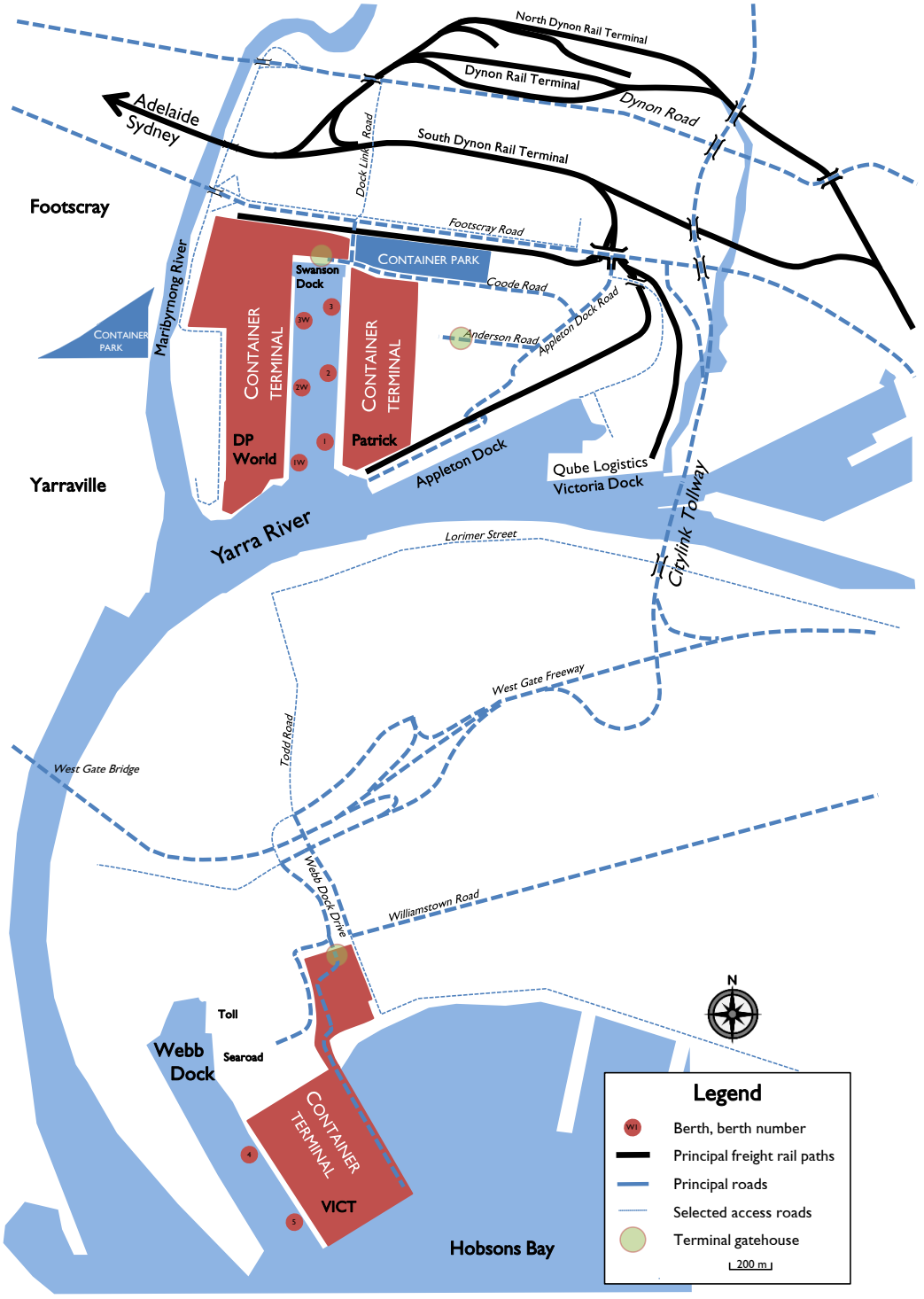
- cotton and agricultural produce from Nevertire, Warren, Warren South, Trangie South, Narrabri and Wee Waa (Qube Logistics; Sydney Rail Services);
- paper products and grain from Harefield (Qube Logistics);
- aluminium and agricultural produce from Walsh Point, Carrington and Sandgate [Newcastle] (Qube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

View from a quay crane during container loading operations on *COSCO Singapore*. Photo courtesy of Flinders 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.

