Australian Government
Department of Transport and Regional Services
Bureau of Transport and Regional Economics

WATERLINE

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Feature Article

This issue contains a feature article on a new set of port terminal productivity indicators. The article discusses the rationale for new indicators related to the landside of port terminals. The new indicators deal with the interface of road and rail transport with Australia's port terminals. They measure various aspects of the performance of the interface including capacity utilisation for vehicles on the landside of a port, and utilisation of vehicle booking system slots at port terminals.

Explanatory notes

This issue contains extended explanatory notes about the terms and concepts that are used in *Waterline*. These explanatory notes will become a standard feature of the *Waterline* journal.

In brief

- In January–June 2006, total cargo throughput was 58.4 million tonnes and total container traffic 2.317 million twenty foot equivalent units (page 23).
- The five-port average crane rate decreased from 27.8 containers per hour in the March quarter 2006 to 27.0 containers per hour in the June quarter 2006 (page 14).
- The five-port average vessel working rate has increased over the period from 34.9 containers per hour in the March quarter 2006 to 35.3 in the June quarter 2006 (page 14).
- The five port total of container moves increased from 741 960 in the March quarter 2006 to 795 252 in the June quarter 2006 (page 14).
- Harbour towage charges increased at three of the five major ports during the financial year 2005–2006 (page 27).
- The national port interface cost index for exporting a container was $613/teu in 2001 constant prices for January–June 2006. This is higher than in July–December 2005 when it was $605/teu (page 20).
- Total ship visits increased by 16 per cent to 4078 in the year ended 30 June 2006 (page 22).
- The tonnage of cargo estimated to be moved under coastal permits has fallen from 15.5 million tonnes in the calendar year 2005 to 15.3 million tonnes for the financial year 2005–2006 (page 25).

Contents

Performance indicators for landside of port terminal

The story so far

First published in 1994, *Waterline* is a bi-annual journal containing key indicators of port and/or terminal performance based on data sourced from Australian stevedoring companies, port authorities, shipping lines and other industry participants. A major criticism of the current set of performance indicators is that they are not comprehensive. They focus on the wharf side of port terminals and pay no attention to the landside. There is increasing demand for indicators of productivity improvements in the interface between port terminals and the trucks and trains that deliver freight to and from the terminal. This article introduces a set of indicators of the performance of that interface.

Why the new indicators?

The push for reform at the waterfront was given special emphasis following the publication some twenty years ago of the Webber report (Webber,1986). The interface between seaports and land transport extends from the wharf to the importer and from the exporter to the wharf. In major capital city ports, 80–85 per cent of containers are moved to and from the wharf by road (HORSCOTCI 1992). Low productivity anywhere in the logistic chain translates into significant costs (BTCE 1990).

There are effects on individual operators which could include lost production time, slowdown or stoppage of production processes, loss of contracts, and cancellation of orders because delays mean critical deadlines cannot be met. There are increased costs to consumers of Australian exports and imports leading to substantial economic losses. BTCE (1990) estimated that truck queues at the waterfront led to national annual losses of $45 million in 1988. There also are flow-on effects to many other sectors in the economy which use and rely on the services provided by the waterfront, and intangible costs, including loss of trading reputation as a reliable exporter or importer.

There also is the issue of whether truck loads are optimal; that is, are there more trucks on the road because of inefficient loading? Sub-optimal truck loads have implications for both total freight costs and congestion. Sub-optimal loads mean that more vehicles and vehicle-related resources are used for the movement of freight, thereby increasing freight costs. More vehicles contribute to congestion on the road network and greenhouse gas emissions. This is pertinent to the more recent debate about adequacy of infrastructure (Brereton, 2005 and Infrastructure Partnerships Australia, 2005). At the core of the problem is what Meyrick and Associates (2005) has described as a mismatch of working hours in the freight supply chain.

Taken together with existing *Waterline* indicators of port performance, these new indicators represent a step towards the adoption of a more integrated approach to the assessment of the performance of the logistics industry.

Data sources for the new indicators

The new set of landside port terminal productivity indicators is derived from data collected in the vehicle booking systems (VBS) of terminal operators. During the 1990s a number of reforms were implemented at the waterfront in response to the issues raised by HORSCOTCI (1992, 1995). These included the introduction of enterprise bargaining agreements on productivity and equipment availability at the waterfront, and the establishment of VBS in Melbourne and Sydney and, eventually, in most of the capital city ports in Australia. Under a VBS:

- a road transport operator makes an advance booking for a time-slot at the terminal to deliver or collect a container;
- a truck owner or trucking company pays either an annual fee or a separate charge every time a VBS slot is allocated to a truck; and
- there is a monetary penalty charged if a booked slot is not utilised.

There is an administrative penalty associated with non-use of a booking: a truck has to apply for another slot or queue in the standby section.

The two current terminal operators, Toll/Patrick and P&O/ Dubai Ports World, jointly own a company called One Stop that provides a common web based platform for each operator's booking system in several main ports. Despite this commonality, each system remains fundamentally different in its operational methodology. Presently there are also some stand alone vehicles booking systems at certain ports operated by DP World.

Landside of port terminal productivity indicators

A decision is yet to be made on the final selection of indicators to publish in *Waterline*, although it is likely to be a sub-set of the following indicators.

A. Size of task indicators

Trucks

(1) Total number of trucks processed in a quarter (Monday–Friday). This indicator shows the total truck-related task performed at a port terminal in a quarter in a standard five day working week.

(2) Total number of trucks processed in a quarter (Saturday). This indicator shows the total truck-related task performed at a port terminal in a quarter on Saturdays.

(3) Total number of trucks processed in a quarter (Sunday). This indicator shows the total truck-related task performed at a port terminal in a quarter on Sundays. However, currently only some terminals open on Sundays, subject to demand.

Breaking up this size of task indicator by day of the week is intended to show how the landside of port freight task varies between the standard Monday–Friday working week and the weekend period.

Containers

(4) Number of containers processed in a quarter (Monday–Friday). This alternative task size indicator measures the work done on the landside of port terminals in terms of containers processed in a standard five day working week.

(5) Number of containers processed in a quarter (Saturday). This indicator measures the work done on the land-side of port terminals in terms of containers processed on Saturdays.

(6) Total containers processed in a quarter (Sunday). This indicator shows the total number of containers processed at a port terminal in a quarter on Sundays. However, currently only some terminals open on Sundays, subject to demand.

As in the other indicator of task, the indicator is broken up between the standard Monday–Friday working week and the weekend period.

The count of containers excludes bulk runs, and Australian Customs Service containers which are removed and returned to the port terminal after x-ray screening.

Rail

(7) Number of containers loaded on or unloaded from rail in a quarter. This indicator shows the total rail-related task performed at a port terminal in a quarter.

(8) Rail mode share of total containers in a quarter. This indicator shows the percentage share of rail in the task performed on the landside of a port terminal. This indicator could be used to gauge the extent to which targets for rail mode shares at port terminals are being achieved.

B. Average number of containers per truck

(9) Average containers per truck (Monday–Friday). This is a measure of truck capacity utilisation in the standard five day working week. The lower this measure is, the greater the under utilisation of truck capacity on the landside of port terminals at each respective facility.

(10) Average containers per truck (Saturday). This is a measure of truck capacity utilisation on Saturdays. The lower this measure is, the greater the under utilisation of truck capacity on the landside of port terminals at each respective facility.

(11) Average containers per truck (Sunday). This is a measure of truck capacity utilisation on Sundays. The lower this measure is, the greater the under utilisation of truck capacity on the landside of port terminals at each respective facility. Currently, only some terminals open on Sundays, subject to demand.

C. Container Turnaround Time (Minutes)

(12) Container turnaround time (Monday–Friday). This indicator measures the efficiency in the handling of an individual container at a port terminal in a five day working week. This measure includes more than just the time it takes to bring a container from the container storage yard and put it on a truck or take it from the truck. It is related to the truck turnaround time as follows:

> Container turnaround time = (Average truck turnaround time in a quarter) divided by (the average number of containers on a truck in a quarter).

In this definition, average truck turnaround time (TTT) in the quarter is a measure of the efficiency with which trucks are processed within a given terminal. The TTT indicator measures the length of time (in minutes) that a truck takes from the time it enters a port terminal to the time it exits the port terminal. The time spent at the gate is not included in this measure. A major driver of TTT is the availability of sufficient lifting capacity within the port terminal (Barber and Carmody, 1996).

Container turnaround time (CTT) recognises the task for the terminal and is a better measure of the performance of a terminal. CTT improves (that is, it goes down) if either the vehicle utilisation rate improves, implying that the number of containers per truck increases, or the port terminal is faster in processing each truck.

(13) Container turnaround time (Saturday). This indicator measures the efficiency in the

handling of an individual container at a port terminal on Saturdays. Apart from relating to a different part of the week, this indicator is defined in the same way as the container turnaround time (Monday–Friday).

(14) Container turnaround time (Sunday). This indicator measures the efficiency in the handling of an individual container at a port terminal on Sundays. Apart from relating to a different part of the week, this indicator is defined in the same way as the container turnaround time (Monday–Friday).

(15) Percentage of containers processed in a quarter with a turnaround time of 60 minutes or less (Monday–Friday). This is a measure of the efficiency with which containers are processed within a given terminal during the standard five day working week.

(16) Percentage of containers processed in a quarter with a turnaround time of 60 minutes or less (Saturday). This is a measure of the efficiency with which containers are processed within a given terminal on Saturdays.

(17) Percentage of containers processed in a quarter with a turnaround time of 60 minutes or less (Sunday). This is a measure of the efficiency with which containers are processed within a given terminal on Sundays. Currently, only some terminals open on Sundays, subject to demand.

D. Available vehicle booking system time slots (supply)

Stevedoring companies make available a number of vehicle booking slots per day per time zone, based on the deployment of container handling equipment. The major driver of the availability of VBS time slots is the volume of containers and terminal resources required to receive and deliver containers over a 24 hour period, seven days a week.

When shipping schedules permit and volumes demand, extra resources in the form of labour time and equipment can be deployed to the landside of a port terminal and extra time slots can be provided. Generally, resources are reallocated in this way one or two days in advance. The following indicators attempt to measure the supply of VBS time slots at port terminals.

(18) Available vehicle booking system slots between 0000 hours and 1600 hours (Monday–Friday) in a quarter. This indicator measures the supply of infrastructure at a port terminal for use by the landside of logistics businesses during this period.

(19) Available vehicle booking system slots between 0801 hours and 1600 hours (Monday–Friday) in a quarter. This indicator measures the supply of infrastructure at a port terminal for use by the landside logistics businesses during this period.

(20) Available vehicle booking system slots between 1601 hours and 2359 hours (Monday–Friday) in a quarter. This indicator measures the supply of infrastructure at a port terminal for use by the landside businesses during this period.

(21) Available vehicle booking system slots on Saturdays in a quarter. This indicator measures the supply of infrastructure at a port terminal for use by the landside businesses during this period. Whilst these numbers reflect the infrastructure supplied, this supply is frequently limited only by demand.

(22) Available vehicle booking system slots on Sundays in a quarter. This indicator measures the supply of infrastructure at a port terminal for use by the landside businesses on Sundays. Whilst these numbers reflect the infrastructure supplied, this supply is frequently limited only by demand.

E. Adjusted usage rates for vehicle booking system slots (demand)

These indicators attempt to measure the degree of synchronisation between supply of and demand for slots. If the supply of vehicle booking system time slots was constant across time, a set of values showing the percentage of the VBS time slots used at different time points would suffice. However for reasons discussed above, in all port terminals the supply of VBS time slots is not constant. To adjust for the variability of the total supply of VBS the 'demand-supply' mismatch measures are computed in two steps as follows.

First, for the Monday–Friday segment and for Saturday and Sunday, separately, we estimate the maximum possible VBS time slots the port terminal is observed to be capable of supplying. Let VBS (i) be the number of VBS vehicle slot that a port terminal can supply in time window (i). We compute the maximum of {VBS(1), VBS(2) ... VBS(9)} where, VBS(1) is the number of vehicle slots in the Monday–Friday 0000–0800 hours window and VBS(9) is the number of vehicle slots in the Sunday 1600–2359 hours window.

This estimate of the maximum possible VBS time slots is then used in computing the adjusted usage rates for VBS time slots. For each of the time windows the adjusted usage rate is given by (the number of time slots booked) divided by (the maximum VBS time slots a port terminal can supply).

(23) Adjusted rate of usage of vehicle booking system time slots between 0000 hours and 0800 hours (Monday–Friday). This is a measure of the extent of synchronisation between the 24/7 businesses of port terminals and the operators of landside logistics business during this period. The higher the level of synchronisation between the two types of businesses, the higher the usage rates and the more efficient is the use of available infrastructure.

(24) Adjusted rate of usage of the vehicle booking system time slots 0801 hours and 1600 hours (Monday–Friday). This is a measure of the extent of mismatch between the 24/7 businesses of port terminals and the operators in the landside of port terminal logistics business during this period. The higher the level of mismatch between the two types of businesses, the lower the usage rates and the less efficient the use of available infrastructure.

(25) Adjusted rate of usage of the vehicle booking system time slots between 1601 hours and 2359 hours (Monday–Friday). This is a measure of the extent of mismatch between the 24/7 businesses of port terminals and the operators in the landside of port terminal logistics business during this period. The higher the level of mismatch between the two types of businesses, the lower the usage rates and the less efficient the use of available infrastructure.

(26) Adjusted rate of usage of the vehicle booking system slots on Saturdays. This is a measure of the extent of mismatch between the 24/7 businesses of port terminals and the operators in the landside of port terminal logistics business during this period. The higher the level of mismatch between the two types of businesses, the lower the usage rates and the less efficient the use of available infrastructure.

(27) Adjusted rate of usage of the vehicle booking system slots on Sundays. This is a measure of the extent of mismatch between the 24/7 businesses of port terminals and the operators in the landside of port terminal logistics business on Sundays.

Experimental estimates

In Table 1 we report preliminary, experimental estimates of landside port terminal productivity. These estimates are published for comment, and are intended to show the proposed coverage of the indicators, the approach used in indicator construction and the level of reporting proposed for the indicators. Table 1 gives a summary of a selection of these indicators for five ports and for each of the contributing port terminals—Brisbane, Sydney, Melbourne, Adelaide and Fremantle.

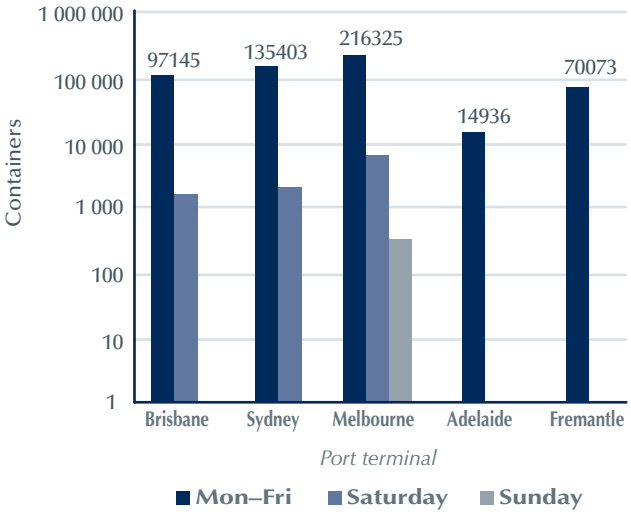
Size of task indicators

Total number of trucks (Monday–Friday) processed on the landside of the five port terminals increased by a total of 3744 from the March Quarter 2006 to June Quarter 2006 - an increase of 1%. This increase was uneven between the five ports with Brisbane increasing by 1%, Sydney increasing by 3%, Melbourne increasing by 2%, Adelaide decreasing by 3% (from 14 936 trucks in March quarter to 14 551 trucks in June quarter), and Fremantle increasing by 2%. The number of trucks processed on Saturdays increased by 2058—an increase of 30% between the March Quarter 2006 to the June Quarter 2006.

The total number of containers processed on the landside of the five port terminals increased by a total of 13 552 from the March Quarter 2006 to June Quarter 2006—an increase of 3%. This increase was also uneven between the five ports with Brisbane increasing by 1%, Sydney increasing by 3%, Melbourne increasing by 3%, Adelaide increasing by 2%, and Fremantle increasing by 3%.

Figure 1 and Figure 2 show the outcomes for the five ports with respect to number of containers processed for the five ports by the different time windows in the March quarter 2006 and June quarter 2006 respectively.

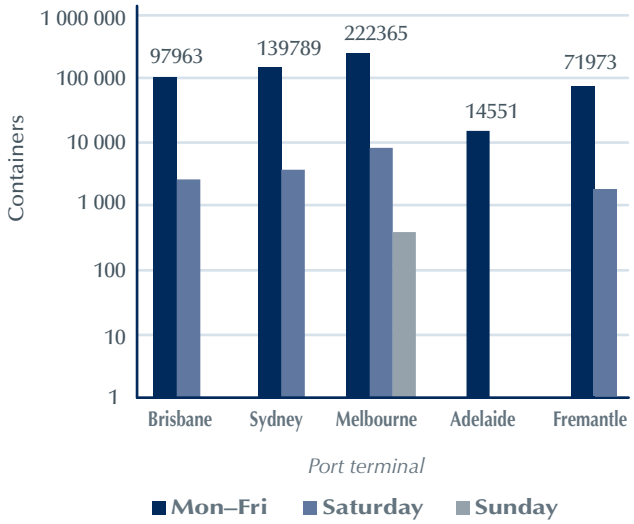
Figure 1 Total containers processed on the land side of port terminal, Monday–Friday, Saturday and Sunday, March quarter 2006



Notes
1. *All port terminals are open Monday–Friday*
2. *The Saturday opening hours only apply to the port terminals of Brisbane, Sydney and Melbourne.*
3. *The scale on the vertical axis is logarithmic.*
4. *DP World figures do not include stack/bulk runs, Customs X-ray or rail moves.*
5. *Up to 50% of Sydney Exports are empty containers which are frequently handled outside of Vehicle Booking Systems*

Sources *Patrick and P&O/DP World*

Figure 2 Total containers processed on the land side of port terminal, Monday–Friday, Saturday and Sunday, June quarter 2006



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Rail

The number of containers loaded on or unloaded from rail remained constant from March Quarter 2006 to June Quarter 2006 at 52805 containers.

