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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 December quarter 2020.

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.

Leo Soames
A/g Head of Bureau
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December 2021

At a glance

Throughput

- The *number of twenty-foot equivalent units (TEUs) handled by stevedores* increased by 5.7 per cent in July–December 2020 compared to July–December 2019, to 4.2 million TEUs. This exceeds the previous throughput record from July–December 2018 by 1.4 per cent.
Throughput in Melbourne increased by 10.0 per cent, Brisbane by 7.0 per cent and Sydney by 3.8 per cent, compared to July–December 2019.
Record throughput was achieved in Brisbane (1.7 per cent above July–December 2018) and Melbourne (5.1 per cent above July–December 2018).
- The *number of unitised cellular container (UCC) vessels handled by stevedores* fell by an average of 14.9 per cent across the five ports, with 298 fewer vessel calls in July–December 2020 compared to July–December 2019.

The greatest percentage reduction was in Adelaide, with 27.8 per cent fewer vessels handled compared to July–December 2019, or 57 fewer calls. In absolute terms, Sydney saw 105 fewer vessels handled—an 18.2 per cent reduction.

- The reduction in vessels handled is driven in large part by uplift in *lifts per berth visit*, which increased to an average 20.0 per cent above July–December 2019 levels across the five ports.

The average berth visit at Melbourne exchanged 2000 lifts (a 15.6 per cent increase compared to July–December 2019), at Sydney 1766 lifts (22.2 per cent increase), Fremantle 1407 lifts (22.7 per cent increase), Brisbane 973 lifts (14.9 per cent) and Adelaide 935 lifts (27.6 per cent).

The trend of increasing call size has been underway for some time, but has been accelerated as shipping lines redeploy vessels globally to adapt to the impacts of the COVID-19 pandemic.

Productivity

- All three stevedoring velocity measures declined in July–December 2020 compared to July–December 2019. As measured in containers per elapsed hour, the five-port average *ship rate* declined by 10.5 per cent, *crane rate* by 11.0 per cent and *labour rate* by 5.6 per cent.

In terms of TEUs per elapsed hour, the reductions were lessened as increased imports raised the *proportion of 40-foot containers* by 3.6 percentage points.

- Trucks became more productive in July–December 2020, with *average TEUs per truck* increasing by 18.3 per cent to 2.6 TEUs, on average, across the five ports. Performance on this measure was fairly consistent, ranging from Adelaide at 2.7 TEUs per truck movement to Sydney at 2.3 TEUs. Sydney saw the greatest improvement, a 27.7 per cent increase from 1.8 TEUs per truck in July–December 2019.

- Despite improved productivity, *average container turnaround time* still increased in July–December 2020 by an average of 2.3 minutes (12.2 per cent) across the five ports. The landside interface may have been particularly impacted by COVID-19 measures.

Container turnaround time at Sydney was unchanged in the current period compared to July–December 2019, as a result of only a modest decline in truck turnaround and significant uplift in truck productivity. However, the other four ports saw increases of at least two minutes in average container turnaround times.

- The number of *lifts per berth-hour* declined in all five ports in July–December 2020, with an average reduction of 11.6 per cent compared to July–December 2019. Much of this could be due to operational changes for the management of COVID-19, compounded by congestion effects and industrial disputes.

With the exception of Melbourne, reductions in lifts per berth-hour were worse at ports experiencing greater uplift in call size. Sydney, which experienced significant congestion of its empty-container supply chain, saw a reduction of 19.3 per cent in lifts per berth hour compared to July–December 2019. Fremantle declined by 13.5 per cent, Brisbane by 8.8 per cent, Melbourne by 6.5 per cent and Adelaide by just 2.1 per cent.

Melbourne had the best performance, at 48.5 lifts per berth hour, followed by Fremantle at 34.7 lifts per berth hour.

- The number of *VBS/TAS timeslots used by trucks in all off-peak periods as a proportion of total timeslots used* increased slightly across the five ports on average, by 0.7 percentage points to 53.2 per cent.

This was driven by an increase in weekday off-peak slot usage, which increased by 2.8 percentage points overall. Usage of weekend slots declined by 2.0 percentage points.

Port interface costs

- In constant-price terms, port interface costs for exports declined in July–December 2020 compared to July–December 2019.
 - Export costs for small (5 000–20 000 gross tonnes) vessels declined by \$13 in July–December 2020 compared to July–December 2019 (and by \$25 compared to January–June 2020), largely due to the effect of a recovery in call size on ship-based costs.
 - For mid-sized (35 000–50 000 gross tonnes) vessels, export costs declined by \$4, again due to larger call sizes, especially at the east-coast ports.
 - Export costs for large (65 000–80 000 gross tonnes) vessels were the same as in July–December 2019.

- Except for small (5 000-20 000 gross tonne) vessels, port interface costs for imports increased for all size classes in July–December 2020 compared to the second half of 2019.
 - The average import cost for small (5 000-20 000 gross tonne) vessels declined by \$2 compared to July–December 2019. This is the result of a rebalancing of activity to Brisbane, the only port where the cost for this vessel class fell.
 - For mid-size (35 000–50 000 gross tonnes) and large (65 000–80 000 gross tonnes) vessels , import costs increased by \$12. Falling ship-based costs due to larger call sizes did not keep pace with the significant uplift in Terminal Access Charges (TACs) over the year to December 2020. Only Adelaide, which undertook in 2018 to cap increases in the TAC to the Consumer Price Index (CPI) until 30 June 2021, saw an overall reduction in import cost.

Also contributing to the increase was the commencement of the \$9.75 levy per import TEU at Port of Melbourne to fund the Port Rail Transformation Project (PRTTP).

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- 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 water-side workers or stevedores. A stevedoring company typically owns equipment used in the loading or discharging operation and hires labour for that purpose. A stevedoring company may also contract with a terminal owner to manage all terminal operations. In Australia, there are three major stevedoring companies which handle containers: Patrick, Dubai Ports World and Hutchison Ports Australia.

Wharf-side throughput measures

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

Indicator 1.1 UCC ships handled, as reported by stevedores

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

Indicator 1.2 Total containers handled

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

Indicator 1.3 Total TEUs handled

This indicator is similar to total containers handled (Indicator 1.2), but measured in 'twenty-foot equivalent units' (TEUs). It accounts for containers of different sizes. The TEU is a universally-recognised measure which represents containers of different sizes in a standardised way. A 20-foot container equals one TEU, and a 40-foot container equals two TEUs. Less common container sizes may be fractions of a TEU.

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

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

Landside throughput measures**Indicator 1.5 Number of trucks used in VBS/TAS operations**

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

Indicator 1.6 Total number of containers transported by trucks and rail

This indicator includes the total number of containers transported in all modes on the land-side, 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.

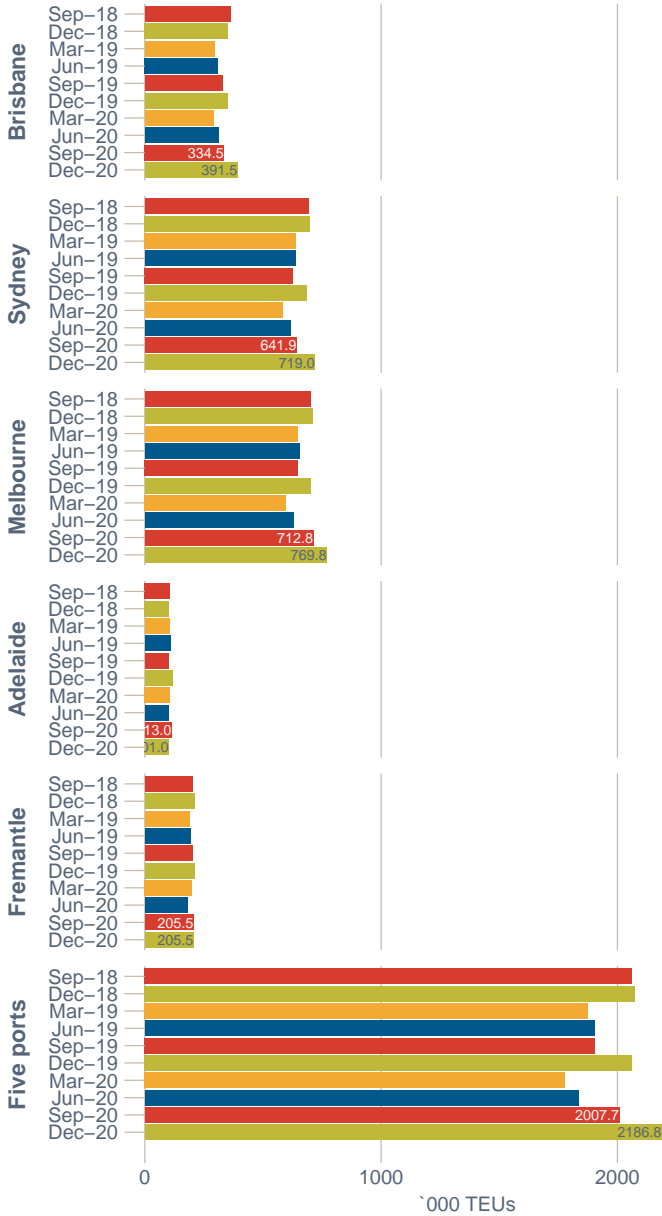
Indicator 1.20 Empty export TEUs

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



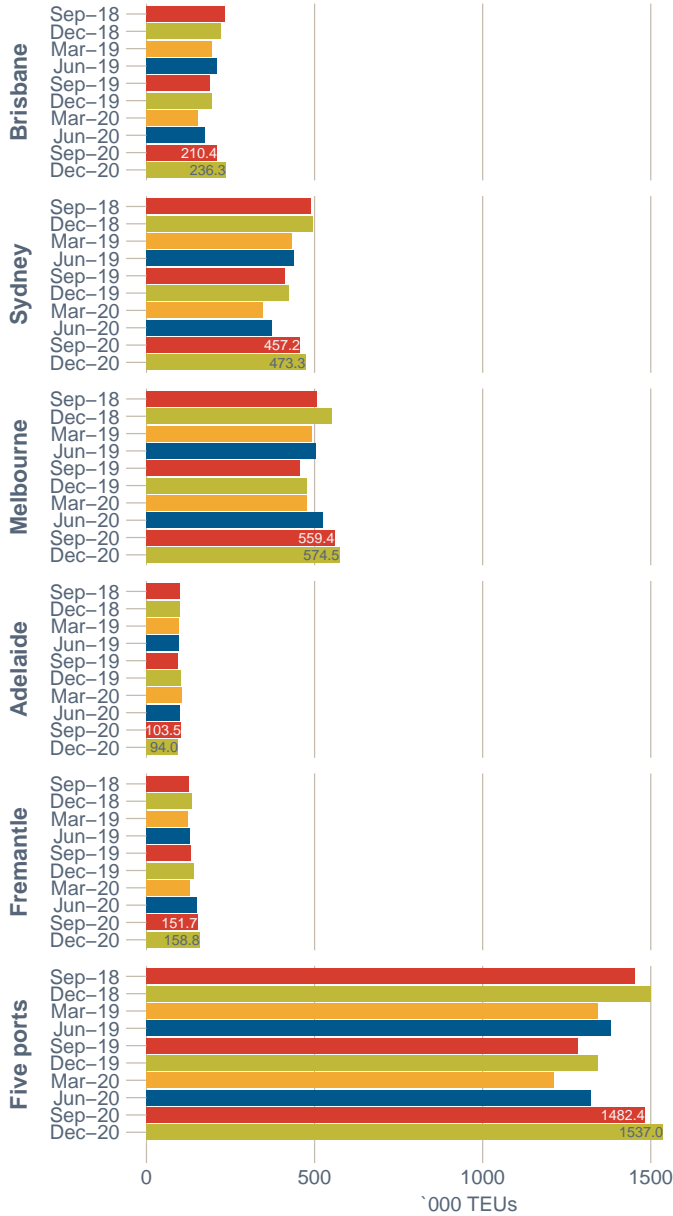
Aerial view over Fisherman Islands towards Brisbane Multimodal Terminal and the container wharves. Photo courtesy of Port of Brisbane Pty Ltd.

Figure 1.1 TEU throughput by container port: wharf-side



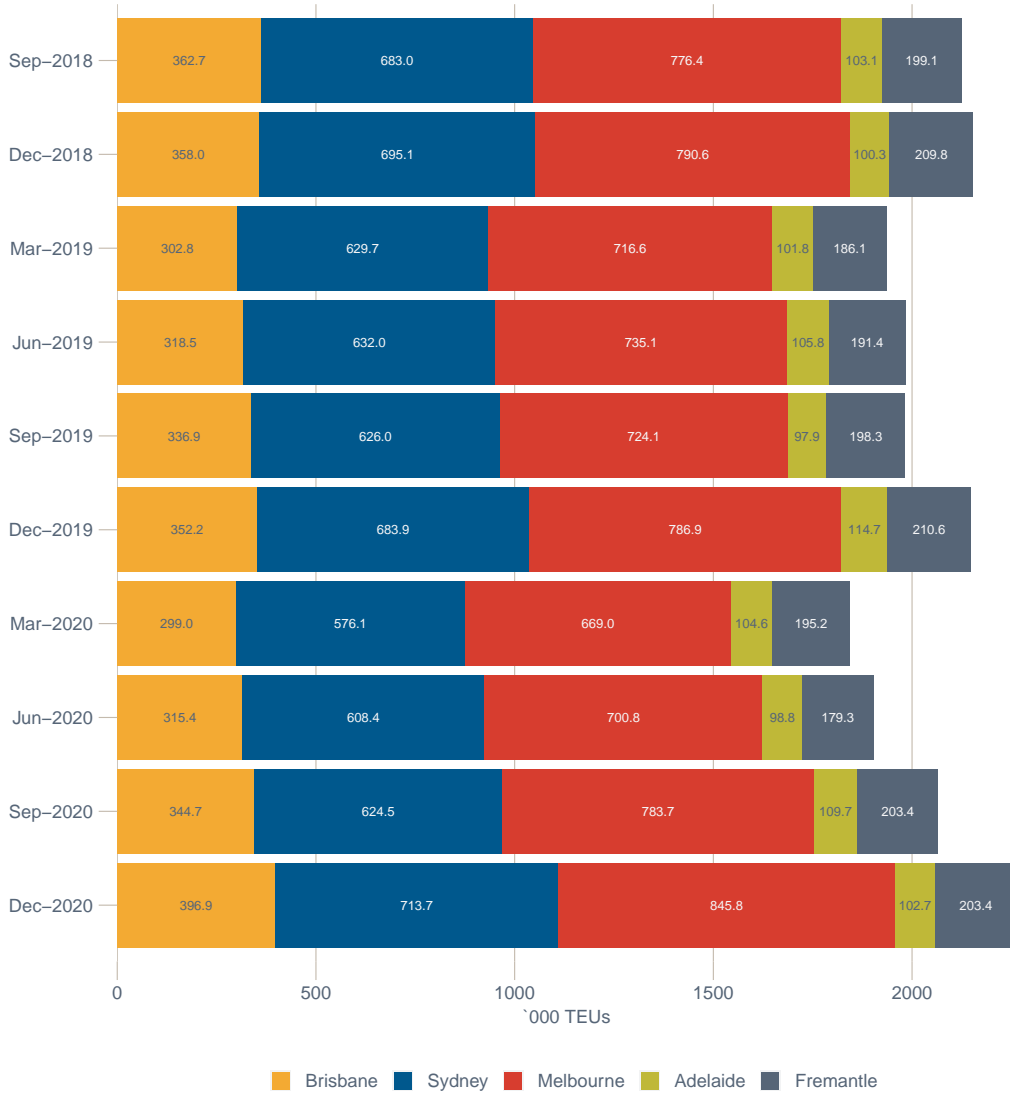
Sources: DP World (2021), Flinders Adelaide Container Terminal (2021), Hutchison Ports Australia (2021), Patrick (2021) and Victoria International Container Terminal (2021)

Figure 1.2 TEU throughput by container port: landside



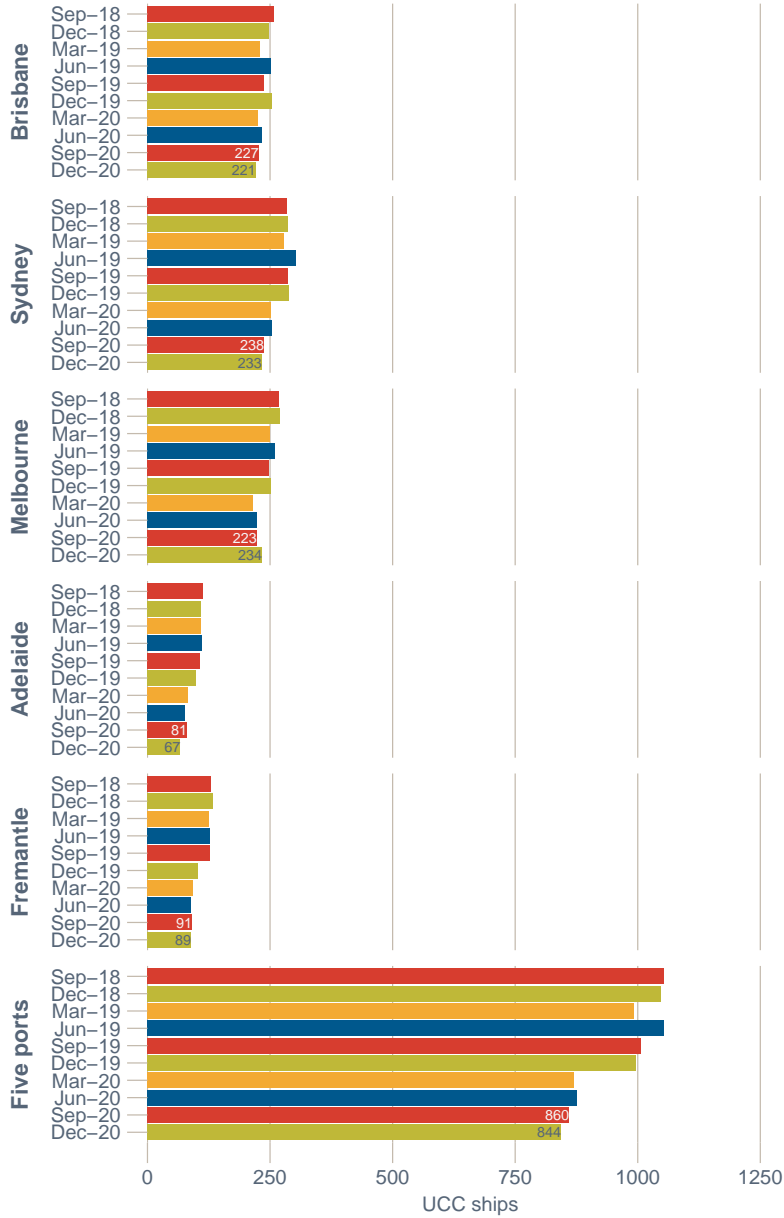
Sources: DP World (2021), Flinders Adelaide Container Terminal (2021), Hutchison Ports Australia (2021), Patrick (2021), Victoria International Container Terminal (2021), Flinders Ports (2021), Port of Brisbane Pty Ltd (2021), Port of Melbourne Operations Pty Ltd (2021) and Fremantle Ports (2021)

Figure 1.3 TEU throughput by container port: whole of port



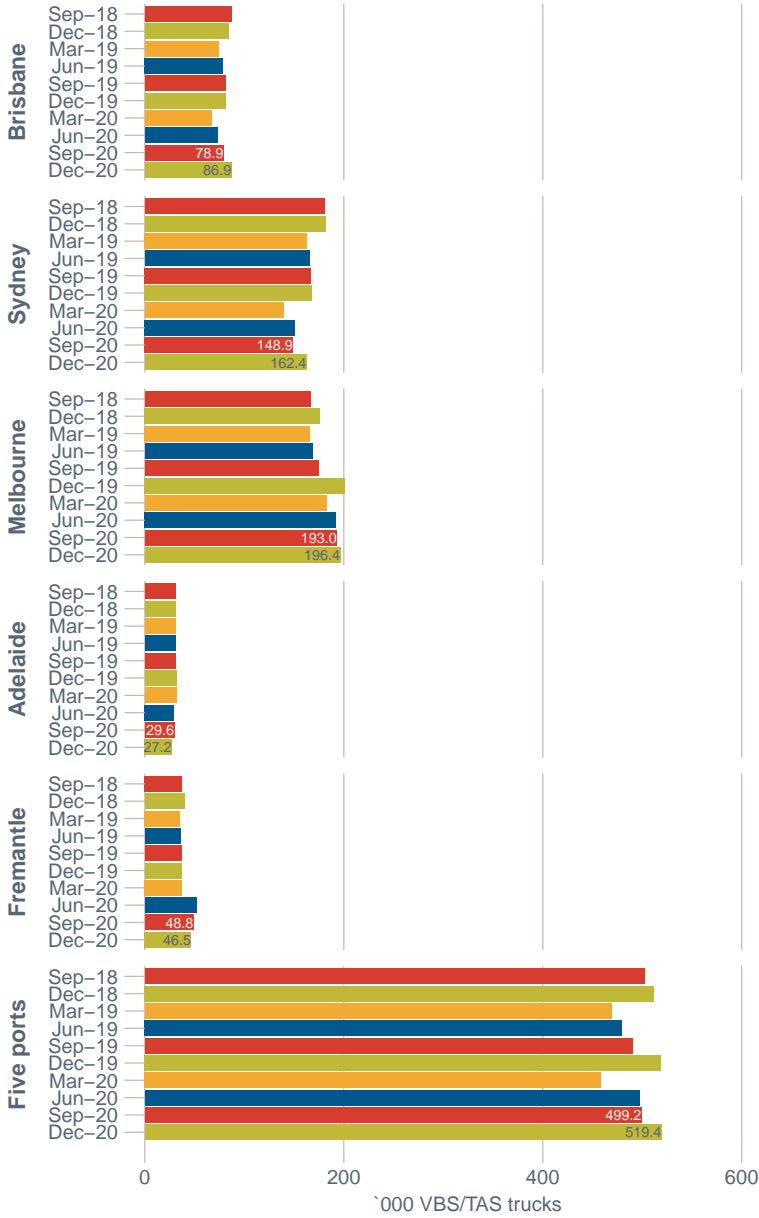
Sources: Port of Brisbane Pty Ltd (2021), NSW Ports (2021), Port of Melbourne Operations Pty Ltd (2021), Flinders Ports (2021) and Fremantle Ports (2021)