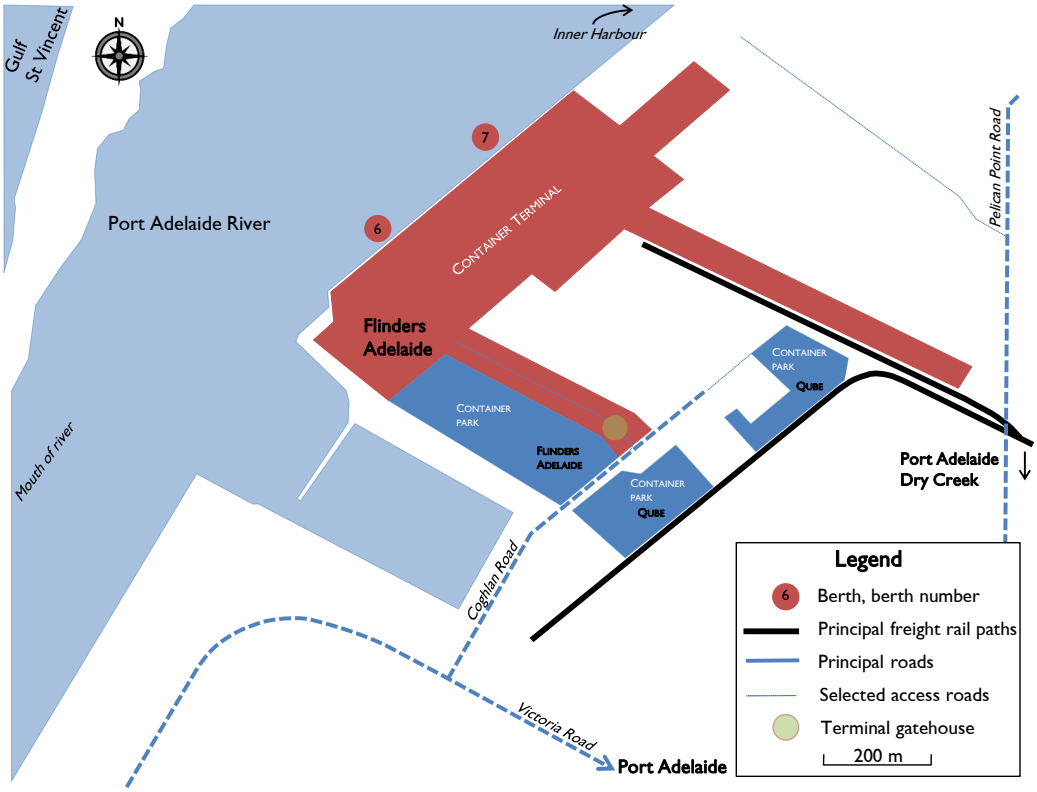
Rail linkages. The dock area consists of rail facilities near the docks and the nearby intermodal container terminals at South Dynon, Dynon and North Dynon. Although there is an eastern link from the Dynon terminals towards the east (Southern Cross and Flinders Street), the container movements are to 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.

A straddle carrier on the quay at Flinders Adelaide Container Terminal. Photo courtesy of Flinders 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).

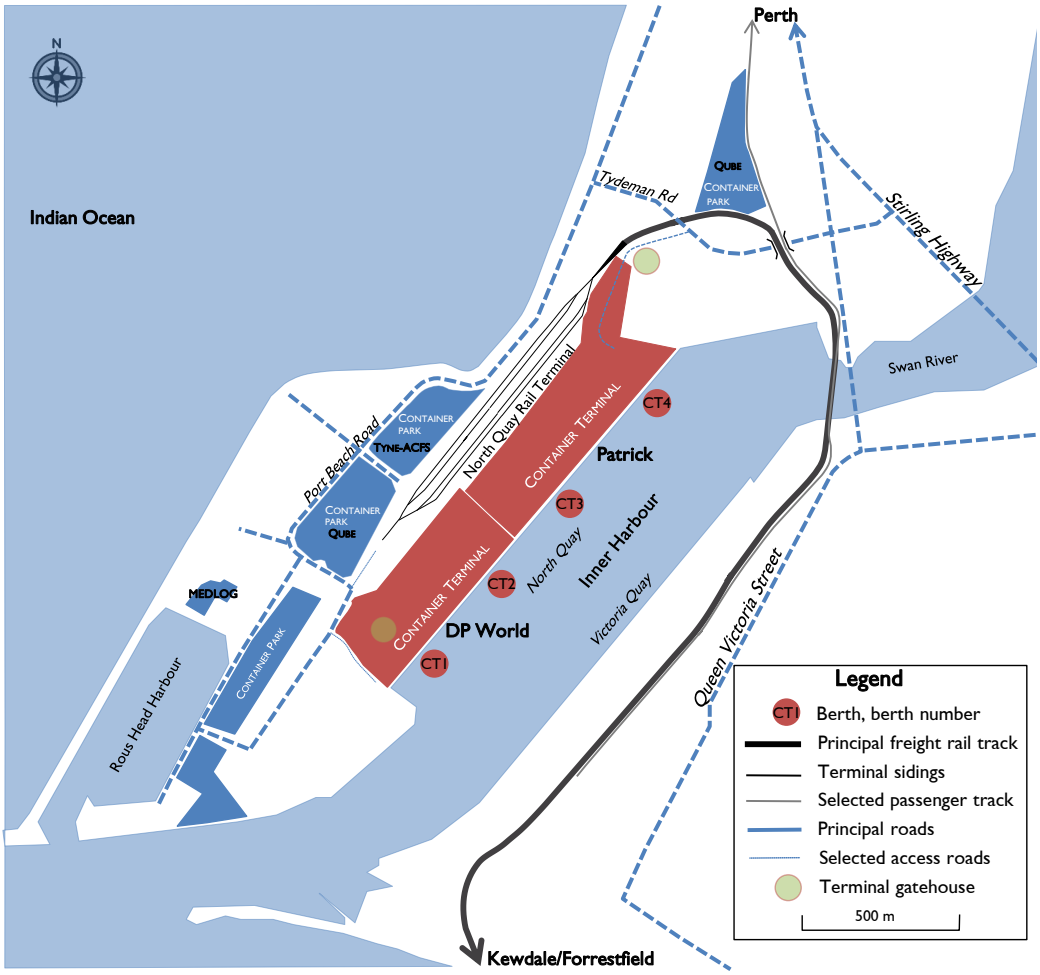
Long-haul:

- 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.

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