Average number of containers per truck

This is one of the indicators whose value is dependent on decisions made by the trucking industry and on the nature and pattern of the demand for trucking services. The indicator measures the extent to which trucking companies using various port terminals optimise the capacity of their trucks in each respective facility. Values close to one indicate that there is empty truck running. Truck utilisation improves as the values of this indicator increase above one. Figure 3 and Figure 4 summarise the average number of containers per truck for the five ports for the March quarter 2006 and the June quarter 2006 respectively.

On the basis preliminary data, the ranking of port terminals in decreasing order of truck utilisation efficiency during the working week (Monday–Friday) is as follows:

- Brisbane is ranked first at 1.6 in both quarters;
- Fremantle is second increasing by 7% from 1.5 to 1.6 in the June quarter;
- Melbourne, at 1.5 in both quarters, is third;
- Adelaide increasing by 3% from 1.36 to 1.4 is fourth; and,
- Sydney at 1.3 in both quarters.

Figure 3 Average containers per truck Monday–Friday, Saturday and Sunday, March quarter 2006

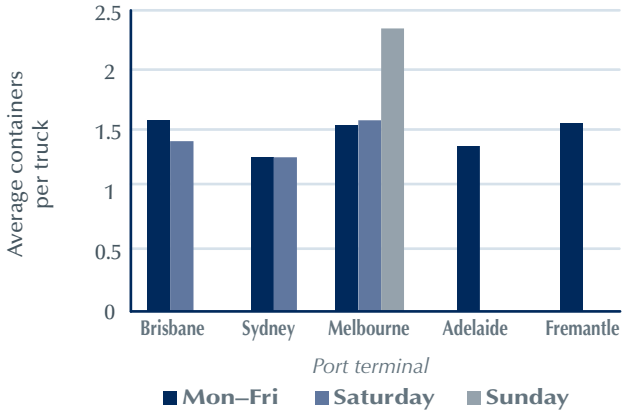

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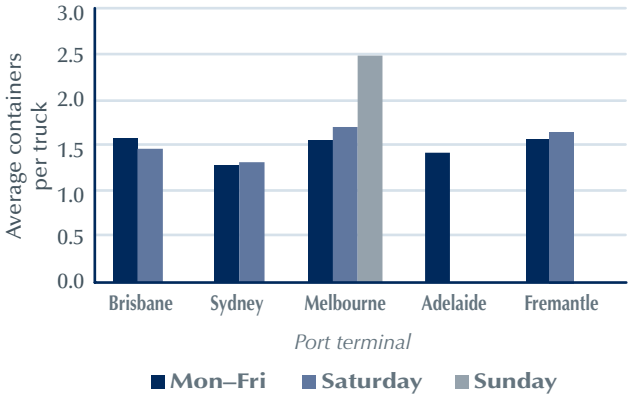
Figure 4 Average containers per truck Monday–Friday, Saturday and Sunday, June quarter 2006



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Adelaide and Fremantle did not process trucks on weekends in the March quarter 2006. However, the ranking of the other port terminals changes on Saturdays as follows:

- Melbourne had 1.6 containers per truck in June quarter 2006 rising to 1.7 in the June quarter 2006;
- Fremantle takes second place at 1.6 in the June quarter 2006;
- Brisbane had an average of 1.4 containers per truck in March quarter 2006 rising to 1.5 in the June quarter 2006; and
- Sydney had 1.3.

Container turnaround time (minutes)

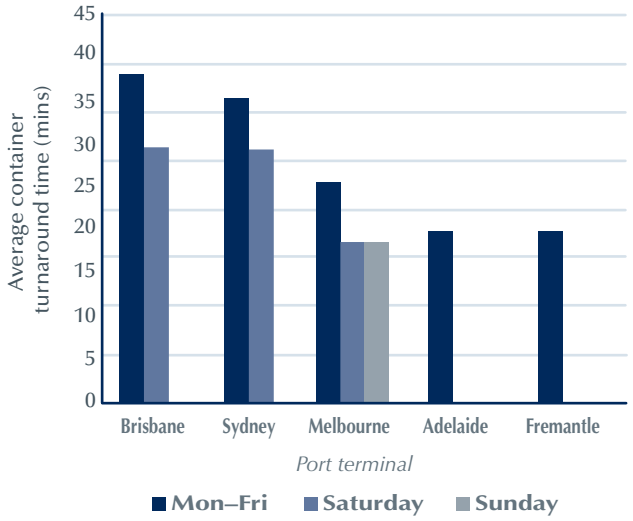
This is a composite indicator computed using two variables as follows:

Container turnaround time = (Average truck turnaround time in a quarter) divided by (the number of containers on a truck in a quarter).

For a given value of the number of containers on a truck, this indicator shows the efficiency in processing containers at a given port terminal. The lower the value for the container turnaround time, the more efficient is the port terminal.

Figure 5 and Figure 6 show the ranking of the five major port terminals in Australia by this measure in the March quarter 2006 and the June quarter 2006 respectively. Brisbane appears to be the least efficient in the processing of containers. This placement of the Brisbane port terminal in the ranking of ports may be related to technical problems the port has experienced over recent months in its automation program. Fremantle appears to be the most efficient while in the March quarter 2006, Adelaide is the more efficient in the June quarter 2006.

Figure 5 Average container turnaround time Monday–Friday, Saturday and Sunday, March quarter 2006



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Available vehicle booking system time slots (supply)

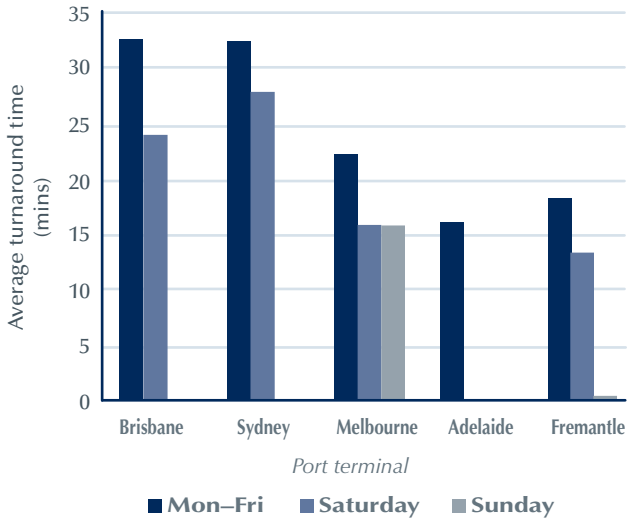
Figures 7 and 8 show the supply of vehicle booking time slots available at the five major Australian ports. The key points that arise from the two figures include the following. First, Melbourne has the highest number of VBS time slots in the time slots from 8.00 am to 4.00pm in the Monday–Friday part of the week. Second, the supply of time slots is not constant across the different time slots. The supply of VBS slots is determined by a complex set of factors including ship arrival and departure schedules, availability of equipment and of labour.

Adjusted usage rates for vehicle booking system slots (demand)

Figures 9 and 10 show the pattern of demand for VBS time slots against a standardised supply of VBS time slots. These two figures show the following:

- The most popular time slot for pick up and drop off of containers at all port terminals in Australia is the time period between 0800 hours and 1600 hours;
- The next most popular time slot varies by port terminal. In Brisbane it is the window from 1601–2359 hours; for Sydney the second most popular time slot is the window from 0000–0800 hours; for Melbourne it is Saturday.

Figure 6 Average container turnaround time Monday–Friday, Saturday and Sunday, June quarter 2006



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- Similarly the windows which are least popular vary by port terminal. These variations are most likely due to local planning controls, the nature of which need to be investigated.

Figure 7 Available vehicle booking system time slots, March quarter 2006

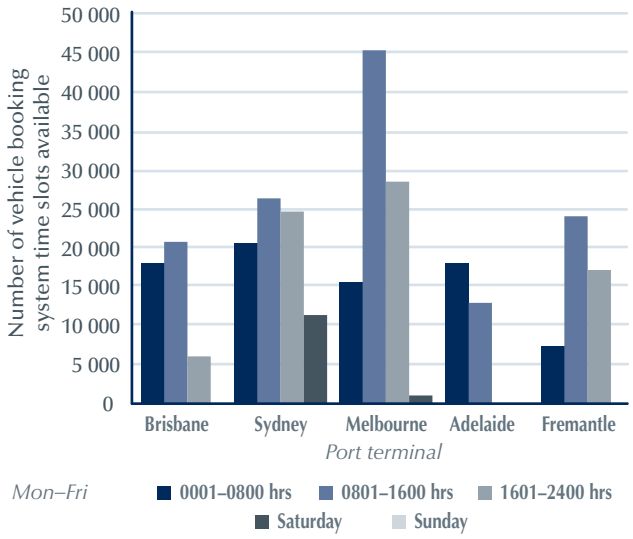

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Figure 8 Available vehicle booking system time slots, June quarter 2006

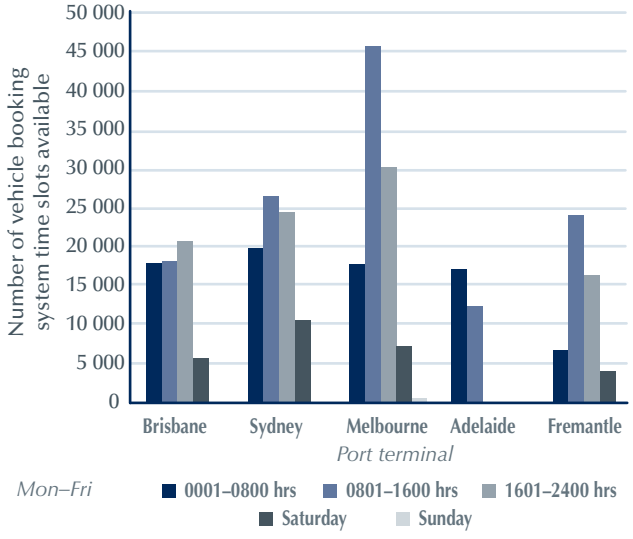

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Figure 9 Adjusted usage rates for vehicle booking system truck slots, March quarter 2006

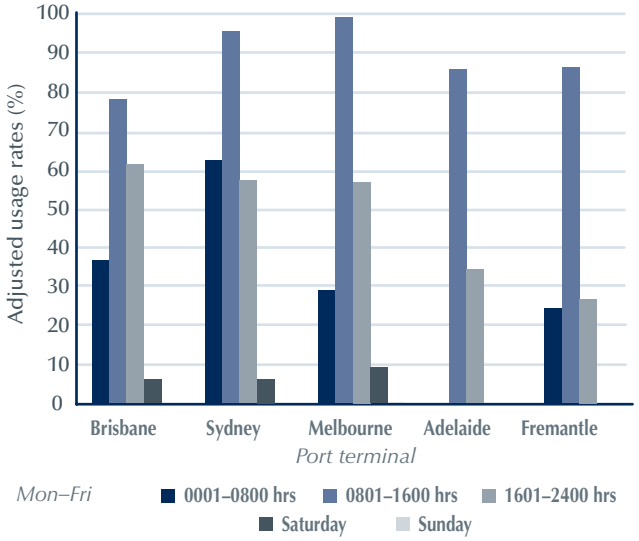

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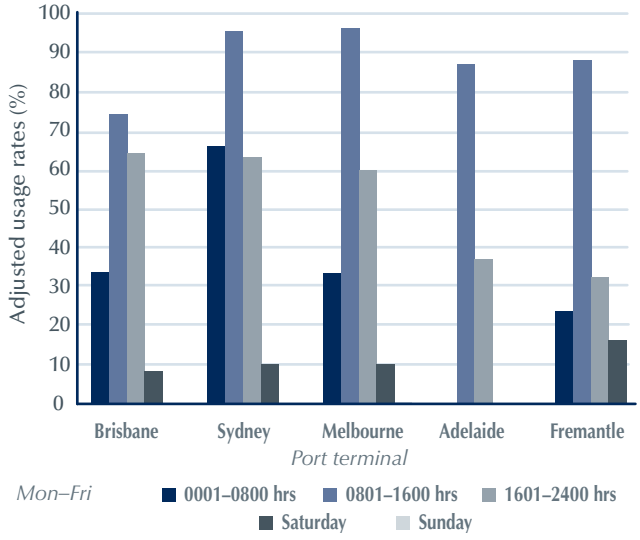
Figure 10 Adjusted usage rates for vehicle booking system truck slots, June quarter 2006



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Conclusions

The publication of the new landside of port terminal indicators will contribute to the discussion of the following:

- How big is the freight task on the landside of port terminals?
- How efficient is the utilisation of vehicles on the landside of port terminal?
- How efficient is the utilisation of infrastructure at port terminals?
- What options exist for the improvement of the interface between vehicles on the landside of port terminals and the port terminals?

The proposed indicators are derived from data collected as a by-product of the business activities of port terminal operators and rail and truck companies operating on the landside of port terminals. This data is available on a daily basis, is capable of independent verification and is low cost. The alternative ways of collecting similar data would be by use of survey methodology which tends to be expensive and prone to error because of the method's reliance on recall of respondents. A disadvantage of the method used is that it does not directly measure truck delays or the length of time trucks spend in queues at terminal gates. However, these are concepts which pose major methodological challenges. The indicators in Table 1 will provide information on what contributes to the delays from within the port terminal and how an operator could avoid or reduce waiting times at port terminals.

The measures used for these indicators apply to only one part of the logistic chain of container movements. Other parties at different points of the chain could also have performance measures which apply specifically to their industry and their part in the distribution network. For example, container unloading and processing is only one part of the working day in the warehouse industry. Similarly efficient truck utilisation during the day is important in the transport industry. The logistic funnel narrows the further the container moves away from the port terminal.

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Table 1 Container terminal landside performance indicators: experimental estimates

Port / Indicator	Mar-06	Jun-06
5 PORTS		
Road: Monday–Friday		
Total trucks	370 173	373 917
Containers per truck	1.5	1.5
Avg container turnaround time mins	29.8	29.8
Total containers	543 506	551 994
% of containers with turnaround time of 00–60 mins (exc Adelaide)	91.4	91.5
Road: Saturday		
Total trucks	6 816	8 874
Containers per truck	1.4	1.5
Avg container turnaround time mins	24.6	29.9
% of containers with turnaround time of 00–60 mins (exc Adelaide and Fremantle)	95.3	90.5
Rail		
Total containers	52 805	52 805
Modal share (per cent)	15.2	15.2
Maximum VBS time slots available (Supply)		
Monday–Friday	112 803	114903
Total–Saturday	22 206	27203
% VBS time slots used (Demand)		
Monday–Friday		
Total 0001–0800	38.7	28.9
Total 0801–1600	92.1	68.9
Total 1601–2400	49.9	44.5
Total—Saturday	6.0	7.7
BRISBANE		
Road: Monday–Friday		
Total trucks	61 876	62 397
Containers per truck	1.6	1.6
Avg container turnaround time in mins	40.2	38.4
Total containers	97 145	97 963
% of containers with turnaround time of 00–60 mins	82.3	85.5
Road: Saturday		
Total trucks	1 121	1709
Containers per truck	1.4	1.5
Avg container turnaround time in mins	23.7	33.9
% of containers with turnaround time of 00–60 mins	94.9	85.6
Rail		
Total containers	0	0
Modal share (per cent)	0	0
Maximum VBS time slots available (Supply)		
Monday–Friday	20 480	20 800
Total–Saturday	5 160	5 590
% VBS time slots used (Demand)		
Road: Monday–Friday		
Total 0001–0800	36.5	33.4
Total 0801–1600	77.7	73.8
Total 1601–2400	61.1	63.9
Total—Saturday	5.5	8.2
SYDNEY		
Road: Monday–Friday		
Total trucks	106 617	109 639
Containers per truck	1.3	1.3
Avg container turnaround time in mins	34.1	34.9
Total containers	135 403	139 789
% of containers with turnaround time of 00–60 mins	88.3	86.5
Road: Saturday		
Total trucks	1 599	2 640
Containers per truck	1.3	1.3
Avg container turnaround time in mins	24.8	27.2
% of containers with turnaround time of 00–60 mins	93.9	91.7
Rail		
Total containers	30 395	30 395
Modal share (per cent)	28.3	28.3
Maximum VBS time slots available (Supply)		
Monday–Friday	26 118	26 632
Total–Saturday	10 826	10 590
% VBS time slots used (Demand)		
Road: Monday–Friday		
Total 0001–0800	62.2	65.3
Total 0801–1600	95.0	94.8
Total 1601–2400	57.0	62.8
Total—Saturday	6.1	9.9