Figure 1.4 Container terminal traffic: number of UCC ships handled



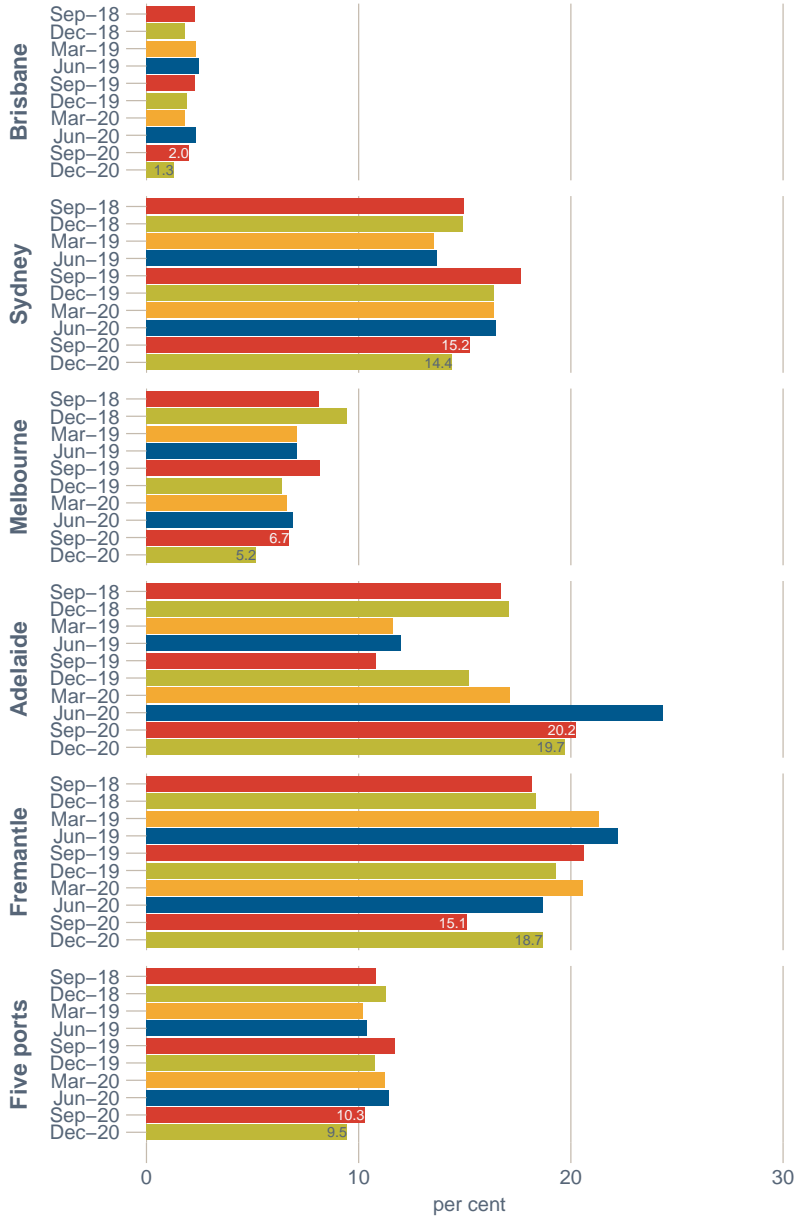
Sources: DP World (2021), Flinders Adelaide Container Terminal (2021), Hutchison Ports Australia (2021), Patrick (2021) and Victoria International Container Terminal (2021)

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



Sources: DP World (2021), Flinders Adelaide Container Terminal (2021), Hutchison Ports Australia (2021), Patrick (2021) and Victoria International Container Terminal (2021)

Figure 1.6 Rail share of TEUs handled



Sources: DP World (2021), Flinders Adelaide Container Terminal (2021), Hutchison Ports Australia (2021), Patrick (2021), Flinders Ports (2021), Port of Brisbane Pty Ltd (2021), Port of Melbourne Operations Pty Ltd (2021) and Fremantle Ports (2021)

Table 1.1 Container terminal throughput: Brisbane

	2018			2019						2020					
	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec
Wharfside															
UCC ships handled, as reported by stevedores	258	247	505	230	252	482	237	254	491	226	233	459	227	221	448
Total containers handled ('000)	232.4	225.0	457.4	190.6	198.6	389.2	211.8	221.8	433.6	189.1	201.2	390.3	212.4	246.0	458.4
Total TEUs handled ('000)	362.0	352.1	714.1	295.9	309.1	605.0	329.4	349.3	678.8	291.9	311.9	603.7	334.5	391.5	726.0
40-foot containers as proportion of all containers handled (%)	55.8	56.5	56.1	55.3	55.6	55.5	55.6	57.5	56.5	54.4	55.0	54.7	57.5	59.1	58.4
Landside															
Number of trucks used in VBS/TAS operations ('000)	86.8	83.9	170.7	73.8	78.5	152.2	80.9	81.0	161.9	67.0	73.0	140.0	78.9	86.9	165.9
Total containers transported by VBS/TAS trucks and rail ('000)	153.1	146.1	299.3	130.9	138.8	269.6	143.5	143.8	287.3	117.2	128.0	245.2	136.1	153.2	289.3
Containers by VBS/TAS trucks ('000)	145.7	140.5	286.1	124.5	131.7	256.3	136.8	138.0	274.8	112.4	121.5	233.8	130.2	148.7	278.9
Containers by rail ('000)	7.5	5.7	13.1	6.3	7.0	13.3	6.8	5.7	12.5	4.8	6.5	11.3	6.0	4.5	10.4
Total TEUs transported by VBS/TAS trucks and rail ('000)	232.2	221.2	453.4	196.3	210.4	406.7	189.7	194.9	384.6	153.3	173.1	326.4	210.4	236.3	446.8
TEUs by VBS/TAS trucks ('000)	224.1	214.8	438.9	189.3	202.7	392.1	182.1	188.3	370.4	148.0	165.8	313.7	203.8	231.2	435.0
TEUs by rail ('000)	8.2	6.4	14.6	7.0	7.7	14.7	7.6	6.6	14.2	5.3	7.3	12.7	6.7	5.1	11.7
Whole of container terminal															
Total number of container ship visits	258	258	516	239	257	496	247	263	510	237	232	469	235	224	459
Total number of containers (lifts) exchanged ('000)	229.7	225.2	454.9	190.3	197.8	388.2	213.5	218.2	431.7	190.7	189.7	380.3	209.2	237.4	446.6
Whole of port															
Total cargo throughput (million tonnes)	8.7	8.5	17.2	8.2	8.5	16.8	8.7	8.2	16.9	8.1	6.4	14.5	7.1	7.3	14.4
Non-containerised general cargo throughput (million tonnes)	0.3	0.3	0.6	0.2	0.2	0.5	0.2	0.2	0.4	0.2	0.2	0.4	0.2	0.2	0.4
Total TEUs exchanged ('000)	362.7	358.0	720.7	302.8	318.5	621.3	336.9	352.2	689.1	299.0	315.4	614.4	344.7	396.9	741.6
Full import ('000)	162.0	162.9	324.9	139.3	142.7	282.0	149.1	159.6	308.7	131.3	145.7	277.0	162.1	189.0	351.1
Empty import ('000)	22.6	12.6	35.2	13.7	18.1	31.9	26.6	17.1	43.8	15.1	20.3	35.4	16.6	15.4	32.0
Full export ('000)	99.3	82.7	182.0	79.8	92.8	172.6	97.6	90.5	188.1	78.6	86.4	165.0	88.6	90.8	179.3
Empty export ('000)	78.8	99.8	178.6	69.9	64.9	134.8	63.6	85.0	148.5	73.9	63.1	137.0	77.4	101.7	179.1

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

Sources: DP World (2021), Hutchison Ports Australia (2021), Patrick (2021) and Port of Brisbane Pty Ltd (2021)

Table 1.2 Container terminal throughput: Sydney

	2018			2019						2020					
	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec
Wharfside															
UCC ships handled, as reported by stevedores	284	287	571	279	303	582	287	289	576	252	254	506	238	233	471
Total containers handled ('000)	442.6	443.4	886.0	408.4	408.2	816.6	400.4	430.7	831.1	369.9	389.7	759.6	397.1	441.5	838.5
Total TEUs handled ('000)	691.9	698.7	1 390.5	640.0	638.2	1 278.2	627.7	684.0	1 311.7	583.7	616.0	1 199.7	641.9	719.0	1 360.9
40-foot containers as proportion of all containers handled (%)	56.3	57.6	56.9	56.7	56.4	56.5	56.8	58.8	57.8	57.8	58.1	57.9	61.7	62.9	62.3
Landside															
Number of trucks used in VBS/TAS operations ('000)	180.3	181.5	361.9	163.1	165.5	328.6	167.1	168.0	335.1	139.4	151.1	290.5	148.9	162.4	311.3
Total containers transported by VBS/TAS trucks and rail ('000)	321.3	324.2	645.5	285.4	290.0	575.4	307.2	305.8	613.0	253.1	276.3	529.5	285.7	297.0	582.7
Containers by VBS/TAS trucks ('000)	256.2	259.4	515.6	229.8	233.9	463.7	237.3	235.6	472.9	192.1	211.8	403.9	223.7	229.7	453.4
Containers by rail ('000)	65.1	64.8	129.9	55.6	56.1	111.7	69.8	70.2	140.1	61.0	64.6	125.6	62.0	67.3	129.3
Total TEUs transported by VBS/TAS trucks and rail ('000)	488.2	494.4	982.6	431.6	439.7	871.3	413.2	424.5	837.7	346.7	374.4	721.2	457.2	473.3	930.5
TEUs by VBS/TAS trucks ('000)	384.6	390.4	775.0	344.9	352.4	697.2	302.4	312.5	614.9	251.2	272.9	524.1	359.5	369.6	729.1
TEUs by rail ('000)	103.6	104.1	207.7	86.7	87.3	174.1	110.9	112.0	222.8	95.5	101.5	197.1	97.7	103.7	201.4
Whole of container terminal															
Total number of container ship visits	279	283	562	276	297	573	285	289	574	250	253	503	236	231	467
Total number of containers (lifts) exchanged ('000)	434.4	436.1	870.5	407.9	400.5	808.4	398.5	430.9	829.5	360.9	387.7	748.7	392.7	432.2	824.9
Whole of port															
Total cargo throughput (million tonnes)	7.1	6.0	13.1	5.8	6.2	12.0	6.1	5.7	11.7	5.4	5.7	11.1	5.3	6.7	12.0
Non-containerised general cargo throughput (million tonnes)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0
Total TEUs exchanged ('000)	683.0	695.1	1 378.2	629.7	632.0	1 261.7	626.0	683.9	1 309.9	576.1	608.4	1 184.5	624.5	713.7	1 338.2
Full import ('000)	338.7	347.3	686.0	307.5	310.2	617.7	320.8	339.5	660.3	283.1	308.6	591.7	323.1	362.1	685.3
Empty import ('000)	3.8	3.7	7.6	2.3	4.0	6.3	4.1	4.1	8.2	3.1	3.0	6.2	1.2	0.9	2.1
Full export ('000)	134.4	125.3	259.7	118.6	127.0	245.6	125.8	126.1	251.9	113.2	114.0	227.2	103.8	109.1	213.0
Empty export ('000)	206.1	218.8	424.8	201.3	190.8	392.1	175.3	214.2	389.5	176.7	182.8	359.4	196.4	241.6	437.9

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 (2021), Hutchison Ports Australia (2021), Patrick (2021) and NSW Ports (2021)

Table 1.3 Container terminal throughput: Melbourne

	2018			2019						2020					
	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec
Wharfside															
UCC ships handled, as reported by stevedores	269	271	540	250	261	511	247	252	499	215	223	438	223	234	457
Total containers handled ('000)	453.9	458.7	912.6	416.4	421.5	837.9	416.1	446.5	862.6	384.4	405.8	790.2	449.9	482.5	932.4
Total TEUs handled ('000)	701.1	710.0	1 411.1	647.4	654.8	1 302.2	647.8	699.9	1 347.7	597.1	629.3	1 226.4	712.8	769.8	1 482.6
40-foot containers as proportion of all containers handled (%)	54.5	54.8	54.6	55.4	55.4	55.4	55.7	56.7	56.2	55.3	55.1	55.2	58.4	59.6	59.0
Landside															
Number of trucks used in VBS/TAS operations ('000)	166.7	176.0	342.7	166.1	168.8	334.8	174.5	201.2	375.7	182.8	192.1	374.9	193.0	196.4	389.4
Total containers transported by VBS/TAS trucks and rail ('000)	330.6	356.1	686.7	318.0	322.6	640.7	351.2	416.8	768.0	340.6	359.1	699.7	354.3	364.7	719.0
Containers by VBS/TAS trucks ('000)	293.6	312.8	606.4	288.6	292.7	581.3	317.3	388.3	705.6	315.1	331.0	646.1	324.0	339.8	663.8
Containers by rail ('000)	37.0	43.3	80.3	29.5	29.9	59.4	34.0	28.5	62.4	25.5	28.1	53.6	30.3	25.0	55.2
Total TEUs transported by VBS/TAS trucks and rail ('000)	508.2	550.3	1 058.5	493.7	503.1	996.8	455.5	477.7	933.2	477.9	523.7	1 001.6	559.4	574.5	1 133.9
TEUs by VBS/TAS trucks ('000)	451.1	483.2	934.3	447.9	456.5	904.4	402.6	433.1	835.6	438.2	480.2	918.4	511.4	534.7	1 046.1
TEUs by rail ('000)	57.1	67.1	124.2	45.8	46.5	92.3	52.9	44.6	97.5	39.7	43.5	83.2	48.0	39.8	87.8
Whole of container terminal															
Total number of container ship visits	262	270	532	250	257	507	248	235	483	221	223	444	221	234	455
Total number of containers (lifts) exchanged ('000)	446.3	454.9	901.2	415.5	413.8	829.3	416.6	418.8	835.3	382.3	399.5	781.8	436.8	472.9	909.8
Whole of port															
Total cargo throughput (million tonnes)	9.7	9.5	19.1	8.8	9.0	17.8	9.0	9.2	18.2	8.4	9.0	17.5	9.3	9.7	18.9
Non-containerised general cargo throughput (million tonnes)	0.5	0.5	1.0	0.5	0.5	1.0	0.5	0.4	0.9	0.5	0.4	0.8	0.4	0.5	0.9
Total TEUs exchanged ('000)	776.4	790.6	1 566.9	716.6	735.1	1 451.7	724.1	786.9	1 511.0	669.0	700.8	1 369.8	783.7	845.8	1 629.6
Full import ('000)	358.3	367.9	726.2	325.2	331.2	656.3	341.3	356.8	698.1	299.7	324.2	623.9	366.8	406.2	773.1
Empty import ('000)	30.5	27.3	57.9	33.6	35.8	69.5	32.3	35.3	67.6	36.5	35.5	72.1	31.6	29.1	60.8
Full export ('000)	239.4	230.3	469.7	212.1	229.7	441.8	223.8	228.3	452.1	206.8	222.0	428.9	234.8	236.1	470.9
Empty export ('000)	148.2	165.0	313.2	145.7	138.4	284.1	126.7	166.6	293.3	125.9	119.0	244.9	150.5	174.4	324.9

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 (2021), Patrick (2021), Victoria International Container Terminal (2021) and Port of Melbourne Operations Pty Ltd (2021)

Table 1.4 Container terminal throughput: Adelaide

	2018			2019						2020					
	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec
Wharfside															
UCC ships handled, as reported by stevedores	113	109	222	109	111	220	107	98	205	83	77	160	81	67	148
Total containers handled ('000)	73.9	72.4	146.3	72.2	75.2	147.4	70.0	84.0	154.0	76.0	69.9	145.9	76.2	70.1	146.3
Total TEUs handled ('000)	106.3	102.0	208.3	104.4	107.5	211.9	99.1	117.3	216.4	106.4	100.0	206.3	113.0	101.0	214.0
40-foot containers as proportion of all containers handled (%)	43.8	41.0	42.4	44.6	42.9	43.7	41.5	39.6	40.5	39.9	43.1	41.4	48.2	44.1	46.2
Landside															
Number of trucks used in VBS/TAS operations ('000)	31.1	30.8	61.9	31.1	30.9	61.9	30.7	31.6	62.3	32.0	29.3	61.3	29.6	27.2	56.8
Total containers transported by VBS/TAS trucks and rail ('000)	67.6	68.8	136.4	66.3	66.7	133.0	64.2	72.1	136.3	74.5	71.8	146.3	72.9	66.1	139.0
Containers by VBS/TAS trucks ('000)	56.3	57.1	113.5	58.2	58.5	116.8	57.7	61.0	118.7	61.5	53.3	114.7	55.0	51.0	106.0
Containers by rail ('000)	11.3	11.6	22.9	8.1	8.2	16.2	6.5	11.2	17.7	13.1	18.5	31.6	17.9	15.1	33.0
Total TEUs transported by VBS/TAS trucks and rail ('000)	98.7	98.9	197.6	95.5	97.6	193.2	93.1	103.0	196.1	104.6	99.8	204.4	103.5	94.0	197.5
TEUs by VBS/TAS trucks ('000)	81.0	81.5	162.4	83.4	84.8	168.2	82.4	85.2	167.6	86.4	75.5	161.9	80.6	74.1	154.8
TEUs by rail ('000)	17.8	17.4	35.2	12.1	12.9	25.0	10.7	17.8	28.5	18.2	24.3	42.5	22.9	19.9	42.8
Whole of container terminal															
Total number of container ship visits	114	110	224	108	112	220	107	99	206	83	77	160	82	70	152
Total number of containers (lifts) exchanged ('000)	72.5	71.1	143.5	70.7	74.3	145.0	69.2	81.7	150.9	74.4	67.8	142.2	72.1	70.0	142.1
Whole of port															
Total cargo throughput (million tonnes)	3.6	3.3	6.9	3.0	3.3	6.3	3.0	3.3	6.3	3.1	3.8	6.9	3.6	3.7	7.3
Non-containerised general cargo throughput (million tonnes)	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.0	0.1	0.1	0.1	0.2
Total TEUs exchanged ('000)	103.1	100.3	203.3	101.8	105.8	207.6	97.9	114.7	212.6	104.6	98.8	203.4	109.7	102.7	212.4
Full import ('000)	40.4	40.9	81.2	40.9	38.8	79.7	35.8	45.5	81.3	34.5	33.0	67.5	41.2	39.4	80.6
Empty import ('000)	13.1	10.4	23.5	9.9	15.5	25.4	13.9	15.1	29.0	15.4	15.1	30.5	11.0	11.5	22.4
Full export ('000)	43.1	42.6	85.8	37.5	43.8	81.3	39.5	43.5	83.0	45.4	47.1	92.5	49.4	44.0	93.5
Empty export ('000)	5.9	6.1	12.0	12.2	7.3	19.5	8.4	7.9	16.3	8.5	2.6	11.1	5.4	6.0	11.4

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 (2021) and Flinders Ports (2021)

Table 1.5 Container terminal throughput: Fremantle

	2018			2019					2020						
	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec
Wharfside															
UCC ships handled, as reported by stevedores	129	133	262	125	127	252	128	103	231	93	89	182	91	89	180
Total containers handled ('000)	134.0	141.0	275.0	126.1	130.1	256.2	135.1	137.7	272.9	132.2	118.8	251.0	131.4	132.6	264.0
Total TEUs handled ('000)	200.6	210.9	411.5	187.9	192.8	380.7	201.3	211.1	412.3	199.0	179.3	378.3	205.5	205.5	411.0
40-foot containers as proportion of all containers handled (%)	49.7	49.6	49.6	49.0	48.1	48.6	48.9	53.3	51.1	50.5	50.9	50.7	56.4	54.9	55.7
Landside															
Number of trucks used in VBS/TAS operations ('000)	37.5	39.7	77.2	35.3	36.1	71.4	37.0	36.9	73.9	37.5	51.8	89.3	48.8	46.5	95.3
Total containers transported by VBS/TAS trucks and rail ('000)	90.2	96.8	187.0	89.9	93.8	183.7	93.0	90.1	183.1	96.7	116.8	213.5	102.3	105.4	207.7
Containers by VBS/TAS trucks ('000)	62.7	67.3	130.0	59.8	61.3	121.0	62.4	60.7	123.0	67.7	93.2	160.9	80.1	79.7	159.8
Containers by rail ('000)	27.5	29.5	57.0	30.2	32.6	62.7	30.6	29.5	60.1	29.0	23.6	52.6	22.2	25.6	47.9
Total TEUs transported by VBS/TAS trucks and rail ('000)	126.0	134.9	260.9	124.9	129.6	254.5	132.5	142.6	275.2	130.4	150.7	281.1	151.7	158.8	310.6
TEUs by VBS/TAS trucks ('000)	89.6	96.2	185.8	84.8	86.8	171.6	91.0	101.9	192.9	89.5	117.2	206.6	120.7	120.5	241.2
TEUs by rail ('000)	36.4	38.7	75.1	40.1	42.8	82.9	41.5	40.7	82.3	41.0	33.5	74.5	31.0	38.4	69.4
Whole of container terminal															
Total number of container ship visits	132	133	265	125	129	254	126	106	232	92	88	180	94	90	184
Total number of containers (lifts) exchanged ('000)	134.6	138.0	272.6	124.9	129.2	254.1	132.2	134.0	266.2	125.5	115.5	240.9	130.2	128.8	259.0
Whole of port															
Total cargo throughput (million tonnes)	8.3	8.5	16.8	9.0	8.7	17.7	8.6	8.4	17.0	8.3	7.4	15.7	7.2	7.9	15.1
Non-containerised general cargo throughput (million tonnes)	0.2	0.2	0.5	0.2	0.2	0.4	0.2	0.3	0.5	0.2	0.2	0.5	0.2	0.3	0.5
Total TEUs exchanged ('000)	199.1	209.8	408.9	186.1	191.4	377.5	198.3	210.6	408.9	195.2	179.3	374.5	203.4	203.4	406.8
Full import ('000)	96.0	95.2	191.2	85.4	85.0	170.4	92.9	99.0	191.8	89.3	91.5	180.8	97.8	100.8	198.7
Empty import ('000)	7.3	10.8	18.1	9.3	12.4	21.7	11.9	10.6	22.5	5.1	4.4	9.5	4.2	5.2	9.4
Full export ('000)	59.9	68.3	128.2	64.4	66.7	131.1	65.6	63.9	129.5	55.9	52.4	108.3	51.3	55.2	106.5
Empty export ('000)	35.9	35.4	71.3	27.0	27.3	54.3	27.9	37.1	65.1	44.9	31.1	75.9	50.1	42.2	92.3

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

Sources: DP World (2021), Patrick (2021) and Fremantle Ports (2021)

