

S Stevedoring productivity



Table 1 presents the June quarter 1997 to June quarter 1999 indicators of stevedoring productivity at the five major Australian container terminals, expressed in *container moves per hour*. Figures 1 to 6 present these data over the December quarter 1995 to June quarter 1999 period. The data for Brisbane, Sydney, Melbourne and Fremantle are weighted averages for the major terminals operated by P&O Ports and Patrick. The Adelaide data cover the Sea-Land terminal.

Overall, national stevedoring productivity, as measured by the five-port average, improved further in the June quarter 1999. In fact, the June quarter 1999 five-port average rates reflect the highest level of stevedoring productivity since the BTE commenced monitoring of stevedoring productivity.

- the five-port average *crane rate* (productivity *per crane* while the ship is worked) was 20.3 containers per hour for the June quarter compared with 19.9 in the March quarter;
- the four-port average *elapsed rate* (productivity *per ship* based on the time labour is aboard the ship) was 24.0 containers per hour for the June quarter compared with 23.1 in the March quarter. (Fremantle elapsed rate data from one operator are not available, and therefore only a four-port average indicator could be calculated. However, given that the five-port average is dominated by Melbourne and Sydney, the four-port figure calculated is a reasonable approximation of the five-port average); and
- the five-port average *net rate* (productivity *per ship* while the ship is worked) was 29.0 containers per hour for the June quarter compared with 28.2 in the March quarter.

The level of stevedoring productivity achieved in the June quarter 1999 comes mainly as a consequence of improvements in productivity at the Patrick terminals, where new enterprise agreements were introduced in September 1998, and partly from the generally sustained levels of performance achieved by P&O Ports and Sea-Land during their negotiations with the MUA. The new enterprise agreements at P&O Ports had a staggered introduction: Brisbane and Fremantle in June, Sydney in July, and at Melbourne in August as an award. The new enterprise agreements at Sea-Land were also recently approved, and backdated to April.

The *Brisbane* average crane rate was 18.9 containers per hour in the June quarter, up from 18.3 in the March quarter. The Brisbane elapsed rate of 21.4 containers per hour and the net rate of 25.9 containers per hour were both up on the March quarter figures. The average proportion of elapsed time not worked increased to approximately 18 per cent.

The *Sydney* average crane rate was 18.2 containers per hour in the June quarter, up from 17.7 in the March quarter. The Sydney elapsed rate of 22.2 containers per hour and the net

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rate of 28.7 containers per hour were both down on the March quarter figures. The average proportion of elapsed time not worked remained steady at approximately 24 per cent.

The *Melbourne* average crane rate was 21.8 containers per hour in the June quarter, up from 21.5 in the March quarter. The Melbourne elapsed rate of 25.8 containers per hour and the net rate of 31.0 containers per hour were both up on the March quarter figures. The average proportion of elapsed time not worked decreased to approximately 17 per cent.

The Adelaide average crane rate was 23.1 containers per hour in the June quarter, marginally down from 23.2 in the March quarter. The Adelaide elapsed rate of 30.0 containers per hour and the net rate of 31.1 containers per hour were both up on the March quarter. The average proportion of elapsed time not worked returned to approximately 4 per cent from the all time high of 7 per cent last quarter.

The *Fremantle* average crane rate was 21.7 containers per hour in the June quarter, up from 21.4 containers per hour in the March quarter. The P&O Ports elapsed data for the June quarter are not available and therefore the elapsed data for Fremantle have not been produced for this quarter. The net rate of 26.6 containers per hour was up on the March quarter figure.

Container port activity

Table 1 also provides information on container ship visits and container throughput at each of the five mainland capital city ports. The June quarter 1999 five-port average showed ship visits increased by 1.7 per cent, and container throughput increased by 4.8 per cent when compared with the March quarter. Only at Fremantle did the container throughput fall below the March quarter 1999 figure (in part due to the cessation of the MSC Far East and South East Asia service). Compared with the June quarter of the previous year, the five-port average for container ship visits increased by 13.4 per cent, and the five-port average for container throughput increased by 15.4 per cent.

On a port-by-port basis, the June quarter 1999 *container exchange* at:

- Brisbane was up 16.0 per cent on the March quarter figure, and up 20.5 per cent when compared with the June quarter 1998;
- Sydney was up 7.9 per cent on the March quarter figure, and up 18.0 per cent when compared with the June quarter 1998;
- Melbourne was up 3.7 per cent on the March quarter figure, and up 14.2 per cent when compared with the June quarter 1998;
- Adelaide was up 0.9 per cent on the March quarter figure, and up 4.9 per cent when compared with the June quarter 1998; and
- Fremantle was down 10.1 per cent on the March quarter figure, but up 11.1 per cent when compared with the June quarter 1998.

Teus per hour

Table 12 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 1 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 I CONTAINER TERMINAL PERFORMANCE INDICATORS—
PRODUCTIVITY IN CONTAINERS PER HOUR**

Port/indicator	Quarter								
	Jun-97	Sep-97	Dec-97	Mar-98	Jun-98	Sep-98	Dec-98	Mar-99	Jun-99
Five ports									
Ships handled	891	907	963	909	845	1020	942	942	958
Total containers	387277	431853	467122	421769	406938	493502	477744	448224	469742
Crane rate	18.3	18.3	18.5	18.8	18.7	19.1	18.9	19.9	20.3
Elapsed rate	19.0	20.4	20.5	20.0 ^a	20.7 ^a	20.7 ^a	21.9 ^a	23.1 ^a	24.0 ^a
Net rate	23.6	24.3	24.3	23.4	24.7	24.2	26.9	28.2	29.0
Elapsed time not worked (per cent)	19	16	16	15 ^a	16 ^a	15 ^a	19 ^a	19 ^a	18 ^a
Brisbane									
Ships handled	164	162	177	170	168	192	180	176	193
Total containers	52610	58424	58014	49197	58939	70200	67691	61204	71008
Crane rate	16.4	16.1	16.8	18.0	17.3	18.2	16.8	18.3	18.9
Elapsed rate	16.6	16.8	16.8	16.4	17.1	18.7	19.6	21.2	21.4
Net rate	18.7	19.1	19.6	19.1	20.2	21.9	22.9	24.7	25.9
Elapsed time not worked (per cent)	12	12	15	14	15	15	14	14	18
Sydney									
Ships handled	249	243	266	238	219	267	230	221	243
Total containers	131004	142659	157430	137600	130513	160007	155063	142767	154062
Crane rate	17.7	18.2	18.4	17.5	16.9	16.5	15.7	17.7	18.2
Elapsed rate	18.5	21.7	21.9	19.9	20.2	19.2	18.9	22.6	22.2
Net rate	25.5	27.9	27.7	25.7	26.2	24.2	24.6	29.5	28.7
Elapsed time not worked (per cent)	28	22	21	23	23	21	23	24	24
Melbourne									
Ships handled	249	268	281	276	234	309	274	271	282
Total containers	143708	162591	178302	166284	147122	187696	170056	161894	167942
Crane rate	19.0	18.6	18.8	19.5	19.2	20.2	21.5	21.5	21.8
Elapsed rate	20.3	20.5	19.9	20.1	21.0	21.8	24.3	23.6	25.8
Net rate	24.0	23.5	22.6	22.7	24.2	24.5	30.7	28.8	31.0
Elapsed time not worked (per cent)	15	13	12	12	13	11	21	18	17
Adelaide									
Ships handled	65	68	66	60	66	63	74	73	66
Total containers	16874	20974	20773	18163	23293	21444	26319	24221	24445
Crane rate	21.0	21.1	21.4	22.5	23.1	23.2	23.2	23.2	23.1
Elapsed rate	28.3	28.4	29.2	29.6	30.4	29.0	29.3	28.5	30.0
Net rate	29.1	29.2	30.1	30.7	31.5	30.3	30.4	30.7	31.1
Elapsed time not worked (per cent)	3	3	3	4	3	4	4	7	4
Fremantle									
Ships handled	164	166	173	165	158	189	184	201	174
Total containers	43081	47205	52603	50525	47071	54155	58615	58138	52285
Crane rate	19.0	18.8	18.9	19.6	21.5	22.2	20.7	21.4	21.7
Elapsed rate	15.9	17.0	18.9	na	na	na	na	na	na
Net rate	19.8	20.6	23.2	21.1	23.9	23.8	25.5	25.6	26.6
Elapsed time not worked (per cent)	19	18	18	na	na	na	na	na	na

na not available

a. Four-port average only as Fremantle elapsed rate data are not available.