Table 1 Continued

	Mar-06	Jun-06
MELBOURNE		
Road: Monday–Friday		
Total trucks	141 389	144 393
Containers per truck	1.5	1.5
Avg container turnaround time—mins	26.3	26
Total containers	216 325	222 365
% of containers with turnaround time of 00–60 mins	97.3	97.9
Road: Saturday		
Total trucks	4 096	4 525
Containers per truck	1.6	1.7
Avg container turnaround time—mins	25.4	28.5
% of containers with turnaround time (00–60 mins)	97.2	94.1
Road: Sunday		
Total trucks	137	152
Containers per truck	2.34	2.47
Avg container turnaround time—mins	38.43	34.61
% of containers with turnaround time of 00–60 mins	82.81	91.73
Rail		
Total containers	22 410	22 410
Modal share (per cent)	13.6	13.6
Maximum VBS time slots available (Supply)		
Monday–Friday	45 044	45 941
Total–Saturday	6 220	7 127
Total–Sunday	362	464
% VBS time slots used (Demand)		
Monday–Friday		
Total 0001–0800	28.8	33.3
Total 0801–1600	98.8	95.6
Total 1601–2400	56.7	59.4
Total–Saturday	9.1	9.8
Total–Sunday	0.3	0.3
ADELAIDE		
Road: Monday–Friday		
Total trucks	14 936	14 551
Containers per truck	1.36	1.4
Avg container turnaround time—mins	24	25.3
Total containers	20 275	20 683
Average truck turn round time—minutes	32.64	35.48
% of trucks with truck turnaround time of less than 30 mins	56.18	51.67
Rail		
Total containers	0	0
Modal share (per cent)	0	0
Maximum VBS time slots available (Supply)		
Monday–Friday	17 538	17 159
Total–Saturday	na	na
% VBS time slots used (Demand)		
Total (mon-fri) 0701–1400	85.4	86.4
Total (mon-fri) 1401–2200	34.3	36.7
Total–Saturday	na	na
FREMANTLE		
Road: Monday–Friday		
Total trucks	45 355	46 434
Containers per truck	1.5	1.6
Avg container turnaround time—mins	20.3	20.9
Total containers	70 073	71 973
% of containers with turnaround time of 00–60 mins	97.7	96.2
Road: Saturday		
Total trucks	na	1.63
Containers per truck	na	32.63
Avg container turnaround time mins	na	32.63
% of containers with turnaround time of 00–60 mins	na	86.2
Rail		
Total containers	0	0
Modal share (per cent)	0	0
Maximum VBS time slots available (Supply)		
Monday–Friday	23 721	24 130
Total–Saturday	na	3 896
% VBS time slots used (Demand)		
Road Monday–Friday		
Total 0001–0800	24.3	23.4
Total 0801–1600	85.9	87.5
Total 1601–2400	26.7	32.1
Road Total—Saturday	na	na

na *not applicable*
VBS *stands for vehicle booking system*
Note *1. The five port totals for Saturday exclude Adelaide and Fremantle in the March 2006 quarter. They exclude Adelaide in the June 2006 quarter.*
2. These estimates are experimental. In some cases the indicators are based on incomplete data.
In other cases, because the data capture programs by the different stevedoring companies are at different stages of development, the levels of disaggregation are not consistent. For example, the Monday–Friday figures on VBS timeslots includes some weekend timeslots.
In the next issue of Waterline when regular reporting of these indicators starts, these inconsistencies are expected to have been ironed out.
3. The concepts used in compiling these indicators are defined in explanatory notes at the end of the journal.
Sources *Patrick and P&O/DP World.*

Stevedoring productivity

National crane rate productivity, as measured by the five port average, increased to 27.8 containers per hour in the March quarter 2006 (2.2 per cent higher than the March quarter 2005 rate of 27.2). In the June quarter 2006, the crane rate decreased to 27.0 containers per hour (2.5 per cent lower than the June quarter 2005 rate of 27.7).

Table 2 presents the June quarter 2004 to June quarter 2006 indicators of stevedoring productivity at the five major Australian container ports, expressed in container moves per hour. Figures 11–16 present these data over the June quarter 1996 to June quarter 2006 period. The data for Brisbane, Sydney, Melbourne and Fremantle are weighted averages for the container terminals operated by DP World and Patrick. The Adelaide data are for the DP World container terminal.

In summary:

- the five-port average crane rate (average productivity per crane while the ship is worked) was 27.2 in the September quarter 2005, 27.7 in the December quarter 2005, 27.8 in the March quarter 2006, and 27.0 containers per hour for the June quarter 2006;

- the five port total of container moves through reporting terminals increased from 741 960 in the March quarter 2006 to 795 252 moves in the June quarter 2006, a decrease of 11.4 per cent below the December 2005 record of 837 459 containers. The June quarter 2006 is up 6.9 per cent on the June quarter 2005 figure;

- the five-port average vessel working rate (productivity per ship based on the time labour is aboard the ship) was 35.2 in the September quarter 2005, 35.7 in the December quarter 2005, 34.9 in the March quarter 2006, and 35.3 containers per hour in the June quarter 2006, which was the same as the rate of 35.3 achieved in the June quarter 2005.

The Brisbane (DP World, Patrick) average crane rate decreased from 27.7 in the December quarter 2005 to 25.1 in the March quarter 2006, and to 24.0 containers per hour in the June quarter 2006. The vessel working rate decreased from 27.0 containers per hour in the December quarter 2005 to 25.4 in the March quarter 2006, and increased to 27.0 in the June quarter 2006.

The Sydney (DP World, Patrick) average crane rate was 27.4 in the December quarter 2005 and increased to 28.0 in the March quarter 2006. It decreased to 26.7 containers per hour in the June quarter 2006. The vessel working rate was 36.0 containers per hour in the December quarter 2005 and 34.8 in the March quarter 2006. It decreased to 33.9 in the June quarter 2006.

The Melbourne (DP World, Patrick) average crane rate was 27.8 in the December quarter 2005 and 28.4 in the March quarter 2006. It decreased to 28.2 containers per hour in the June quarter 2006. The vessel working rate was 39.9 containers per hour in the December quarter 2005 and decreased to 39.3 in the March quarter 2006. It increased to 40.5 in the June quarter 2006.

The Adelaide (DP World) average crane rate was 29.9 in the December quarter 2005 and 30.2 in the March quarter 2006. It increased to 30.6 containers per hour in the June quarter 2006. The vessel working rate increased from 35.8 containers per hour in the December quarter 2005 to 36.0 in the March quarter 2006, and decreased to 35.9 in the June quarter 2006.

The Fremantle (DP World, Patrick) average crane rate was 27.1 in the December quarter 2005 and 28.6 in the March quarter 2006. It decreased to 27.3 containers per hour in the June quarter 2006. The vessel working rate was 34.5 containers per hour in the December quarter 2005 and 34.1 in the March quarter 2006, it decreased to 33.1 in the June quarter 2006.

Overall, stevedoring (or crane-rate) variability was reasonably stable over the December 2005 to June 2006 quarters except for Brisbane where it was affected by the ongoing change over to automation of the Patrick's container operations.

Teus per hour

Annex 1 on page 28 presents the stevedoring productivity indicators in terms of teus per hour. These data are retained in *Waterline* for the purpose of long-term historical comparison. They are not directly comparable with the data in Table 2 because indicators based on teus per hour may be affected by changes in the mix of 20-foot and 40-foot containers from one period to the next.

Table 2 Container terminal performance indicators—productivity in containers per hour

Port / Indicator	Jun-04	Sep-04	Dec-04	Mar-05	Jun-05	Sep-05	Dec-05	Mar-06	Jun-06
Five ports									
Ships handled	825	905	936	890	993	1 027	1 043	1 026	1 075
Total containers	737 231	776 125	819 744	744 032	743 597	790 348	837 459	741 960	795 252
Crane rate	28.2	27.5	27.1	27.2	27.7	27.2	27.7	27.8	27.0
Vessel working rate	34.1	32.6	33.1	34.9	35.3	35.1	35.7	34.9	35.3
Crane time not worked (per cent)	28	29	28	25	24	22	24	23	22
40-foot containers (per cent)	38	41	42	40	39	40	43	41	41
Ship rate	47.6	45.9	45.6	46.6	46.3	45.3	46.7	45.1	45.2
Throughput pbm	103	109	115	104	104	111	117	104	111
Brisbane									
Ships handled	175	219	227	205	222	244	261	262	257
Total containers	110 300	132 527	134 274	116 561	115 730	130 156	142 728	124 908	129 537
Crane rate	27.3	26.6	26.5	27.2	27.2	26.9	27.7	25.1	24.0
Vessel working rate	29.7	26.0	24.6	26.1	26.7	27.6	27.0	25.4	27.0
Crane time not worked (per cent)	34	38	40	37	34	0	26	27	24
40-foot containers (per cent)	37	42	43	42	37	33	43	42	42
Stevedoring variability (per cent)	54	53	57	54	47	40	44	44	51
Ship rate	44.8	41.7	41.3	41.3	40.1	37.6	40.7	34.9	35.6
Throughput pbm	69	83	84	73	72	81	89	78	81
Sydney									
Ships handled	231	253	262	258	283	294	297	293	307
Total containers	231 556	241 539	256 898	230 741	231 959	252 971	265 762	231 970	249 580
Crane rate	27.5	27.1	26.7	26.7	27.7	26.1	27.4	28.0	26.7
Vessel working rate	35.9	33.7	34.9	34.9	36.9	34.9	36.0	34.8	33.9
Crane time not worked (per cent)	25	25	26	25	24	23	35	25	25
40-foot containers (per cent)	42	44	45	43	43	44	45	44	44
Stevedoring variability (per cent)	51	48	53	46	50	44	50	47	54
Ship rate	47.7	45.3	47.0	46.6	48.2	45.3	47.6	46.3	45.0
Throughput pbm	119	124	132	119	119	130	137	119	129
Melbourne									
Ships handled	244	266	272	260	299	293	300	293	318
Total containers	273 495	279 831	301 997	281 637	278 030	287 655	302 693	273 641	297 877
Crane rate	29.4	28.5	27.5	27.5	27.6	27.9	27.8	28.4	28.2
Vessel working rate	36.3	35.9	35.6	39.3	38.7	40.0	39.9	39.3	40.5
Crane time not worked (per cent)	30	29	26	21	20	21	39	21	19
40-foot containers (per cent)	39	42	41	40	39	41	42	41	40
Stevedoring variability (per cent)	66	62	65	70	68	61	68	58	57
Ship rate	52.0	50.6	47.7	50.0	48.6	50.4	49.7	49.7	50.1
Throughput pbm	150	153	165	154	152	158	166	150	163
Adelaide									
Ships handled	60	54	56	53	68	66	66	66	67
Total containers	35 207	35 950	34 654	34 551	37 587	40 467	36 426	34 260	37 581
Crane rate	28.3	28.9	29.8	29.7	30.4	30.8	29.9	30.2	30.6
Vessel working rate	31.5	34.4	35.3	37.1	33.6	36.6	35.8	36.0	35.9
Crane time not worked (per cent)	13	16	10	15	14	16	37	13	13
40-foot containers (per cent)	26	25	27	26	27	30	33	34	31
Stevedoring variability (per cent)	na	na	na	na	na	na	na	na	na
Ship rate	36.1	40.9	39.2	43.5	39.0	43.3	41.3	41.5	41.2
Throughput pbm	75	77	74	74	80	86	78	73	80
Fremantle									
Ships handled	115	113	119	114	121	130	119	112	126
Total containers	86 673	86 278	91 921	80 542	80 291	79 099	89 850	77 181	80 677
Crane rate	27.1	26.3	27.2	26.7	27.8	26.5	27.1	28.6	27.3
Vessel working rate	28.6	28.5	31.3	31.4	32.2	30.0	34.5	34.1	33.1
Crane time not worked (per cent)	31	30	28	28	29	26	31	20	26
40-foot containers (per cent)	34	39	41	37	40	40	43	38	39
Stevedoring variability (per cent)	38	41	41	45	44	38	45	46	47
Ship rate	41.6	40.7	43.4	43.6	45.4	40.6	46.0	42.8	44.9
Throughput pbm	67	67	71	62	62	61	70	60	63

na *not available*
r *revised*
pbm *per berth metre*
Notes *1. The definitions used in compiling the stevedoring productivity data are detailed in explanatory notes at the end of the journal.*
2. The data in this table are expressed in container moves per hour and therefore are not directly comparable with the teus per hour data in Annex 1
3. Crane time not worked is the difference between the ship and the vessel working rates as a percentage of the vessel working rate.
Sources *Patrick and P&O/DP World.*

Figure 11 Five major ports

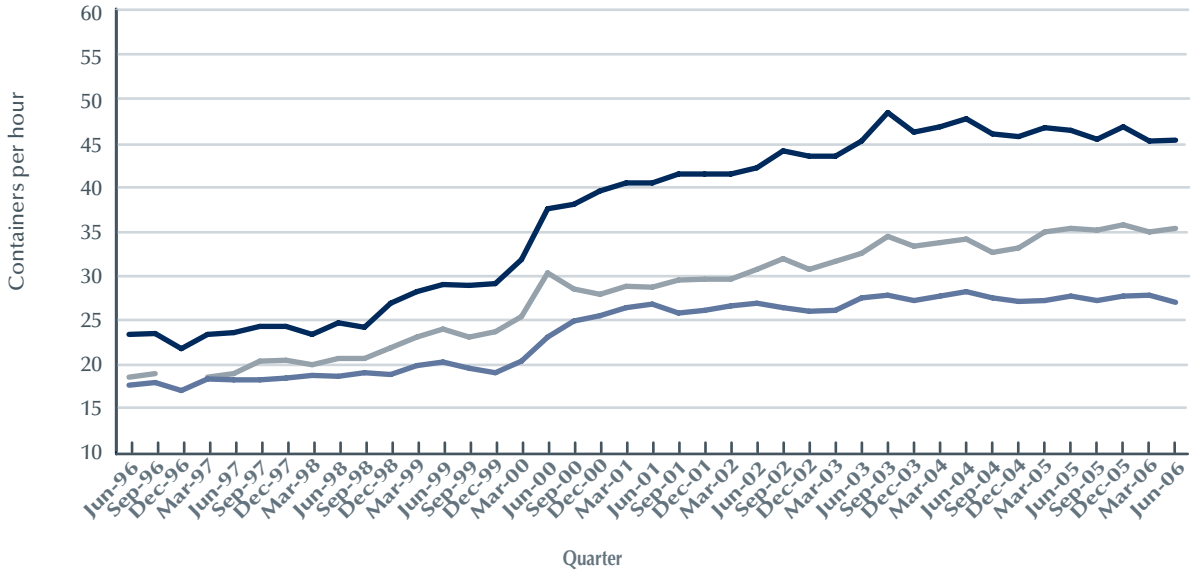


Figure 12 Brisbane

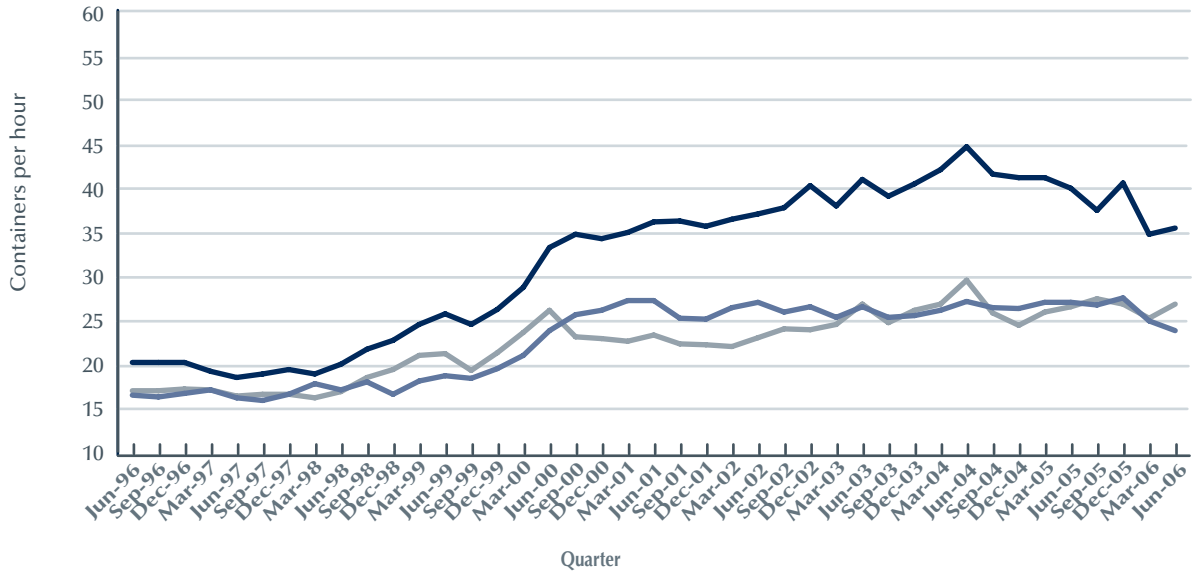
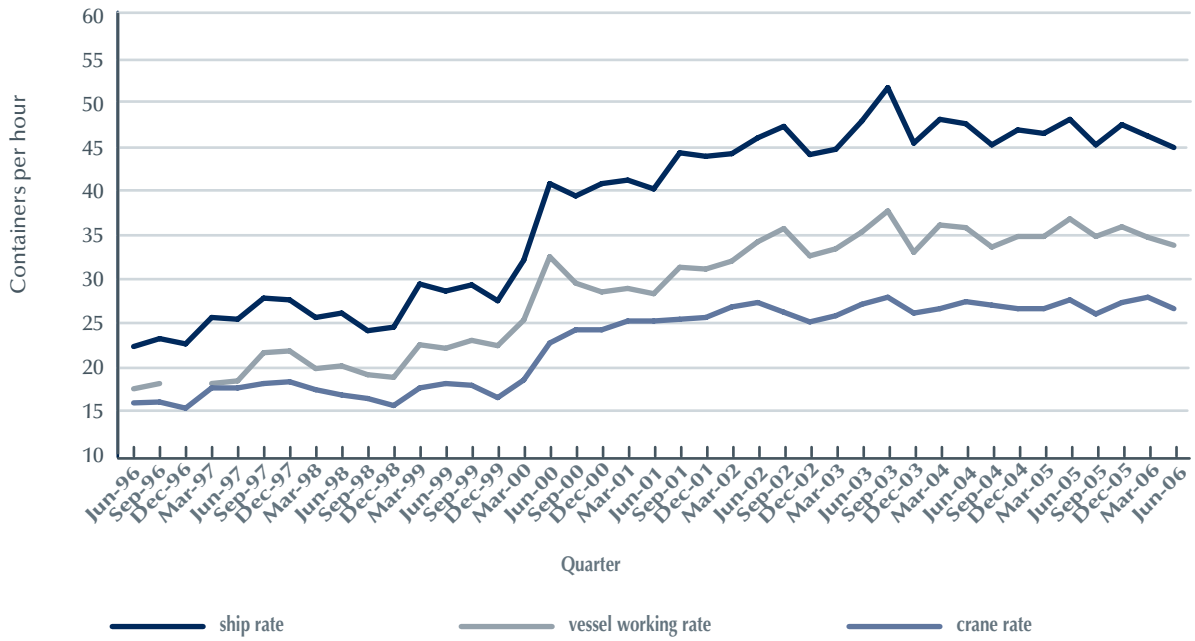