Table 1.6 Container terminal throughput: Five ports

	2018			2019						2020					
	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec
Wharfside															
UCC ships handled, as reported by stevedores	1 053	1 047	2 100	993	1 054	2 047	1 006	996	2 002	869	876	1 745	860	844	1 704
Total containers handled ('000)	1 336.7	1 340.5	2 677.2	1 213.7	1 233.6	2 447.3	1 233.4	1 320.8	2 554.2	1 151.6	1 185.4	2 337.0	1 267.0	1 372.7	2 639.7
Total TEUs handled ('000)	2 061.8	2 073.8	4 135.6	1 875.5	1 902.4	3 777.9	1 905.3	2 061.5	3 966.9	1 778.1	1 836.4	3 614.5	2 007.7	2 186.8	4 194.5
40-foot containers as proportion of all containers handled (%)	54.2	54.7	54.5	54.5	54.2	54.4	54.5	56.1	55.3	54.4	54.9	54.7	58.5	59.3	58.9
Landside															
Number of trucks used in VBS/TAS operations ('000)	502.4	511.9	1 014.4	469.3	479.7	949.0	490.3	518.7	1 009.0	458.6	497.3	956.0	499.2	519.4	1 018.6
Total containers transported by VBS/TAS trucks and rail ('000)	962.9	991.9	1 954.8	890.5	911.9	1 802.4	959.2	1 028.7	1 987.8	882.2	951.9	1 834.1	951.4	986.3	1 937.7
Containers by VBS/TAS trucks ('000)	814.5	837.0	1 651.6	760.9	778.1	1 539.0	811.4	883.6	1 695.0	748.7	810.7	1 559.5	812.9	848.9	1 661.8
Containers by rail ('000)	148.4	154.9	303.3	129.6	133.8	263.4	147.7	145.1	292.8	133.5	141.2	274.7	138.5	137.4	275.9
Total TEUs transported by VBS/TAS trucks and rail ('000)	1 453.3	1 499.8	2 953.1	1 342.0	1 380.5	2 722.5	1 284.0	1 342.8	2 626.7	1 212.9	1 321.8	2 534.7	1 482.4	1 537.0	3 019.4
TEUs by VBS/TAS trucks ('000)	1 230.3	1 266.1	2 496.4	1 150.3	1 183.2	2 333.5	1 060.4	1 121.0	2 181.4	1 013.2	1 111.5	2 124.8	1 276.0	1 330.2	2 606.2
TEUs by rail ('000)	223.0	233.6	456.7	191.8	197.2	389.0	223.6	221.8	445.3	199.7	210.3	409.9	206.3	206.9	413.2
Whole of container terminal															
Total number of container ship visits	1 045	1 054	2 099	998	1 052	2 050	1 013	992	2 005	883	873	1 756	868	849	1 717
Total number of containers (lifts) exchanged ('000)	1 317.4	1 325.3	2 642.7	1 209.5	1 215.6	2 425.0	1 230.3	1 283.8	2 513.9	1 133.9	1 160.4	2 294.2	1 241.3	1 341.2	2 582.5
Whole of port															
Total cargo throughput (million tonnes)	37.4	35.8	73.2	34.8	35.8	70.6	35.4	34.7	70.1	33.3	32.3	65.6	32.5	35.2	67.8
Non-containerised general cargo throughput (million tonnes)	1.1	1.1	2.2	1.0	1.0	2.1	1.0	1.0	1.9	1.1	0.8	1.9	0.9	1.2	2.1
Total TEUs exchanged ('000)	2 124.3	2 153.8	4 278.0	1 937.0	1 982.9	3 919.9	1 983.2	2 148.3	4 131.5	1 843.8	1 902.8	3 746.6	2 066.0	2 262.6	4 328.6
Full import ('000)	995.3	1 014.1	2 009.5	898.3	907.9	1 806.1	939.8	1 000.3	1 940.1	838.0	902.9	1 740.9	991.1	1 097.6	2 088.7
Empty import ('000)	77.4	64.8	142.2	68.9	85.9	154.7	88.9	82.2	171.1	75.3	78.4	153.6	64.6	62.1	126.6
Full export ('000)	576.1	549.3	1 125.4	512.4	560.0	1 072.4	552.4	552.3	1 104.6	499.9	522.0	1 021.9	527.9	535.2	1 063.1
Empty export ('000)	474.9	525.1	1 000.0	456.1	428.7	884.7	401.9	510.8	912.7	429.8	398.5	828.4	479.7	565.9	1 045.6

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

Sources: DP World (2021), Patrick (2021), Hutchison Ports Australia (2021), Flinders Adelaide Container Terminal (2021), Victoria International Container Terminal (2021), Port of Brisbane Pty Ltd (2021), NSW Ports (2021), Port of Melbourne Operations Pty Ltd (2021), Flinders Ports (2021) and Fremantle Ports (2021)

Table 1.7 Container ship visits by port: July–December 2020

	Brisbane	Sydney	Melbourne	Adelaide	Fremantle	Five ports
<i>Gross Tonnage</i>						
5 000–20 000 GT	55	64	44	1	36	200
20 001–35 000 GT	27	46	48	4	5	130
35 001–50 000 GT	124	112	122	48	31	437
50 001–65 000 GT	54	28	28	3	3	116
65 001–80 000 GT	136	143	128	45	55	507
80 001–95 000 GT	43	44	48	18	19	172
95 001–110 000 GT	12	27	30	29	29	127
All ship sizes	451	464	448	148	178	1 689

Sources: Port of Brisbane Pty Ltd (2021), NSW Ports (2021), Port of Melbourne Operations Pty Ltd (2021), Flinders Ports (2021) and Fremantle Ports (2021)

Table 1.8 Container ship visits by port: January–June 2020

	Brisbane	Sydney	Melbourne	Adelaide	Fremantle	Five ports
<i>Gross Tonnage</i>						
5 000–20 000 GT	49	79	37	-	25	190
20 001–35 000 GT	33	44	42	2	4	125
35 001–50 000 GT	160	146	155	61	45	567
50 001–65 000 GT	76	48	48	5	-	177
65 001–80 000 GT	100	115	89	42	59	405
80 001–95 000 GT	32	41	43	24	25	165
95 001–110 000 GT	9	25	24	24	21	103
All ship sizes	459	498	438	158	179	1 732

Sources: Port of Brisbane Pty Ltd (2021), NSW Ports (2021), Port of Melbourne Operations Pty Ltd (2021), Flinders Ports (2021) and Fremantle Ports (2021)

Table 1.9 Container ship visits by port: July–December 2019

	Brisbane	Sydney	Melbourne	Adelaide	Fremantle	Five ports
<i>Gross Tonnage</i>						
5 000–20 000 GT	52	83	36	-	26	197
20 001–35 000 GT	39	51	42	2	2	136
35 001–50 000 GT	192	180	176	76	49	673
50 001–65 000 GT	97	75	73	34	39	318
65 001–80 000 GT	93	139	112	67	87	498
80 001–95 000 GT	23	30	30	13	13	109
95 001–110 000 GT	2	12	10	12	12	48
All ship sizes	498	570	479	204	228	1 979

Sources: Port of Brisbane Pty Ltd (2021), NSW Ports (2021), Port of Melbourne Operations Pty Ltd (2021), Flinders Ports (2021) and Fremantle Ports (2021)

CHAPTER 2

Measures of container terminal productivity

Overview

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

Seven quarterly wharf-side productivity 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 productivity 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 productivity.

- 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 productivity measures

Measures of productivity 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 total 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 in an hour.

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.

Landside productivity 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.

Box 2.1 Crane time

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

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

Indicator 2.8 Containers per truck

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

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.

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 2.10 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.

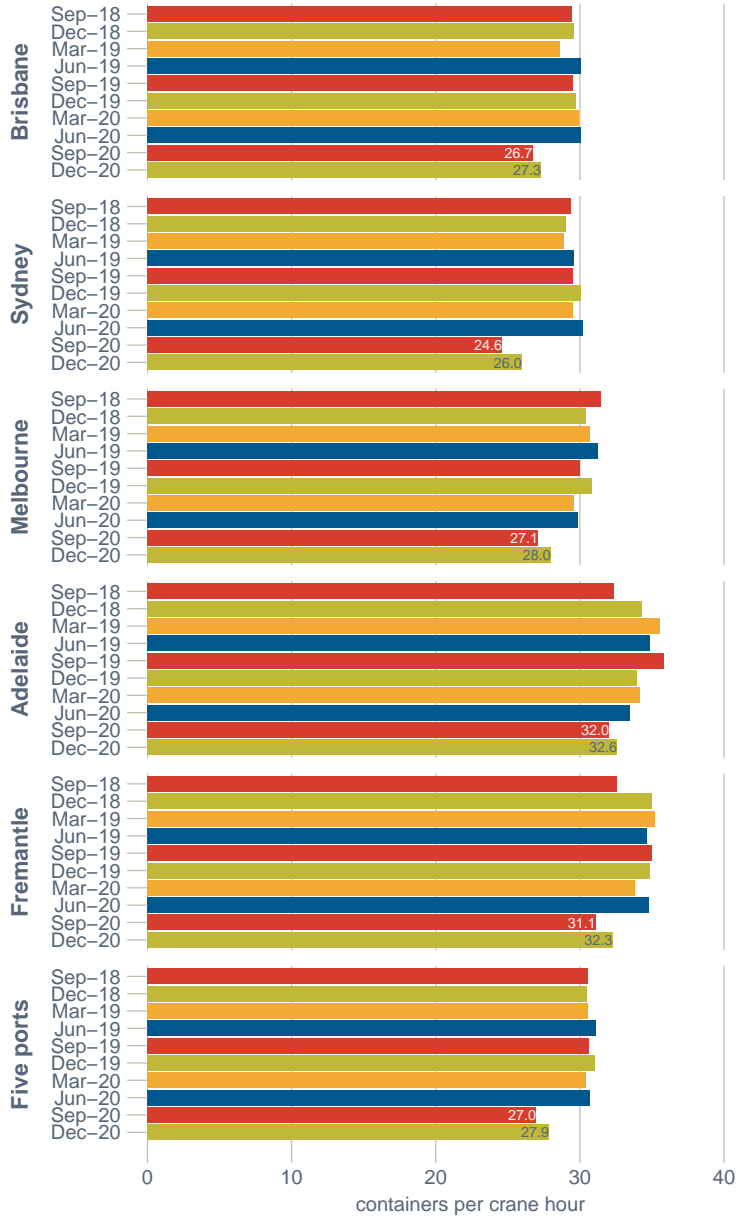
Indicator 2.23 Average lifts per hour of stevedoring operation

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

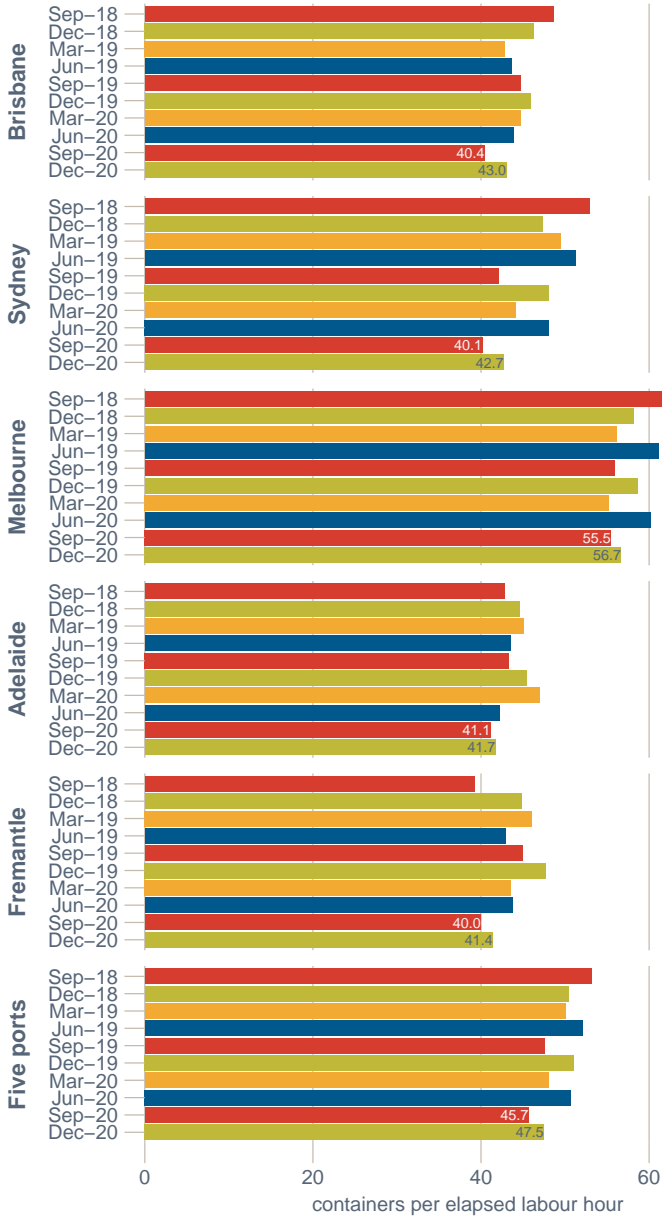
This is the number of crane lifts (containers handled) divided by the number of berth visits of dedicated container ships (UCC).

Figure 2.1 Wharf-side crane rate



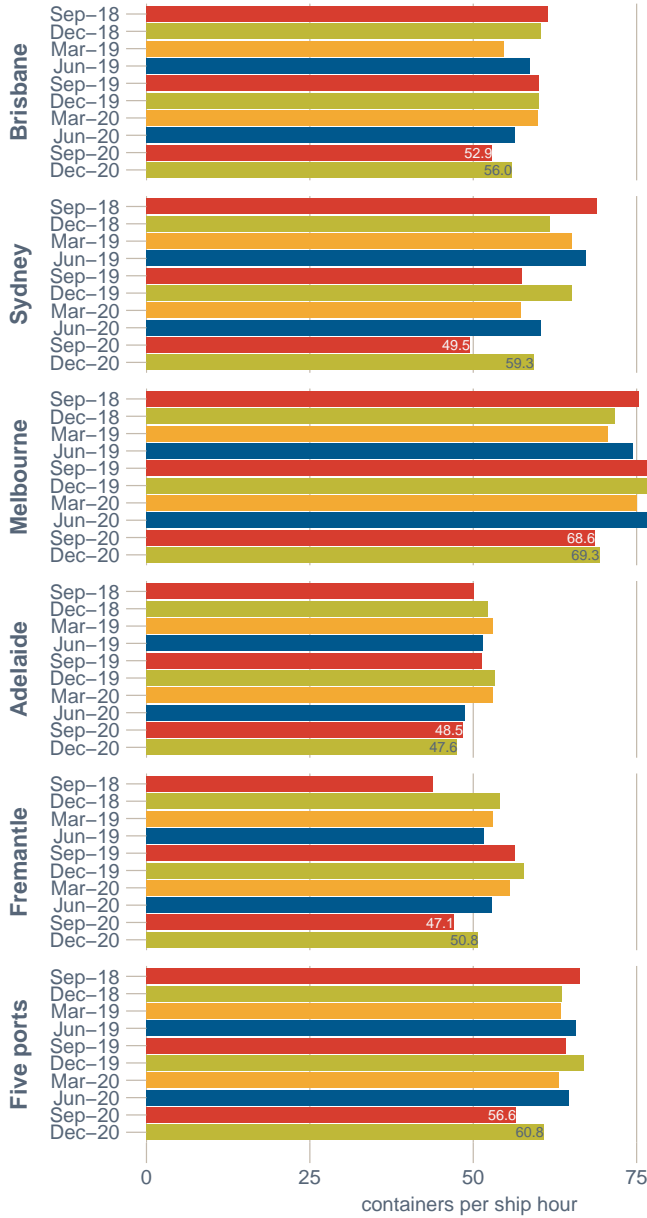
Sources: DP World (2021), Flinders Adelaide Container Terminal (2021), Hutchison Ports Australia (2021), Patrick (2021) and Victoria International Container Terminal (2021)

Figure 2.2 Wharf-side elapsed labour rate



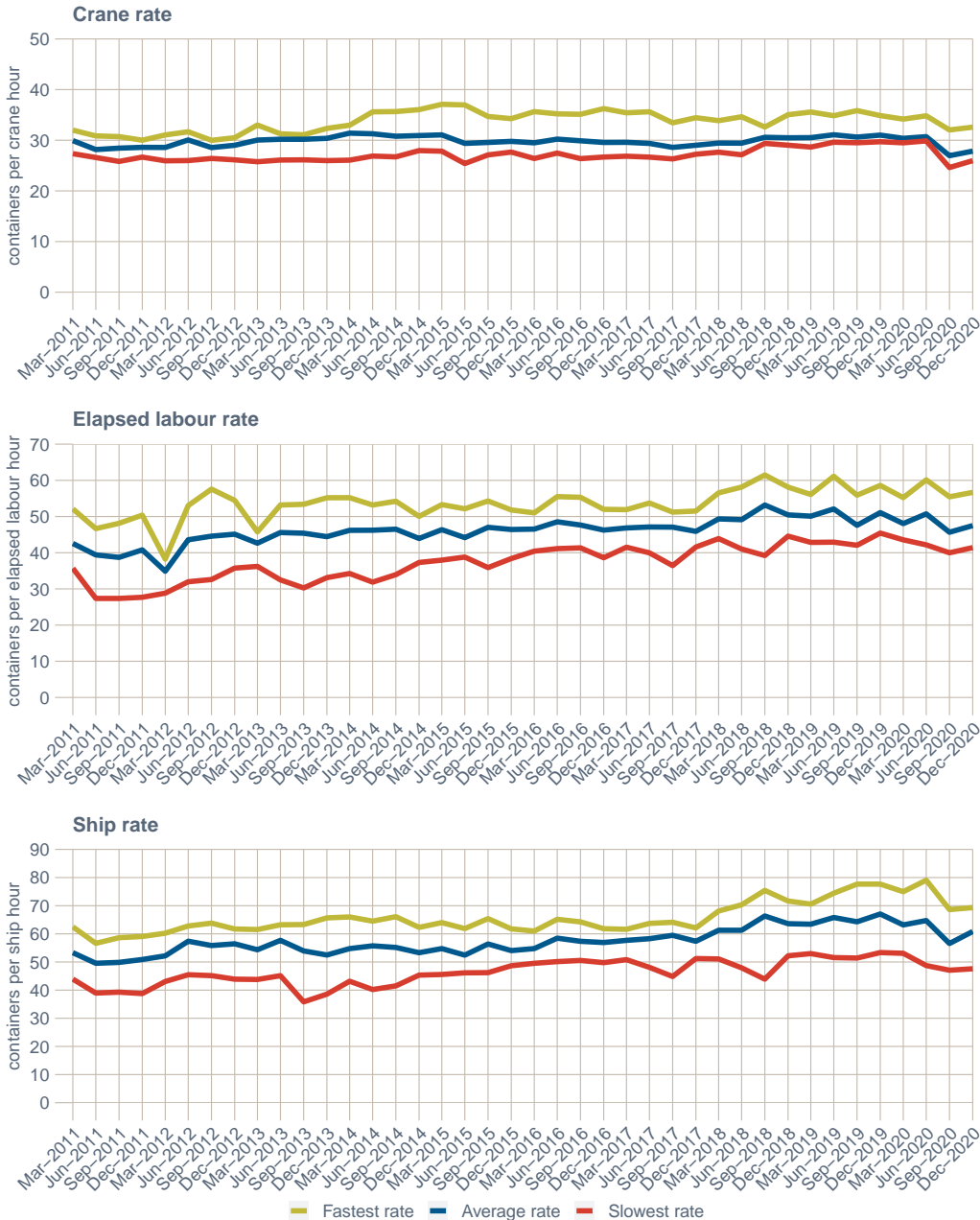
Sources: DP World (2021), Flinders Adelaide Container Terminal (2021), Hutchison Ports Australia (2021), Patrick (2021) and Victoria International Container Terminal (2021)

Figure 2.3 Wharf-side ship rate



Sources: DP World (2021), Flinders Adelaide Container Terminal (2021), Hutchison Ports Australia (2021), Patrick (2021) and Victoria International Container Terminal (2021)

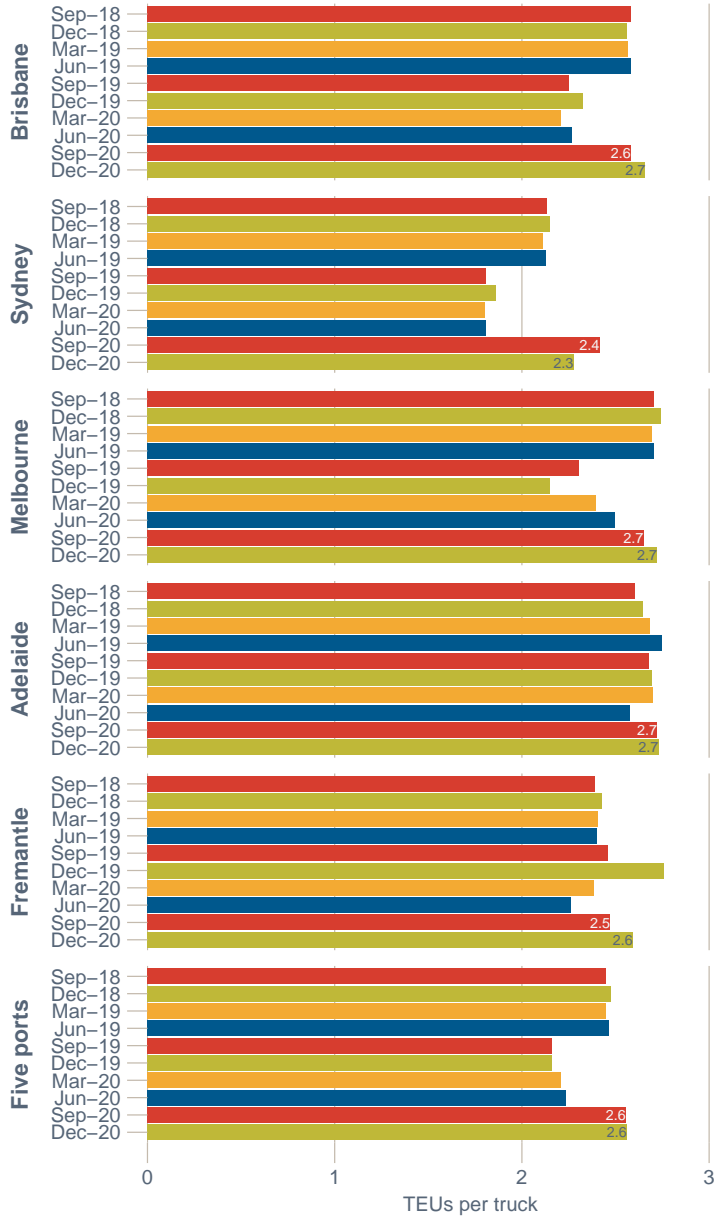
Figure 2.4 Productivity in five ports: Comparison of wharfside rates



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, labour rate and ship rate are measured in containers per crane hour, elapsed labour hour and berth hour respectively.