Notes 1. The June quarter 1998 figures do not include data for Patrick covering the 8 April to 7 May 1998 period of the major industrial disputation with the MUA.

2. The data in this table are expressed in containers per hour and therefore are not directly comparable with the teus per hour data in table 12.

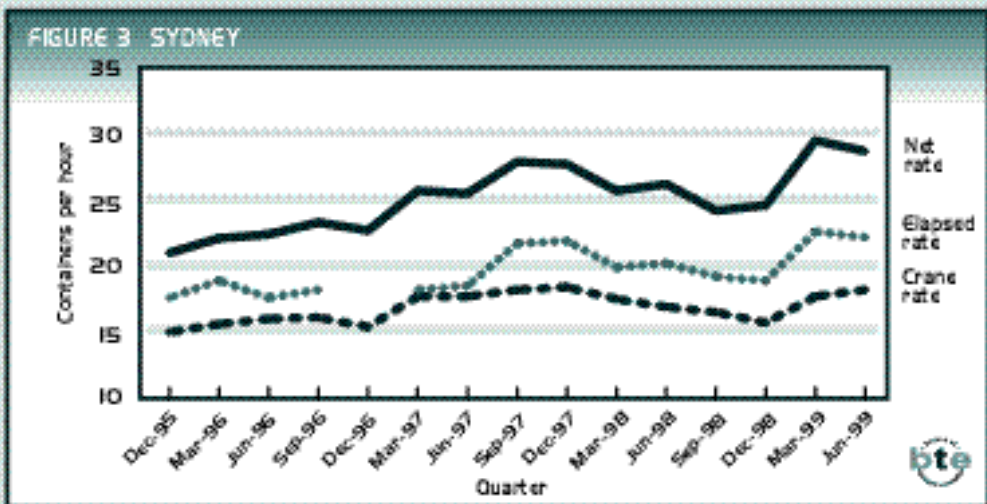
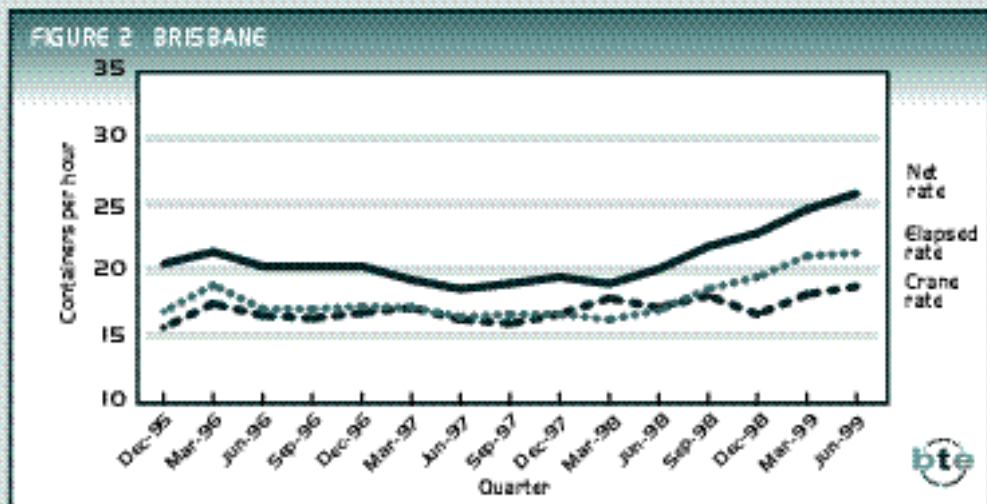
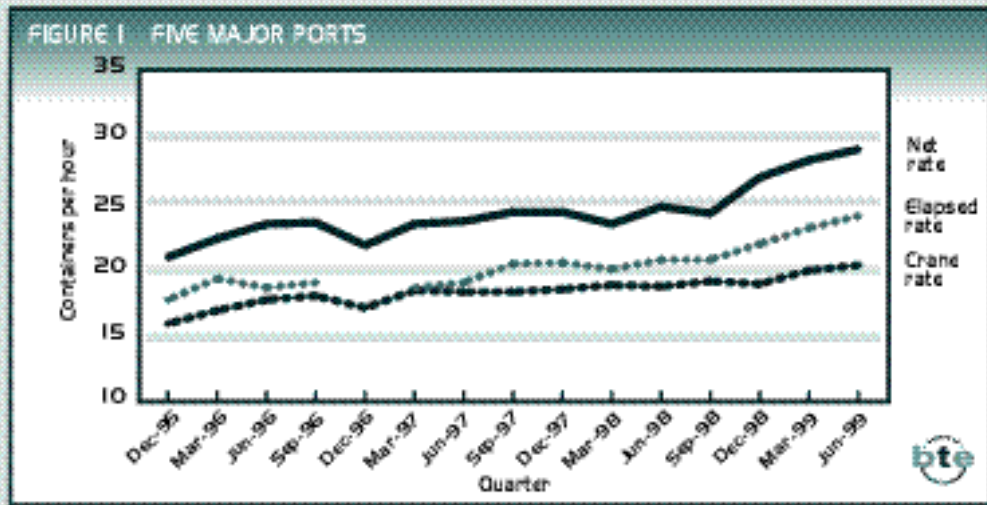
3. Elapsed time not worked is the difference between the net and elapsed rates as a percentage of the net rate.

Sources Patrick, P&O Ports and Sea-Land.