Figure 13 Sydney



Note *These figures are based on data contained in Table 2. Readers should refer to the notes in that table.*
Sources *Patrick and P&O / DP World.*

Figure 14 Melbourne

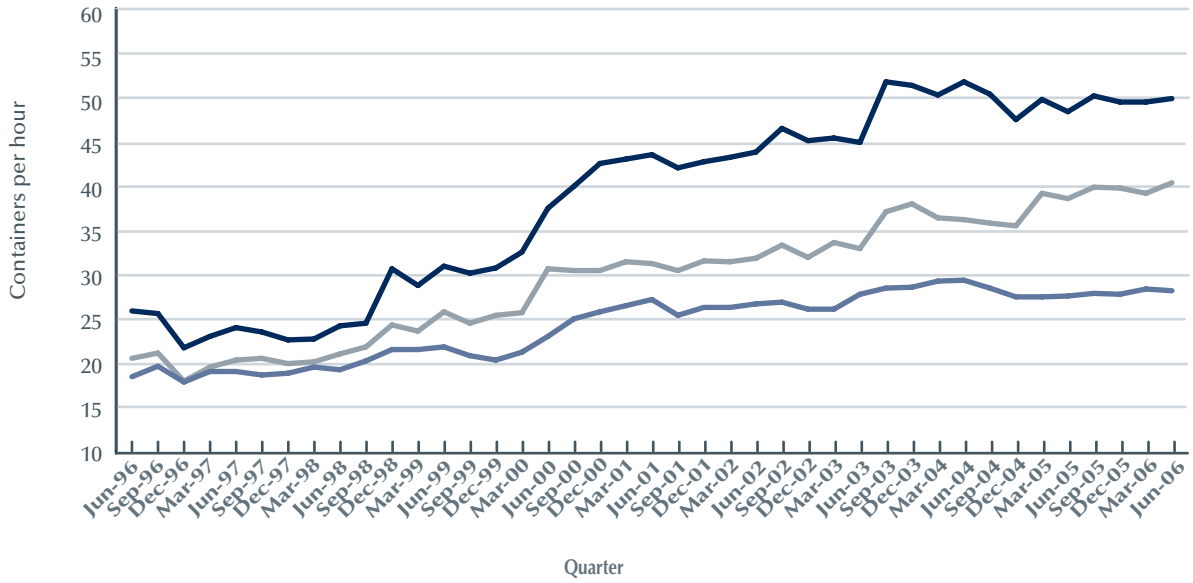


Figure 15 Adelaide

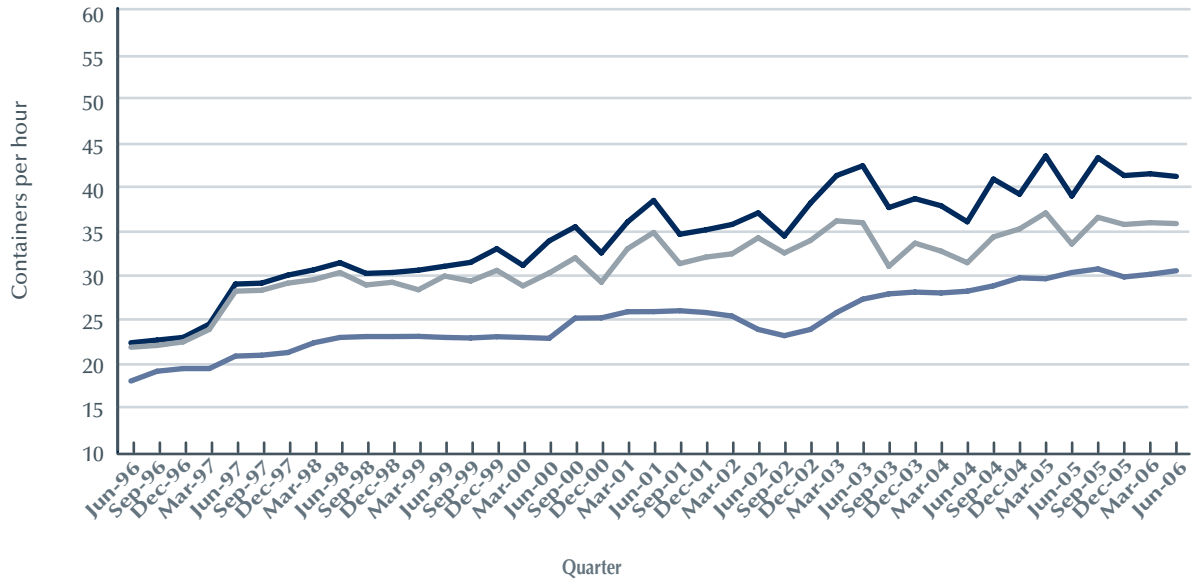
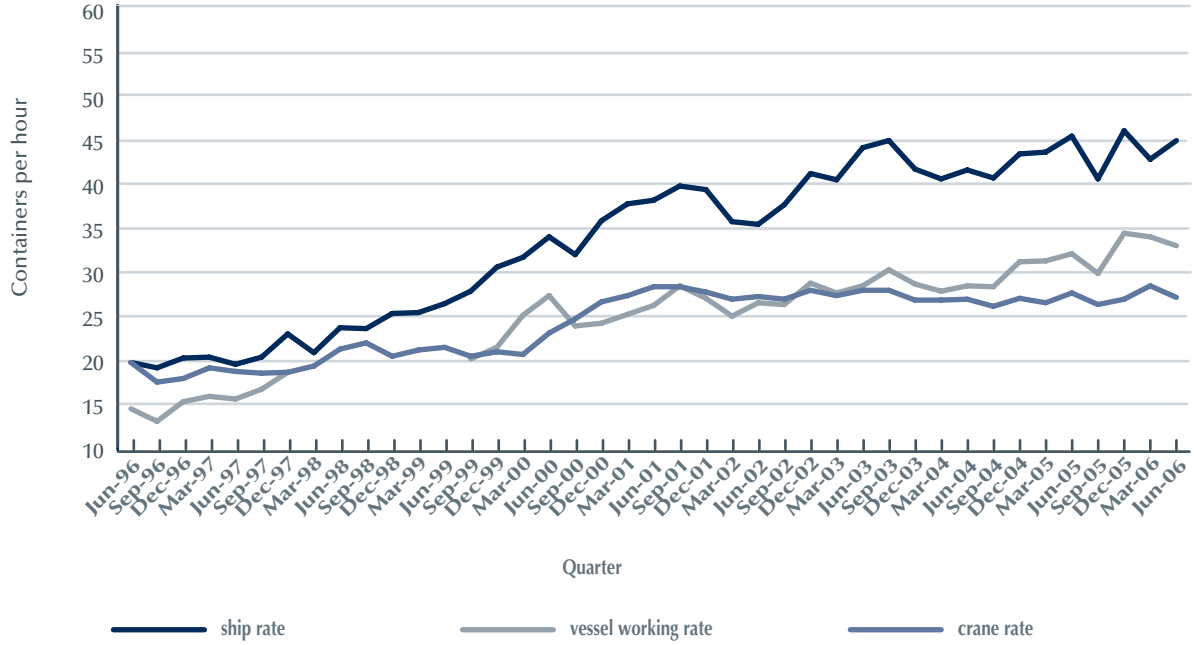


Figure 16 Fremantle



Note *These figures are based on data contained in Table 2. Readers should refer to the notes in that table.*
Sources *Patrick and P&O / DP World.*

Port interface cost index

The port interface cost index provides a measure of shore-based shipping costs (charges) for containers moved through Australian mainland capital city ports. These five ports account for approximately 90 per cent of Australia's container traffic.[1] Data for July–December 2005 and January–June 2006 are presented in Tables 3–7. The port interface cost index is based on an indicative approach; that is, the index is not an average of all costs, but is based on those costs typically charged by service providers in most instances.

Port and related charges

Table 3 provides the parameters used to determine the port and related charges in Tables 4 and 5. These parameters relate to a representative port call by container ships using the Lloyd's ship classification unitized cellular container ship (UCC). For the 15 000–20 000 GT range[2] the representative vessel size used is 17 215 GT and for the 35 000–40 000 GT range the representative vessel size 37 394 GT.

Tables 4 and 5 provide the port and related charges at the five mainland capital city ports for the 15 000–20 000 GT range and the 35 000–40 000 GT range respectively, for July–December 2005 and January–June 2006. Port and related charges comprise ship-based charges and cargo-based charges.

Ship-based charges

While overall ship-based charges changed little in January–June 2006, there were some significant changes in charges per teu, mainly reflecting the variation in the average number of teus exchanged per ship call.

Compared to the previous period, the overall changes in total ship-based charges per teu in January–June 2006 for ships in the 15 000–20 000 GT range were:

- Brisbane–6 per cent decrease;
- Sydney–8 per cent increase;
- Melbourne–14 per cent increase;
- Adelaide–21 per cent increase; and
- Fremantle–15 per cent decrease.

For ships in this range, the average number of teus exchanged increased by 20 per cent at Brisbane and 27 per cent at Sydney. They decreased by 6 per cent at Melbourne by 22 per cent at Fremantle, and by 32 per cent at Adelaide, compared to the previous period.

Compared to the previous period, the overall changes in total ship-based charges per teu in January–June 2006 for ships in the 35 000–40 000 GT range were:

- Brisbane—1 per cent increase;
- Sydney—4 per cent decrease;
- Melbourne—9 per cent decrease;
- Adelaide—31 per cent increase; and
- Fremantle—2 per cent decrease.

In the 35 000–40 000 GT range, the average number of teus exchanged fell at all ports except

Table 3 Parameters used in the port interface cost index, 2006

	Brisbane		Sydney		Melbourne		Adelaide		Fremantle	
	Jul–Dec 2005	Jan–June 2006	Jul–Dec 2005	Jan–June 2006	Jul–Dec 2005	Jan–June 2006	Jul–Dec 2005	Jan–June 2006	Jul–Dec 2005	Jan–June 2006
Vessel size GT 17 215										
Average Teus exchanged[a]										
All (Empty + Loaded)	596	633	962	892	1 088	952	661	573	696	822
Empty	152	215	268	214	207	132	245	188	99	146
Loaded (total)	444	418	694	679	881	821	416	386	597	676
Loaded inwards (Imports)	285	242	485	425	545	453	122	114	391	411
Loaded outwards (Exports)	158	176	210	253	336	367	293	271	205	265
Ship call parameters[a]										
Number of port calls	3	3	4	4	4	3	3	2	3	3
Elapsed berth time (hrs)	23	24	27	26	28	26	23	35	24	26
Vessel size GT 37 394										
Average Teus exchanged[b]										
All (Empty + Loaded)	1 113	980	1739	1545	1962	1807	642	705	841	960
Empty	211	217	473	379	344	272	135	168	269	278
Loaded (total)	902	763	1265	1166	1618	1534	506	537	572	682
Loaded inwards (Imports)	550	477	878	757	953	844	165	175	301	290
Loaded outwards (Exports)	352	286	387	409	665	690	342	362	271	392
Ship call parameters[b]										
Number of port calls	5	3	4	3	4	3	3	3	4	3
Elapsed berth time (hrs)	27	27	36	34	35	32	16	29	27	25

a. Mean value for ships between 15 000 and 20 000 GT.
b. Mean value for ships between 35 000 and 40 000 GT.
Sources BTRE estimates based on ship call data supplied by relevant port authorities/corporations and other port service providers.

1. Based on TEU numbers for Australian ports published by Australian Association of Port and Maritime Authorities (AAPMA). (aapma.org.au/trade stats/? Id=5)

2. To obtain a sufficient sample size for Adelaide and Fremantle containers exchanged (average), the ship size range was increased to 10 000 GT–26 000 GT.

Table 4 Port and related charges for ships in the 15 000–20 000 GT range, 2006

	Brisbane		Sydney		Melbourne		Adelaide		Fremantle	
	Jul–Dec 2005	Jan–Jun 2006	Jul–Dec 2005	Jan–Jun 2006	Jul–Dec 2005	Jan–Jun 2006	Jul–Dec 2005	Jan–Jun 2006	Jul–Dec 2005	Jan–Jun 2006
Ship-based charges ($/teu)										
Conservancy	4.51	4.24	-	-	-	-	3.32	4.47	-	-
Tonnage	-	-	7.68	8.28	4.79	5.47	7.93	11.08	4.01	3.39
Pilotage	11.81	11.12	3.45	3.71	6.50	7.43	6.66	7.68	3.30	2.80
Towage	14.97	14.09	9.64	10.39	8.41	9.62	23.72	27.35	7.46	6.32
Mooring, unmooring	3.35	3.16	2.93	3.16	1.10	1.26	-	-	1.26	1.07
Berth hire[a]	-	-	-	-	-	-	-	-	-	-
Total[b]	34.64	32.61	23.69	25.54	20.81	23.78	41.64	50.58	16.03	13.58
Cargo-based charges ($/teu)										
Wharfage										
Imports	28.60	28.60	67.65	67.65	35.75	35.75	61.27	61.27	51.03	51.03
Exports	28.60	28.60	51.15	51.15	35.75	35.75	61.27	61.27	51.03	51.03
Harbour dues	46.20	46.20	-	-	-	-	-	-	-	-
Berth charge	-	-	-	-	-	-	-	-	15.29	15.29
Total port and related charges ($/teu)[b]										
Loaded imports	109.44	107.41	91.34	93.19	56.56	59.53	102.91	111.85	82.36	79.91
Loaded exports	109.44	107.41	74.84	76.69	56.56	59.53	102.91	111.85	82.36	79.91
Charges per ship visit ($/visit)										
Total ship-based charges	20 637	20 637	22 784	22 784	22 645	22 645	27 512	28 986	11 160	11 160
Empty teus[c]	2 380	3 362	0	0	1 825	1 158	0	0	765	1 125

- *not applicable*
a. *Charged by stevedores and itemised separately from basic stevedoring charge.*
b. *Components may not sum to totals due to rounding.*
c. *Sum of wharfage, harbour dues and berth charge per empty teu, multiplied by average exchange of empty teus.*
Note *Port and related charges are based on the parameters described in table 3.*
Sources *BTRE estimates based on: ship call data supplied by relevant port authorities/corporations, and price schedules of relevant port authorities/corporations, towage operators and pilotage service providers.*

Table 5 Port and related charges for ships in the 35 000–40 000 GT range, 2006

	Brisbane		Sydney		Melbourne		Adelaide		Fremantle	
	Jul–Dec 2005	Jan–June 2006	Jul–Dec 2005	Jan–June 2006	Jul–Dec 2005	Jan–June 2006	Jul–Dec 2005	Jan–June 2006	Jul–Dec 2005	Jan–June 2006
Ship-based charges ($/teu)										
Conservancy	5.24	5.95	-	-	-	-	5.04	5.50	-	-
Tonnage	-	-	9.23	10.38	5.77	6.27	9.83	12.69	7.20	6.31
Pilotage	15.06	17.10	3.46	3.90	4.58	4.97	6.86	6.24	2.73	2.40
Towage	10.12	11.50	5.67	6.38	4.99	5.42	31.45	28.62	9.14	8.01
Mooring, unmooring	1.80	2.04	2.08	2.34	0.61	0.66	-	-	1.05	0.92
Berth hire[a]	-	-	-	-	-	-	-	-	-	-
Total[b]	32.22	36.59	20.44	23.00	15.95	17.33	53.17	53.05	20.12	17.63
Cargo-based charges ($/teu)										
Wharfage										
Imports	28.60	28.60	67.65	67.65	35.75	35.75	61.27	61.27	51.03	51.03
Exports	28.60	28.60	51.15	51.15	35.75	35.75	61.27	61.27	51.03	51.03
Harbour dues	46.20	46.20	-	-	-	-	-	-	-	-
Berth charge	-	-	-	-	-	-	-	-	15.29	15.29
Total port and related charges ($/teu)[b]										
Loaded imports	107.02	111.39	88.09	90.65	51.70	53.08	114.44	114.32	86.45	83.96
Loaded exports	107.02	111.39	71.59	74.15	51.70	53.08	114.44	114.32	86.45	83.96
Charges per ship visit ($/visit)										
Total ship-based charges	35 856	35 856	35 532	35 532	31 298	31 298	34 123	37 416	16 926	16 926
Empty teus[c]	3 289	3 385	0	0	3 026	2 395	0	0	2 074	2 138

- *not applicable*
a. *Charged by stevedores and itemised separately from basic stevedoring charge.*
b. *Components may not sum to totals due to rounding.*
c. *Sum of wharfage, harbour dues and berth charge per empty teu, multiplied by average exchange of empty teus.*
Note *Port and related charges are based on the parameters described in table 3.*
Sources *BTRE estimates based on: ship call data supplied by relevant port authorities/corporations, and price schedules of relevant port authorities/corporations, towage operators and pilotage service providers.*

Melbourne and Fremantle in January–June 2006 period when compared to the previous period. In Sydney they decreased by 1 per cent and in Adelaide by 18 per cent and in Brisbane by 12 per cent. In Fremantle they increased by 17 per cent and Melbourne by 3 per cent.