Sources: DP World (2021), Flinders Adelaide Container Terminal (2021), Hutchison Ports Australia (2021), Patrick (2021) and Victoria International Container Terminal (2021)

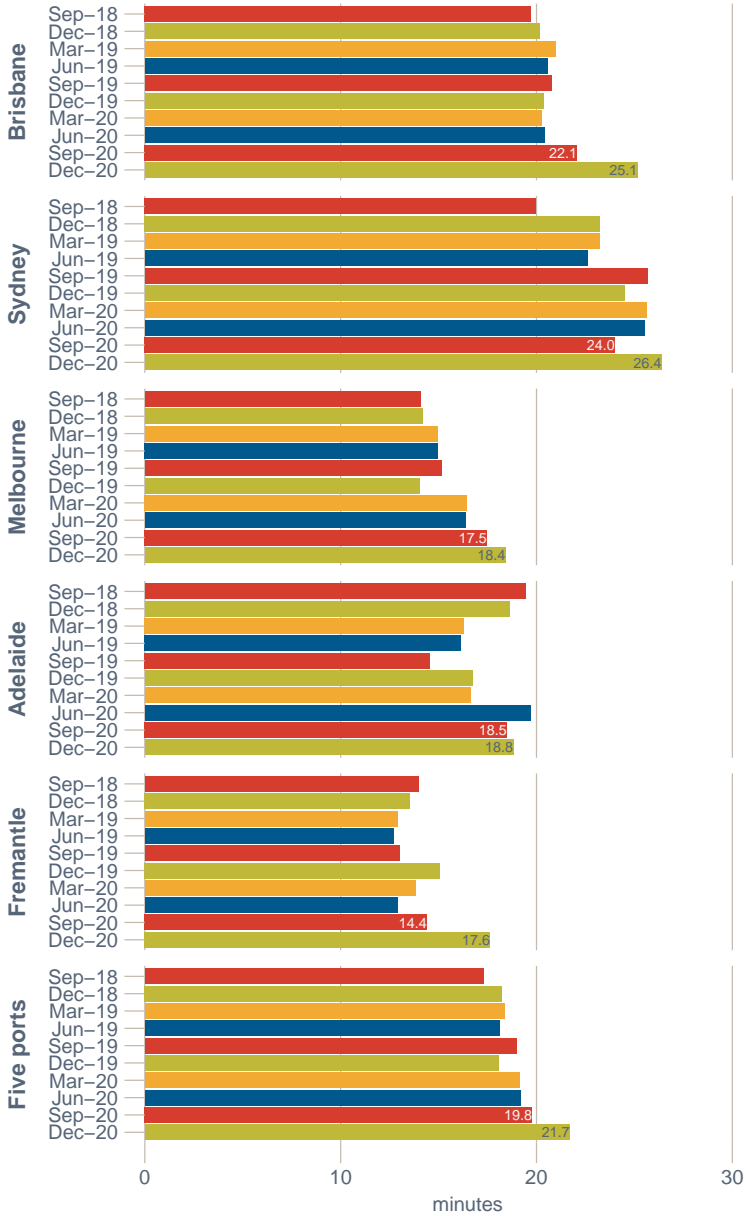
Figure 2.5 Average TEUs per truck on landside of container terminals



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

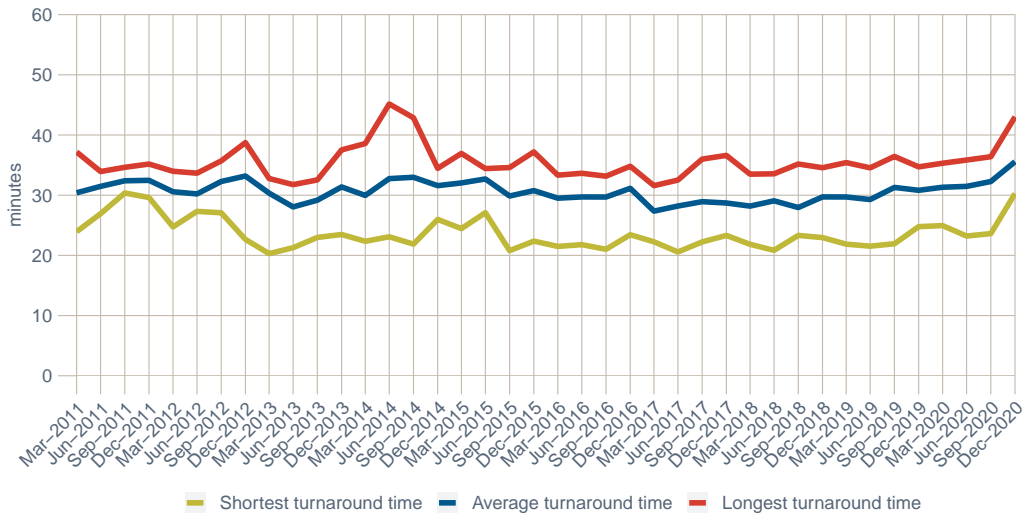
Sources: DP World (2021), Flinders Adelaide Container Terminal (2021), Hutchison Ports Australia (2021), Patrick (2021) and Victoria International Container Terminal (2021)

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 (2021), Flinders Adelaide Container Terminal (2021), Hutchison Ports Australia (2021), Patrick (2021) and Victoria International Container Terminal (2021)

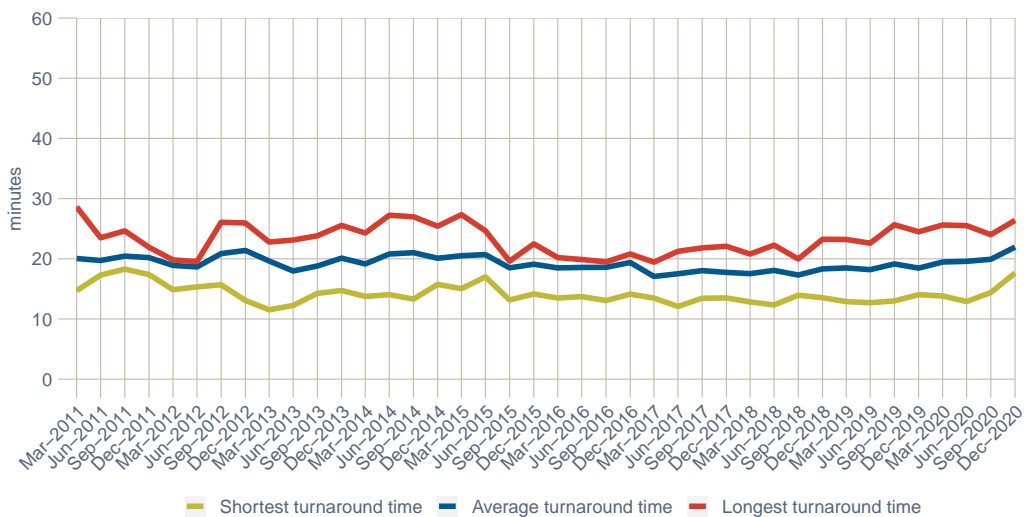
Figure 2.7 Longest and shortest truck turnaround time in five ports



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 (2021), Flinders Adelaide Container Terminal (2021), Hutchison Ports Australia (2021), Patrick (2021) and Victoria International Container Terminal (2021)

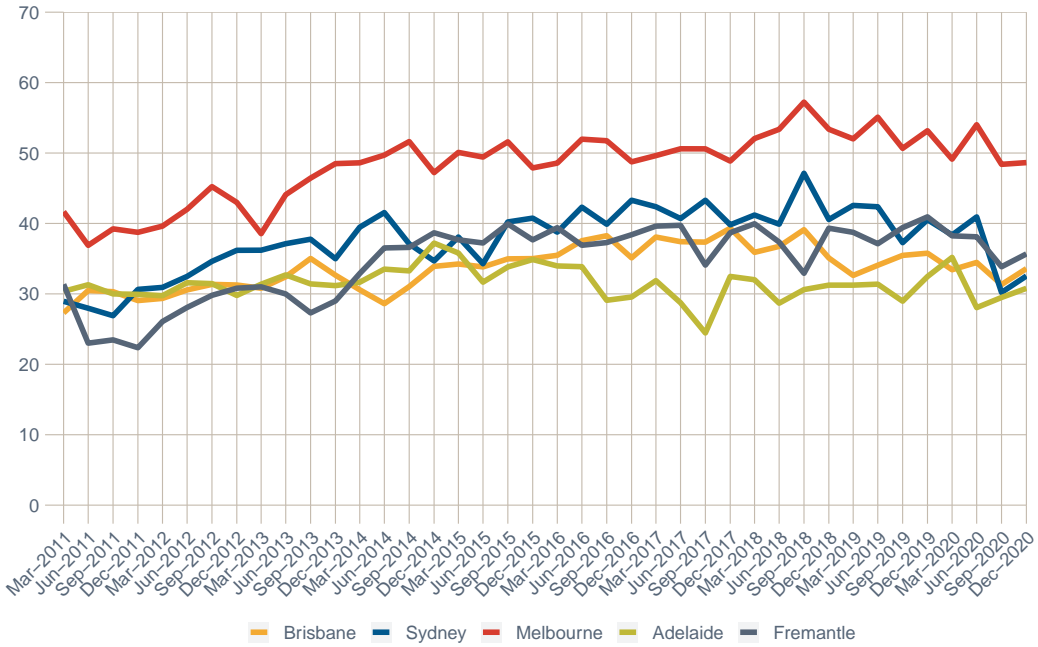
Figure 2.8 Longest and shortest container turnaround time in five ports



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.

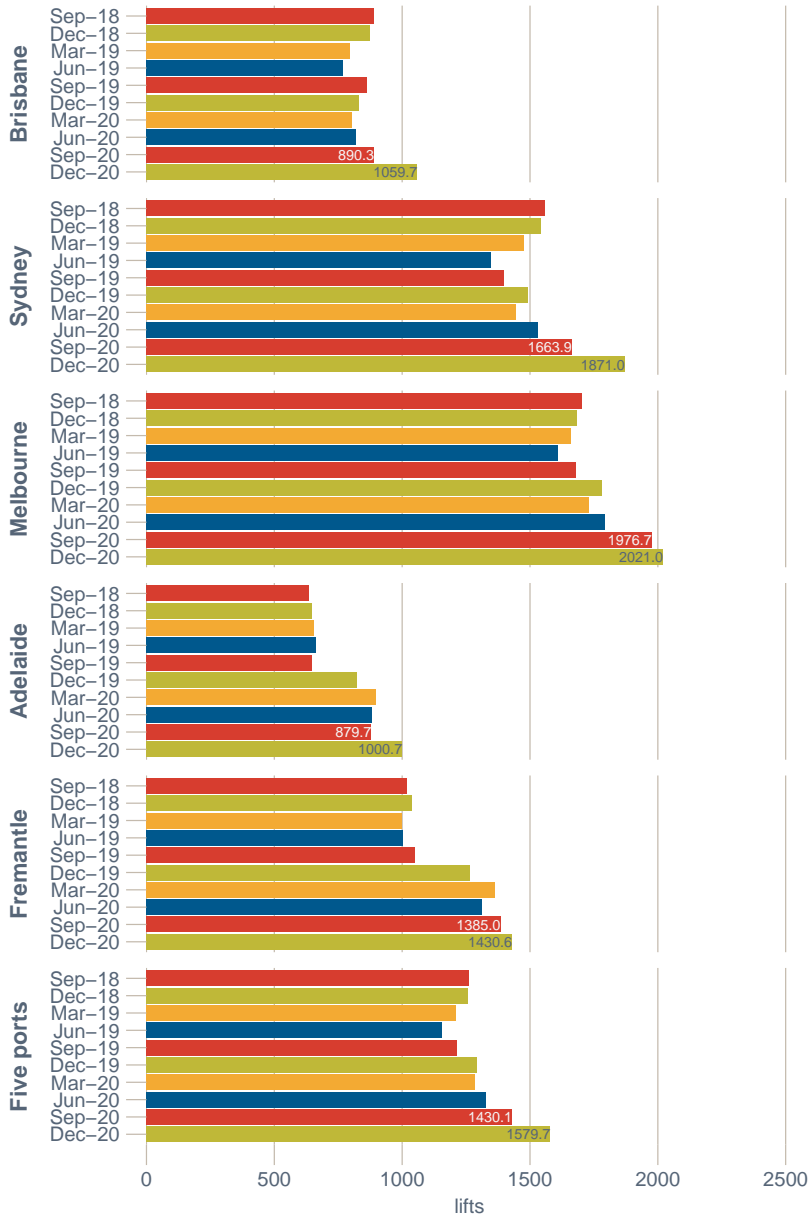
Sources: DP World (2021), Flinders Adelaide Container Terminal (2021), Hutchison Ports Australia (2021), Patrick (2021) and Victoria International Container Terminal (2021)

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 (2021), NSW Ports (2021), Port of Melbourne Operations Pty Ltd (2021), Flinders Ports (2021) and Fremantle Ports (2021)

Figure 2.10 Average number of lifts per berth visit



Sources: BITRE estimates based on data from Port of Brisbane Pty Ltd (2021), NSW Ports (2021), Port of Melbourne Operations Pty Ltd (2021), Flinders Ports (2021) and Fremantle Ports (2021)

Table 2.1 Container terminal productivity: Brisbane

	2018			2019					2020						
	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec
Wharfside															
Containers per hour															
Crane rate	29.4	29.6	29.5	28.6	30.1	29.4	29.5	29.7	29.6	30.0	30.1	30.0	26.7	27.3	27.0
Elapsed labour rate	48.6	46.3	47.5	42.9	43.6	43.2	44.7	45.9	45.3	44.7	43.9	44.3	40.4	43.0	41.8
Ship rate	61.4	60.3	60.9	54.7	58.7	56.7	60.0	60.0	60.0	59.9	56.5	58.1	52.9	56.0	54.6
TEUs per hour															
Crane rate	45.9	46.2	46.1	44.5	46.8	45.7	45.9	46.9	46.4	46.4	46.6	46.5	42.1	43.5	42.9
Elapsed labour rate	75.8	72.6	74.2	66.6	67.8	67.2	69.4	72.3	70.9	69.1	68.1	68.6	63.8	68.5	66.3
Ship rate	96.0	94.7	95.4	85.0	91.9	88.5	93.5	94.8	94.2	92.6	87.7	90.1	83.8	89.2	86.7
Containers per berth metre															
	93.2	90.3	91.7	76.4	79.7	78.1	84.9	89.0	87.0	75.8	80.7	78.3	85.2	98.7	91.9
Landside															
Containers per truck															
	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.6	1.7	1.7
TEUs per truck															
	2.6	2.6	2.6	2.6	2.6	2.6	2.3	2.3	2.3	2.2	2.3	2.2	2.6	2.7	2.6
Per cent of trucks backloaded (%)															
	12.2	11.3	11.8	11.8	11.9	11.9	12.4	11.8	12.1	10.9	10.9	10.9	11.0	11.9	11.5
Average truck turnaround time (mins)															
	33.1	33.8	33.4	35.4	34.5	35.0	35.1	34.7	34.9	34.0	34.0	34.0	36.4	43.0	39.9
Average container turnaround time (mins)															
	19.7	20.1	19.9	21.0	20.6	20.8	20.8	20.4	20.6	20.2	20.4	20.3	22.1	25.1	23.7
Whole of container terminal															
Ship turnaround time															
Median of ship turnaround time (hours)	30.2	31.3	30.8	30.6	29.1	29.8	31.0	30.1	30.5	30.7	29.7	30.4	34.6	39.8	37.6
95th percentile of ship turnaround time (hours)	50.6	54.0	52.7	56.2	52.0	52.9	60.3	57.8	58.7	63.2	57.8	61.5	68.4	100.4	91.2
Port congestion															
Number of ships waiting at anchorage for more than 2 hours	20	17	37	15	21	36	23	20	43	24	16	40	30	43	73
Per cent of ships waiting at anchorage for more than 2 hours (%)	7.8	6.6	7.2	6.3	8.2	7.3	9.3	7.6	8.4	10.1	6.9	8.5	12.8	19.2	15.9
Average waiting time at anchorage (hours)	22.2	20.6	21.5	17.5	15.0	16.1	19.0	20.5	19.7	15.4	21.0	17.7	24.1	28.2	26.5
Median waiting time at anchorage (hours)	12.7	10.3	12.4	13.0	9.2	11.4	16.2	14.3	14.3	9.6	16.1	12.2	14.8	14.6	14.6
Total time ships spent at berth ('000 hours)															
	5.9	6.4	12.3	5.8	5.8	11.6	6.0	6.1	12.1	5.7	5.5	11.2	6.7	7.1	13.7
Average TEUs per ship-hour at berth (TEUs per hour)															
	60.9	54.9	57.8	50.7	53.0	51.8	55.2	56.3	55.8	51.6	53.4	52.5	49.3	53.4	51.4
Average lifts per ship-hour at berth (lifts per hour)															
	39.1	35.1	37.0	32.6	34.1	33.3	35.5	35.8	35.6	33.4	34.5	33.9	31.3	33.6	32.5
Total time ships are available to stevedores ('000 hours)															
	4.8	4.9	9.7	4.5	4.6	9.0	4.7	4.8	9.6	4.2	4.6	8.8	5.3	5.7	11.1
Average lifts per hour of stevedoring operation (lifts per hour)															
	47.8	46.1	46.9	42.6	43.4	43.0	45.0	45.1	45.0	45.0	41.3	43.1	39.2	41.4	40.3
Average lifts per berth visit (lifts)															
	890.3	872.8	881.6	796.3	769.8	782.6	864.3	829.8	846.5	804.5	817.6	810.9	890.3	1 059.7	972.9

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

Sources: DP World (2021), Hutchison Ports Australia (2021), Patrick (2021), Port of Brisbane Pty Ltd (2021) and Maritime Safety Queensland (2021)

Table 2.2 Container terminal productivity: Sydney

	2018			2019						2020					
	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec
Wharfside															
Containers per hour															
Crane rate	29.4	29.0	29.2	28.9	29.6	29.3	29.5	30.1	29.8	29.5	30.2	29.9	24.6	26.0	25.3
Elapsed labour rate	52.9	47.3	50.1	49.4	51.3	50.3	42.1	48.1	45.2	44.1	48.1	46.2	40.1	42.7	41.5
Ship rate	68.9	61.7	65.3	65.2	67.3	66.2	57.4	65.1	61.4	57.3	60.4	58.9	49.5	59.3	54.6
TEUs per hour															
Crane rate	45.9	45.7	45.8	45.3	46.3	45.8	46.3	47.8	47.1	46.5	47.7	47.1	39.9	42.3	41.1
Elapsed labour rate	83.0	74.7	78.9	77.7	80.2	78.9	65.9	76.6	71.4	69.8	76.0	73.0	64.8	69.6	67.3
Ship rate	108.2	97.5	102.8	102.6	105.3	103.9	89.9	103.8	97.1	90.5	95.5	93.1	80.0	96.4	88.7
Containers per berth metre	121.7	121.9	121.8	112.3	112.2	112.3	110.1	118.4	114.3	101.7	107.2	104.4	109.2	121.4	115.3
Landside															
Containers per truck	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.5	1.4	1.5
TEUs per truck	2.1	2.2	2.1	2.1	2.1	2.1	1.8	1.9	1.8	1.8	1.8	1.8	2.4	2.3	2.3
Per cent of trucks backloaded (%)	8.6	8.4	8.5	6.9	7.4	7.1	7.9	6.7	7.3	6.1	6.4	6.2	6.3	5.0	5.6
Average truck turnaround time (mins)	28.4	33.2	30.8	32.7	31.9	32.3	36.4	34.3	35.4	35.3	35.8	35.5	36.1	37.3	36.7
Average container turnaround time (mins)	20.0	23.2	21.6	23.2	22.6	22.9	25.7	24.5	25.1	25.6	25.5	25.6	24.0	26.4	25.2
Whole of container terminal															
Ship turnaround time															
Median of ship turnaround time (hours)	31.9	34.9	33.3	32.3	29.4	30.7	33.5	33.8	33.6	35.5	34.0	34.8	46.1	49.5	48.7
95th percentile of ship turnaround time (hours)	55.8	68.8	60.5	66.1	56.0	60.2	70.0	69.2	69.7	68.8	66.8	68.8	126.0	116.6	116.6
Port congestion															
Number of ships waiting at anchorage for more than 2 hours	43	89	132	54	45	99	75	77	152	51	69	120	92	123	215
Per cent of ships waiting at anchorage for more than 2 hours (%)	15.4	31.4	23.5	19.6	15.2	17.3	26.3	26.6	26.5	20.4	27.3	23.9	39.0	53.2	46.0
Average waiting time at anchorage (hours)	9.3	27.1	21.3	19.5	13.6	16.8	25.3	14.2	19.7	16.9	31.1	25.0	35.6	55.1	46.8
Median waiting time at anchorage (hours)	4.5	18.0	11.0	7.2	6.6	7.0	15.5	8.8	10.3	9.9	12.5	10.4	25.2	31.2	28.9
Total time ships spent at berth ('000 hours)	9.2	10.8	20.0	9.6	9.5	19.0	10.7	10.6	21.3	9.4	9.5	18.9	13.0	13.3	26.3
Average TEUs per ship-hour at berth (TEUs per hour)	73.7	63.9	68.4	66.7	66.2	66.5	58.4	64.4	61.4	60.5	64.7	62.6	48.8	53.0	50.9
Average lifts per ship-hour at berth (lifts per hour)	47.1	40.6	43.6	42.6	42.4	42.5	37.3	40.5	38.9	38.4	40.9	39.6	30.2	32.5	31.4
Total time ships are available to stevedores ('000 hours)	8.7	9.7	18.4	8.4	8.1	16.5	9.7	9.3	19.0	8.6	8.2	16.8	10.3	10.7	20.9
Average lifts per hour of stevedoring operation (lifts per hour)	50.0	44.9	47.3	48.3	49.6	48.9	41.1	46.5	43.7	42.0	47.0	44.4	38.2	40.6	39.4
Average lifts per berth visit (lifts)	1 556.9	1 541.0	1 548.9	1 478.0	1 348.4	1 410.9	1 398.4	1 491.1	1 445.1	1 443.7	1 532.5	1 488.4	1 663.9	1 871.0	1 766.3

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

Sources: DP World (2021), Hutchison Ports Australia (2021), Patrick (2021), NSW Ports (2021) and Port Authority of New South Wales (2021)

Table 2.3 Container terminal productivity: Melbourne

	2018			2019					2020						
	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec
Wharfside															
Containers per hour															
Crane rate	31.5	30.4	30.9	30.7	31.3	31.0	30.0	30.9	30.4	29.6	29.9	29.7	27.1	28.0	27.6
Elapsed labour rate	61.5	58.1	59.8	56.1	61.1	58.6	55.9	58.6	57.3	55.2	60.1	57.7	55.5	56.7	56.1
Ship rate	75.4	71.7	73.5	70.5	74.4	72.5	77.7	77.7	77.7	75.0	79.1	77.1	68.6	69.3	69.0
TEUs per hour															
Crane rate	48.3	46.8	47.6	47.6	48.3	47.9	46.5	48.2	47.4	45.8	46.1	46.0	42.7	44.5	43.7
Elapsed labour rate	94.8	89.9	92.3	87.2	94.9	91.1	87.0	92.0	89.6	85.9	93.3	89.7	88.0	90.6	89.4
Ship rate	116.6	111.1	113.9	110.0	115.9	113.0	121.0	122.0	121.5	116.7	122.7	119.8	109.0	110.9	110.0
Containers per berth metre	159.1	160.8	159.9	146.0	147.7	146.8	145.8	156.5	151.2	134.7	142.2	138.5	157.7	169.1	163.4
Landside															
Containers per truck	1.8	1.8	1.8	1.7	1.7	1.7	1.8	1.9	1.9	1.7	1.7	1.7	1.7	1.7	1.7
TEUs per truck	2.7	2.7	2.7	2.7	2.7	2.7	2.3	2.2	2.2	2.4	2.5	2.4	2.7	2.7	2.7
Per cent of trucks backloaded (%)	16.9	18.5	17.7	18.1	18.1	18.1	16.4	11.5	13.8	16.9	17.0	16.9	17.5	17.4	17.5
Average truck turnaround time (mins)	24.8	25.2	25.0	26.0	26.0	26.0	27.6	27.1	27.3	28.4	28.2	28.3	29.3	31.8	30.6
Average container turnaround time (mins)	14.1	14.2	14.1	15.0	15.0	15.0	15.2	14.0	14.5	16.4	16.4	16.4	17.5	18.4	18.0
Whole of container terminal															
Ship turnaround time															
Median of ship turnaround time (hours)	36.6	38.5	37.5	37.8	35.6	36.7	39.9	40.2	40.1	42.4	40.5	41.3	48.8	48.0	48.3
95th percentile of ship turnaround time (hours)	63.6	61.8	62.8	64.1	51.0	57.9	70.3	70.6	70.6	76.4	77.4	77.4	104.8	134.9	119.0
Port congestion															
Number of ships waiting at anchorage for more than 2 hours	1	1	2	1	2	3	7	6	13	9	12	21	20	21	41
Per cent of ships waiting at anchorage for more than 2 hours (%)	0.4	0.4	0.4	0.4	0.8	0.6	2.8	2.6	2.7	4.1	5.4	4.7	9.0	9.0	9.0
Average waiting time at anchorage (hours)	3.9	17.2	10.5	6.3	54.5	38.4	20.3	19.5	19.9	24.0	32.6	28.9	30.1	45.5	38.0
Median waiting time at anchorage (hours)	3.9	17.2	10.5	6.3	54.5	18.9	18.1	17.7	18.1	14.4	37.3	26.1	26.1	36.2	26.5
Total time ships spent at berth ('000 hours)	7.8	8.5	16.3	8.0	7.5	15.5	8.2	7.9	16.1	7.8	7.4	15.2	9.0	9.7	18.7
Average TEUs per ship-hour at berth (TEUs per hour)	88.4	82.6	85.4	80.8	85.6	83.1	78.9	83.3	81.1	76.3	83.8	79.9	76.7	77.6	77.2
Average lifts per ship-hour at berth (lifts per hour)	57.2	53.4	55.2	52.0	55.1	53.5	50.7	53.2	51.9	49.1	54.0	51.5	48.4	48.6	48.5
Total time ships are available to stevedores ('000 hours)	7.4	8.0	15.4	7.4	6.9	14.3	7.5	7.6	15.1	7.0	6.8	13.8	8.2	8.6	16.8
Average lifts per hour of stevedoring operation (lifts per hour)	60.2	57.1	58.6	56.0	59.9	57.9	55.8	54.7	55.3	54.3	59.1	56.7	53.5	55.0	54.2
Average lifts per berth visit (lifts)	1 703.6	1 684.7	1 694.0	1 662.1	1 610.0	1 635.7	1 680.0	1 782.0	1 729.4	1 729.7	1 791.5	1 760.7	1 976.7	2 021.0	1 999.5