CONTAINER TERMINALS' PRODUCTIVITY

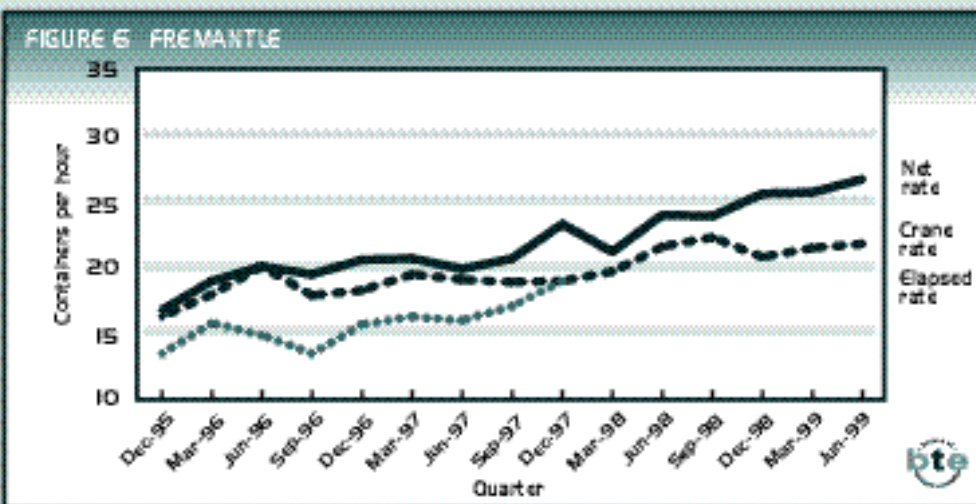
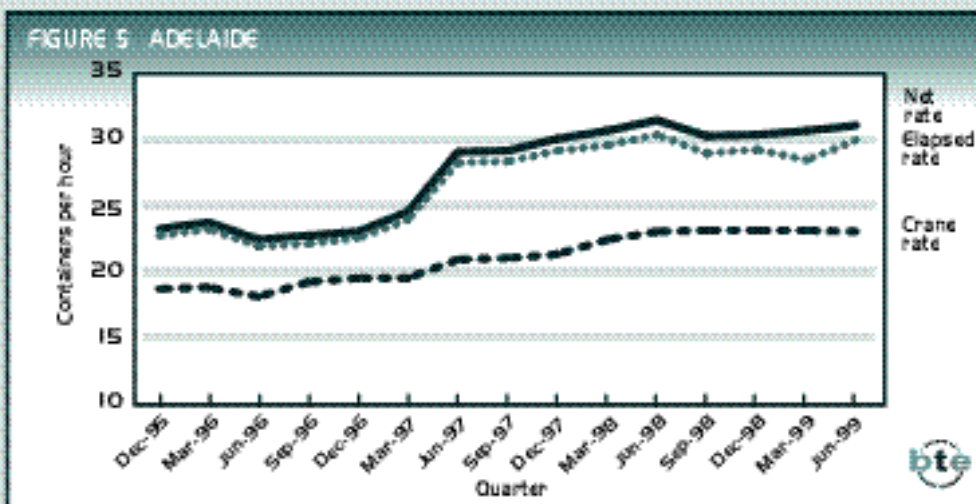
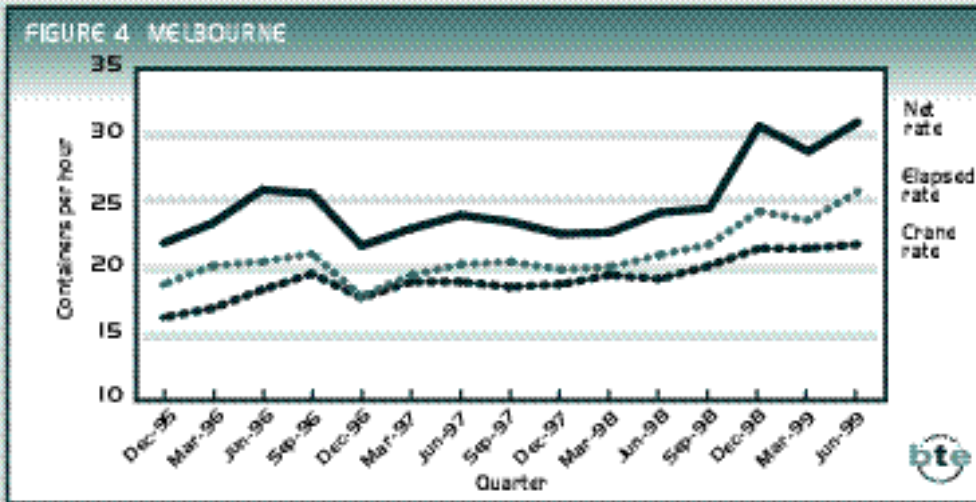


Note These figures are based on the data in table I. Readers should refer to the notes in that table.

Sources Patrick, P&O Ports and Sea-Land.



CONTAINER TERMINALS' PRODUCTIVITY



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Sources Patrick, P&O Ports and Sea-Land.





WATERFRONT RELIABILITY

The *Waterline* reliability indicators provide partial measures of the variability of waterfront performance for container traffic at major Australian ports. The indicators cover the timeliness of selected port services, sources of other ship waiting time, aspects of stevedoring performance and the accuracy of ship arrival advice.

Berth availability, pilotage, towage

Table 2 presents provisional figures on berth availability, pilotage and towage for a sample of ship calls in the June quarter 1999. It indicates the extent to which selected port services were available at the scheduled or confirmed time.

The figures are provisional as several shipping lines that participate in the BTE survey were able to provide data for only part of the June quarter 1999. The number

TABLE 2 PROVISIONAL DATA ON AVAILABILITY OF BERTH, PILOTAGE AND TOWAGE SERVICES AT THE SCHEDULED/CONFIRMED TIME, JUNE QUARTER 1999

Port/operation	(Number of ship calls)								Total no. of ship calls
	Delay (hrs)								
	0	1	2	3	4	5-10	11-20	>20	
Brisbane									
Berth availability	13	0	0	0	0	2	1	0	16
Pilotage	16	0	0	0	0	0	0	0	16
Towage	16	0	0	0	0	0	0	0	16
Sydney									
Berth availability	30	0	1	0	0	2	2	1	36
Pilotage	36	0	0	0	0	0	0	0	36
Towage	36	0	0	0	0	0	0	0	36
Melbourne									
Berth availability	64	0	0	0	0	2	1	1	68
Pilotage	67	1	0	0	0	0	0	0	68
Towage	68	0	0	0	0	0	0	0	68
Adelaide									
Berth availability	20	0	1	0	0	2	0	0	23
Pilotage	22	1	0	0	0	0	0	0	23
Towage	23	0	0	0	0	0	0	0	23
Fremantle									
Berth availability	39	0	0	0	1	1	0	0	41
Pilotage	41	0	0	0	0	0	0	0	41
Towage	41	0	0	0	0	0	0	0	41
Five ports									
Berth availability	166	0	2	0	1	9	4	2	184
Pilotage	182	2	0	0	0	0	0	0	184
Towage	184	0	0	0	0	0	0	0	184

Note Figures are provisional due to unavailability of some data at time of publication. Figures for individual ports should be interpreted with caution as sample sizes for several ports are very small.

Sources Data for a sample of ship calls provided by shipping lines.

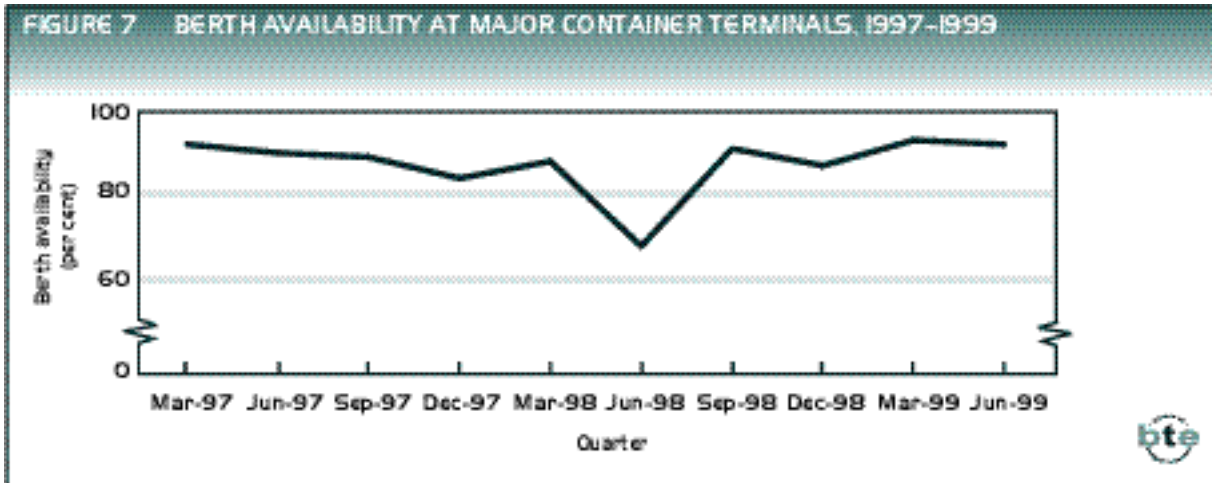
of ship calls covered by the figures is around 30 per cent less than the usual sample size. The June quarter 1999 sample represents 19 per cent of total ship calls at the major container terminals during the period, compared with a proportion of 27-28 per cent in previous quarters.