Fremantle has the lowest ship-based charges on a per ship visit basis for representative vessel sizes for ships in the 15 000–20 000 GT and the 35 000–40 000 GT range.

Cargo-based charges

There have been no increases in cargo-based charges in the 15 000–20 000 GT range in this period. However there have been changes in the 35 000–40 000 GT range. These were:

- Brisbane—no increase;
- Sydney—3 per cent increase;
- Melbourne—4 per cent increase;

- Adelaide—4 per cent increase; and
- Fremantle—4 per cent increase.

Stevedoring charges per teu

In order to obtain a sufficient sample size of average containers exchanged for Adelaide and Fremantle, the 15 000–20 000 GT ship size range was broadened to include ships from 10 000–26 000 GT.

The stevedoring charges per teu used in this issue of *Waterline* are those published in the most recently available ACCC report on stevedoring prices (2004–05 data reported in Report No. 7 of November 2005). These charges are $175.20 per teu.

Land-based charges per teu

Average customs brokers' fees and road transport charges for July–December 2005 and January–June 2006 are included in Tables' 6 and 7. These charges are based on data provided by some 30 customs brokers and 30 road transport operators.

Customs brokers' fees for imports are higher than fees for exports, reflecting the more complex clearance procedures for import containers. During January–June 2006 the average customs broker fee for imports increased by 2 per cent at Melbourne, 2 per cent at Adelaide and 9 per cent at Sydney. They did not increase at Brisbane and Fremantle. For exports the average fee did not increase at Brisbane, Sydney and Fremantle. They increased by 3 per cent at Adelaide 1 per cent at Melbourne.

Table 6 Port interface costs for ships in the 15 000–20 000 GT range, 2006

	Brisbane		Sydney		Melbourne		Adelaide		Fremantle	
	Jul–Dec 2005	Jan–June 2006	Jul–Dec 2005	Jan–June 2006	Jul–Dec 2005	Jan–June 2006	Jul–Dec 2005	Jan–June 2006	Jul–Dec 2005	Jan–June 2006
Import										
Ship-based charges	35	33	24	26	21	24	42	51	16	14
Cargo-based charges	75	75	68	68	36	36	61	61	66	66
Stevedoring[p]	175	175	175	175	175	175	175	175	175	175
Customs brokers' fees	134	134	135	135	131	134	130	132	160	160
Road transport charges	260	276	403	432	376	398	246	257	247	270
Import total[a]	679	693	805	835	738	766	654	676	665	686
Export										
Ship-based charges	35	33	24	26	21	24	42	51	16	14
Cargo-based charges	75	75	51	51	36	36	61	61	66	66
Stevedoringp	175	175	175	175	175	175	175	175	175	175
Customs brokers' fees	116	116	107	107	89	90	77	79	81	81
Road transport charges	260	276	403	432	376	398	246	257	247	270
Export total[a]	660	675	760	791	697	723	601	624	586	606

p. *provisional, updated annually after the release of the ACCC stevedoring monitoring report.*
a. *components may not sum to totals due to rounding.*
Notes 1. *Based on parameters described in table 3.*
2. *Waterline data on customs brokers' fees and road transport charges are collected for the purpose of monitoring trends in charges over time. They should not be used for inter-port comparisons, as sample characteristics may vary between ports.*
3. *The stevedoring charge used in Waterline is monitored by the ACCC and is the weighted average for Brisbane, Sydney, Melbourne, Adelaide, Fremantle and Burnie. Stevedoring charges vary between ports but detailed data for individual ports are not publicly available.*
Sources *BTRE estimates based on: ship call data supplied by relevant port authorities/corporations; price schedules of relevant port authorities/ corporations, towage operators and pilotage service providers; surveys of customs brokers and road transport operators; and stevedoring charge data supplied by the ACCC.*

Table 7 Port interface costs for ships in the 35 000–40 000 GT range, 2006

	Brisbane		Sydney		Melbourne		Adelaide		Fremantle	
	Jul–Dec 2005	Jan–June 2006	Jul–Dec 2005	Jan–June 2006	Jul–Dec 2005	Jan–June 2006	Jul–Dec 2005	Jan–June 2006	Jul–Dec 2005	Jan–June 2006
Import										
Ship-based charges	32	37	20	23	16	17	53	53	20	18
Cargo-based charges	75	75	68	68	36	36	61	61	66	66
Stevedoring[p]	175	175	175	175	175	175	175	175	175	175
Customs brokers' fees	134	175	135	135	131	134	130	132	160	160
Road transport charges	260	276	403	432	376	398	246	257	247	270
Import total[a]	676	738	802	833	733	760	665	679	669	690
Export										
Ship-based charges	32	37	20	23	16	17	53	53	20	18
Cargo-based charges	75	75	51	51	36	36	61	61	66	66
Stevedoring[p]	175	175	175	175	175	175	175	175	175	175
Customs brokers' fees	116	116	107	107	89	90	77	79	81	81
Road transport charges	260	276	403	432	376	398	246	257	247	270
Export total[a]	658	679	757	788	692	716	613	626	590	610

p. *provisional, updated annually after the release of the ACCC stevedoring monitoring report.*
a. *components may not sum to totals due to rounding.*
Notes 1. *Based on parameters described in table 3.*
2. *Waterline data on customs brokers' fees and road transport charges are collected for the purpose of monitoring trends in charges over time. They should not be used for inter-port comparisons, as sample characteristics may vary between ports.*
3. *The stevedoring charge used in Waterline is monitored by the ACCC and is the weighted average for Brisbane, Sydney, Melbourne, Adelaide, Fremantle and Burnie. Stevedoring charges vary between ports but detailed data for individual ports are not publicly available.*
Sources *BTRE estimates based on: ship call data supplied by relevant port authorities/corporations; price schedules of relevant port authorities/ corporations, towage operators and pilotage service providers; surveys of customs brokers and road transport operators; and stevedoring charge data supplied by the ACCC.*

Road transport charges increased at Brisbane (6 per cent), Melbourne (6 per cent), Adelaide (5 per cent), Sydney (7 per cent) and Fremantle (9 per cent). One of the parameters used to estimate road transport charges is the time taken to move containers between the wharf and the customer's warehouse. Both distance and traffic congestion impact on this parameter and, therefore, help explain the significant difference between road transport charges at Melbourne and Sydney compared with Brisbane, Adelaide and Fremantle.

Indices for individual ports

Table 6 indicates that for ships in the 15 000–20 000 GT range, between July–December 2005 and January–June 2006, costs per teu for import containers at Brisbane increased by 2 per cent, export containers also increased 2 per cent. At Sydney and Melbourne, they increased by 4 per cent for both imports and exports. At Adelaide and Fremantle, import costs increased 3 per cent and export costs by 4 per cent.

Table 8 indicates that for ships in the 35 000–40 000 GT range, costs per teu for import and export containers between July-December 2005 and January–June 2006 decreased at Brisbane by 3 per cent and increased by 3 per cent at Adelaide and Fremantle. Costs at Sydney for import and exports increased 1 per cent, while at Melbourne import costs decreased by 1 per cent, and export costs remained steady.

These results should be interpreted with caution. The use of a single stevedoring charge for all ports reflects the scope of the available information, which is not disaggregated on an individual port basis. In practice, container stevedoring charges tend to vary between ports.

National index

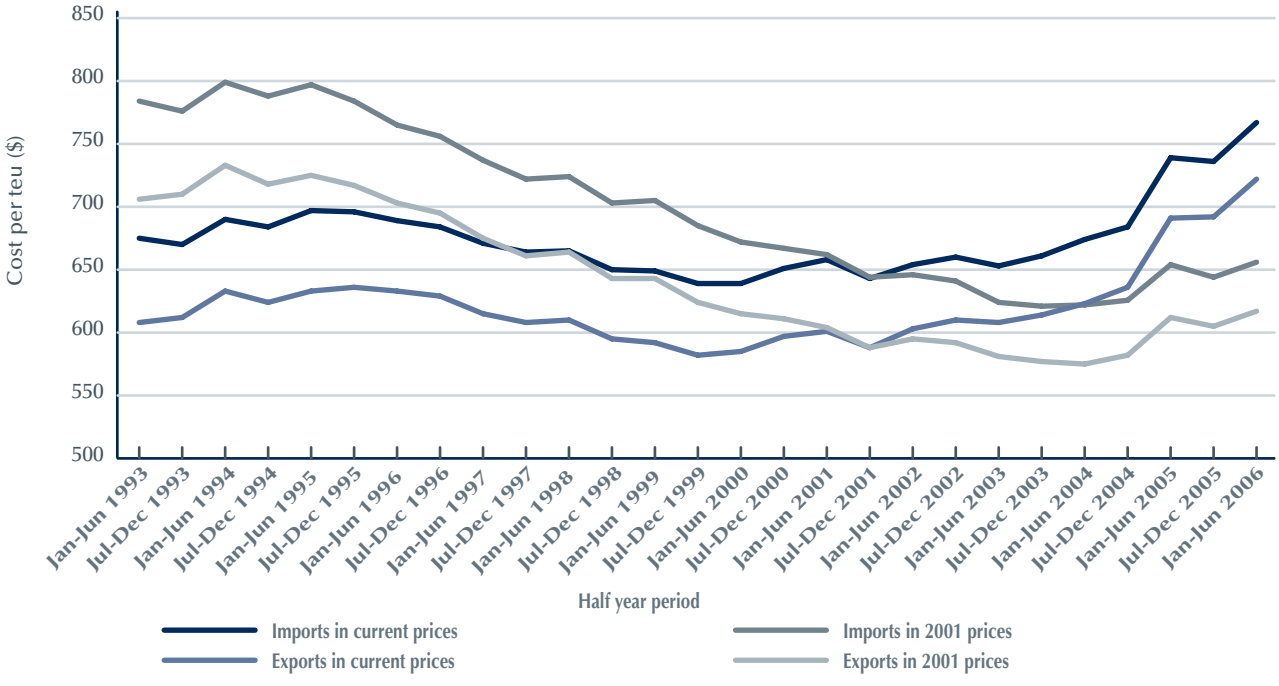
Figure 17 provides the national port interface cost index for ships in the 15 000–20 000 GT range from 1992 onwards. In current prices, the national index for imports increased from $739 per teu in July–December 2005 to $765 in January–June 2006, and the index for exports increased from $694 per teu to $719 per teu.

Table 8 The national port interface cost index for ships in the 35 000–40 000 GT range, 2001–2006

	Jan–Jun 2002	Jul–Dec 2002	Jan–Jun 2003	Jul–Dec 2003	Jan–Jun 2004	Jul–Dec 2004	Jan–Jun 2005	Jul–Dec 2005	Jan–Jun 2006
Imports in current prices	654	660	653	661	674	684	739	737	763
Imports in 2001 prices	646	641	624	621	622	626	654	644	652
Exports in current prices	603	610	608	614	623	636	691	692	717
Exports in 2001 prices	595	592	581	577	575	582	612	605	613

Sources *BTRE estimates based on: ship call data supplied by port authorities/corporations; price schedules of port authorities/corporations, towage operators and pilotage service providers; surveys of customs brokers and road transport operators; stevedoring charges data supplied by the ACCC and industry sources; and ABS 5206.041 National Accounts table.*

Figure 17 National port interface cost index for ships in the 15 000–20 000 GT range



Sources *BTRE estimates based on: ship call data supplied by port authorities/corporations; price schedules of port authorities/corporations, towage operators and pilotage service providers; surveys of customs brokers and road transport operators; stevedoring charges data supplied by the ACCC and industry sources; and ABS 5206.041 National Accounts table.*

In real terms (2001 prices), the national cost index per import teu has by decreased 16 per cent since 1993, and by 13 per cent per export teu.

Table 8 shows the national port interface cost index from July–December 2001 for ships in the 35 000–40 000 GT range. The national index for imports increased from $737 per teu in July–December 2005 to $763 per teu in January–June 2006 in current prices. The index for exports increased from $692 to $717 per teu in current prices.

The increases in both National Indices are primarily due to the increases in land transport costs at all ports.

Ship Visits

Table 9 provides the five-port total number of ship visits and the average number of teus exchanged per ship visit for container vessels with sizes ranging from 5000–60 000 GT. Ship visits measures the number of times a ship calls at a port or ports; for example, a ship that sails to Australia 3 times and makes a total of 15 port calls in a year counts as 1 ship, 3 voyages and 15 ship visits.

Total ship visits increased by 16 per cent in the year ended June 2006 compared with the preceding year, with ship visits peaking at 2127 in the six months to June 2006. The number of ship visits varied across all ranges in each period. The largest variation was in the 30 000–35 000 GT range, which registered 141 visits in the six month period to December 2005 and 198 in the six month period to June 2006 (40 per cent). The largest decrease was in the 50 000–55 000 range (49 per cent).

On a national level, 19 per cent of all ship visits were vessels in the 25 000–30 000 GT range, and 84 per cent of ship visits fell within the 15 000–45 000 GT ranges.

Table 10 provides the GT range distribution of ship visits by port for the 2005–06 financial year. The distribution varies between the ports. The median visit for Sydney and Melbourne was in the 20 000–25 000 GT range, for Brisbane in the 15 000–25 000 GT range, For Adelaide in the 20 000–30 000 GT range and for Fremantle in the 25 000–30 000 GT range. For Sydney, Brisbane and Melbourne the 75 percentile ship visit occurred in the 25 000–35 000 GT range, while

Table 9 Five port average number of teus exchanged and total ship visits per 6 month period for selected GT ranges, weighted by number of ships

GT	Dec-97	Jun-98	Dec-98	Jun-99	Dec-99	Jun-00	Dec-00	Jun-01	Dec-01	Jun-02	Dec-02	Jun-03	Dec-03	Jun-04	Dec-04	Jun-05	Dec-05	Jun-06
5 000–10 000																		
Average teus exchanged	321	347	323	217	369	380	383	456	285	239	187	161	193	333	204	283	368	269
Total ship visits	159	130	145	143	123	88	118	93	77	66	78	75	72	93	80	71	67	93
10 000–15 000																		
Average teus exchanged	569	473	530	546	660	683	702	702	707	712	424	405	485	688	628	554	506	459
Total ship visits	204	172	143	146	183	152	123	106	108	79	59	53	54	40	84	89	106	136
15 000–20 000																		
Average teus exchanged	605	539	678	656	768	776	813	825	885	763	839	840	826	971	885	693	800	684
Total ship visits	329	361	309	349	363	255	278	330	293	285	223	181	191	153	266	316	439	406
20 000–25 000																		
Average teus exchanged	518	506	599	629	790	754	833	838	830	762	818	902	990	1 014	935	818	859	685
Total ship visits	217	200	278	280	249	270	314	276	240	233	241	182	214	199	306	321	294	374
25 000–30 000																		
Average teus exchanged	559	608	545	591	740	682	636	869	777	888	1 070	1 027	1 031	959	1 071	956	1 021	882
Total ship visits	105	97	125	95	129	153	132	116	129	186	252	286	323	344	185	332	377	395
30 000–35 000																		
Average teus exchanged	951	754	695	696	821	912	1041	991	1 061	1 014	1 149	1 262	1 374	1 478	896	1 216	1 434	1 152
Total ship visits	192	206	251	252	180	208	222	187	196	216	232	175	257	247	191	223	141	198
35 000–40 000																		
Average teus exchanged	799	793	807	831	945	1071	1 149	1 111	1 223	1 262	1 403	1 408	1 445	1 474	1 385	1 394	1 454	1 138
Total ship visits	205	235	246	239	207	193	224	210	197	203	223	214	189	225	228	227	225	178
40 000–45 000																		
Average teus exchanged	869	759	894	878	1 013	1 074	1 133	1 102	1 246	1 228	1 465	1 450	1 558	1 601	1 099	1 511	1 653	1 180
Total ship visits	76	91	146	137	148	153	140	158	176	195	172	162	186	181	143	196	165	223
45 000–50 000																		
Average teus exchanged	0	35	174	188	233	0	0	0	0	808	938	1 201	1 271	1 379	853	1 279	1 434	914
Total ship visits	0	4	3	3	1	0	0	0	0	5	38	72	77	75	32	65	77	88
50 000–55 000																		
Average teus exchanged	678	734	810	737	932	1007	1274	1143	1062	1134	1 027	995	1 044	1 366	795	1 735	1 250	632
Total ship visits	28	24	61	64	68	56	63	55	56	60	55	61	69	22	71	89	60	36
55 000–60 000																		
Average teus exchanged	1 139	991	1 026	1 046	1 248	1 099	1 223	1 072	1 019	1 069	1 166	1 252	0	0	681	537	0	623
Total ship visits	36	36	25	31	28	29	21	13	17	15	14	3	0	0	6	8	0	0
Total ship visits	**1 551**	**1 556**	**1 732**	**1 739**	**1 679**	**1 557**	**1 635**	**1 544**	**1 489**	**1 543**	**1 587**	**1 464**	**1 632**	**1 579**	**1 592**	**1 937**	**1 951**	**2 127**

Source *BTRE estimates based on ship call data supplied by relevant port authorities/corporations.*

for Adelaide it occurred in the 35 000–45 000 GT range and for Fremantle in the 30 000–45 000 GT range.