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

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

Sources: DP World (2021), Patrick (2021), Port of Melbourne Operations Pty Ltd (2021) and Victoria International Container Terminal (2021)

Table 2.4 Container terminal productivity: Adelaide

	2018			2019						2020					
	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec
Wharfside															
Containers per hour															
Crane rate	32.3	34.3	33.3	35.6	34.8	35.2	35.9	33.9	34.8	34.2	33.5	33.9	32.0	32.6	32.3
Elapsed labour rate	42.8	44.6	43.7	45.0	43.5	44.3	43.4	45.4	44.5	46.9	42.2	44.6	41.1	41.7	41.4
Ship rate	50.1	52.2	51.1	53.0	51.6	52.3	51.4	53.3	52.5	53.1	48.7	51.0	48.5	47.6	48.0
TEUs per hour															
Crane rate	46.5	48.4	47.4	51.4	49.8	50.6	50.7	47.4	48.9	47.8	47.9	47.9	47.5	46.9	47.2
Elapsed labour rate	61.5	62.9	62.2	65.1	62.2	63.7	61.3	63.4	62.5	65.6	60.3	63.1	60.9	60.1	60.6
Ship rate	72.1	73.6	72.8	76.7	73.7	75.2	72.7	74.5	73.7	74.3	69.7	72.1	71.8	68.6	70.3
Containers per berth metre	123.1	120.6	121.9	120.3	125.4	122.8	116.7	140.0	128.3	126.7	116.5	121.6	127.1	116.8	122.0
Landside															
Containers per truck	1.8	1.9	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.9	1.9	1.9	1.9
TEUs per truck	2.6	2.6	2.6	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.6	2.6	2.7	2.7	2.7
Per cent of trucks backloaded (%)	27.3	27.9	27.6	29.0	29.5	29.2	26.2	27.4	26.8	25.8	22.1	24.0	22.6	23.2	22.9
Average truck turnaround time (mins)	35.2	34.6	34.9	30.5	30.6	30.6	27.4	32.2	29.8	31.9	35.8	33.8	34.3	35.3	34.8
Average container turnaround time (mins)	19.4	18.6	19.0	16.3	16.1	16.2	14.6	16.7	15.7	16.6	19.7	18.1	18.5	18.8	18.6
Whole of container terminal															
Ship turnaround time															
Median of ship turnaround time (hours)	21.5	20.3	21.0	20.5	20.9	20.7	21.9	23.3	22.8	24.6	29.4	26.3	27.7	32.0	29.3
95th percentile of ship turnaround time (hours)	32.4	30.0	31.9	33.8	33.0	33.0	33.5	43.1	40.6	38.9	68.2	47.9	49.8	63.0	60.5
Port congestion															
Number of ships waiting at anchorage for more than 2 hours	13	9	22	7	8	15	3	6	9	5	6	11	7	9	16
Per cent of ships waiting at anchorage for more than 2 hours (%)	11.4	8.2	9.8	6.5	7.1	6.8	2.8	6.1	4.4	6.0	7.8	6.9	8.5	12.9	10.5
Average waiting time at anchorage (hours)	15.8	17.5	16.5	11.1	18.3	14.9	12.3	23.0	19.4	12.5	34.3	24.4	30.7	21.5	25.5
Median waiting time at anchorage (hours)	10.8	11.4	11.1	11.7	20.4	13.4	12.5	24.7	19.8	9.7	23.8	16.8	29.9	18.3	24.8
Total time ships spent at berth ('000 hours)	2.4	2.3	4.6	2.3	2.4	4.6	2.4	2.5	4.9	2.1	2.4	4.5	2.4	2.3	4.7
Average TEUs per ship-hour at berth (TEUs per hour)	44.0	44.1	44.0	45.2	44.8	45.0	41.0	45.3	43.2	49.2	40.1	44.4	43.7	44.4	44.0
Average lifts per ship-hour at berth (lifts per hour)	30.6	31.2	30.9	31.2	31.4	31.3	29.0	32.5	30.8	35.2	28.1	31.4	29.5	30.8	30.1
Total time ships are available to stevedores ('000 hours)	1.7	1.6	3.4	1.6	1.7	3.3	1.6	1.8	3.5	1.6	1.7	3.3	1.9	1.7	3.5
Average lifts per hour of stevedoring operation (lifts per hour)	41.9	43.8	42.8	44.1	43.0	43.5	42.9	44.2	43.6	45.9	40.9	43.4	38.9	41.7	40.2
Average lifts per berth visit (lifts)	635.6	646.1	640.8	654.5	663.5	659.0	647.2	824.9	732.6	896.2	880.3	888.5	879.7	1 000.7	935.1

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

Sources: Flinders Adelaide Container Terminal (2021) and Flinders Ports (2021)

Table 2.5 Container terminal productivity: Fremantle

	2018			2019						2020					
	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec
Wharfside															
Containers per hour															
Crane rate	32.6	35.0	33.9	35.2	34.6	34.9	35.0	34.9	34.9	33.8	34.8	34.3	31.1	32.3	31.7
Elapsed labour rate	39.2	44.8	42.1	46.1	42.9	44.5	45.0	47.7	46.4	43.6	43.7	43.6	40.0	41.4	40.7
Ship rate	43.9	54.1	49.1	53.0	51.6	52.3	56.4	57.8	57.1	55.6	52.9	54.3	47.1	50.8	48.9
TEUs per hour															
Crane rate	49.0	52.5	50.8	52.5	51.3	51.9	52.3	53.4	52.8	50.5	52.2	51.3	48.1	49.6	48.8
Elapsed labour rate	58.8	67.0	63.0	68.7	63.6	66.1	67.0	73.2	70.2	65.5	65.9	65.7	62.4	63.9	63.2
Ship rate	65.7	80.9	73.5	78.9	76.4	77.6	83.9	88.7	86.3	83.7	79.9	81.9	73.5	78.3	75.9
Containers per berth metre	104.4	109.9	107.2	98.3	101.4	99.9	104.6	106.6	105.6	102.4	91.9	97.1	101.7	102.7	102.2
Landside															
Containers per truck	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.6	1.7	1.8	1.8	1.8	1.6	1.7	1.7
TEUs per truck	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.8	2.6	2.4	2.3	2.3	2.5	2.6	2.5
Per cent of trucks backloaded (%)	10.0	10.5	10.2	11.4	11.4	11.4	11.4	9.8	10.5	7.7	7.3	7.5	8.3	8.1	8.2
Average truck turnaround time (mins)	23.3	23.0	23.1	21.9	21.5	21.7	21.9	24.8	23.3	25.0	23.2	23.9	23.6	30.3	26.9
Average container turnaround time (mins)	14.0	13.5	13.7	12.9	12.7	12.8	13.0	15.1	14.0	13.8	12.9	13.3	14.4	17.6	16.0
Whole of container terminal															
Ship turnaround time															
Median of ship turnaround time (hours)	35.5	29.3	32.0	28.9	30.0	29.3	30.2	36.5	33.1	40.6	38.1	38.8	43.9	44.2	44.1
95th percentile of ship turnaround time (hours)	82.4	55.2	67.2	48.4	53.0	50.2	48.0	66.2	59.2	74.5	66.5	74.1	89.5	88.9	89.5
Port congestion															
Number of ships waiting at anchorage for more than 2 hours	16	1	17	4	6	10	6	7	13	6	7	13	8	4	12
Per cent of ships waiting at anchorage for more than 2 hours (%)	12.1	0.8	6.4	3.2	4.7	3.9	4.8	6.6	5.6	6.5	8.0	7.2	8.5	4.4	6.5
Average waiting time at anchorage (hours)	22.3	44.4	23.6	29.8	17.6	22.5	16.0	30.4	23.7	22.8	18.8	20.7	33.6	21.7	29.6
Median waiting time at anchorage (hours)	15.8	44.4	16.4	23.0	17.5	17.5	14.1	30.3	16.0	22.4	16.3	16.3	28.5	17.3	18.3
Total time ships spent at berth ('000 hours)	4.1	3.5	7.6	3.2	3.5	6.7	3.4	3.3	6.6	3.3	3.0	6.3	3.8	3.6	7.5
Average TEUs per ship-hour at berth (TEUs per hour)	49.3	58.8	53.7	57.7	55.0	56.3	58.7	62.7	60.7	57.6	57.5	57.5	52.9	55.3	54.1
Average lifts per ship-hour at berth (lifts per hour)	32.9	39.3	35.9	38.7	37.1	37.9	39.4	40.9	40.2	38.2	38.1	38.2	33.9	35.7	34.7
Total time ships are available to stevedores ('000 hours)	3.4	3.1	6.6	2.7	3.0	5.8	3.0	2.9	5.9	3.0	2.7	5.8	3.3	3.2	6.5
Average lifts per hour of stevedoring operation (lifts per hour)	39.3	43.8	41.5	45.6	42.6	44.0	44.0	46.4	45.2	41.3	42.4	41.8	39.5	39.8	39.7
Average lifts per berth visit (lifts)	1 019.5	1 037.8	1 028.7	998.9	1 001.9	1 000.4	1 049.5	1 264.0	1 147.5	1 364.0	1 312.0	1 338.6	1 385.0	1 430.6	1 407.4

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

Sources: DP World (2021), Patrick (2021) and Fremantle Ports (2021)

Table 2.6 Container terminal productivity: Five ports

	2018			2019						2020					
	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec	Mar Qtr	Jun Qtr	Jan-Jun	Sep Qtr	Dec Qtr	Jul-Dec
Wharfside															
Containers per hour															
Crane rate	30.6	30.5	30.5	30.5	31.1	30.8	30.6	31.0	30.8	30.4	30.7	30.6	27.0	27.9	27.4
Elapsed labour rate	53.1	50.4	51.8	50.1	52.0	51.1	47.6	51.1	49.4	48.0	50.7	49.4	45.7	47.5	46.6
Ship rate	66.3	63.6	64.9	63.4	65.7	64.6	64.2	67.0	65.7	63.1	64.7	63.9	56.6	60.8	58.8
TEUs per hour															
Crane rate	47.1	47.0	47.0	47.0	47.8	47.4	47.2	48.3	47.8	46.8	47.4	47.1	42.5	44.2	43.4
Elapsed labour rate	82.3	78.2	80.2	77.6	80.5	79.1	73.5	80.0	76.9	74.4	78.7	76.6	72.4	75.8	74.2
Ship rate	102.9	98.8	100.9	98.6	102.1	100.3	99.6	105.2	102.5	97.9	100.6	99.3	89.8	97.3	93.7
Containers per berth metre															
	123.0	123.4	123.2	111.7	113.5	112.6	113.4	121.4	117.4	105.9	109.0	107.4	116.5	126.2	121.4
Landside															
Containers per truck	1.6	1.6	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.6	1.6	1.6	1.6	1.6	1.6
TEUs per truck	2.4	2.5	2.5	2.5	2.5	2.5	2.2	2.2	2.2	2.2	2.2	2.2	2.6	2.6	2.6
Per cent of trucks backloaded (%)	13.0	13.4	13.2	12.6	12.8	12.7	12.7	10.4	11.5	11.7	11.6	11.6	11.9	11.5	11.7
Average truck turnaround time (mins)	28.0	29.8	29.0	29.8	29.4	29.6	31.4	30.8	31.1	31.3	31.3	31.3	32.2	35.5	33.9
Average container turnaround time (mins)	17.3	18.2	17.8	18.4	18.1	18.2	19.0	18.1	18.5	19.1	19.2	19.2	19.8	21.7	20.8
Whole of container terminal															
Ship turnaround time															
Median of ship turnaround time (hours)	31.8	33.2	32.4	31.8	30.1	30.9	32.4	33.8	33.1	35.1	34.7	34.9	41.0	44.3	42.8
95th percentile of ship turnaround time (hours)	58.5	60.8	60.0	59.6	52.0	56.2	67.3	64.3	66.0	71.0	67.4	69.2	101.2	113.3	105.1
Port congestion															
Number of ships waiting at anchorage for more than 2 hours	93	117	210	81	82	163	114	116	230	95	110	205	157	200	357
Per cent of ships waiting at anchorage for more than 2 hours (%)	8.9	11.1	10.0	8.1	7.8	8.0	11.3	11.7	11.5	10.8	12.6	11.7	18.1	23.6	20.8
Average waiting time at anchorage (hours)	15.1	25.4	20.9	18.8	15.7	17.2	22.9	17.0	19.9	17.3	29.2	23.7	32.4	46.1	40.1
Median waiting time at anchorage (hours)	9.3	15.3	11.8	9.1	9.2	9.2	15.7	10.1	12.5	10.7	15.0	12.9	24.0	24.9	24.3
Total time ships spent at berth ('000 hours)	29.3	31.5	60.8	28.9	28.6	57.5	30.7	30.4	61.1	28.3	27.8	56.1	35.0	36.0	71.0
Average TEUs per ship-hour at berth (TEUs per hour)	69.2	65.1	67.1	64.7	65.5	65.1	61.9	65.9	63.9	61.9	64.6	63.2	56.2	59.4	57.8
Average lifts per ship-hour at berth (lifts per hour)	44.9	42.1	43.5	41.9	42.5	42.2	40.1	42.2	41.2	40.1	41.7	40.9	35.5	37.3	36.4
Total time ships are available to stevedores ('000 hours)	26.0	27.3	53.4	24.7	24.3	49.0	26.5	26.5	53.0	24.5	24.0	48.5	28.9	29.9	58.8
Average lifts per hour of stevedoring operation (lifts per hour)	50.6	48.5	49.5	49.0	50.0	49.5	46.4	48.5	47.4	46.2	48.4	47.3	42.9	44.8	43.9
Average lifts per berth visit (lifts)	1 260.7	1 257.4	1 259.0	1 211.9	1 155.5	1 182.9	1 214.5	1 294.1	1 253.8	1 284.1	1 329.2	1 306.5	1 430.1	1 579.7	1 504.1

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

Sources: DP World (2021), Patrick (2021), Hutchison Ports Australia (2021), Flinders Adelaide Container Terminal (2021), Victoria International Container Terminal (2021), Port of Brisbane Pty Ltd (2021), Maritime Safety Queensland (2021), Port Authority of New South Wales (2021), NSW Ports (2021), Port of Melbourne Operations Pty Ltd (2021), Flinders Ports (2021) and Fremantle Ports (2021)

CHAPTER 3

Vehicle booking system and empty container park operations

Overview

This chapter reports on three main indicator types:

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

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

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

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

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

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

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

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

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

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

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

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

Indicator 3.1 Number of truck timeslots available

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

Box 3.1 Container timeslots

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

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.

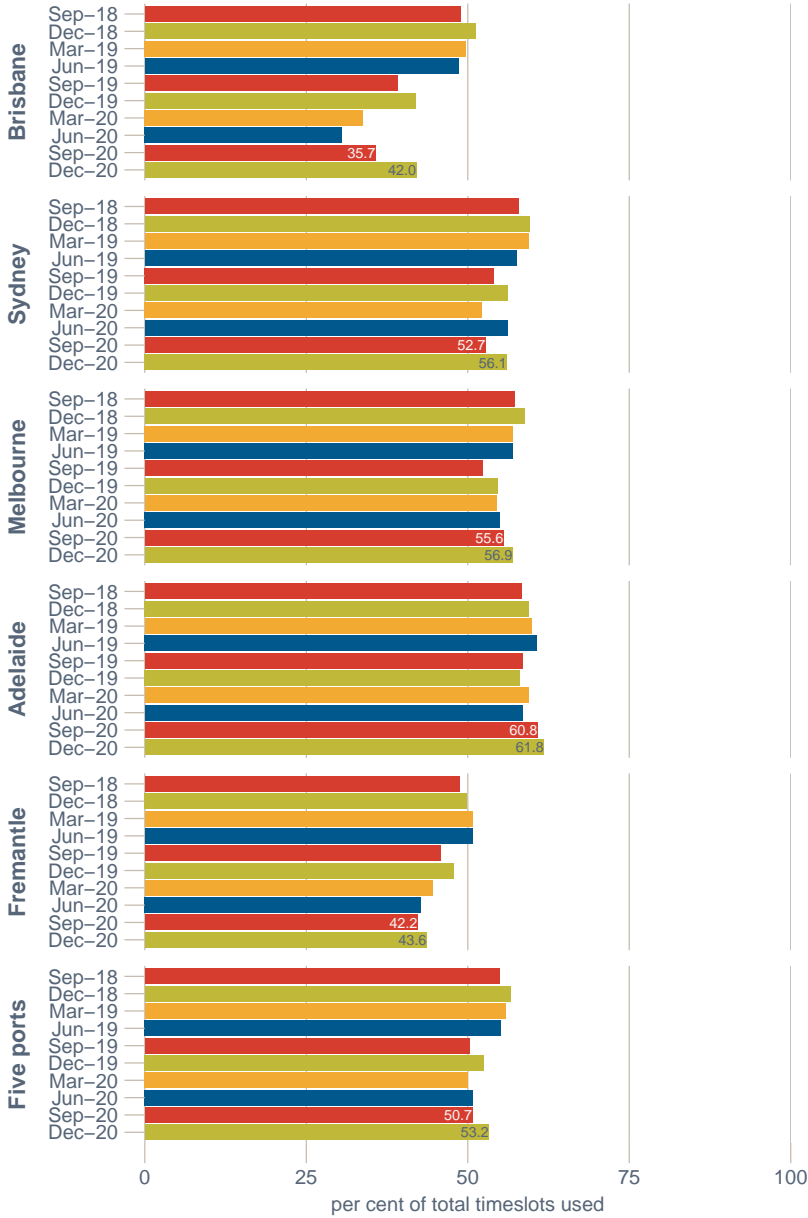
Indicator 3.8 Number of TEUs moved through empty container parks

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.



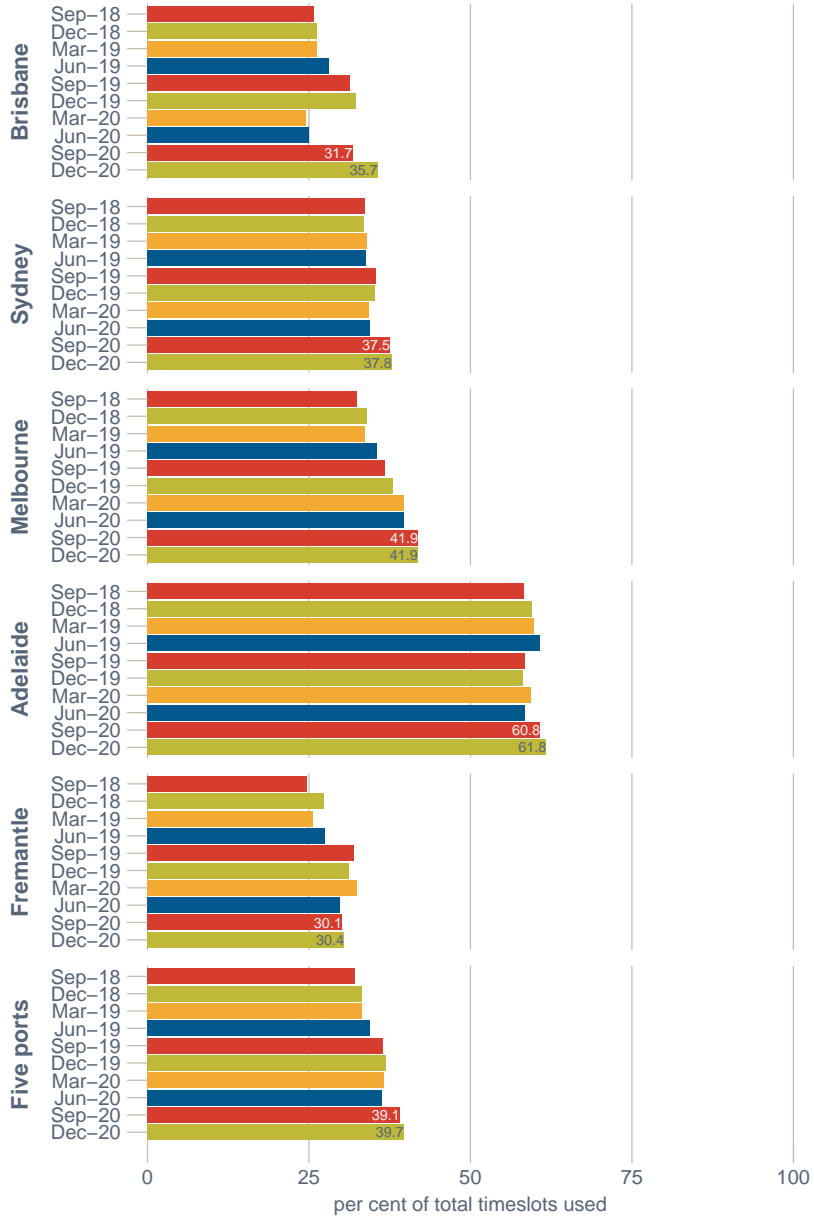
Port Drive and the Fisherman Islands container terminals. Foreground: DP World truck gates and Brisbane Multimodal Terminal. Photo courtesy of Port of Brisbane Pty Ltd.