Caution should therefore be used in interpreting the June quarter 1999 figures, particularly as sample sizes for several ports are very small. The BTE expects that it will be able to include revised June quarter 1999 indicators, based on a larger sample size, in the next issue of *Waterline*.

The *berth availability* indicator measures the

proportion of ship arrivals where a berth is available within four hours of the scheduled berthing time. Berth availability for the sample of ship calls was 92 per cent (provisional figure) in the June quarter 1999. This was similar to the figure of 93 per cent reported in the March quarter 1999. Figure 7 provides information on berth availability over the period since the March quarter 1997.

Average waiting time for ships unable to obtain a berth within four hours of the scheduled berthing time was 13 hours (provisional figure) in the June quarter 1999. This was up from the figure of 11 hours that was recorded in the previous quarter.



Sources Data for a sample of ship calls provided by shipping lines.

The *pilotage* and *towage* indicators reported in *Waterline* measure the proportion of ship movements where the service is available to the ship within one hour of the confirmed ship arrival/departure time. The proportions were 100 per cent in the June quarter 1999. Performance has been at similar levels since the first data (covering the March quarter 1997) were published in *Waterline*.

Other waiting time

The seven shipping lines that supplied information for table 2 also provided data on other ship waiting time. 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.

In the June quarter 1999, 52 per cent (provisional figure) of ship calls in the sample were affected by other waiting time incidents that had a duration of at least one hour. The corresponding proportion in the March quarter 1999 was 47 per cent.

The average duration of other waiting time incidents was 5.7 hours per incident (provisional figure) in the June quarter 1999, compared with 7.3 hours per incident in the previous quarter.

Table 3 summarises the data on other waiting time incidents in the June quarter 1999. The shipping lines identified a total of 144 incidents (affecting 95 ship

TABLE 3 PROVISIONAL DATA ON OTHER SHIP WAITING TIME INCIDENTS AT THE FIVE MAINLAND CAPITAL CITY PORTS, JUNE QUARTER 1999

Incident type	(Number of incidents)							Total no. of incidents
	Ship waiting time (hrs)							
	1	2	3	4	5-10	11-20	>20	
Early ship arrival	10	10	6	7	9	2	0	44
Awaiting labour	3	6	5	5	5	1	0	25
Crane breakdown	7	4	5	2	4	0	0	22
Stevedoring finished early	4	8	1	2	3	0	0	18
Ship repairs or maintenance	3	0	1	1	2	1	0	8
Weather or tides	0	2	1	0	1	1	0	5
Pilot/tug booking not at preferred time	1	2	1	0	0	0	0	4
Stevedoring finished late	0	2	0	0	0	0	0	2
Late ship arrival	0	0	0	0	1	1	0	2
Industrial action	0	0	0	0	1	0	0	1
Other	2	5	1	2	1	2	0	13
Total incidents	30	39	21	19	27	8	0	144^a

a. These incidents affected 95 of the 184 ship calls covered in table 2.

Note Figures are provisional due to unavailability of some data at time of publication.

Sources Data for a sample of ship calls provided by shipping lines.



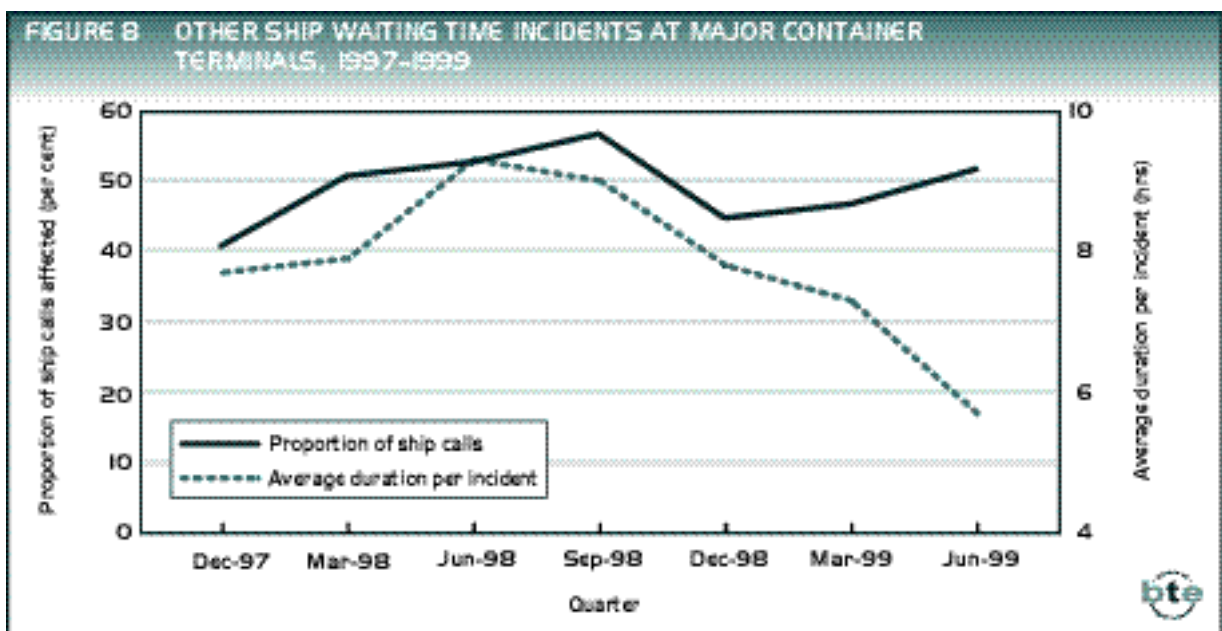


calls) for the sample of ship calls over this period (provisional figures). These incidents reflected both ship-related and waterfront factors.

The total waiting time attributable to particular incident types reflects the number of incidents and the waiting time associated with individual incidents. The data provided by shipping lines indicate that four incident types accounted for around 71 per cent (provisional figure) of the total hours attributed to other ship waiting time in the June quarter 1999:

- early ship arrival (31 per cent);
- awaiting labour (19 per cent);
- crane breakdowns (12 per cent); and
- completion of stevedoring earlier than forecast (9 per cent).

Figure 8 provides information on other ship waiting time over the period since the December quarter 1997. It indicates the proportion of ship calls affected and the average duration per incident in each quarter.



Sources Data for a sample of ship calls provided by shipping lines.

Stevedoring

Table 4 presents the available information on two aspects of stevedoring reliability at major container terminals - stevedoring rate and cargo receipt. Data are not available for Adelaide and Fremantle.

Stevedoring rate provides a partial indicator of the variability of stevedoring productivity at each port. It is defined as the proportion of ship visits where the average crane rate for the ship is within two containers per hour (plus or minus) of the quarterly average crane rate for the terminal. In the June quarter 1999, the stevedoring rate indicator declined significantly at each of the ports for which data are available.

Cargo receipt is the proportion of receipts (exports) completed by the stevedore's cut-off time. It provides a partial indicator of one factor that can affect container



terminal performance. In the June quarter 1999, the cargo receipt indicator declined significantly at two of the three ports for which data are available.

The declines in stevedoring rate and cargo receipt are reportedly attributable to temporary factors at several terminals.