The average number of teus exchanged has declined since the previous six month period to December 2005. The biggest decrease in the six month period to June 2006 was in the in the 50 000–55 000 (49 per cent). In the 30 000–35 000 (20 per cent), 40 000–45 000 (29 per cent), 45 000–50 000 (36 per cent) and in the 5000–10 000 range (27 per cent).

Table 10 Number of ship visits by port, 2005–2006

GT range	Brisbane	Sydney	Melbourne	Adelaide	Fremantle	Total
5,000–10,000	94	20	45	0	1	160
10,000–15,000	36	76	109	1	20	242
15,000–20,000	239	266	242	87	11	845
20,000–25,000	190	213	192	18	55	668
25,000–30,000	135	195	206	89	147	772
30,000–35,000	99	101	106	6	27	339
35,000–40,000	73	105	97	53	75	403
40,000–45,000	68	85	101	44	90	388
45,000–50,000	46	55	54	3	7	165
50,000–55,000	2	25	24	23	22	96
above 55,000	0	0	0	0	0	0
Total	**982**	**1 141**	**1 176**	**324**	**455**	**4 078**

Source *BTRE estimates based on ship call data supplied by relevant port authorities/corporations.*

Port performance—non-financial

The January–June 2002 to January–June 2006 non-financial indicators for the five mainland capital city ports are presented in Table 11.

Cargo throughput

Total cargo throughput at the five ports was 58.4 million tonnes for January–June 2006 , compared with 57.8 million tonnes for the previous half-year July–December 2005 and 57.1 million tonnes for January–June 2005. This represented an increase of 2.3 per cent in total cargo throughput for the five ports compared with January–June 2005 and an increase of 1.0 per cent compared with July–December 2005.

Compared with January - June 2005, total cargo throughput in January–June 2006 increased 2.0 per cent at Brisbane, and increased by 6.9 per cent at Sydney, decreased by 3.0 per cent at Melbourne, and increased by 9.3 per cent at Adelaide and 1.3 per cent at Fremantle.

Non-containerised general cargo throughput at the five ports was 2.504 million tonnes for January–June 2006, which represents a decrease of 2.6 per cent on the 2.572 million tonnes throughput for July–December 2005 and an decrease of 0.6 per cent on the 2.518 million tonnes throughput for January–June 2005.

Total container traffic throughput for the five ports was 2.316 million teus for January–June 2006, which represents a decrease of 6.2 per cent on the 2.469 million teus throughput for July–December 2005 and an increase of 3.2 per cent on the 2.244 million teus throughput for January–June 2005.

Compared with January–June 2005, loaded teus at the five ports increased by 0.7 per cent, with loaded imports increasing by 5.1 per cent and loaded exports decreasing by 5.2 per cent.

Table 11 Non-financial performance indicators, selected Australian ports, 2001–2006

	Jul-Dec 2001	Jan-Jun 2002	Jul-Dec 2002	Jan-Jun 2003	Jul-Dec 2003	Jan-Jun 2004	Jul-Dec 2004	Jan-Jun 2005	Jul-Dec 2005	Jan-Jun 2006
Five ports[d]										
Total cargo throughput ('000 tonnes)	50 638	51 422	52 110	51 797	54 284	57 713	58 593	57 064	57 776	58 358
Non-containerised general cargo ('000 tonnes)[a]	1 876	1 964	2 143	2 060	2 316	2 285	2 338	2 518	2 572	2 504
Containerised cargo (teus exchanged)										
Full import	767 239	714 041	898 549	834 191	972 737	952 302	1 104 324	978 300	1 139 342	1 028 263
Empty import	144 929	134 785	127 665	117 616	116 179	129 114	125 158	135 088	129 224	199 487
Full export	640 288	632 229	659 965	618 896	651 772	694 261	721 595	719 329	755 826	681 571
Empty export	192 083	213 298	302 462	344 846	373 294	364 000	455 000	411 302	445 509	407 265
TOTAL	1 744 539	1 694 353	1 988 641	1 915 549	2 113 982	2 139 677	2 406 077	2 244 019	2 469 901	2 316 586
Average total employment[b]	759	795	803	816	865	914	934	967	1 037	1 056
Port turnaround time (hrs)[c]										
Median result	-	-	-	-	-	-	-	-	-	
95th percentile	-	-	-	-	-	-	-	-	-	
Brisbane										
Total cargo throughput ('000 tonnes)	11 642	11 525	12 172	12 399	12 745	12 326	13 006	12 967	13 531	13 226
Non-containerised general cargo ('000 tonnes)[a]	306	304	316	304	413	392	373	447	461	459
Containerised cargo (teus exchanged)										
Full import	88 281	85 688	114 878	107 977	137 111	124 773	158 781	133 594	172 175	149 226
Empty import	37 675	32 112	35 719	28 565	31 633	31 676	37 379	34 136	33 218	34 164
Full export	102 634	95 966	101 229	91 446	104 279	100 760	114 029	113 090	130 459	115 564
Empty export	17 874	21 393	41 581	48 809	56 923	52 117	73 495	61 643	60 349	71 123
TOTAL	246 464	235 159	293 407	276 797	329 946	309 326	383 684	342 463	396 201	370 077
Average total employment[b]	206	212	215	209	214	225	238	248	253	256
Port turnaround time (hrs)[c]										
Median result	34	32	32	31	35	32	37	45	44	48
95th percentile	53	52	55	49	59	59	72	57	56	61
Sydney										
Total cargo throughput ('000 tonnes)	12 462	11 838	12 073	11 485	12 429	12 738	13 215	12 635	13 219	13 505
Non-containerised general cargo ('000 tonnes)[a]	291	279	319	316	321	307	299	329	312	302
Containerised cargo (teus exchanged)										
Full import	270 691	236 594	309 070	277 860	320 061	323 051	366 037	320 732	378 451	342 216
Empty import	13 341	8 853	8 071	6 005	4 503	7 222	5 262	7 670	9 929	9 490
Full export	159 494	147 918	154 314	139 456	149 314	154 195	161 310	158 342	171 320	168 830
Empty export	78 535	94 027	123 810	141 927	154 189	157 721	185 558	170 699	191 297	173 932
TOTAL	522 061	487 392	595 265	565 248	628 067	642 189	718 167	657 443	750 997	694 468
Average total employment[b]	195	199	198	199	198	198	198	200	241	243
Port turnaround time (hrs)[c]										
Median result	32	30	36	32	32	32	33	28.3	29.4	27.8
95th percentile	68	55	63	58	66	55	55	51	50	48
Melbourne										
Total cargo throughput ('000 tonnes)	11 452	12 138	12 388	12 283	12 458	14 222	14 115	14 211	13 978	13 782
Non-containerised general cargo ('000 tonnes)[a]	753	834	896	931	984	1 032	1 015	1 127	1 060	1 081
Containerised cargo (teus exchanged)										
Full import	310 034	295 343	358 818	337 671	388 339	386 413	446 960	406 623	456 345	416 323
Empty import	60 384	58 936	52 600	52 238	48 478	57 082	51 113	59 334	51 035	60 806
Full export	273 910	279 866	291 272	277 392	276 401	315 000	323 454	329 766	330 003	339 949
Empty export	68 761	73 547	104 266	119 541	127 967	118 038	152 055	141 136	149 346	126 118
TOTAL	713 089	707 692	806 956	786 842	841 185	876 533	973 582	936 859	986 729	943 196
Average total employment[b]	93	96	95	102	142	170	171	184	191	199
Port turnaround time (hrs)[c]										
Median result	36	35	38	36	35	38	39	33	32	30
95th percentile	68	63	68	62	57	65	78	60	54	52
Adelaide										
Total cargo throughput ('000 tonnes)	3 934	4 446	4 130	3 524	4 478	4 982	5 273	4 699	4 832	5 137
Non-containerised general cargo ('000 tonnes)[a]	189	239	251	172	238	213	263	207	282	193
Containerised cargo (teus exchanged)										
Full import	21 097	19 591	21 864	19 015	22 214	19 317	20 564	19 785	24 201	23 483
Empty import	11 714	15 055	11 715	13 050	15 895	14 073	16 774	19 663	21 280	18 024
Full export	34 482	35 793	37 358	33 468	43 874	41 734	39 277	40 259	46 933	43 954
Empty export	4 117	3 377	5 660	6 203	6 757	5 244	7 503	6 760	6 562	4 954
TOTAL	71 410	73 816	76 597	71 736	88 740	80 368	84 118	86 467	98 976	90 415
Average total employment[b]	98	95	97	95	94	95	97	95	94	97
Port turnaround time (hrs)[c]										
Median result	22	21	19	21	23	24	23	22	21	19
95th percentile	43	43	29	40	41	43	60	41	34	32
Fremantle										
Total cargo throughput ('000 tonnes)	11 147	11 476	11 348	12 105	12 173	13 445	12 985	12 551	12 217	12 709
Non-containerised general cargo ('000 tonnes)[a]	337	309	361	338	361	341	389	409	457	468
Containerised cargo (teus exchanged)										
Full import	77 136	76 825	93 919	91 668	105 012	98 748	111 982	97 566	108 170	97 015
Empty import	21 815	19 829	19 560	17 758	15 670	19 061	14 630	14 285	13 762	77 003
Full export	69 768	72 686	75 792	77 134	77 904	82 572	83 525	77 872	77 111	13 274
Empty export	22 796	20 954	27 145	28 366	27 458	30 880	36 389	31 064	37 955	31 138
TOTAL	191 515	190 294	216 416	214 926	226 044	231 261	246 526	220 787	236 998	218 430
Average total employment[b]	167	193	199	211	217	226	230	241	258	261
Port turnaround time (hrs)[c]										
Median result	21	22	25	25	28	29	31	24	23	21
95th percentile	46	52	60	52	57	63	60	51	56	48

- *not applicable*

a. *Excludes bulk cargoes.*

b. *Comparisons between ports are not appropriate because each port authority/corporation has a different structure.*

c. *Port turnaround times refer only to ships calling at container terminals. Comparisons between ports are not appropriate because each port has a different set of parameters to measure the turnaround time. Normally, only inter-temporal comparison at individual ports is of use.*

d. *Components may not sum to totals due to rounding.*

Source *Association of Australian Ports and Marine Authorities (APMA)*

Waterfront reliability

In recent issues *Waterline* has been providing data on partial measures of the variability of waterfront performance for container movements at major Australian ports. These have included indicators on the timeliness of selected port services, factors contributing to ship waiting time, aspects of stevedoring performance and the accuracy of ship arrival advice.

The data on berth availability, pilotage, towage and other ship waiting time incidents was provided in the past on condition that the sample on which they were based was large enough to protect the confidentiality of individual observations. Recent mergers of shipping lines in the industry mean that the current sample is too small to publish.

The provision of data on cargo receival and ship arrival is not affected by this situation.

Stevedoring—cargo receival

Table 12 presents the available information on an aspect of stevedoring reliability at major container terminals—cargo receivable. Data were not available for Adelaide.

Cargo receival is the proportion of receivables (exports) completed by the stevedore's cut-off time. It provides a partial measure of one factor that can affect container terminal performance. Cargo receivable in the March quarter 2006 increased at Melbourne, Sydney and Brisbane and was unchanged for Fremantle compared with the previous quarter. Cargo receivable in the June quarter 2006 increased for Brisbane and Melbourne and decreased at Fremantle and Sydney compared with the previous quarter.

Ship arrival

Table 12 also includes data for two indicators of ship arrival advice.

The first indicator is the proportion of ship arrivals within one hour (plus or minus) of the most recently advised arrival time available to the port authority/corporation at 24 hours prior to actual arrival. Compared with the previous quarter, the March quarter 2006 indicator rose at Brisbane, Sydney and Fremantle. It was not available for Melbourne. In the June quarter 2006, the indicator fell at Sydney and rose at Brisbane, Adelaide and Fremantle. It was not available for Melbourne.

The second indicator is the proportion of ship arrivals within one hour (plus or minus) of the last scheduled arrival time advised inside the 24 hours prior to actual arrival. In the March quarter 2006, this indicator rose at Sydney, Fremantle and Brisbane. It's movement was not available for Melbourne and Adelaide. In the June quarter 2006, this indicator fell at Sydney and rose at Fremantle. It was not available for Melbourne and did not change for Brisbane and Adelaide.

Table 12 Stevedoring and ship arrival reliability indicators, March quarter 2006 and June quarter 2006.

per cent

Indicator	Brisbane		Sydney		Melbourne		Adelaide		Fremantle	
	Jan-Mar	Apr-Jun	Jan-Mar	Apr-Jun	Jan-Mar	Apr-Jun	Jan-Mar	Apr-Jun	Jan-Mar	Apr-Jun
Stevedoring										
Cargo receival	96	97	94	90	87	90	na	na	98	96
Ship arrival										
Advice at 24 hrs	51	60	49	43	na	na	94	95	53	60
Advice inside 24 hrs	96	96	96	88	na	na	98	98	91	95

na not available
Sources *Association of Australian Ports and Marine Authorities(AAPMA), Patrick and P&O/ DP World.*

Coastal shipping permits

Total tonnages of cargo permits issued to applicants under Single Voyage Permits (SVPs) and Continuing Voyage Permits (CVPs) decreased by 1.3 per cent from 15.5 million tonnes in the financial 2004–2005 to 15.3 million tonnes in the financial year 2005–2006, (Figure 18).

Single voyage permits

Figure 19 illustrates the number of SVPs issued, and the pre-voyage estimation of tonnes of cargo to be carried, between January–June 1991 and January–June 2006. The number of SVPs issued in January–June 2006 increased by 0.8 per cent compared with July–December 2005 and by 17.5 per cent compared with the January–June 2005 period. The associated estimated tonnes of cargo to be carried decreased by 7.5 per cent compared with July–December 2005, and increased by 3.7 per cent compared with January–June 2005.

Table 13 gives a breakdown of SVPs by cargo types for January–June 2006. General cargo (including containerised cargo) permits now represent 3.3 per cent by weight, while making up 38.5 per cent of total permits issued. Bulk cargo accounts for 96.7 per cent of the total tonnage moved under SVPs.

Continuing voyage permits

Although CVPs were available prior to 1998, they were rarely requested or issued during this period. Since 1998, there have been significant fluctuations in both the number of permits issued and the tonnage to be carried, as shown in Figure 20. In January–June 2006, a total of 1.74 million tonnes of cargo were to be carried under CVPs, compared with 1.55 million tonnes in July–December 2005 and 1.8 million tonnes in January–June 2005.

CVPs issued since the start of 2003 have been for 3 months maximum duration rather than the 6 months allowed previously. One CVP is estimated to be equivalent to an average of three SVPs. In January–June 2006 there were 73 CVPs issued compared with 80 in the same period in 2005, an increase of 9.6 per cent.