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



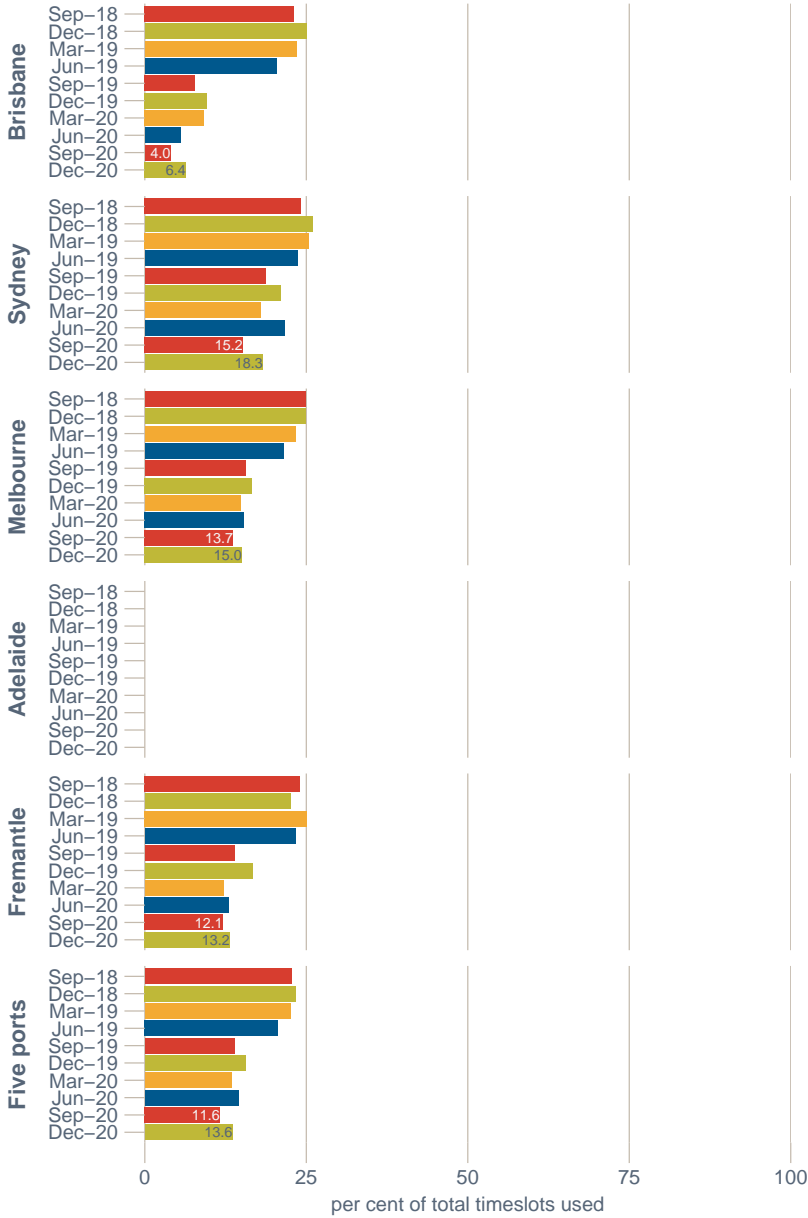
Sources: DP World (2021), Flinders Adelaide Container Terminal (2021), Hutchison Ports Australia (2021), Patrick (2021) and Victoria International Container Terminal (2021)

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



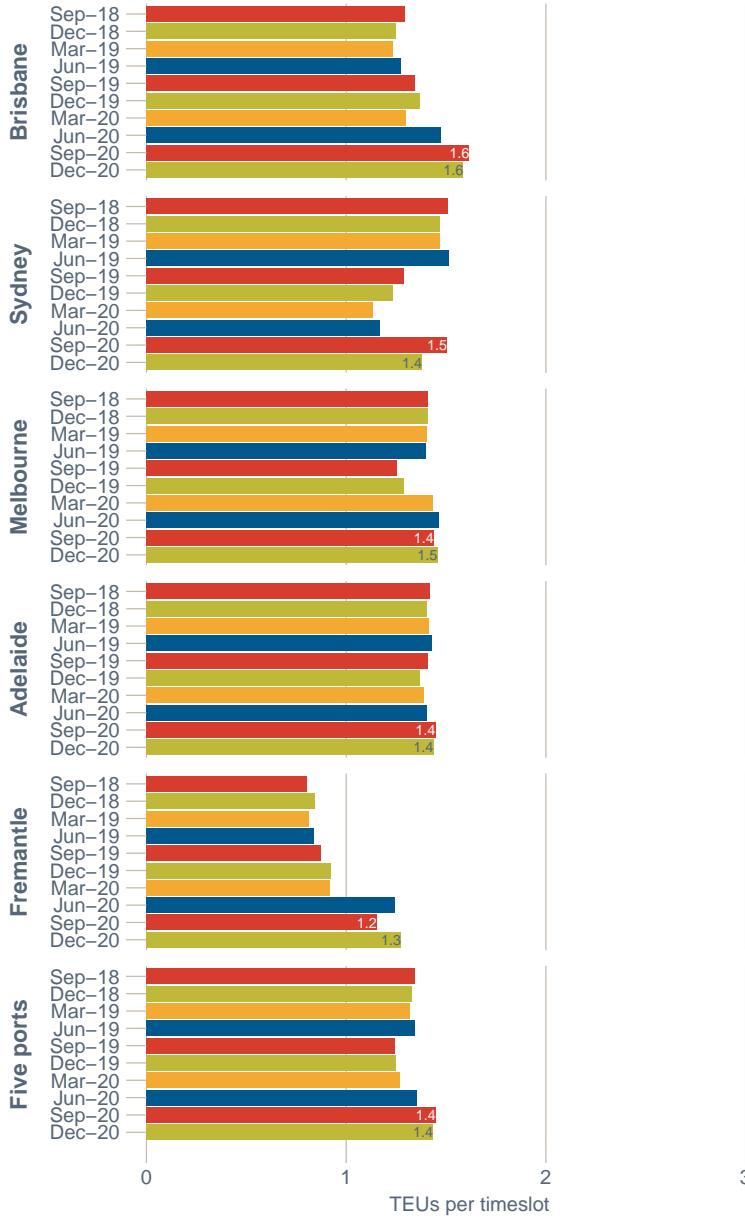
Sources: DP World (2021), Flinders Adelaide Container Terminal (2021), Hutchison Ports Australia (2021), Patrick (2021) and Victoria International Container Terminal (2021)

Figure 3.3 Timeslots used by trucks on Saturday and Sunday



Sources: DP World (2021), Flinders Adelaide Container Terminal (2021), Hutchison Ports Australia (2021), Patrick (2021) and Victoria International Container Terminal (2021)

Figure 3.4 TEUs processed per VBS timeslot used at container terminals



Sources: DP World (2021), Flinders Adelaide Container Terminal (2021), Hutchison Ports Australia (2021), Patrick (2021) and Victoria International Container Terminal (2021)

Table 3.1 Timeslots available and actually used by trucks: Brisbane

	Weekday	Shift	2018			2019			2020				
			Sep Qtr	Dec Qtr	Mar Qtr	Jun Qtr	Sep Qtr	Dec Qtr	Mar Qtr	Jun Qtr	Sep Qtr	Dec Qtr	
Available ('000)	Monday–Friday	Day	94.1	89.5	84.6	88.0	117.6	114.0	109.7	109.7	114.2	115.0	
		Evening	31.0	31.2	30.0	31.4	40.1	39.9	31.7	31.6	36.4	41.8	
		Night	16.4	17.5	15.0	18.0	22.7	26.0	11.4	8.7	21.3	30.4	
		Sub-total	141.4	138.2	129.7	137.4	180.5	179.9	152.8	150.0	171.9	187.3	
	Saturday	Day	16.6	16.8	16.6	14.9	8.5	10.4	7.7	1.2	5.3	9.5	
		Evening	5.6	5.7	4.8	4.1	0.1	0.1	0.1	0.1	0.0	0.2	
		Night	2.8	5.6	3.4	1.9	2.0	2.6	1.5	0.7	0.3	1.6	
		Sub-total	25.0	28.1	24.8	20.9	10.6	13.1	9.4	2.0	5.5	11.3	
	Sunday	Day	11.6	12.1	8.8	9.8	2.6	2.8	2.9	2.9	0.4	0.6	
		Evening	1.2	0.7	0.9	0.9	0.9	0.9	0.8	0.9	0.7	1.3	
		Night	3.4	3.2	2.1	1.6	0.6	0.9	1.0	1.0	0.6	0.6	
		Sub-total	16.3	16.0	11.8	12.3	4.1	4.6	4.7	4.8	1.7	2.5	
	Total timeslots available			182.8	182.3	166.2	170.6	195.2	197.6	166.8	156.8	179.2	201.1
	Used ('000)	Monday–Friday	Day	88.6	83.9	77.1	81.8	82.4	79.7	75.4	78.0	81.0	84.5
			Evening	29.2	29.2	27.3	29.0	27.2	26.9	20.5	21.8	25.3	30.0
Night			15.4	15.9	13.0	15.8	15.3	17.5	7.6	6.3	14.7	21.9	
Sub-total			133.1	128.9	117.5	126.7	124.9	124.1	103.5	106.1	121.0	136.4	
Saturday		Day	15.9	16.6	16.3	14.7	4.9	6.8	4.5	0.7	3.7	6.4	
		Evening	5.5	5.5	4.7	4.0	0.1	0.1	0.1	0.1	0.0	0.1	
		Night	2.8	5.5	3.4	1.9	1.6	1.9	1.2	0.7	0.2	1.1	
		Sub-total	24.2	27.6	24.4	20.6	6.6	8.7	5.9	1.5	3.9	7.6	
Sunday		Day	11.3	11.6	8.8	9.4	2.5	2.8	2.8	2.8	0.1	0.5	
		Evening	1.2	0.7	0.8	0.9	0.9	0.8	0.7	0.9	0.5	0.7	
		Night	3.4	3.2	2.1	1.6	0.6	0.9	1.0	1.0	0.6	0.5	
		Sub-total	15.9	15.4	11.7	11.9	3.9	4.4	4.6	4.7	1.1	1.7	
Total timeslots used			173.2	172.0	153.5	159.2	135.4	137.3	113.9	112.2	126.0	145.7	

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 (2021), Hutchison Ports Australia (2021) and Patrick (2021)

Table 3.2 Timeslots available and actually used by trucks: Sydney

Weekday	Shift	2018		2019				2020				
		Sep Qtr	Dec Qtr	Mar Qtr	Jun Qtr	Sep Qtr	Dec Qtr	Mar Qtr	Jun Qtr	Sep Qtr	Dec Qtr	
Available ('000)	Monday–Friday	Day	133.5	134.5	127.6	128.1	175.6	180.1	176.9	166.9	177.1	180.7
		Evening	60.5	60.7	56.9	56.4	73.3	76.8	68.5	70.1	76.8	83.3
		Night	49.6	50.7	43.2	45.5	60.1	63.5	54.0	55.8	62.9	69.9
		Sub-total	243.6	245.8	227.7	230.0	309.1	320.3	299.4	292.8	316.8	333.9
	Saturday	Day	19.0	21.8	19.2	17.6	16.2	21.8	16.6	19.0	15.2	22.4
		Evening	10.0	10.7	9.9	9.5	2.7	2.8	2.3	3.2	2.2	4.3
		Night	12.2	12.8	11.1	10.0	10.2	11.9	9.7	10.2	8.0	8.8
		Sub-total	41.3	45.3	40.2	37.1	29.2	36.5	28.5	32.4	25.5	35.6
	Sunday	Day	17.1	20.2	17.7	17.1	19.0	21.2	18.5	20.5	14.7	19.5
		Evening	4.9	6.2	4.8	4.4	10.6	11.4	9.4	9.5	6.9	8.7
		Night	8.2	10.5	9.8	7.2	3.1	3.3	2.4	3.7	4.3	4.7
		Sub-total	30.1	36.8	32.4	28.7	32.7	35.8	30.3	33.7	25.9	32.9
Total timeslots available		315.1	328.0	300.3	295.8	370.9	392.6	358.2	358.9	368.2	402.3	
Used ('000)	Monday–Friday	Day	107.3	107.3	95.5	98.9	107.5	110.9	105.7	102.3	112.9	117.7
		Evening	47.9	48.5	44.2	43.8	45.7	48.3	42.6	45.0	50.0	55.6
		Night	37.8	40.6	35.7	35.1	37.2	40.5	33.2	35.3	39.7	45.7
		Sub-total	193.1	196.3	175.3	177.8	190.3	199.8	181.5	182.5	202.6	218.9
	Saturday	Day	15.8	18.1	15.5	14.4	10.4	14.0	10.4	13.7	10.0	15.4
		Evening	9.3	9.5	8.6	8.2	2.3	2.5	1.6	2.8	1.7	3.3
		Night	9.1	9.5	8.1	7.8	6.3	7.6	5.2	6.4	3.7	4.2
		Sub-total	34.2	37.0	32.1	30.4	19.0	24.1	17.1	22.9	15.4	22.8
	Sunday	Day	15.9	17.7	14.8	15.0	14.1	17.0	13.9	17.1	11.8	15.4
		Evening	4.3	4.8	3.9	3.5	8.0	9.0	6.8	7.2	5.3	6.4
		Night	7.3	9.4	8.8	6.2	2.6	3.0	1.7	3.3	3.8	4.3
		Sub-total	27.5	31.9	27.5	24.7	24.7	28.9	22.4	27.6	20.9	26.0
Total timeslots used		254.7	265.2	235.0	232.9	234.1	252.8	221.1	233.1	238.9	267.8	

Sources: DP World (2021), Hutchison Ports Australia (2021) and Patrick (2021)

Table 3.3 Timeslots available and actually used by trucks: Melbourne

	Weekday	Shift	2018			2019			2020				
			Sep Qtr	Dec Qtr	Mar Qtr	Jun Qtr	Sep Qtr	Dec Qtr	Mar Qtr	Jun Qtr	Sep Qtr	Dec Qtr	
Available ('000)	Monday–Friday	Day	165.1	156.5	151.5	148.1	174.7	166.3	152.6	154.3	157.3	165.5	
		Evening	88.0	98.8	47.9	90.0	98.5	90.7	84.3	83.0	84.8	93.8	
		Night	38.7	49.2	34.2	66.1	69.0	64.8	60.1	56.5	58.8	71.2	
		Sub-total	291.8	304.5	233.6	304.2	342.3	321.9	297.0	293.8	300.9	330.5	
	Saturday	Day	33.5	32.8	31.6	27.1	20.5	20.8	17.9	18.6	20.1	22.2	
		Evening	10.4	10.1	9.0	7.9	3.5	3.7	3.1	2.6	0.5	0.4	
		Night	9.0	11.5	8.9	12.9	12.8	11.9	9.1	8.0	7.1	9.3	
		Sub-total	52.8	54.4	49.6	47.8	36.9	36.5	30.1	29.2	27.7	31.9	
	Sunday	Day	26.2	30.1	26.3	26.7	18.9	18.3	15.8	14.9	10.9	13.2	
		Evening	6.5	7.3	3.6	4.5	7.7	8.8	11.3	11.9	11.6	12.5	
		Night	8.6	8.4	6.6	6.7	3.9	3.7	3.8	4.3	4.4	4.2	
		Sub-total	41.3	45.7	36.5	37.8	30.5	30.8	30.9	31.0	27.0	29.9	
	Total timeslots available			385.9	404.7	319.7	389.9	409.7	389.1	358.0	354.0	355.5	392.3
	Used ('000)	Monday–Friday	Day	136.6	141.3	137.2	140.5	153.2	152.7	139.1	147.4	158.0	158.1
			Evening	66.6	76.3	73.1	73.3	75.7	79.9	76.6	81.7	91.5	92.0
Night			36.9	40.2	34.3	42.8	42.3	47.9	44.5	48.2	57.5	61.6	
Sub-total			240.1	257.8	244.6	256.6	271.1	280.4	260.2	277.3	307.0	311.8	
Saturday		Day	27.0	28.4	28.0	23.7	15.3	18.7	15.3	18.3	18.0	20.0	
		Evening	10.2	9.9	8.5	7.7	3.4	3.4	1.8	2.3	2.1	3.5	
		Night	8.8	9.8	7.7	8.4	7.1	7.8	5.7	5.5	4.4	6.1	
		Sub-total	45.9	48.0	44.3	39.9	25.8	29.9	22.8	26.2	24.5	29.7	
Sunday		Day	20.0	23.9	20.3	19.5	13.5	15.1	13.0	13.7	9.9	11.1	
		Evening	5.4	5.3	3.5	4.3	7.1	7.5	6.9	7.7	10.4	10.5	
		Night	8.3	8.0	6.3	6.5	3.6	3.3	2.6	2.8	3.7	3.9	
		Sub-total	33.6	37.2	30.1	30.3	24.1	25.9	22.5	24.2	24.0	25.5	
Total timeslots used			319.7	343.0	319.0	326.8	321.0	336.2	305.4	327.6	355.6	367.0	

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

Sources: DP World (2021), Patrick (2021) and Victoria International Container Terminal (2021)

Table 3.4 Timeslots available and actually used by trucks: Adelaide

Weekday	Shift	2018		2019				2020					
		Sep Qtr	Dec Qtr	Mar Qtr	Jun Qtr	Sep Qtr	Dec Qtr	Mar Qtr	Jun Qtr	Sep Qtr	Dec Qtr		
Available ('000)	Monday–Friday	Day	24.3	24.2	24.0	24.0	25.0	26.7	25.5	23.2	23.2	22.1	
		Evening	18.9	18.8	19.5	19.6	19.2	19.2	20.2	17.6	18.6	17.0	
		Night	17.5	18.2	18.8	19.4	19.5	20.4	20.1	18.8	20.4	19.8	
		Sub-total	60.8	61.2	62.3	63.0	63.6	66.2	65.8	59.6	62.2	58.8	
	Saturday	Day											
		Evening											
		Night											
		Sub-total											
	Sunday	Day											
		Evening											
		Night											
		Sub-total											
			Total timeslots available		60.8	61.2	62.3	63.0	63.6	66.2	65.8	59.6	62.2
Used ('000)	Monday–Friday	Day	23.7	23.6	23.7	23.3	24.2	26.0	25.2	22.4	21.9	19.7	
		Evening	18.3	18.4	19.2	19.1	18.6	18.8	19.8	16.7	17.1	15.6	
		Night	14.9	16.1	16.1	17.0	15.5	17.3	17.1	14.8	16.8	16.3	
		Sub-total	57.0	58.1	59.0	59.3	58.3	62.1	62.1	53.8	55.7	51.6	
	Saturday	Day											
		Evening											
		Night											
		Sub-total											
	Sunday	Day											
		Evening											
		Night											
		Sub-total											
			Total timeslots used		57.0	58.1	59.0	59.3	58.3	62.1	62.1	53.8	55.7

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

Sources: Flinders Adelaide Container Terminal (2021)

Table 3.5 Timeslots available and actually used by trucks: Fremantle

	Weekday	Shift	2018			2019			2020				
			Sep Qtr	Dec Qtr	Mar Qtr	Jun Qtr	Sep Qtr	Dec Qtr	Mar Qtr	Jun Qtr	Sep Qtr	Dec Qtr	
Available ('000)	Monday–Friday	Day	58.8	58.2	52.8	52.2	67.5	70.6	66.4	63.5	70.3	64.3	
		Evening	19.4	20.9	17.7	19.0	23.5	25.3	23.2	22.0	25.2	23.4	
		Night	9.7	11.6	10.0	10.3	14.2	14.6	14.2	11.8	12.8	11.0	
		Sub-total	87.8	90.7	80.5	81.5	105.2	110.5	103.8	97.3	108.3	98.7	
	Saturday	Day	12.5	12.0	11.9	11.2	6.6	9.1	7.1	5.1	7.2	6.6	
		Evening	4.2	3.9	4.0	3.7	0.2	0.2	0.0	0.0	0.2	0.4	
		Night	2.8	3.2	3.1	3.1	0.0	0.0	0.0	0.0	0.0	0.0	
		Sub-total	19.5	19.2	19.0	18.1	6.8	9.2	7.1	5.1	7.4	7.1	
	Sunday	Day	8.2	6.8	7.4	6.4	8.7	10.1	6.3	7.9	6.5	6.4	
		Evening	0.4	0.3	0.3	0.1	0.7	0.8	0.5	0.8	0.4	0.5	
		Night	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	
		Sub-total	8.6	7.2	7.8	6.4	9.4	10.9	6.9	8.8	6.9	6.9	
	Total timeslots available			116.0	117.1	107.3	106.1	121.4	130.6	117.7	111.2	122.6	112.8
	Used ('000)	Monday–Friday	Day	57.2	57.1	51.4	51.0	56.4	57.5	53.9	54.0	60.5	53.3
			Evening	18.3	19.8	16.9	18.2	20.2	21.1	19.6	18.0	21.3	19.1
Night			9.3	11.3	9.8	10.2	13.0	13.1	11.9	10.0	10.3	9.6	
Sub-total			84.8	88.2	78.2	79.4	89.6	91.7	85.4	82.0	92.1	82.1	
Saturday		Day	12.0	11.7	11.8	11.1	5.8	8.0	6.0	4.3	6.3	5.8	
		Evening	4.0	3.7	3.9	3.7	0.2	0.1	0.0	0.0	0.2	0.3	
		Night	2.6	3.1	3.1	3.1	0.0	0.0	0.0	0.0	0.0	0.0	
		Sub-total	18.6	18.6	18.7	17.8	6.0	8.1	6.0	4.4	6.5	6.2	
Sunday		Day	7.9	6.6	7.1	6.2	7.8	9.5	5.3	7.1	5.8	5.8	
		Evening	0.3	0.3	0.3	0.1	0.6	0.7	0.5	0.8	0.4	0.5	
		Night	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
		Sub-total	8.2	7.1	7.5	6.3	8.4	10.2	5.8	7.9	6.2	6.3	
Total timeslots used			111.6	113.9	104.4	103.5	104.0	110.1	97.2	94.3	104.7	94.5	

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 (2021) and Patrick (2021)

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

Weekday	Shift	2018		2019				2020				
		Sep Qtr	Dec Qtr	Mar Qtr	Jun Qtr	Sep Qtr	Dec Qtr	Mar Qtr	Jun Qtr	Sep Qtr	Dec Qtr	
Available ('000)	Monday–Friday	Day	475.8	462.8	440.5	440.5	560.5	557.7	531.1	517.7	542.1	547.6
		Evening	217.8	230.4	172.1	216.4	254.6	251.8	227.8	224.3	241.8	259.3
		Night	131.9	147.2	121.2	159.3	185.5	189.3	159.8	151.6	176.2	202.3
		Sub-total	825.5	840.4	733.8	816.2	1000.6	998.8	918.7	893.6	960.1	1009.2
	Saturday	Day	81.6	83.6	79.3	70.8	51.8	62.1	49.3	44.0	47.8	60.8
		Evening	30.2	30.4	27.8	25.2	6.6	6.8	5.5	6.0	2.9	5.4
		Night	26.8	33.1	26.5	27.9	25.1	26.4	20.3	18.8	15.3	19.7
		Sub-total	138.6	147.0	133.6	123.9	83.5	95.3	75.1	68.7	66.1	85.9
	Sunday	Day	63.1	69.1	60.2	59.9	49.2	52.4	43.5	46.2	32.5	39.7
		Evening	13.0	14.5	9.6	9.9	19.9	21.8	22.0	23.1	19.7	22.9
		Night	20.3	22.2	18.6	15.6	7.5	7.9	7.3	9.1	9.3	9.5
		Sub-total	96.4	105.8	88.4	85.3	76.6	82.1	72.7	78.3	61.6	72.2
Total timeslots available		1060.4	1093.2	955.8	1025.4	1160.8	1176.2	1066.5	1040.6	1087.8	1167.3	
Used ('000)	Monday–Friday	Day	413.5	413.1	384.8	395.6	423.7	426.8	399.4	403.9	434.3	433.3
		Evening	180.3	192.2	180.7	183.3	187.3	195.0	179.1	183.1	205.0	212.4
		Night	114.3	124.1	109.0	120.8	123.3	136.4	114.2	114.7	139.1	155.2
		Sub-total	708.0	729.4	674.5	699.8	734.2	758.2	692.7	701.7	778.4	800.8
	Saturday	Day	70.7	74.8	71.6	63.9	36.4	47.4	36.2	37.1	38.0	47.6
		Evening	29.0	28.6	25.7	23.7	6.0	6.1	3.5	5.3	4.0	7.2
		Night	23.1	27.9	22.3	21.2	15.0	17.3	12.1	12.6	8.3	11.5
		Sub-total	122.8	131.3	119.5	108.7	57.3	70.8	51.8	54.9	50.2	66.3
	Sunday	Day	55.0	59.8	50.9	50.2	38.0	44.4	35.0	40.8	27.6	32.8
		Evening	11.2	11.0	8.6	8.9	16.5	17.9	14.9	16.5	16.5	18.0
		Night	19.0	20.7	17.3	14.2	6.7	7.2	5.3	7.1	8.1	8.7
		Sub-total	85.2	91.5	76.8	73.2	61.2	69.5	55.2	64.4	52.3	59.5
Total timeslots used		916.1	952.2	870.8	881.7	852.8	898.5	799.7	821.0	880.9	926.6	

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

Sources: DP World (2021), Flinders Adelaide Container Terminal (2021), Hutchison Ports Australia (2021), Patrick (2021) and Victoria International Container Terminal (2021)

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 (2021)
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),

Box 4.1 Changes to PICI

PICI vessel size classes were updated and expanded in *Waterline 66*.