Ship arrival

Table 4 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, there were significant declines in this indicator at two ports and increases at the other two ports.

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*. The proportion at the four ports ranged between 75 per cent and 96 per cent in the June quarter 1999. The major change from the previous quarter was a significant decline at Fremantle.

The accuracy of ship arrival advice is potentially affected by various factors such as weather conditions.

TABLE 4 STEVEDORING AND SHIP ARRIVAL RELIABILITY INDICATORS, MARCH AND JUNE QUARTERS 1999

Indicator	(per cent)									
	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										
Stevedoring rate	60 ^r	51	51 ^r	42	48 ^r	41	na	na	na	na
Cargo receipt	90	84	82	73	97	97	na	na	na	na
Ship arrival										
Advice at 24 hrs	82	70	55	59	na	na	69	76	64	50
Advice inside 24 hrs	91	95	96	96	na	na	91	92	87	75

na not available

r revised to incorporate amended data provided by a terminal operator

Sources AAPMA, Patrick and P&O Ports.





PORT INTERFACE COST INDEX

The Port Interface Cost Index provides a measure of shore-based shipping costs (charges) for containers moved through the Australian mainland capital city ports. Data for the periods July–December 1998 and January–June 1999 are presented in tables 5 to 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. The indicative approach was adopted because of the difficulty of obtaining data on the multitude of factors affecting the prices charged by each service provider, particularly for towage and road transport charges, and customs brokers' fees.

Port and related charges

Table 5 provides the parameters used to determine the port and related charges in table 6. These parameters relate to a representative port call by a containership (Lloyd's ship classification UCC). The representative ship was selected from the range of ship-size with the most port calls by UCC-type ships during the six months. The ship size range of 15 000 to 20 000 GRT has had the most port calls at each port since monitoring of port charges commenced in 1992. The other cost parameters are then determined by taking the mean of all port calls in the range that contains the representative ship.

TABLE 5 PARAMETERS USED IN THE PORT INTERFACE COST INDEX, 1998/1999

	Brisbane		Sydney		Melbourne		Adelaide		Fremantle	
	Jul-Dec 1998	Jan-Jun 1999	Jul-Dec 1998	Jan-Jun 1999	Jul-Dec 1998	Jan-Jun 1999	Jul-Dec 1998	Jan-Jun 1999	Jul-Dec 1998	Jan-Jun 1999
Vessel size										
GRT	17215	17215	17215	17215	17215	17215	17215	17215	17215	17215
NRT	8372	8372	8372	8372	8372	8372	8372	8372	8372	8372
Teus exchanged^a										
Total	447	399	858	772	868	888	560	560	363	394
Loaded	346	310	679	621	719	736	427	433	282	312
Empty	101	89	179	151	149	152	133	127	81	82
Loaded inwards	164	132	432	393	389	466	187	176	149	156
Loaded outwards	182	178	247	228	330	270	240	257	133	156
Ship call parameters^a										
Number of port calls	4	4	3	3	4	4	6	10	7	10
Elapsed berth time (hrs)	26	24	42	40	35	38	20	20	20	21

a. Mean value for ships between 15 000 and 20 000 GRT.

Sources BTE estimates based on ship call data supplied by relevant port authorities/corporations and other port service providers.

It is important to directly connect the mean number of teus exchanged per port call with the size of the representative ship. This is because most port and related charges, particularly towage and port authority tonnage charges, are dependent upon the size of the ship. However, shipping economics are such that, the larger the ship being used to transport the cargo, the more ship operators attempt to exchange higher volumes of cargo per port call. As a result, the per unit (in this case teu) cost of exchanging cargo at a particular port remains roughly the same for each port call regardless of the size of the ship. It is for this reason that comparative port charge analyses that keep the cargo exchange constant while varying the ship size are misleading. A discussion of this, in relation to the Port Interface Cost Index, can be found in *Waterline 4*, October 1995, pp. 9–13. That article also demonstrates that the BTE's



Port Interface Cost Index is a reasonable approximation of port interface costs for most container movements across the Australian mainland capital city ports.

Table 6 provides the port and related charges at the five mainland capital city ports for the periods July–December 1998 and January–June 1999. Port and related charges comprise ship-based charges and cargo-based charges.

TABLE 6 PORT AND RELATED CHARGES, 1998

	Brisbane		Sydney		Melbourne		Adelaide		Fremantle	
	Jul-Dec 1998	Jan-Jun 1999	Jul-Dec 1998	Jan-Jun 1999	Jul-Dec 1998	Jan-Jun 1999	Jul-Dec 1998	Jan-Jun 1999	Jul-Dec 1998	Jan-Jun 1999
Ship-based charges (\$/teu)										
Conservancy	5.01	5.70	-	-	-	-	1.53	1.53	1.46	1.01
Tonnage	-	-	7.82	8.69	6.03	5.90	7.27	7.26	6.97	6.42
Pilotage	11.48	12.86	3.96	4.07	6.32	6.18	4.20	4.20	5.75	5.30
Towage	16.99	19.03	11.39	9.49	7.05	7.75	21.96	21.98	13.55	12.48
Mooring, unmooring	3.83	4.29	3.67	4.08	1.08	1.06	-	-	3.03	2.79
Berth hire ^a	-	-	-	-	9.66	10.18	-	-	-	-
Total ^b	37.31	41.87	26.84	26.33	30.14	31.07	34.96	34.97	30.76	27.99
Cargo-based charges (\$/teu)										
Wharfage										
Imports	26.00	26.00	60.00	60.00	33.00	33.00	53.00	53.00	47.30	47.30
Exports	26.00	26.00	45.00	45.00	33.00	33.00	53.00	53.00	47.30	47.30
Harbour dues	42.00	42.00	-	-	-	-	-	-	-	-
Berth charge	-	-	-	-	-	-	-	-	13.90	13.90
Total port and related charges (\$/teu)^b										
Loaded imports	105	110	87	86	63	64	88	88	92	89
Loaded exports	105	110	72	71	63	64	88	88	92	89
Charges per ship visit (\$/visit)										
Total ship-based charges	16667	16702	23036	20334	26173	27576	19581	19574	11171	11039
Empty teus ^c	1439	1268	1790	0	596	608	0	0	624	631

- 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 5.

Sources BTE 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.



Ship-based charges

Compared with the July–December 1998 period, the only changes to actual ship-based charges, on a ship-visit basis, in January–June 1999 were:

- a 1.5 per cent increase in conservancy dues at Brisbane;
- a 7.5 per cent decrease in pilotage charges at Sydney; and
- a 12.4 per cent increase in towage charges at Melbourne.

However, taking into account changes in the parameters upon which the ship-based charges are calculated, the overall changes in ship-based charges, on a teu basis, in January–June 1999 were:

- at *Brisbane*, a 12 per cent rise in ship-based charges per teu—resulting from a slight increase in conservancy charges and an 11 per cent drop in the average teu-exchange;





- at *Sydney*, a 2 per cent fall in ship-based charges per teu—resulting from the impact of both a 7.5 per cent decrease in pilotage charges and a decrease in the tugs required per ship visit being reduced by a 10 per cent decrease in the teu-exchange;
- at *Melbourne*, a 3 per cent rise in ship-based charges per teu—resulting from the 12.4 per cent increase in towage charges which counteracted the 2 per cent increase in average teu-exchange. Although the increase of 12.4 per cent is greater than the 10 per cent approved by the ACCC in February this year, it should be noted that the increase approved by the ACCC was a weighted average for *all* port calls, not just for the vessels in our indicative range;
- at *Adelaide*, a negligible change in ship-based charges per teu—resulting from a minor change in both the average teu-exchange and the elapsed berth time; and
- at *Fremantle*, a 9 per cent fall in ship-based charges per teu—resulting from both a 9 per cent increase in average teu-exchange and a substantial increase in the average number of port calls per ship.