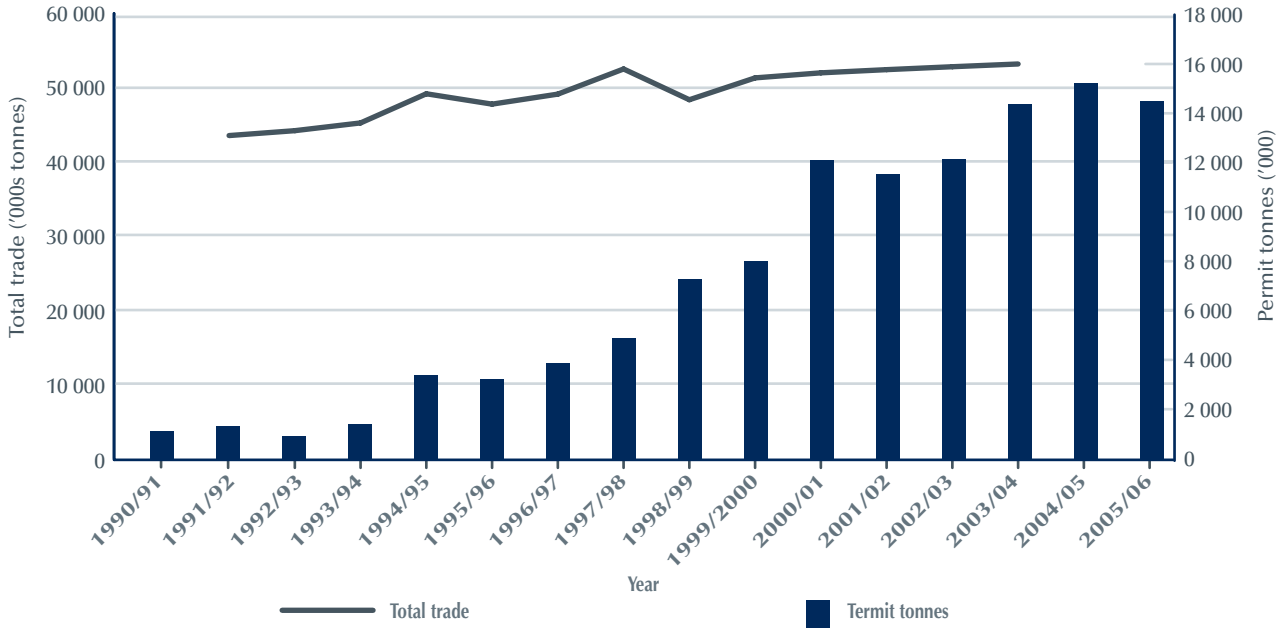
More information on coastal permits can be found on the Department of Transport and Regional Services' internet site at http://www.dotars.gov.au/transreg/str_permits.aspx

Table 13 Summary of single voyage permits issued, January—June 2006

Cargo Category	Permits	Tonnes
Bulk Cargo		
Petroleum Products	76	1 882 988
Liquefied Gas	6	16 058
Other Bulk Liquids	6	28 525
Dry Bulk	139	3 699 742
General Cargo	142	189 766
Total	369	5 817 079

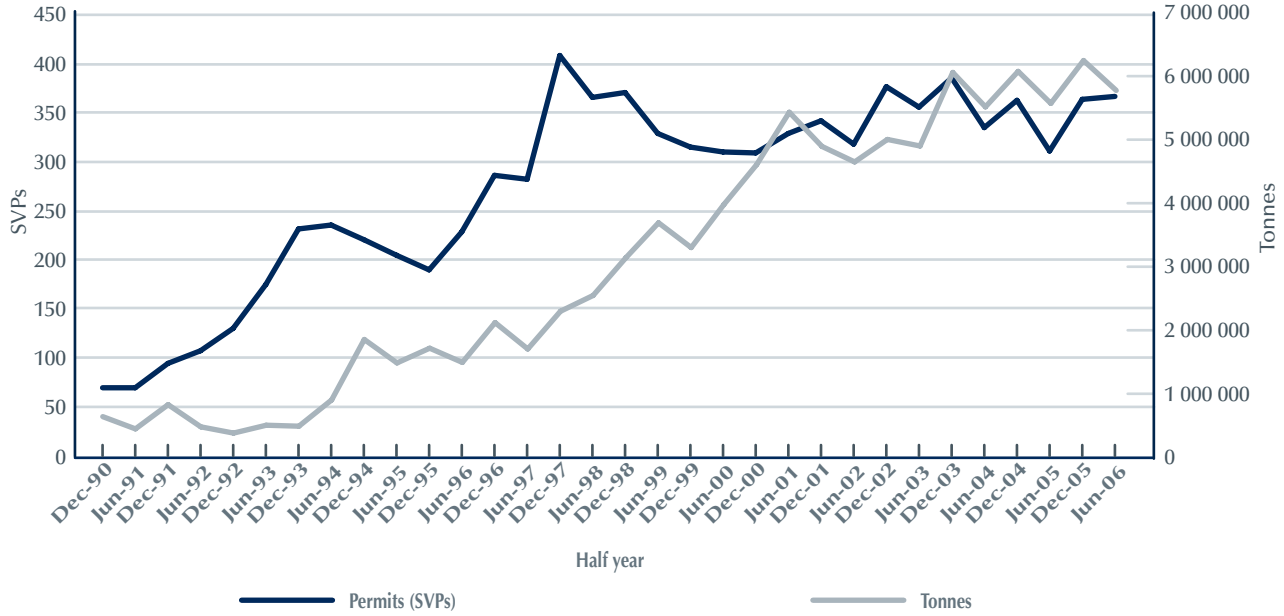
Note *Tonnages are the pre-voyage estimation of the tonnes to be carried.*
Source *Office of Transport Security, Department of Transport & Regional Services.*

Figure 18 Total coastal trade, 1990–2006



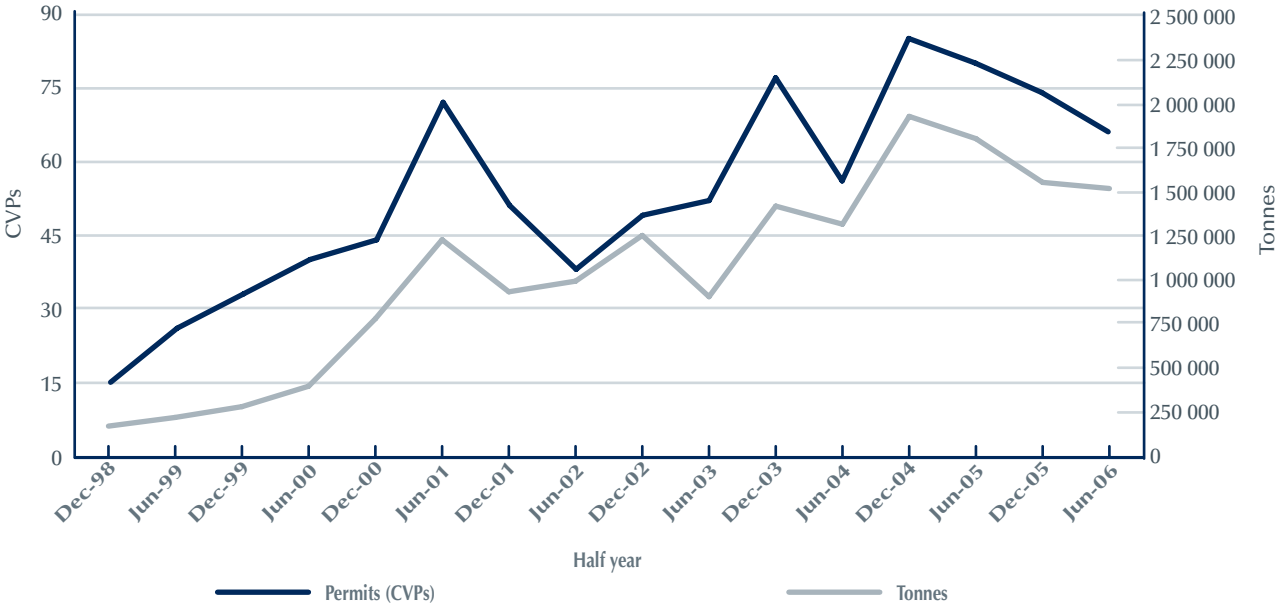
Note *All tonnages are pre-voyage estimates.*
Source *BTRE; Australian Sea Freight series; Office of Transport Security and Maritime and Land Transport Division, Department of Transport and Regional Services, various years.*

Figure 19 Tonnes to be carried via single voyage permits, 1991–2006



Note *All tonnages are pre-voyage estimates.*
Sources *Office of Transport Security and Maritime and Land Transport Division, Department of Transport and Regional Services, various years.*

Figure 20 Tonnes to be carried via continuing voyage permits, 1998–2006



Note *All tonnages are pre-voyage estimates.*
Sources *Office of Transport Security and Maritime and Land Transport Division, Department of Transport and Regional Services, various years.*

Harbour towage charges

Table 14 provides the publicly available towage charges for the five mainland capital city ports as well as a selection of regional ports as at 30 June 2005 and 30 June 2006 for the two representative vessel sizes, 19 999 GT and 59 999 GT.

Nine of the ten ports recorded changes to towage charges during the 2005–06 financial year:

- *Brisbane*—a 2.0 per cent increase in the 19 999 GT vessel size and a 1.9 per cent increase in the 59 999 GT vessel size;
- *Sydney*—a 2.1 per cent increase in the 19 999 GT vessel size and 1.8 per cent increase in the 59 999 GT vessel size;
- *Melbourne*—a 2.0 per cent increase in the 19 999 GT vessel size and a 2.1 per cent increase in the 59 999 GT vessel size;
- *Adelaide*—a 3.0 per cent increase in the 19 999 GT vessel size and no increase in the 59 999 GT vessel size;
- *Fremantle*—2.1 per cent decrease in the 19 999 GT vessel size and a 2.0 per cent decrease in the 59 999 GT vessel size;
- *Bunbury*—a 5.8 per cent increase for both vessel sizes;
- *Burnie*—a 6.5 per cent increase in the 19 999 GT vessel size;
- *Gladstone*—no increase for both vessel sizes;
- *Newcastle*—a 4.5 per cent increase for both vessel sizes;
- *Pt Kembla*—a 6.1 per cent increase in the 19 999 GT vessel size and a 7.2 per cent decrease in the 59 999 GT vessel size.

Towage charges are collected for the purpose of monitoring trends in charges over time and should, therefore, be interpreted with caution. They should not be used for inter-port comparisons as local conditions vary between ports, and charges may vary for individual ship operators based on negotiated contracts.

Table 14 Harbour towage charges

Capital City Port	Adelaide		Brisbane		Fremantle		Melbourne		Sydney[b]		5 Ports Average	
	30-Jun	30-Jun	30-Jun	30-Jun	30-Jun	30-Jun	30-Jun	30-Jun	30-Jun	30-Jun	30-Jun	30-Jun
Vessel size (GT)	**2005**	**2006**	**2005**	**2006**	**2005**	**2006**	**2005**	**2006**	**2005**	**2006**	**2005**	**2006**
19 999 GT												
$ Per Tug Rate[a]	3 805	3 918	2 971	3 031	2 596	2 541	3 592	3 663	2 920	2 980	3 177	3 227
59 999 GT												
$ Per Tug Rate[a]	5 587	5 587	4 368	4 451	4 389	4 301	3 988	4 070	3 382	3 443	4 343	4 370

Regional Port	Bunbury		Burnie		Gladstone		Newcastle		Port Kembla		5 Ports Average	
	30-Jun	30-Jun	30-Jun	30-Jun	30-Jun	30-Jun	30-Jun	30-Jun	30-Jun	30-Jun	30-Jun	30-Jun
Vessel size (GT)	**2005**	**2006**	**2005**	**2006**	**2005**	**2006**	**2005**	**2006**	**2005**	**2006**	**2005**	**2006**
19 999 GT												
$ Per Tug Rate[a]	3 105	3 285	3 080	3 280	1 909	1 909	3 274	3 421	2 416	2 563	2 696	2 757
59 999 GT												
$ Per Tug Rate[a]	4 629	4 897	na	na	3 556	3 556	4 597	4 804	5 377	4 991	4 563	4 540

na not applicable
a. Cost for each tug to assist a ship arriving at or departing from a berth within the limits of the port at any time.
b. Sydney is represented by tariffs charged at Port Botany only.
Source BTRE estimates based on towage operators' tariff schedules, where there is more than one operator, the charges have been averaged.

Annex 1 Container terminal performance indicators, selected australian ports—productivity in teus per hour

	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Sep-03	Dec-03	Mar-04	Jun-04	Sep-04	Dec-04	Mar-05	Jun-05	Sep-05	Dec-05	Mar-06	Jun-06
Five Ports																	
Ships handled	868	858	856	821	822	841	850	801	825	905	936	890	993	1 027	1 043	1 026	1 075
Total teus	788 090	876 522	938 913	871 089	870 861	952 273	1 023 224	963 667	1 018 623	1 096 611	1 161 451	1 042 313	1 035 658	1 107 901	1 194 998	1 048 694	1 120 123
Crane rate	35.9	35.9	35.6	35.3	37.4	38.5	37.8	38.2	39.0	38.9	38.4	38.2	38.6	38.0	39.5	39.4	38.0
Vessel working rate	41.1	43.4	42.2	42.9	44.3	47.9	46.5	46.7	47.3	46.2	46.6	48.9	49.3	49.5	51.0	49.3	49.6
Ship rate	56.3	59.9	59.4	58.8	61.7	67.4	64.4	64.6	66.1	65.0	64.8	65.4	64.8	63.8	66.8	63.8	63.7
Throughput pbm	110.4	122.8	131.6	122.1	122.0	133.4	143.4	135.0	142.7	153.7	162.7	146.1	145.1	155.2	167.4	146.9	157.0
Brisbane																	
Ships handled	211	216	216	206	184	192	194	179	175	219	227	205	222	244	261	262	257
Total teus	121 920	136 771	143 882	130 384	124 854	147 273	158 065	146 104	151 138	188 092	191 414	165 403	158 860	173 665	204 553	176 840	184 468
Crane rate	35.2	34.6	35.6	33.8	35.8	35.0	35.4	36.1	37.5	37.7	37.8	38.5	37.4	35.9	39.7	35.8	34.4
Vessel working rate	30.0	32.0	32.3	32.6	36.3	34.2	36.3	36.9	40.7	36.9	33.1	37.1	36.7	36.6	38.8	36.2	38.8
Ship rate	48.2	50.2	53.9	50.4	55.3	53.7	55.9	57.7	61.5	59.3	58.9	58.8	55.1	50.0	58.5	49.7	51.1
Throughput pbm	75.9	85.1	89.5	81.1	77.7	91.6	98.4	90.9	94.1	117.1	119.1	102.9	98.9	108.1	127.3	110.0	114.8
Sydney																	
Ships handled	203	204	210	211	217	228	238	221	231	253	262	258	283	294	297	293	307
Total teus	235 664	277 733	302 267	278 456	271 501	303 745	336 988	306 080	327 661	347 047	371 243	330 140	330 816	364 083	385 180	334 708	358 563
Crane rate	37.4	36.2	35.2	35.7	38.0	39.4	37.3	37.7	39.0	39.0	38.6	38.3	39.5	37.5	39.7	40.4	38.2
Vessel working rate	46.7	49.4	45.8	46.2	49.5	53.3	47.1	51.0	51.0	48.5	50.4	49.9	52.6	50.3	52.2	50.3	48.8
Ship rate	62.8	65.5	61.7	61.9	67.2	73.0	64.8	67.8	67.7	65.1	68.0	66.8	68.8	65.1	68.9	66.8	64.6
Throughput pbm	121.4	143.0	155.6	143.4	139.8	156.4	173.5	157.6	168.7	178.7	191.2	170.0	170.3	187.5	198.3	172.4	184.6
Melbourne																	
Ships handled	251	250	243	229	235	240	241	223	244	266	272	260	299	293	300	293	318
Total teus	295 284	325 945	342 684	317 711	327 822	342 966	361 225	351 753	379 002	397 048	425 247	392 776	386 211	406 855	428 845	384 742	415 981
Crane rate	35.6	36.6	35.7	35.3	38.0	39.7	39.8	40.6	40.8	40.5	38.7	38.4	38.4	39.4	39.4	40.0	39.3
Vessel working rate	42.4	45.5	43.8	45.7	45.1	51.9	53.0	50.4	50.3	50.9	50.1	54.8	53.7	56.5	56.5	55.3	56.5
Ship rate	58.5	63.6	61.9	61.8	61.6	72.4	71.8	69.9	72.1	71.7	67.2	69.6	67.5	71.3	70.5	70.0	70.0
Throughput pbm	161.7	178.5	187.7	174.0	179.5	187.8	197.8	192.6	207.6	217.4	232.9	215.1	211.5	222.8	234.9	210.7	227.8
Adelaide																	
Ships handled	59	55	58	50	58	62	63	60	60	54	56	53	68	66	66	66	67
Total teus	41 829	37 317	39 354	37 731	40 012	44 510	47 571	43 768	44 335	44 741	43 850	43 588	47 775	52 432	48 319	45 721	49 296
Crane rate	30.7	30.2	31.3	33.2	34.2	35.4	36.4	35.0	35.7	36.0	37.7	37.4	38.7	39.8	39.7	40.33	40.14
Vessel working rate	43.9	42.2	44.3	46.5	44.9	39.4	43.4	40.9	39.7	42.9	44.7	46.8	42.7	47.5	47.5	48.08	47.07
Ship rate	47.4	44.7	49.7	53.1	52.8	47.6	49.9	47.3	45.4	50.9	49.6	54.8	49.5	56.1	54.8	55.38	53.99
Throughput pbm	89.0	79.4	83.7	80.3	85.1	94.7	101.2	93.1	94.3	95.2	93.3	92.7	101.6	111.6	102.8	97.3	104.9
Fremantle																	
Ships handled	144	133	129	125	128	119	114	118	115	113	119	114	121	130	119	112	126
Total teus	93 393	98 756	110 726	106 807	106 672	113 779	119 375	115 962	116 487	119 683	129 697	110 406	111 996	110 866	128 101	106 683	111 815
Crane rate	36.6	36.8	38.4	36.7	37.3	38.7	36.7	36.7	36.3	36.4	38.3	36.5	38.7	37.0	38.6	39.5	37.6
Vessel working rate	35.7	36.0	39.5	37.2	38.3	42.3	40.0	38.2	38.5	40.1	44.6	43.4	45.0	42.2	49.4	47.2	45.9
Ship rate	47.4	51.2	56.2	54.2	59.1	62.5	57.6	55.4	56.1	57.0	61.7	60.1	63.5	57.0	65.7	59.2	62.2
Throughput pbm	72.3	76.5	85.7	82.7	82.6	88.1	92.4	89.8	90.2	92.7	100.4	85.5	86.7	85.8	99.2	82.6	86.6

na not available
pbm per berth metre
Notes 1. Data from CSX World Terminals at Brisbane are incorported from the December quarter 1999 until June quarter 2001.
2. For data back to the December quarter 1993, refer to Waterline 34.
Sources Patrick, P&O/DP World.