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

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

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

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

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

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).

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

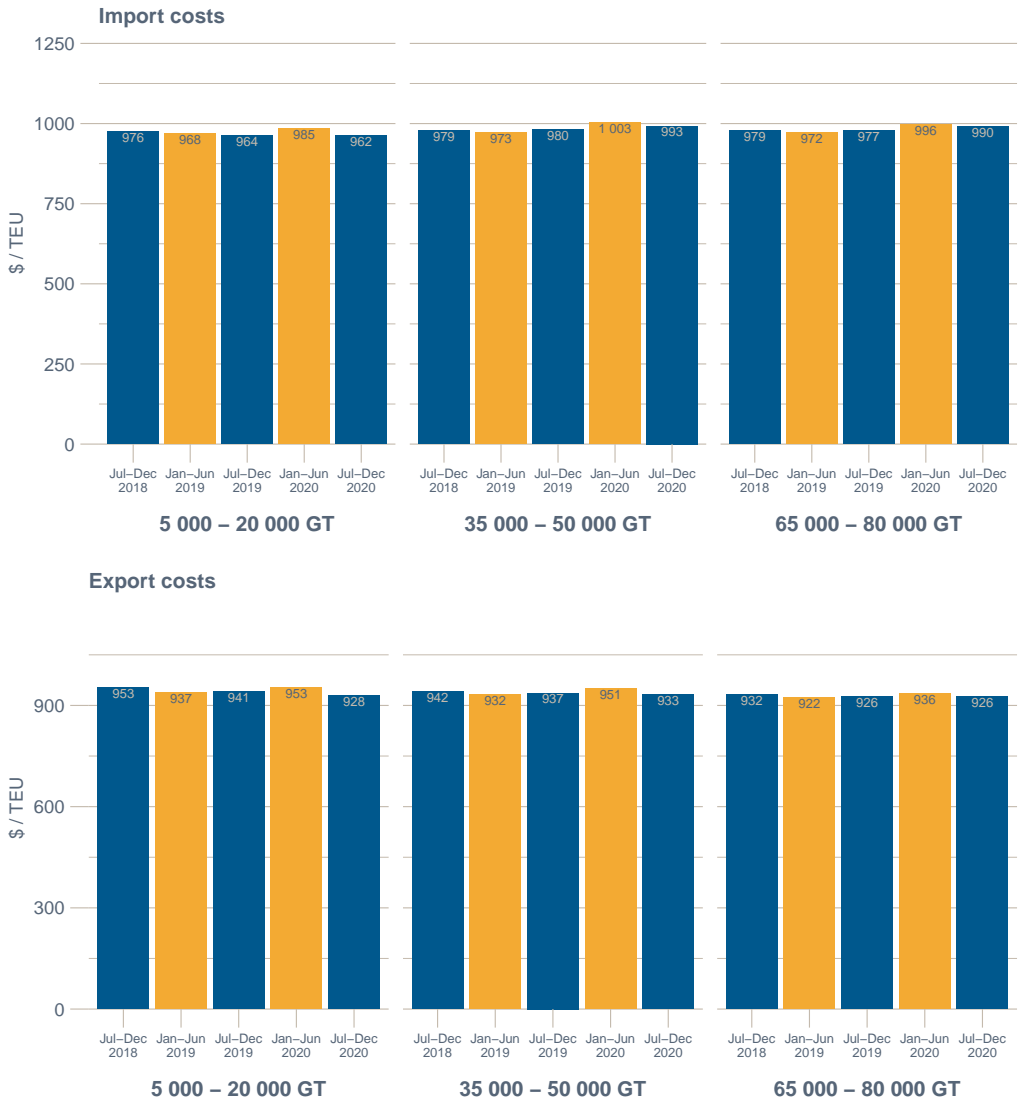
The national port interface cost indexes are the main outputs of the PICI calculations. These indexes are computed separately for imports and exports and for each of the ship size ranges monitored in *Waterline*.

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.



Vessels being worked at Fisherman Islands. Photo courtesy of Port of Brisbane Pty Ltd.

Figure 4.1 Port interface costs, constant prices (July–December 2020), by ship size



Sources: BITRE estimates based on data in Tables 4.1 to 4.5 and ABS (2020).

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				
	2018		2019		2020	2018		2019		2020	2018		2019		2020
	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec
Port call parameters^a															
Total TEUs exchanged	277	326	330	398	525	1 209	1 050	1 220	1 116	1 374	1 961	1 663	1 847	1 646	1 901
Loaded	229	245	244	292	386	953	871	966	888	1 093	1 289	1 136	1 280	1 217	1 402
Loaded inwards	92	104	117	124	238	635	549	625	596	773	800	721	814	821	983
Loaded outwards	137	141	127	168	148	318	322	341	292	320	490	415	466	396	419
Empty ^b	48	81	86	107	138	256	179	254	228	281	672	527	566	429	499
Number of port calls	10	7	11	7	8	4	5	4	4	3	4	4	4	4	4
Elapsed berth time (hours)	24	24	22	28	28	21	21	21	21	27	28	27	28	25	33
Charges per ship visit (\$)															
Total ship-based charges	36 795	37 055	37 693	37 959	38 528	58 357	58 731	59 778	60 160	61 106	67 655	68 053	69 284	69 692	70 818
Empty	792	1 337	1 350	1 688	2 548	5 169	3 608	5 121	4 677	5 863	13 675	10 604	11 488	8 626	10 340
Ship-based charges (\$/TEU)															
Conservancy	14	11	12	10	7	8	9	8	9	7	8	10	9	10	9
Tonnage	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pilotage	44	37	38	31	24	16	19	17	18	15	11	13	12	13	12
Towage	67	57	57	48	37	22	26	22	25	20	14	17	16	18	16
Mooring, unmooring ^c	9	8	8	6	5	2	2	2	2	2	1	1	1	2	1
Total ship-based charges (\$/TEU)	133	114	114	95	73	48	56	49	54	44	34	41	38	42	37
Fees and charges for imports															
Total ship-based charges (\$/TEU)	133	114	114	95	73	48	56	49	54	44	34	41	38	42	37
Cargo-based charges															
Wharfage	38	38	39	39	39	38	38	39	39	39	38	38	39	39	39
Harbour dues	68	68	69	69	69	68	68	69	69	69	68	68	69	69	69
Other charges															
Stevedoring—wharfside	150	150	150	151	150	150	150	150	151	150	150	150	150	151	150
Stevedoring—landside	28	28	33	33	32	28	28	33	33	32	28	28	33	33	32
Terminal access charges ^d	23	34	39	52	65	23	34	39	52	65	23	34	39	52	65
Road transport charges ^e	429	431	431	433	434	429	431	431	433	434	429	431	431	433	434
Customs broker fees	129	127	125	123	122	129	127	125	123	122	129	127	125	123	122
Total fees and charges (\$ / import TEU)	999	990	1 000	996	984	914	932	935	954	955	901	918	923	943	948
Port's share in national index^f (%)	8	10	12	11	16	21	19	21	20	21	9	10	13	16	18

(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				
	2018	2019	2020			2018	2019	2020			2018	2019	2020		
	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec
Fees and charges for exports															
Total ship-based charges (\$/TEU)	133	114	114	95	73	48	56	49	54	44	34	41	38	42	37
Cargo-based charges															
Wharfage	38	38	39	39	39	38	38	39	39	39	38	38	39	39	39
Harbour dues	68	68	69	69	69	68	68	69	69	69	68	68	69	69	69
Other charges															
Stevedoring—wharfside	150	150	150	151	150	150	150	150	151	150	150	150	150	151	150
Stevedoring—landside	28	28	33	33	32	28	28	33	33	32	28	28	33	33	32
Terminal access charges ^d	23	34	39	46	53	23	34	39	46	53	23	34	39	46	53
Road transport charges ^e	429	431	431	433	432	429	431	431	433	432	429	431	431	433	432
Customs broker fees	117	115	114	113	113	117	115	114	113	113	117	115	114	113	113
Total fees and charges (\$ / export TEU)	987	979	990	980	961	902	921	924	938	932	888	906	913	927	925
Port's share in national index^f (%)	12	11	11	13	12	21	19	22	19	20	9	10	14	14	17

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 (2021) 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				
	2018		2019		2020	2018		2019		2020	2018		2019		2020
	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec
Port call parameters^a															
Total TEUs exchanged	557	593	572	523	686	2 206	1 941	2 051	2 139	2 516	3 586	3 098	3 200	3 078	3 394
Loaded	457	499	456	418	527	1 613	1 440	1 514	1 538	1 747	2 365	2 052	2 188	2 168	2 398
Loaded inwards	202	220	184	169	239	1 120	1 013	1 094	1 141	1 320	1 812	1 537	1 641	1 595	1 874
Loaded outwards	256	279	272	249	288	494	427	419	397	428	553	515	547	573	524
Empty ^b	100	94	116	105	159	593	501	537	601	768	1 221	1 046	1 012	910	995
Number of port calls	15	11	14	12	9	4	4	4	3	3	3	3	4	4	4
Elapsed berth time (hours)	23	26	27	27	37	33	31	36	-	55	45	40	42	43	62
Charges per ship visit (\$)															
Total ship-based charges	31 180	31 355	32 183	32 362	32 605	63 498	63 814	65 581	65 903	66 329	83 758	84 093	86 558	86 902	87 368
Empty	1 439	1 356	1 706	1 545	2 338	8 552	7 231	7 908	8 849	11 310	17 620	15 091	14 902	13 393	14 651
Ship-based charges (\$/TEU)															
Conservancy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tonnage	18	17	18	20	15	12	13	13	13	11	12	14	14	14	13
Pilotage	11	10	11	12	9	5	5	5	5	4	3	4	4	4	4
Towage	22	21	22	25	19	10	12	11	11	9	7	8	8	8	7
Mooring, unmooring ^c	5	5	5	5	4	2	2	2	2	2	2	2	2	2	2
Total ship-based charges (\$/TEU)	56	53	56	62	48	29	33	32	31	26	23	27	27	28	26
Fees and charges for imports															
Total ship-based charges (\$/TEU)	56	53	56	62	48	29	33	32	31	26	23	27	27	28	26
Cargo-based charges															
Wharfage	135	135	142	142	142	135	135	142	142	142	135	135	142	142	142
Harbour dues	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other charges															
Stevedoring—wharfside	150	150	150	150	148	150	150	150	150	148	150	150	150	150	148
Stevedoring—landside	28	28	32	32	31	28	28	32	32	31	28	28	32	32	31
Terminal access charges ^d	19	30	37	54	58	19	30	37	54	58	19	30	37	54	58
Road transport charges ^e	473	475	476	478	477	473	475	476	478	477	473	475	476	478	477
Customs broker fees	125	129	132	135	136	125	129	132	135	136	125	129	132	135	136
Total fees and charges (\$ / import TEU)	987	1 000	1 025	1 053	1 040	959	980	1 001	1 022	1 019	954	974	996	1 019	1 018
Port's share in national index^f (%)	21	29	23	22	16	31	32	34	35	33	39	41	39	37	37

(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				
	2018		2019		2020	2018		2019		2020	2018		2019		2020
	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec
Fees and charges for exports															
Total ship-based charges (\$/TEU)	56	53	56	62	48	29	33	32	31	26	23	27	27	28	26
Cargo-based charges															
Wharfage	90	90	96	96	96	90	90	96	96	96	90	90	96	96	96
Harbour dues	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other charges															
Stevedoring—wharfside	150	150	150	150	148	150	150	150	150	148	150	150	150	150	148
Stevedoring—landside	28	28	32	32	31	28	28	32	32	31	28	28	32	32	31
Terminal access charges ^d	19	30	37	50	52	19	30	37	50	52	19	30	37	50	52
Road transport charges ^e	473	475	476	478	477	473	475	476	478	477	473	475	476	478	477
Customs broker fees	108	107	107	107	106	108	107	107	107	106	108	107	107	107	106
Total fees and charges (\$ / export TEU)	924	933	955	974	958	897	913	931	943	937	891	908	926	941	936
Port's share in national index^f (%)	25	32	32	29	24	27	24	26	24	24	21	24	25	25	22

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 (2021) 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				
	2018		2019		2020	2018		2019		2020	2018		2019		2020
	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec
Port call parameters^a															
Total TEUs exchanged	960	960	913	836	852	2 250	2 101	2 206	2 148	2 591	3 401	3 244	3 639	3 736	3 939
Loaded	841	856	794	720	729	1 749	1 631	1 729	1 703	2 028	2 525	2 369	2 731	2 896	3 042
Loaded inwards	305	331	286	277	291	1 110	999	1 103	1 043	1 350	1 578	1 469	1 761	1 844	1 946
Loaded outwards	536	526	508	443	438	639	632	626	660	678	947	900	971	1 051	1 096
Empty ^b	119	104	120	117	123	502	470	477	444	563	876	875	908	840	898
Number of port calls	6	6	6	6	5	4	4	4	4	3	3	3	3	4	4
Elapsed berth time (hours)	29	28	28	26	28	29	27	30	29	38	34	34	40	41	44
Charges per ship visit (\$)															
Total ship-based charges	40 677	40 923	41 293	41 545	42 011	62 637	62 928	63 541	63 838	64 686	86 410	86 704	87 619	87 921	89 239
Empty	2 288	2 001	2 323	2 268	2 435	9 619	9 014	9 272	8 637	11 190	16 804	16 784	17 643	16 326	17 841
Ship-based charges (\$/TEU)															
Conservancy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tonnage	10	10	11	12	12	11	12	11	12	10	14	14	13	13	12
Pilotage	11	11	12	13	13	6	7	7	7	6	5	5	5	4	4
Towage	18	18	20	22	22	9	10	10	10	8	6	7	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)	42	43	45	50	49	28	30	29	30	25	25	27	24	24	23
Fees and charges for imports															
Total ship-based charges (\$/TEU)	42	43	45	50	49	28	30	29	30	25	25	27	24	24	23
Cargo-based charges															
Wharfage	120	120	122	124	135	120	120	122	124	135	120	120	122	124	135
Harbour dues	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other charges															
Stevedoring—wharfside	151	150	151	151	149	151	150	151	151	149	151	150	151	151	149
Stevedoring—landside	29	28	33	33	32	29	28	33	33	32	29	28	33	33	32
Terminal access charges ^d	31	49	54	71	72	31	49	54	71	72	31	49	54	71	72
Road transport charges ^e	459	461	462	465	464	459	461	462	465	464	459	461	462	465	464
Customs broker fees	129	128	127	127	126	129	128	127	127	126	129	128	127	127	126
Total fees and charges (\$ / import TEU)	961	980	994	1 019	1 029	947	968	977	1 000	1 005	944	964	973	993	1 003
Port's share in national index^f (%)	18	19	16	17	14	35	34	34	35	38	34	33	33	32	34

(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				
	2018		2019		2020	2018		2019		2020	2018		2019		2020
	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec
Fees and charges for exports															
Total ship-based charges (\$/TEU)	42	43	45	50	49	28	30	29	30	25	25	27	24	24	23
Cargo-based charges															
Wharfage	105	105	103	103	105	105	105	103	103	105	105	105	103	103	105
Harbour dues	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other charges															
Stevedoring—wharfside	151	150	151	151	149	151	150	151	151	149	151	150	151	151	149
Stevedoring—landside	29	28	33	33	32	29	28	33	33	32	29	28	33	33	32
Terminal access charges ^d	31	49	54	65	63	31	49	54	65	63	31	49	54	65	63
Road transport charges ^e	459	461	462	464	463	459	461	462	464	463	459	461	462	464	463
Customs broker fees	116	114	113	111	110	116	114	113	111	110	116	114	113	111	110
Total fees and charges (\$ / export TEU)	933	951	960	976	973	919	939	943	956	949	916	936	939	950	946
Port's share in national index^f (%)	29	25	26	24	25	39	38	38	43	42	36	36	35	34	41

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 (2021) 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				
	2018		2019		2020	2018		2019		2020	2018		2019		2020
	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec
Port call parameters^a															
Total TEUs exchanged	-	322	-	-	861	729	765	782	813	878	1 056	1 134	1 196	1 370	1 374
Loaded	-	287	-	-	182	624	652	643	637	748	856	833	883	1 028	1 112
Loaded inwards	-	232	-	-	0	375	340	326	307	337	360	371	384	340	463
Loaded outwards	-	55	-	-	182	249	313	317	330	410	496	462	499	688	649
Empty ^b	-	35	-	-	679	106	113	139	176	130	200	301	314	342	262
Number of port calls	-	1	-	-	1	4	5	4	3	3	3	3	3	4	4
Elapsed berth time (hours)	-	24	-	-	29	16	18	22	23	27	23	23	26	30	31
Charges per ship visit (\$)															
Total ship-based charges	27 398	34 240	28 043	28 213	36 556	51 695	52 306	55 401	56 111	59 508	64 122	64 485	66 563	67 347	69 386
Empty	-	0	-	-	0	0	0	0	0	0	0	0	0	0	0
Ship-based charges (\$/TEU)															
Conservancy	-	11	-	-	4	6	5	7	6	7	9	8	8	6	6
Tonnage	-	22	-	-	10	13	13	14	14	15	15	14	14	14	15
Pilotage	-	23	-	-	9	10	10	10	10	9	7	7	7	6	6
Towage	-	49	-	-	19	42	41	40	39	36	30	28	27	24	24
Mooring, unmooring ^c	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total ship-based charges (\$/TEU)	-	106	-	-	42	71	68	71	69	68	61	57	56	49	51
Fees and charges for imports															
Total ship-based charges (\$/TEU)	-	106	-	-	42	71	68	71	69	68	61	57	56	49	51
Cargo-based charges															
Wharfage	90	90	91	91	94	90	90	91	91	94	90	90	91	91	94
Harbour dues	7	7	30	30	30	7	7	30	30	30	7	7	30	30	30
Other charges															
Stevedoring—wharfside	-	156	-	-	155	156	156	157	157	155	156	156	157	157	155
Stevedoring—landside	-	31	-	-	35	31	31	36	36	35	31	31	36	36	35
Terminal access charges ^d	-	20	-	-	20	20	20	21	20	20	20	20	21	20	20
Road transport charges ^e	-	381	-	-	379	382	381	382	382	379	382	381	382	382	379
Customs broker fees	-	131	-	-	129	132	131	131	130	129	132	131	131	130	129
Total fees and charges (\$ / import TEU)	-	922	-	-	885	890	884	920	915	910	879	873	904	895	893
Port's share in national index^f (%)	-	0	-	-	0	4	5	4	4	4	6	6	4	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				
	2018	2019	2020			2018	2019	2020			2018	2019	2020		
	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec
Fees and charges for exports															
Total ship-based charges (\$/TEU)	-	106	-	-	42	71	68	71	69	68	61	57	56	49	51
Cargo-based charges															
Wharfage	90	90	91	91	94	90	90	91	91	94	90	90	91	91	94
Harbour dues	7	7	30	30	30	7	7	30	30	30	7	7	30	30	30
Other charges															
Stevedoring—wharfside	-	156	-	-	155	156	156	157	157	155	156	156	157	157	155
Stevedoring—landside	-	31	-	-	35	31	31	36	36	35	31	31	36	36	35
Terminal access charges ^d	-	20	-	-	20	20	20	21	20	20	20	20	21	20	20
Road transport charges ^e	-	381	-	-	379	382	381	382	382	379	382	381	382	382	379
Customs broker fees	-	86	-	-	88	86	86	88	89	88	86	86	88	89	88
Total fees and charges (\$ / export TEU)	-	877	-	-	844	843	839	876	874	869	833	828	861	854	852
Port's share in national index^f (%)	-	0	-	-	0	6	8	8	8	10	14	13	11	10	9

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 (2021) 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				
	2018		2019		2020	2018		2019		2020	2018		2019		2020
	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec
Port call parameters^a															
Total TEUs exchanged	2 251	1 951	2 360	2 574	2 876	1 434	1 326	1 350	1 134	1 146	1 517	1 430	1 760	2 509	2 433
Loaded	1 956	1 801	2 020	2 105	2 218	1 171	1 135	1 134	923	934	1 136	1 084	1 314	1 796	1 707
Loaded inwards	1 134	948	1 188	1 165	1 391	828	716	794	631	667	624	578	736	1 018	988
Loaded outwards	822	852	833	939	826	342	418	340	292	267	511	506	578	778	719
Empty ^b	296	150	340	469	658	263	192	216	211	211	381	346	447	713	726
Number of port calls	11	12	13	12	10	4	5	5	4	5	6	5	5	6	5
Elapsed berth time (hours)	34	33	32	34	44	26	25	24	26	24	30	26	29	39	43
Charges per ship visit (\$)															
Total ship-based charges	23 878	23 998	24 343	24 515	24 803	42 123	42 316	42 945	43 219	43 719	65 458	65 808	66 726	67 227	68 024
Empty	3 647	1 848	4 272	5 899	8 353	3 244	2 363	2 711	2 655	2 682	4 695	4 264	5 614	8 968	9 224
Ship-based charges (\$/TEU)															
Conservancy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tonnage	2	2	2	2	1	7	8	8	9	9	11	12	10	7	7
Pilotage	3	3	3	2	2	7	8	8	9	9	7	7	6	4	4
Towage	6	7	5	5	5	14	15	15	18	18	24	26	21	15	16
Mooring, unmooring ^c	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total ship-based charges (\$/TEU)	11	12	10	10	9	29	32	32	38	38	43	46	38	27	28
Fees and charges for imports															
Total ship-based charges (\$/TEU)	11	12	10	10	9	29	32	32	38	38	43	46	38	27	28
Cargo-based charges															
Wharfage	82	82	83	83	84	82	82	83	83	84	82	82	83	83	84
Harbour dues	38	38	39	39	40	38	38	39	39	40	38	38	39	39	40
Other charges															
Stevedoring—wharfside	153	153	153	153	151	153	153	153	153	151	153	153	153	153	151
Stevedoring—landside	30	30	34	34	33	30	30	34	34	33	30	30	34	34	33
Terminal access charges ^d	5	5	5	26	31	5	5	5	26	31	5	5	5	26	31
Road transport charges ^e	420	419	418	419	418	420	419	418	419	418	420	419	418	419	418
Customs broker fees	157	155	153	151	150	157	155	153	151	150	157	155	153	151	150
Total fees and charges (\$ / import TEU)	895	895	895	915	914	914	915	917	944	943	928	929	923	933	933
Port's share in national index^f (%)	52	42	49	49	54	8	10	7	6	5	13	11	11	12	8

(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				
	2018	2019	2020	2018	2019	2020	2018	2019	2020	2018	2019	2020	2018	2019	2020
	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec
Fees and charges for exports															
Total ship-based charges (\$/TEU)	11	12	10	10	9	29	32	32	38	38	43	46	38	27	28
Cargo-based charges															
Wharfage	82	82	83	83	84	82	82	83	83	84	82	82	83	83	84
Harbour dues	38	38	39	39	40	38	38	39	39	40	38	38	39	39	40
Other charges															
Stevedoring—wharfside	153	153	153	153	151	153	153	153	153	151	153	153	153	153	151
Stevedoring—landside	30	30	34	34	33	30	30	34	34	33	30	30	34	34	33
Terminal access charges ^d	5	5	5	21	22	5	5	5	21	22	5	5	5	21	22
Road transport charges ^e	420	419	418	419	417	420	419	418	419	417	420	419	418	419	417
Customs broker fees	126	123	120	118	117	126	123	120	118	117	126	123	120	118	117
Total fees and charges (\$ / export TEU)	864	863	862	876	872	882	883	884	905	901	896	897	890	894	891
Port's share in national index^f (%)	35	32	31	34	39	7	10	6	6	4	19	17	16	17	12

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 (2021) and other sources (see text).