While caution should always be used when making port comparisons on a per teu basis, Sydney remains the lowest-cost port for ship-based charges. This is significant from a cargo owner's point of view. From the point of view of ship operators, using ships similar to the representative ship in table 5, Fremantle remains the lowest cost port for ship-based charges on a per ship-visit basis.

Cargo-based charges

Except at Sydney, where wharfage for an empty teu fell from \$10 per unit to zero, there were no other changes in port and related cargo-based charges in January–June 1999. However, it should be noted that charges such as those on empty containers are not included in the Port Interface Cost Index. This is because such charges are borne by the ship operator rather than the cargo owner. Nevertheless, the empty container charges are reported in table 6 as a charge per ship visit for the sake of completeness.

Changes in total port and related charges per loaded teu

Total port and related charges per loaded teu, for the period January–June 1999:

- at *Brisbane*, rose by about 4 per cent, solely due to the 12 per cent increase in the ship-based component;
- at *Sydney*, fell by almost 1 per cent, solely due to the 2 per cent decrease in the ship-based component;
- at *Melbourne*, rose by about 1 per cent, solely due to the 3 per cent increase in the ship-based component;
- at *Adelaide*, remained basically unchanged; and
- at *Fremantle*, fell by about 3 per cent, solely due to the 9 per cent decrease in the ship-based component.

Stevedoring charges per teu

The last ACCC survey of container terminal operations provided a provisional estimate of stevedoring charges of \$203 per teu in 1995. For the January–June 1997 period, the BTE contacted a range of shipping lines and terminal operators in an interim attempt to obtain more recent estimates for container stevedoring charges. As a result, it was estimated that average revenue for container stevedoring was approximately 7.5 per cent, or \$15, per teu lower than the ACCC's provisional 1995 esti-



mate. This led to a provisional stevedoring charge of \$188 being used for the Port Interface Cost Index.

Earlier this year, the Commonwealth Treasurer directed the ACCC to undertake a monitoring program of the prices, costs and profits of the container stevedoring companies at the major Australian container ports. Once the results of this survey become available, the BTE will include the more up-to-date stevedoring charges in the Port Interface Cost Index.

Land-based charges per teu

The average charges for customs brokers' fees and road transport charges for the July–December 1998 and January–June 1999 Port Interface Cost Index are included in table 7. These charges are based on data provided by approximately 40 customs brokers and 50 road transport operators. Customs brokers' fees for imports are higher than fees for exports, reflecting the more complex clearance procedures for import containers.

The January–June 1999 period indicated no movement in aggregate customs brokers' fees apart from a fall, in Fremantle, of 1 per cent in both import fees and export fees. Similarly, there was no movement in average road transport charges other than a 2 per cent rise in Fremantle.

One of the parameters used to estimate road transport charges is the time taken to move containers from (to) the wharf to (from) the customer's warehouse. Both distance and traffic congestion impact upon this parameter and help explain, to some

TABLE 7 PORT INTERFACE COSTS, 1998/1999

	(\$/teu)									
	Brisbane		Sydney		Melbourne		Adelaide		Fremantle	
	Jul-Dec 1998	Jan-Jun 1999	Jul-Dec 1998	Jan-Jun 1999	Jul-Dec 1998	Jan-Jun 1999	Jul-Dec 1998	Jan-Jun 1999	Jul-Dec 1998	Jan-Jun 1999
Imports										
Ship-based charges	37	42	27	26	30	31	35	35	31	28
Cargo-based charges	68	68	60	60	33	33	53	53	61	61
Stevedoring ^p	188	188	188	188	188	188	188	188	188	188
Customs brokers' fees	123	123	152	152	138	138	132	132	143	141
Road transport charges	185	185	288	289	251	251	168	168	195	199
Total imports^a	602	607	714	714	640	640	576	576	618	617
Exports										
Ship-based charges	37	42	27	26	30	31	35	35	31	28
Cargo-based charges	68	68	45	45	33	33	53	53	61	61
Stevedoring ^p	188	188	188	188	188	188	188	188	188	188
Customs brokers' fees	77	77	111	111	89	89	73	73	70	69
Road transport charges	185	185	288	289	251	251	168	168	195	199
Total exports^a	555	560	658	658	591	591	518	518	545	545

p provisional pending updating of stevedoring charge using detailed survey data

a Components may not sum to totals due to rounding.

Notes 1. Based on parameters described in table 5.

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 a weighted average for several major Australian ports. Stevedoring charges vary between ports, but detailed data for individual ports are not publicly available.

Sources BTE 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 charges data supplied by the ACCC and industry sources.





extent, the significant difference between road transport charges at Melbourne and Sydney compared with Brisbane, Adelaide and Fremantle.

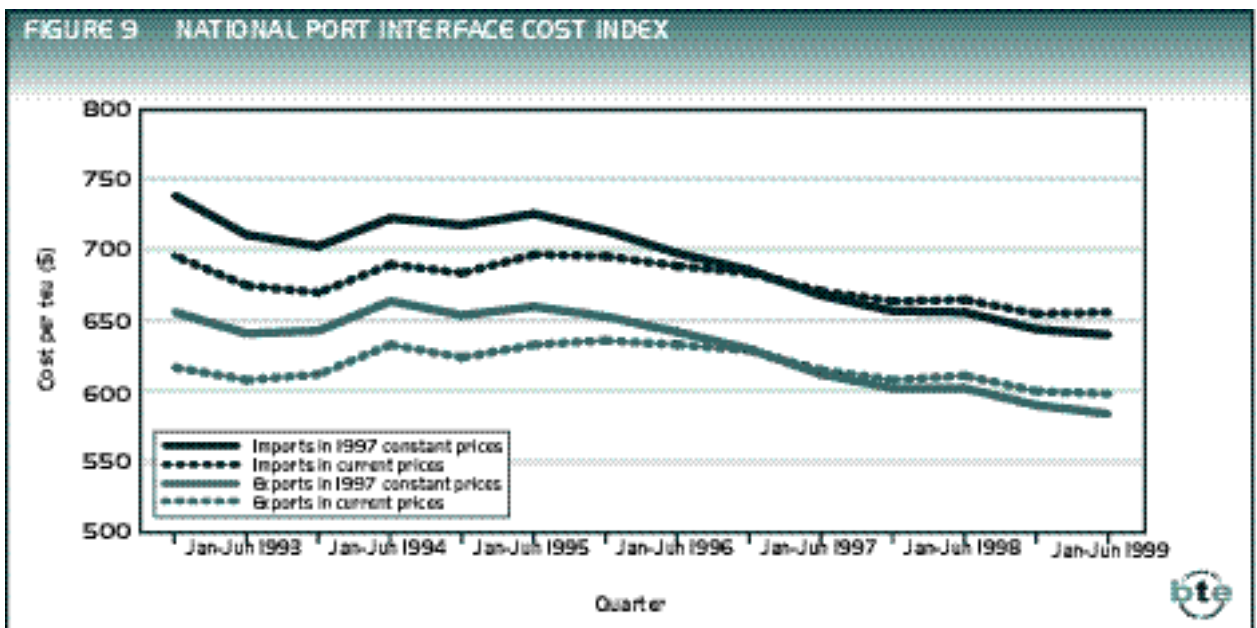
In fact, in *Waterline 18*, the BTE reported that it had received numerous comments from road transport operators in Sydney about increasing congestion and terminal delays. Although most operators surveyed this time said the situation had improved, there is still anecdotal evidence of occasionally significant delays from traffic congestion, and service delays at stevedoring terminals and empty container parks. Consequently, it is likely that road transport charges in Sydney are more variable than at other ports.