Abbreviations and other port service providers

AAPMA	Association of Australian Ports and Marine Authorities
ABS	Australian Bureau of Statistics
ACCC	Australian Competition and Consumer Commission
BTCE	Bureau of Transport and Communications Economics
BTRE	Bureau of Transport and Regional Economics
CVP	Continuing Voyage Permit
DOTARS	Department of Transport and Regional Services
Five-port	The five mainland capital city ports (Brisbane, Sydney, Melbourne, Adelaide, Fremantle)
GT	Gross Tons, formerly abbreviated as GRT
SVP	Single Voyage Permit
Teus	Twenty-foot equivalent units
TTT	Truck Turnaround Time
UCC	Unitized Cellular Container vessel
VBS	Vehicle Booking System

Stevedoring productivity definitions

Containers handled	The total number of containers lifted on/off fully cellular ships.
Crane intensity	The total number allocated crane hours, divided by the elapsed time from labour first boarding the ship and labour last leaving the ship.
Crane Rate	The total containers/teus handled divided by the Elapsed Crane Time.
Elapsed crane time	The total allocated crane hours, less operational and non-operational delays.
Elapsed labour time	The elapsed time between labour first boarding the ship and labour last leaving the ship, less non-operational delays.
Ship rate	The Crane Rate multiplied by Crane Intensity (as defined above).
Ships	Only fully cellular ships are included in calculations. Fully cellular ships are defined as purpose-built container ships equipped with 40-foot cell guides below deck as a minimum, and exclude such vessels if used for mixed cargoes of containers and general cargo.
Teus handled	The total 40-foot containers lifted on/off fully cellular ships multiplied by 2, plus the total 20-foot containers lifted on/off fully cellular ships.
Vessel working rate	The total containers/teus handled divided by the Elapsed Labour Time.

Explanatory notes about terms in *Waterline*

Introduction

Waterline was started to provide a vehicle for publishing descriptive data and various productivity indicators related to waterfront activities. These activities take place in three main parts of the port terminal:

- On the landside of port terminal;
- At the wharf side of port terminal; and
- Within the port terminal.

The information in *Waterline* falls under these three broad categories. These explanatory notes briefly describe these activities and the indicators associated with them. To correctly interpret the information in *Waterline* the reader should be clear about the following issues: the scope of coverage of *Waterline*, the sources of the various data items, the measures of output used in *Waterline*.

Scope

Waterline data relates to five mainland major ports in Australia—namely Brisbane, Sydney, Melbourne, Adelaide and Fremantle.

Waterline focuses on containerised cargo; and excludes all other cargo types.

Waterline includes only fully cellular ships in its calculations. Fully cellular ships are defined as purpose-built container ships equipped with 40-foot cell guides below deck as a minimum, and exclude such vessels if used for mixed cargoes of containers and general cargo.

Data sources:

The measures of port terminal productivity are based on all available data about container movements at the five port terminals. Those measures are based on a census of activities at those port terminals.

Data on costs are based on a sample of ships that call at each of the mainland major ports in Australia. The chosen samples are all ships in the 15 000–20 000 GT range and all ships in the 35 000–40 000 GT range. These vessels represent almost 40 per cent of vessels in the 15 000–45 000 GT range, which itself is almost 85 per cent of all ship visits to these ports in 2005.

Two measures of output are used in *Waterline*:

Containers handled—this is the total number of containers lifted on/off fully cellular ships; and

Twenty foot equivalent units (teus)—this is the number of containers calculated as twenty foot equivalent units. This means that a twenty foot container is counted as one container or teu and a forty foot container is counted as two twenty foot containers or two teus. By definition, for any given period teus handled are more than containers handled.

Terms used on the landside of the port terminal

Vehicle booking system—this is a system under which a road transport operator makes an advance booking for a time-slot at the terminal to deliver or collect a container. The two terminal operators, Toll/Patrick and P&O/ Dubai Ports World, jointly own a company called One Stop that provides a common technical platform for each operator's booking system. Despite this commonality, each system remains fundamentally different in its operational methodology.

Available vehicle booking system slots in a given time period—this indicator measures the supply of infrastructure at port terminal for use by the land side of port terminal logistics businesses during this period.

Unused Vehicle booking system slots between a given time period—this is a measure of the extent of synchronisation between the 24/7 businesses of port terminals and the operators in the land side of port terminal logistics business during this period. It is expected that the values for this indicator will generally be low. The higher the level of synchronisation between the two types of businesses the lower the waste of infrastructure where waste is measured by VBS slots available but not used.

Average truck turnaround time in the quarter—this is a measure of the efficiency with which trucks are processed within a given terminal. The indicator measures the length of time (in minutes) that a truck takes from the time it enters a port terminal to the time it exits the port terminal.

Container terminal performance indicators

Container terminal—the movement of containers from the container vessel takes place on to a wharf or pier known as a container terminal. Unlike a traditional wharf, a container terminal needs a large area adjoining the wharf for storing unloaded containers. The containers are placed in stacks of two, three or more and are kept there until they are moved away from the terminal by truck or train. While in the terminal the containers are the responsibility of a stevedoring company.

Stevedoring—the term 'stevedore' can refer to a company which manages the operation of loading or unloading a ship. In Australia the

people who work on the waterfront are referred to as waterside workers or stevedores. A stevedoring company typically owns equipment used in the loading or discharge operation and hires labour for that purpose. Today, a commercial stevedoring company also may contract with a terminal owner to manage all terminal operations. Many large container ship operators have established in-house stevedoring operations to handle cargo at their own terminals and to provide stevedoring services to other container carriers. In Australia the two major stevedoring companies are Toll/ Patrick and PO Ports/Dubai Ports World.

Ships handled—*Waterline* counts only fully cellular ships. Fully cellular ships are defined as purpose-built container ships equipped with 40-foot cell guides below deck as a minimum, and exclude such vessels if used for mixed cargoes of containers and general cargo.

Total containers—This is the total number of containers lifted on/off fully cellular ships in a given period. They should not be confused with teus. "Twenty foot equivalent units" is a universally recognised measure of containers which aggregates both twenty foot and forty foot containers into twenty foot units for statistical purposes.

40 foot containers (per cent)—This is the number of 40 foot containers as a percentage of total containers handled. The higher this indicator is, the larger the degree to which productivity, measured as teus per hour, exceeds the productivity, measured as containers per hour. With teus per hour used as the measure one container lift becomes two lifts.

Crane rate (containers per hour)—this indicator measures the productivity of capital at a port terminal. This is the total containers handled divided by the elapsed crane time. Elapsed crane time is defined as the total allocated crane hours, less operational and non-operational delays.

Vessel working rate (containers per hour)—this indicator measures labour productivity at a port terminal. It is computed as the total containers handled, divided by the elapsed labour time (in hours). For a given worker, the elapsed labour time is estimated as the difference between the time when workers first board the ship and the time when they last leave the ship, less the time when the workers have not worked for whatever reason.

Crane time not worked (percent)—this is the time when a crane could not be used for any reason (operational or non-operational) as a percentage of the total time allocated to a crane.

Ship rate (containers per hour)—this indicator measures the combined stevedoring productivity of capital and labour. It gives the stevedoring productivity per ship while the ship is being worked. It is computed as the crane rate times the crane intensity where crane intensity is (total number of allocated crane hours/ elapsed labour time).

Throughput pbm (tonnes per berth metre squared)—this is the quantity of container and non-container cargo which passes through the port container terminals and is measured in tonnes per berth metre squared. It is a measure of the density of the storage system and reflects the ability of the terminal container storage area to transfer containers from ship to shore and vice versa.

Port interface cost index

The port interface cost index is a measure of shore-based shipping costs or charges for containers moved through mainland capital city ports. These are called 'shore-based' because they are that part of the charges paid by importers and exporters of containers which are directly related to the activity which occurs in the port and on the wharf. They do not include the total price for importing or exporting goods carried in containers paid by customers to customs brokers and freight forwarders.

The index is a measure of the movements in costs to users of waterfront and related services and, therefore, 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.

Stevedoring and port and related-charges are estimated for a standard representative ship transferring an average number of containers. Also land transport and customs agents charges are estimated for a representative transport distance for land transport and a representative consignment for customs agents charges.

The Port Interface Cost Index provides estimates in the changes in five major cost elements by port for exports and imports. The five cost components covered are: (a) Ship-based charges (b) Cargo-based charges (c) Stevedoring costs (d) Customs brokers' fees (e) road transport costs. The construction of the Port Interface Cost Index is a four stage task:

Stage 1: involves the determination of the vessel sizes to represent all vessels of interest that are used to transport containerised cargo. Two vessel sizes are used to represent all vessels of interest. These are: Vessel size of Gross tonnage equal to 17 215 represents all vessels of sizes ranging from 15 000–20 000; and Vessel size of Gross tonnage equal

to 37 394 represents all vessels of sizes ranging from 35 000–40 000. This size determination was calculated at the commencement of the *Waterline* series and is still used. These two ranges are selected to provide the standard representative ships used in the calculations.

Stage 2: The BTRE calculates key parameters for containers carried by the two representative vessels from data provided by port authorities.

Stage 3: The BTRE estimates ship-based charges and cargo-based charges for the representative vessels from price data obtained from port authorities and other maritime operators and transport companies and customs brokers.

Stage 4: BTRE constructs a Port Interface Cost Index for the five ports showing how the various cost components have changed over the recent past.

The following terms are used when discussing the Port Interface Cost Index

Vessel size: This is the total internal capacity of a vessel. It is often referred to as Gross Tonnage.

Teus: This is an industry standard measure of shipping containers.

Teus are twenty foot equivalent units.
Teus loaded means containers loaded with goods.
Teus empty means empty containers.
Teus loaded inwards means imported.
Teus loaded outwards means exported.

Number of port calls—average number of visits of vessels in a particular GT range.

Elapsed berth time (hours)—average time between arrival at and departure from their berth of all vessels in a particular GT range.

Port and related charges

Ship-based charges are levied on container ships once they come into harbour. They include:

- Conservancy charges which are navigation service charges levied by the government of the state in which the port is situated;
- Tonnage charges that are based on the Gross Tonnage of the vessel. They are port service charges levied by the port authority;
- Pilotage charge to cover services for piloting the ship;
- Towage charges levied by the tug boat operator;
- Mooring & Unmooring—charge levied either by the port authority or the stevedoring company;
- Berth hires charges sometimes charged by the Stevedores.

Cargo-based charges include the following items:

- Wharfage charges that are levied on each container by the port authorities;
- Harbour dues that are levied on each container by the port authorities;
- Berth charge that are sometimes charged by port authorities.

Port interface costs

These costs are the sum of the ship based charges and the cargo based charges with the addition of a stevedoring charge and customs brokers and transport charges. They include ship-based charges and cargo-based charges as shown under the heading port and related charges. They also include:

Stevedoring charges—stevedoring and port and related charges are estimated for a standard representative ship transferring an average number of containers. Stevedoring charges are the charges levied by stevedoring companies for handling containers. They are estimated for Australia each year by the ACCC which monitors their price.

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

Road transport charges—transport charges are estimates of what transport companies charge for transporting a container between the wharf and the metropolitan area of the capital city in which the port is situated. These charges are estimated for a representative transport distance.

Individual port index—port interface costs are calculated for each of the five ports for each six month period. They are shown as the import total or the export total in the Port Interface Cost tables and are the total cost of importing or exporting a container (teu).

National Index—the National Port Interface Cost Index is the Australian average cost for each six month period of importing or exporting a container in an average ship.

Ship visits

Ship visits measure the number of times a ship calls at a port or ports; for example, a ship that

sails to Australia 3 times and makes a total of 15 port calls in a year counts as 1 ship, 3 voyages and 15 ship calls.

Non-financial performance indicators

Cargo throughput (tonnes)—this is the quantity of container and non-container cargo which passes through the port and is measured in tonnes.

Non-containerised general cargo (tonnes)—this is cargo which is not carried in containers.

Containerised cargo (teus exchanged)—this is the cargo which is carried in containers normalised as twenty foot equivalent containers.

Average total employment—this is the total employment of the port authorities. It does not include the waterside workers employed by stevedoring companies.

Port turnaround times (hours)—this is the time in hours a container ship is in a port. It is measured as a median of all the container ships in port over a six month period. It is also measured as the 95 th percentile for those ships. The 95th percentile says that 95 per cent of the time, the turnaround time is below this amount. Conversely, 5 per cent of the time, turnaround time is above that amount.

Waterfront reliability

These reliability indicators provide partial measures of the variability of waterfront performance for container movements at major Australian ports. They cover the timeliness of selected port services, factors contributing to ship waiting time, aspects of stevedoring performance and the accuracy of ship arrival advice.

Availability of berth, pilotage and towage services

This is a measure of the delay in hours caused to a ship wishing to enter a port where there is a delay in providing a berth or providing a pilot or tug boat.

Other ship waiting time incidents

This category incorporates waiting time that is attributable to factors other than the unavailability of a berth, pilot or towage service at the scheduled/ confirmed time. The data on other ship waiting time reported in *Waterline* exclude ship schedule adjustments. The incidents which may cause delays are:

Awaiting labour
Early ship arrival
Stevedoring finished early
Crane breakdown
Pilot/tug booking not at preferred time
Stevedoring finished late
Late ship arrival
Industrial action
Ship repairs or maintenance
Weather or tides
Other

Most of these incidents are self-explanatory.

Stevedoring and ship arrival reliability

Stevedoring Cargo receival (per cent) is the proportion of receivables (exports) completed by the stevedore's cut-off time. It provides a partial measure of one factor that can affect container terminal performance.

Ship arrival advice at 24 hours (per cent): This indicator gives the proportion of ship arrivals within one hour (plus or minus) of the most recently advised arrival time available to the port authority/corporation at 24 hours prior to actual arrival.

Ship arrival advice inside 24 hours (per cent): This indicator is the proportion of ship arrivals within one hour (plus or minus) of the last scheduled arrival time advised inside the 24 hours prior to actual arrival.

Coastal shipping permits

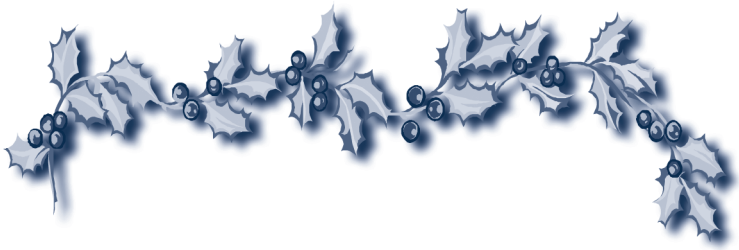
Coastal shipping permits: Under the *Navigation Act 1912* (section 286) vessels may be licensed to participate in Australia's coastal trade irrespective of flag and crew nationality. An unlicensed ship may be granted a permit to trade on the Australian coast in the carriage of either cargo or passengers where:

- There is no suitable licensed ship available for the shipping task; or
- The service carried out by licenced ships is inadequate; and
- It is considered to be desirable in the public interest that an unlicensed ship be allowed to undertake that shipping task.

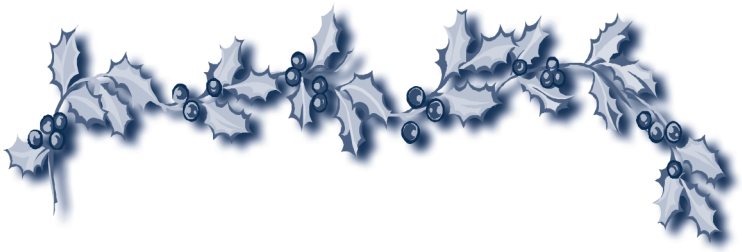
Single voyage permits (SVP)—this permit is issued for a single voyage between designated ports for the carriage of a specified cargo or passengers

Continuing voyage permits (CVP)—this permit is issued for a period of up to three months and enables a vessel to carry specified cargo between specified ports for that period.

Seasons Greetings



The staff of the BTRE would like to extend to you and your family a merry Christmas and happy new year.



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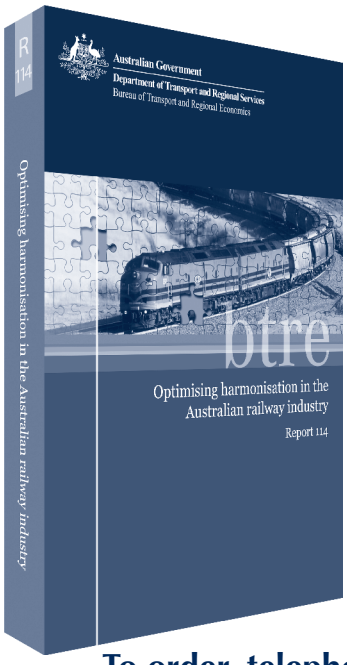

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