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

Port interface costs (\$/TEU)		2018		2019		2020	
		Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun
Import	5,000–20,000 GT	935	951	953	973	962	
	20,000–35,000 GT	957	975	983	1 016	1 012	
	35,000–50,000 GT	938	956	970	992	993	
	50,000–65,000 GT	935	950	963	992	994	
	65,000–80,000 GT	938	955	967	985	990	
	80,000–95,000 GT	939	958	970	983	986	
	95,000–110,000 GT	-	-	969	986	983	
Export	5,000–20,000 GT	913	920	931	942	928	
	20,000–35,000 GT	913	941	948	966	954	
	35,000–50,000 GT	902	915	927	940	933	
	50,000–65,000 GT	897	910	919	941	938	
	65,000–80,000 GT	893	906	916	925	926	
	80,000–95,000 GT	902	913	921	928	927	
	95,000–110,000 GT	-	-	913	922	918	

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)		2018		2019		2020	
		Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun
ABS non-farm GDP deflator		95.8	98.2	98.9	98.8	100.0	
Import	5,000–20,000 GT	976	968	964	985	962	
	20,000–35,000 GT	999	993	994	1 028	1 012	
	35,000–50,000 GT	979	973	980	1 003	993	
	50,000–65,000 GT	975	967	973	1 004	994	
	65,000–80,000 GT	979	972	977	996	990	
	80,000–95,000 GT	980	975	980	995	986	
	95,000–110,000 GT	-	-	979	997	983	
Export	5,000–20,000 GT	953	937	941	953	928	
	20,000–35,000 GT	952	958	958	978	954	
	35,000–50,000 GT	942	932	937	951	933	
	50,000–65,000 GT	936	927	929	952	938	
	65,000–80,000 GT	932	922	926	936	926	
	80,000–95,000 GT	941	930	931	939	927	
	95,000–110,000 GT	-	-	923	933	918	

Notes: Values in constant prices are derived using the ABS non-farm GDP deflator, with July–December 2020 as the base period.

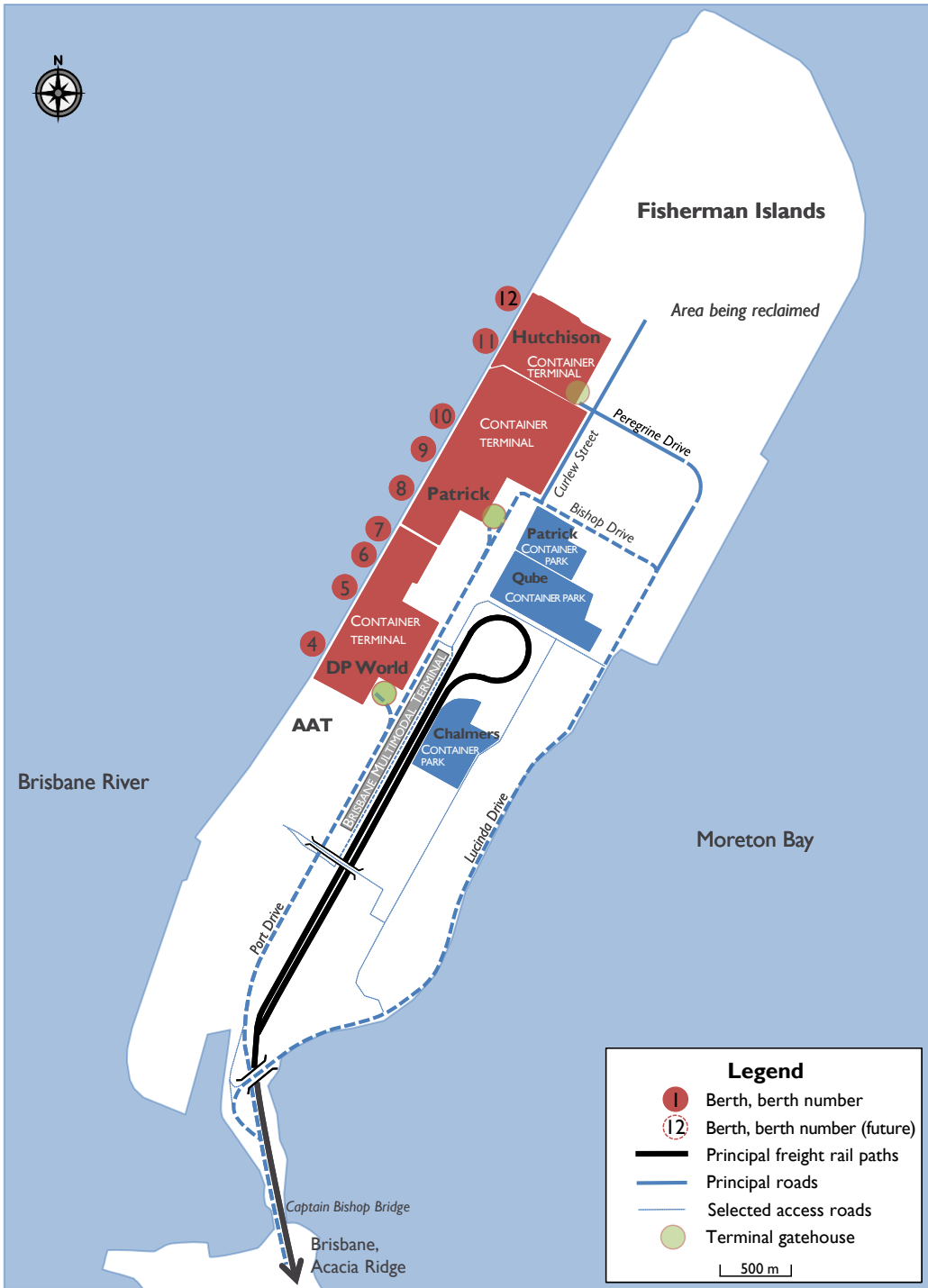
Sources: BITRE estimates based on data in Tables 4.1 to 4.5 and ABS (2021).

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 December 2020.

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 6 cranes, including 5 post-Panamax cranes and one Panamax crane. Two post-Panamax cranes were commissioned in 2018. DP World’s semi-automated terminal has 16 automated stacking cranes. Patrick has 4 post-Panamax cranes, with a fifth on order for delivery in 2021; in addition, Patrick has 31 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

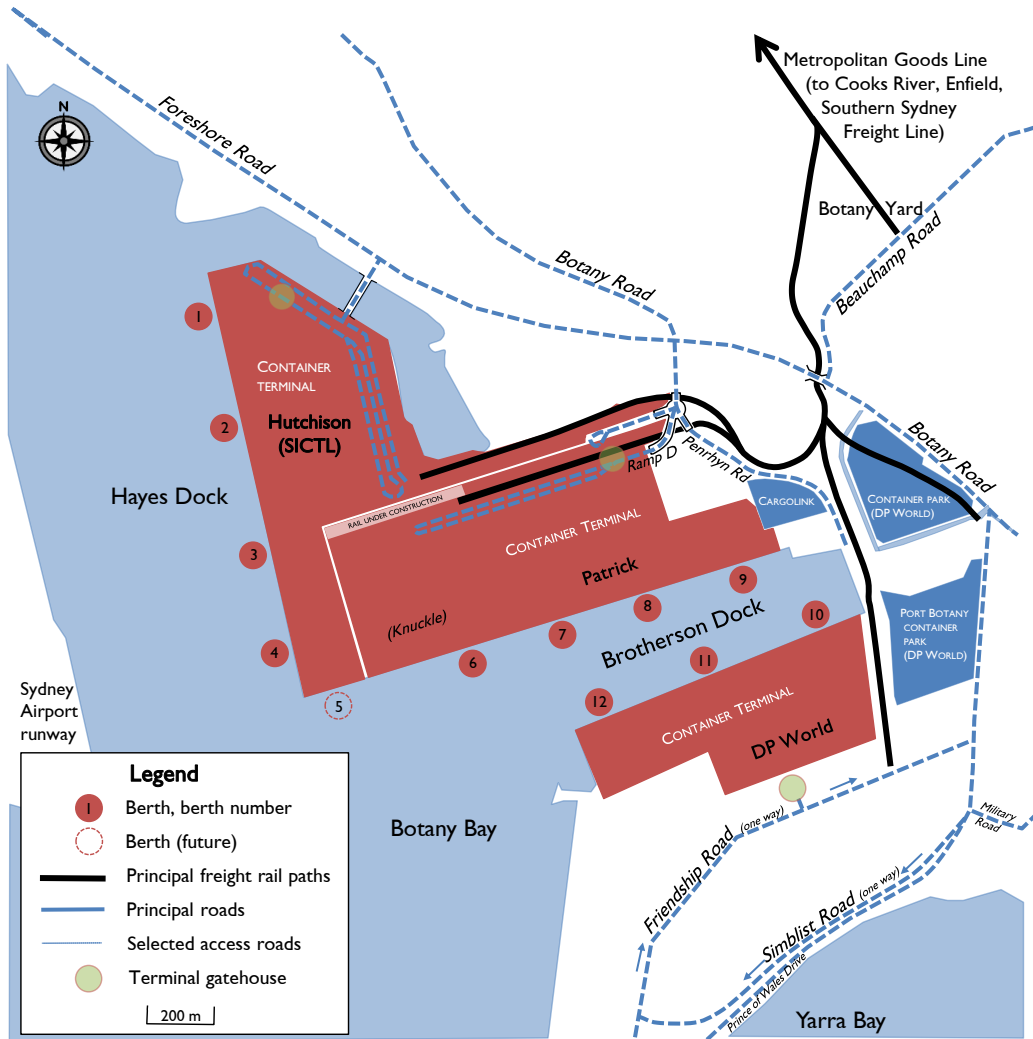
Facilities. Brisbane Multimodal Terminal provides “near-dock” intermodal rail facilities at Fisherman Islands. Train lengths of up to 850 metres are permitted. Containers are moved on public roads between the container terminals and the intermodal rail terminal.

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 2 single-lift quay cranes. DP World took delivery of three twin-lift, post-Panamax cranes in 2018.

Patrick equipment includes 8 twin-lift quay cranes, with a ninth twin-lift crane on order for delivery in early 2021. Patrick has implemented an automated container yard, with 53 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. Four new 600 metre sidings are under construction, with completion expected in 2023. Three (3) Automated Rail-Mounted Gantries (ARMGs) will service the new sidings on completion. The existing two 600 metre rail sidings remain operational.

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

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

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

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

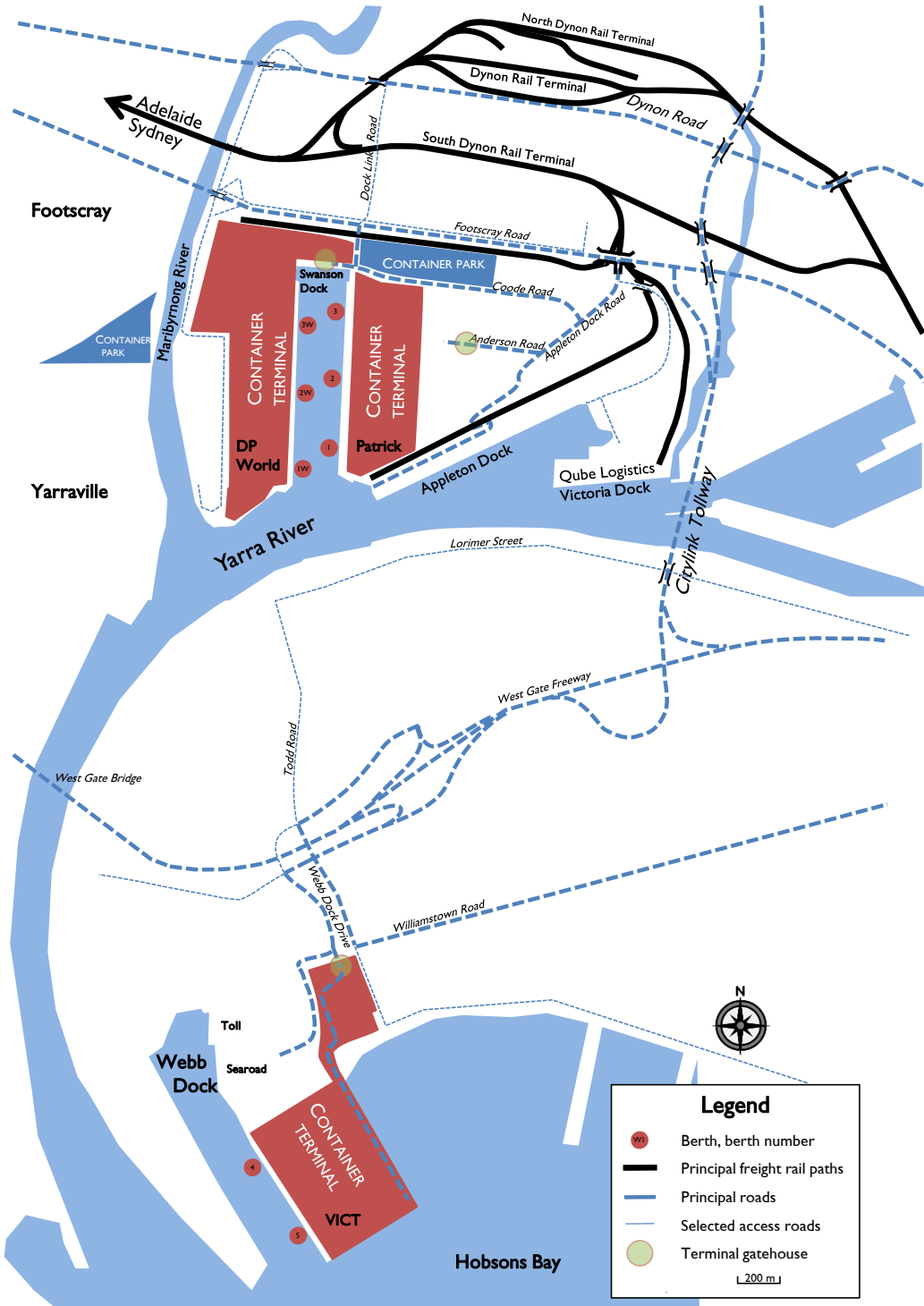
Rail access. Railway sidings at Botany Yard are used to regulate train entry to the port; to split trains, where necessary, for onwards movements to the port, and to re-form trains from port-terminal wagon rakes for movements to Cooks River, Enfield and beyond.

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



Aerial view over Fisherman Islands. Photo courtesy of Port of Brisbane Pty Ltd.

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 9 cranes, including 6 post-Panamax, twin-lift cranes—three post-Panamax cranes were commissioned in 2018.

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;
- 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.

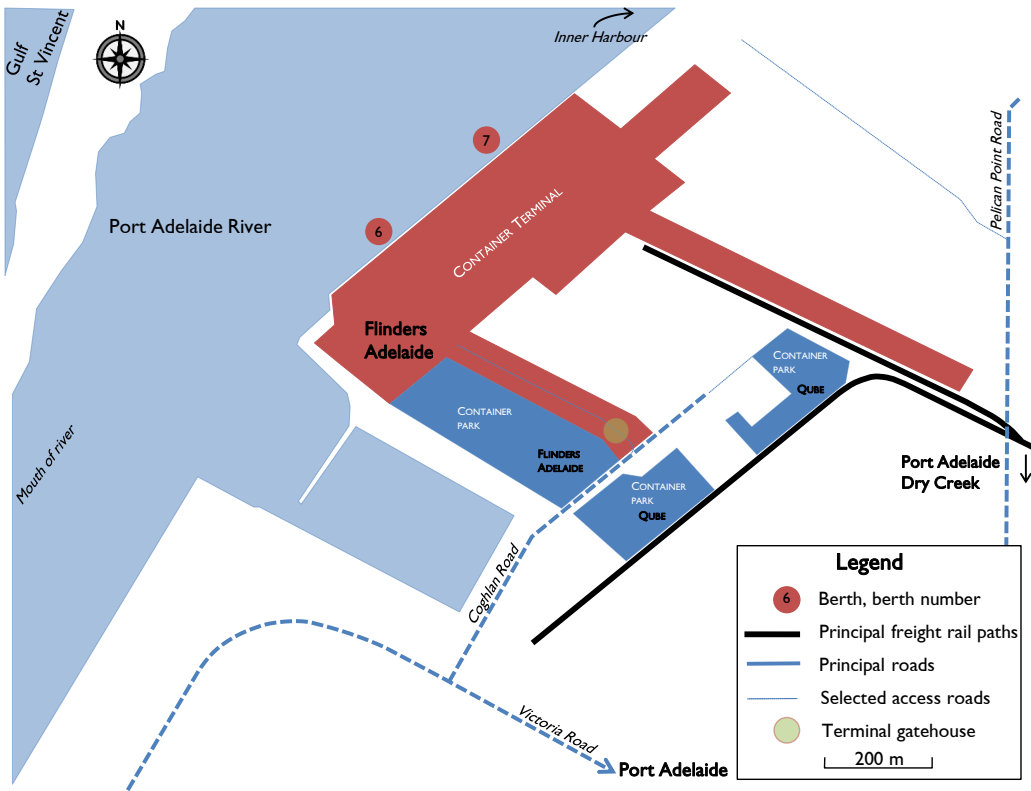
Rail linkages. The dock area consists of rail facilities near the docks and the nearby intermodal container terminals at South Dynon, Dynon and North Dynon. Although there is an eastern link from the Dynon terminals towards the east (Southern Cross and Flinders Street), the container movements are to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



Vessel *Mandalay* (IMO: 9743502) departing the DP World terminal at Fisherman Islands. Photo courtesy of Port of Brisbane Pty Ltd.

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).

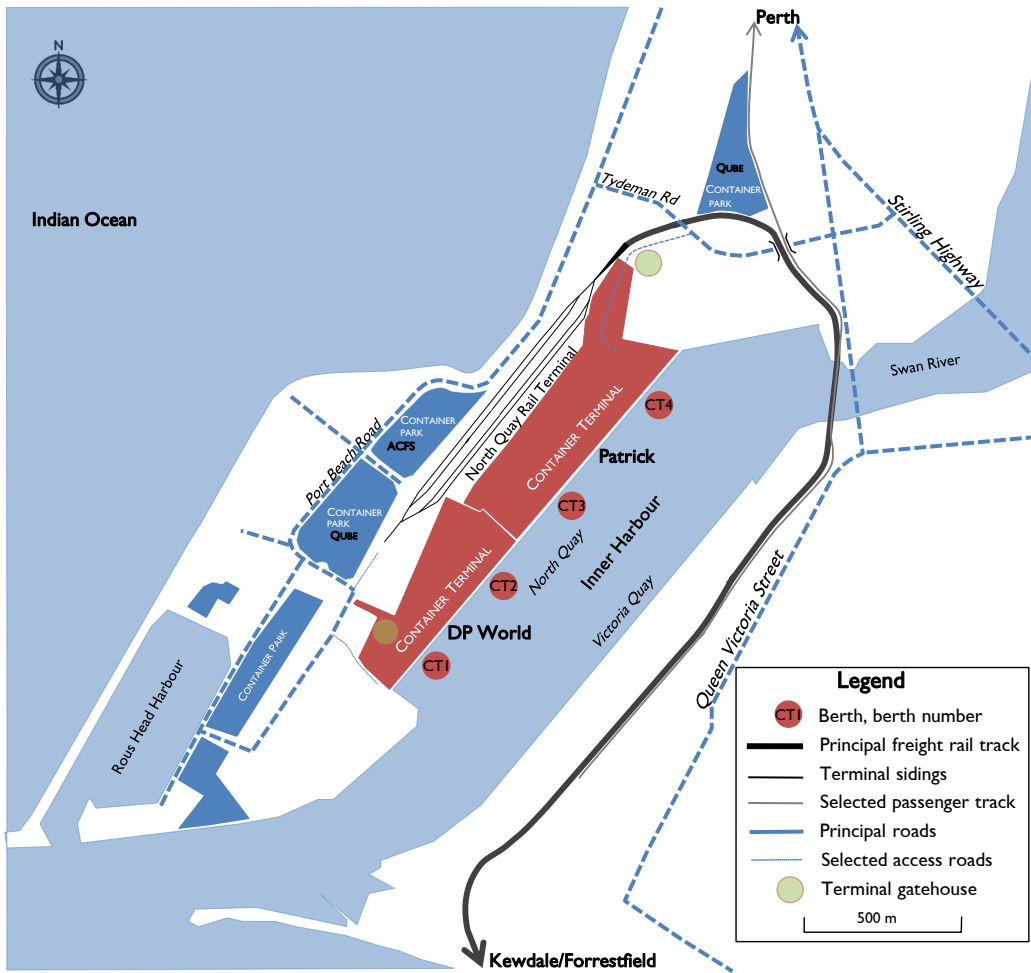
Long-haul:

- 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: April 2021)

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 have four berths and DP World has three berths.

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

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

Road

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

Rail

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

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

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

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

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

References

- Australian Bureau of Statistics (ABS) 2021. *Australian National Accounts: National Income, Expenditure and Product, Jun 2021*, 'Table 24. Selected Analytical Series', time series spreadsheet, cat. no. 5206.0.
- Australian Competition and Consumer Commission (ACCC) 2020. *Container stevedoring monitoring report 2019–20*, November 2020, Canberra.
- Bureau of Transport and Communications Economics (BTCE) 1993. *Port Interface Cost Index*, Report 84, BTCE, Australian Government Publishing Service, Canberra.
- Containerchain Pty Ltd 2020. (unpublished data).
- DP World 2021. (unpublished data).
- Flinders Adelaide Container Terminal 2021. (unpublished data).
- Flinders Ports 2021. (unpublished data).
- Fremantle Ports 2021. (unpublished data).
- Hutchison Ports Australia 2021. (unpublished data).
- Maritime Safety Queensland 2021. (unpublished data).
- NSW Ports 2021. (unpublished data).
- Patrick 2021. (unpublished data).
- Port Authority of New South Wales 2021. (unpublished data).
- Port of Brisbane Pty Ltd 2021. (unpublished data).
- Port of Melbourne Operations Pty Ltd 2021. (unpublished data).
- Ports Australia 2015. (unpublished data).
- SA Track and Signal 2014. Australian railway track and signal drawings and signal locations (online railway and port maps). <http://www.sa-trackandsignal.net>.
- Victoria International Container Terminal 2021. (unpublished data).

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