Indices for individual ports

Table 7 indicates that, between July–December 1998 and January–June 1999, there was a 1 per cent increase in port interface costs per teu at Brisbane, while costs remained steady at the other four ports. However, this should be interpreted with caution given the provisional nature of the reported stevedoring charges. Even if stevedoring charges did not change during the January–June 1999 period, care should still be taken in making inter-port comparisons of port interface costs. 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 9 provides the National Port Interface Cost Index back to 1992. In overall terms, there was little movement in the national index between the July–December 1998 and January–June 1999 periods. In fact, in current prices, national import charges increased by only 0.1 per cent to \$656 per teu, while export charges decreased by 0.2 per cent to \$598 per teu.



Sources BTE 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 gross non-farm product deflator data (cat.no.5205.0).



PORT PERFORMANCE – NON-FINANCIAL

Non-financial indicators for the five mainland capital city ports in 1998/1999 are presented in table 8.

Cargo throughput

Total cargo throughput at the five ports was 47.8 million tonnes for January–June 1999, compared with 46.7 million tonnes for the July–December 1998 period. Total cargo throughput increased at all ports: Brisbane 5.8 per cent, Sydney 0.1 per cent, Melbourne 1.2 per cent, Adelaide 9.9 per cent and Fremantle 0.3 per cent. Overall, this resulted in a rise of 2.2 per cent in total throughput for the five ports compared with the previous half year, and a rise of 5.7 per cent compared with the same half-year period of the previous year.

Non-containerised general cargo throughput at the five ports was 2.37 million tonnes for January–June 1999, compared with 2.42 million tonnes for July–December 1998. This was the outcome of increases at the east coast ports of Brisbane (8.1 per cent) and Sydney (8.4 per cent); and declines at the south and west coast ports of Melbourne (5.8 per cent), Adelaide (1.5 per cent) and Fremantle (13.0 per cent). Overall, this resulted in a fall of 2.2 per cent in non-containerised general cargo throughput for the five ports compared with the previous half year, and a fall of 0.3 per cent compared with the same half-year period in 1998.

Total container traffic throughput for the five ports, measured in teus, was 1.36 million teus for January–June 1999, compared with 1.39 million teus for July–December 1998. This represents a decline of 2.0 per cent. Throughput of loaded teus fell by 0.9 per cent, with loaded imports decreasing by 4.5 per cent and loaded exports increasing by 3.7 per cent. This was the outcome of an increase in loaded containers at Brisbane (8.4 per cent) and Adelaide (5.4 per cent), and a

TABLE 8 NON-FINANCIAL PERFORMANCE INDICATORS, SELECTED AUSTRALIAN PORTS, 1998/1999

Indicator	Brisbane		Sydney		Melbourne		Adelaide		Fremantle		Five ports ^e	
	Jul-Dec 1998	Jan-Jun 1999	Jul-Dec 1998	Jan-Jun 1999	Jul-Dec 1998	Jan-Jun 1999	Jul-Dec 1998	Jan-Jun 1999	Jul-Dec 1998	Jan-Jun 1999	Jul-Dec 1998	Jan-Jun 1999
Total cargo throughput (’000 tonnes)	10 082	10 663	11 435	11 447	10 649	10 774	2 848	3 129	11 727	11 762	46 741	47 775
Non-containerised general cargo (’000 tonnes)^a	481	520	310	336	1 100	1 036	132	130	399	347	2 422	2 368
Containerised cargo (teus exchanged)												
Full import	62 980	61 411	226 977	218 094	254 315	241 834	19 744	19 280	58 041	53 309	622 057	593 928
Empty import	24 630	28 334	9 159	13 006	35 220	38 766	8 209	8 552	15 313	14 230	92 531	102 888
Full export	70 168	82 911	129 669	126 359	215 915	220 387	25 365	28 271	51 833	53 159	492 950	511 087
Empty export	14 388	12 881	84 751	70 565	62 293	52 431	5 781	5 384	16 205	13 607	183 418	154 868
TOTAL	172 166	185 537	450 556	428 024	567 743	553 418	59 099	61 487	141 392	134 305	1 390 956	1 362 771
Average total employment^b	190	211	192	189	73	78	167	162	180	169	802	808
Port turnaround time (hrs)^c												
Median result	35	33	43	38	36	36	21	18	23	23	-	-
95th percentile ^d	69	65	77	66	66	67	48	26	51	44	-	-

- not applicable

a. Excludes bulk cargoes.

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

c. Port turnaround times refer only to container ships calling at container terminals. Comparisons between ports are not appropriate since 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. The 95th percentile time is the point at which there are only five per cent of ship visits experiencing slower turnaround times.

e. Components may not sum to totals due to rounding.

Source AAPMA.





decrease at Sydney (3.4 per cent), Melbourne (1.7 per cent), and Fremantle (3.1 per cent).

The annual 1998/99 five-port total container traffic, measured in teus, increased by 9.5 per cent, compared with 1997/98.

Cargo throughput series

The five-port cargo-throughput indicators, covering the past six years, are presented in table 9. Data for the January–June 1999 period show that cargo throughput rose in all categories, compared with the July–December 1993 figures reported in the first issue of *Waterline*. For instance:

- total cargo throughput increased by 30 per cent;
- non-containerised general cargo increased by 6 per cent;
- loaded teus exchanged increased by 44 per cent;
- empty teus exchanged increased by 63 per cent; and
- total teus exchanged overall increased by 47 per cent.

Employment

Table 8 indicates that *average employment* at the five mainland capital city port authorities/corporations rose by 0.7 per cent in the January–June 1999 period compared with the previous half-year. However, it is a decline of 15.5 per cent compared with July–December 1996, the earliest comparable period since BTE monitoring commenced. Prior to this period, major reforms throughout the Australian port authority sector were at various stages at each of the ports.

TABLE 9 FIVE PORTS CARGO THROUGHPUT, 1993-1999

	Mass tonnes		Teus				
	Total port throughput	Non-containerised general cargo	Full imports	Empty imports	Full exports	Empty exports	Total teus
Jul-Dec 1993	36 775 000	2 231 243	407 204	76 016	362 564	82 427	928 211
Jan-Jun 1994	39 223 000	2 100 493	395 714	77 176	367 384	82 377	922 651
Jul-Dec 1994	39 498 000	2 219 448	473 689	69 796	380 991	97 584	1 022 060
Jan-Jun 1995	40 577 614	2 211 036	445 706	68 513	380 681	118 267	1 013 167
Jul-Dec 1995	39 071 079	2 091 371	470 063	74 224	406 129	113 991	1 064 407
Jan-Jun 1996	42 815 205	2 159 032	451 162	89 389	412 627	111 745	1 064 923
Jul-Dec 1996	42 537 779	2 315 883	517 366	89 019	442 176	114 766	1 163 327
Jan-Jun 1997	45 363 506	2 244 980	491 179	82 588	443 838	104 601	1 122 206
Jul-Dec 1997	43 556 788	2 526 925	584 012	93 206	485 118	135 398	1 297 734
Jan-Jun 1998	45 219 540	2 375 889	537 545	79 821	453 656	146 545	1 217 567
Jul-Dec 1998	46 740 803	2 421 898	622 057	92 531	492 950	183 418	1 390 956
Jan-Jun 1999	47 775 467	2 368 304	593 928	102 888	511 087	154 868	1 362 771

Source AAPMA data in *Waterline*, various issues.





CREW TO BERTH RATIOS

The BTE monitors crew to berth ratios for Australian merchant and offshore shipping on a quarterly basis. The crew to berth ratio is defined as the number of seafarer days worked over a period of time, divided by the number of berth days operated. Berth days operated is defined as the sum, over the period, of the number of people required each day by the relevant statutory authority and the ship operator to carry out the work of the ship(s) in a safe and efficient manner.

As the BTE is still auditing the data, both the June quarter 1999 merchant shipping data and offshore shipping data in this issue of *Waterline* should be regarded as preliminary.

Merchant shipping

Figure 10 presents information on the crew to berth ratio, and its components, for Australian merchant shipping. The overall crew to berth ratio for merchant shipping fell to 2.089 in the June quarter 1999, compared with 2.105 in the March quarter, and 2.133 in the September quarter 1993 when monitoring commenced. The ratio for the June quarter (2.089) is the lowest total merchant shipping figure since crew to berth monitoring began.

Table 10 shows the individual components of the crew to berth ratio for merchant shipping, by crew classification, for the June quarter 1999. Ship time is the largest component of the crew to berth ratio for merchant shipping, and reflects days paid for ship duty (which may include travelling time and days signing on and off). The ship time ratio fell to 1.026 in the June quarter, compared with 1.034 in the March quarter.

Accrued leave gives effect to leave with pay for weekends and public holidays worked, annual leave with pay of five weeks per annum, sick leave, compassionate leave and leave in lieu of a 35 hour week. The accrued leave ratio fell to 0.955 in the June quarter, compared with 0.969 in the March quarter.

Other components of the merchant shipping crew to berth ratio were:

- compensation leave, which fell to 0.042, compared with 0.043 in the March quarter, representing a fall of about 42 per cent since merchant shipping monitoring began in the September quarter 1993;
- long service leave, which remained constant at 0.034, compared with the December quarter;
- study leave, which rose to 0.027, compared with 0.019 in the March quarter; and
- training and other paid leave, which fell to 0.004, compared with 0.005 in the March quarter.

Offshore shipping

Figure 11 presents information on the crew to berth ratio, and its components, for Australian offshore shipping. The overall crew to berth ratio for offshore shipping rose to 2.359 in the June quarter 1999, compared with 2.323 in the March quarter, and 2.327 in the initial March quarter 1995.

Table 11 shows the individual components of the crew to berth ratio for offshore shipping, by crew classification, for the June quarter 1999. Accrued leave is the largest component of the crew to berth ratio for offshore shipping, and comprises paid leave to compensate for work on public holidays, intervals of leave associated with the two crew duty system, annual leave and time spent travelling in off-duty time.



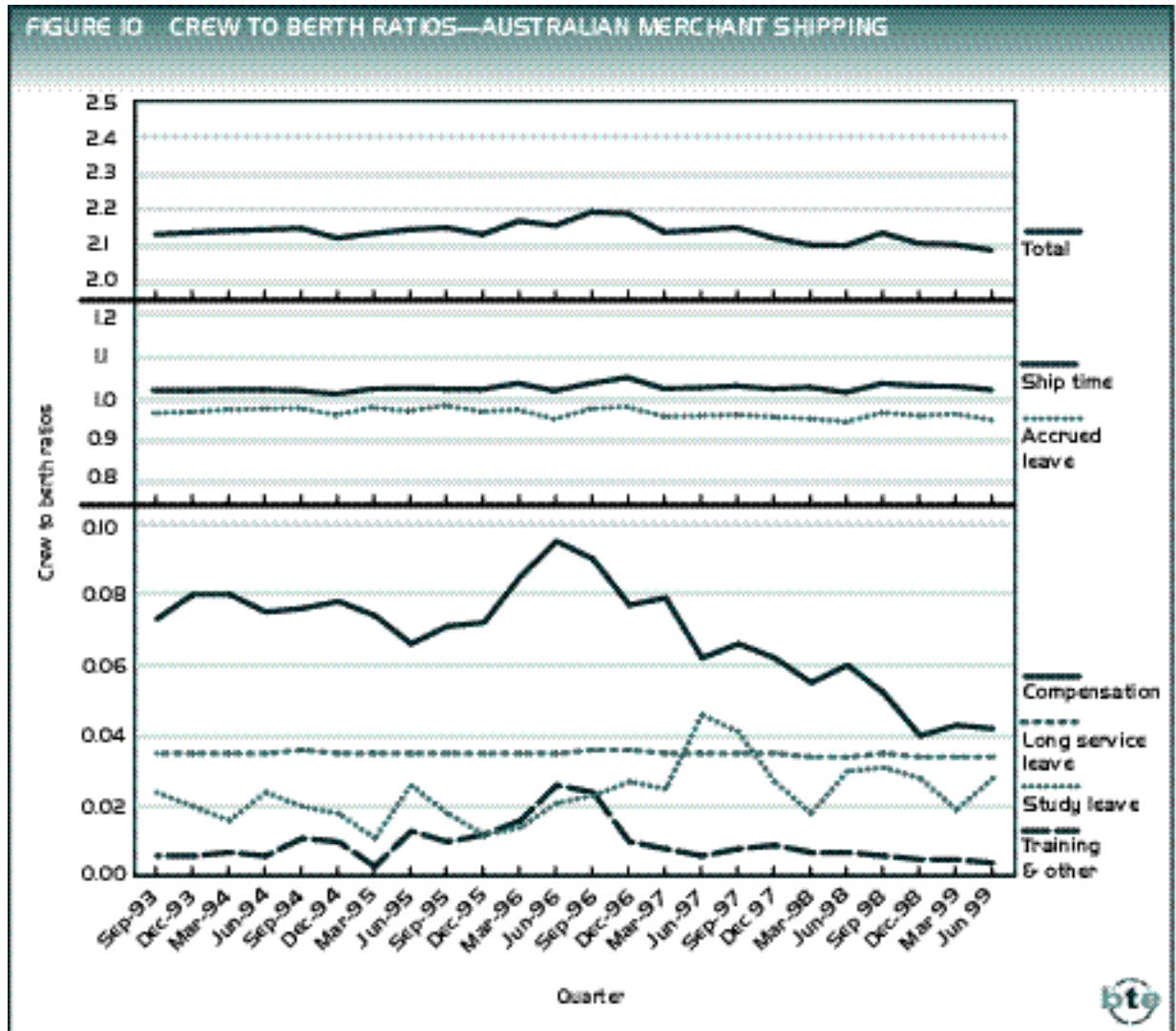


TABLE 10 MERCHANT SHIPPING CREW TO BERTH RATIOS BY ACTIVITY AND CREW CLASSIFICATION, JUNE QUARTER 1999^p

Crew type	Ship time	Accrued leave	Compensation	Long service leave	Study leave	Training & other	Total ^a
Deck officers	1.034	0.962	0.022	0.035	0.047	0.013	2.112
Engineers	1.036	0.963	0.030	0.035	0.064	0.002	2.129
All officers	1.035	0.962	0.026	0.035	0.056	0.007	2.121
Integrated ratings	1.019	0.948	0.049	0.034	0.000	0.001	2.051
Catering crew	1.018	0.948	0.082	0.034	0.000	0.001	2.083
All ratings	1.019	0.948	0.057	0.034	0.000	0.001	2.058
All crew	1.026	0.955	0.042	0.034	0.027	0.004	2.089
Previous quarter	1.034	0.969	0.043	0.034	0.019	0.005	2.105
Initial level ^b	1.025	0.971	0.073	0.035	0.024	0.006	2.133

p preliminary

a. Components may not sum to totals due to rounding.

b. Initial level for September quarter 1993.

Source Data provided by ship operators.



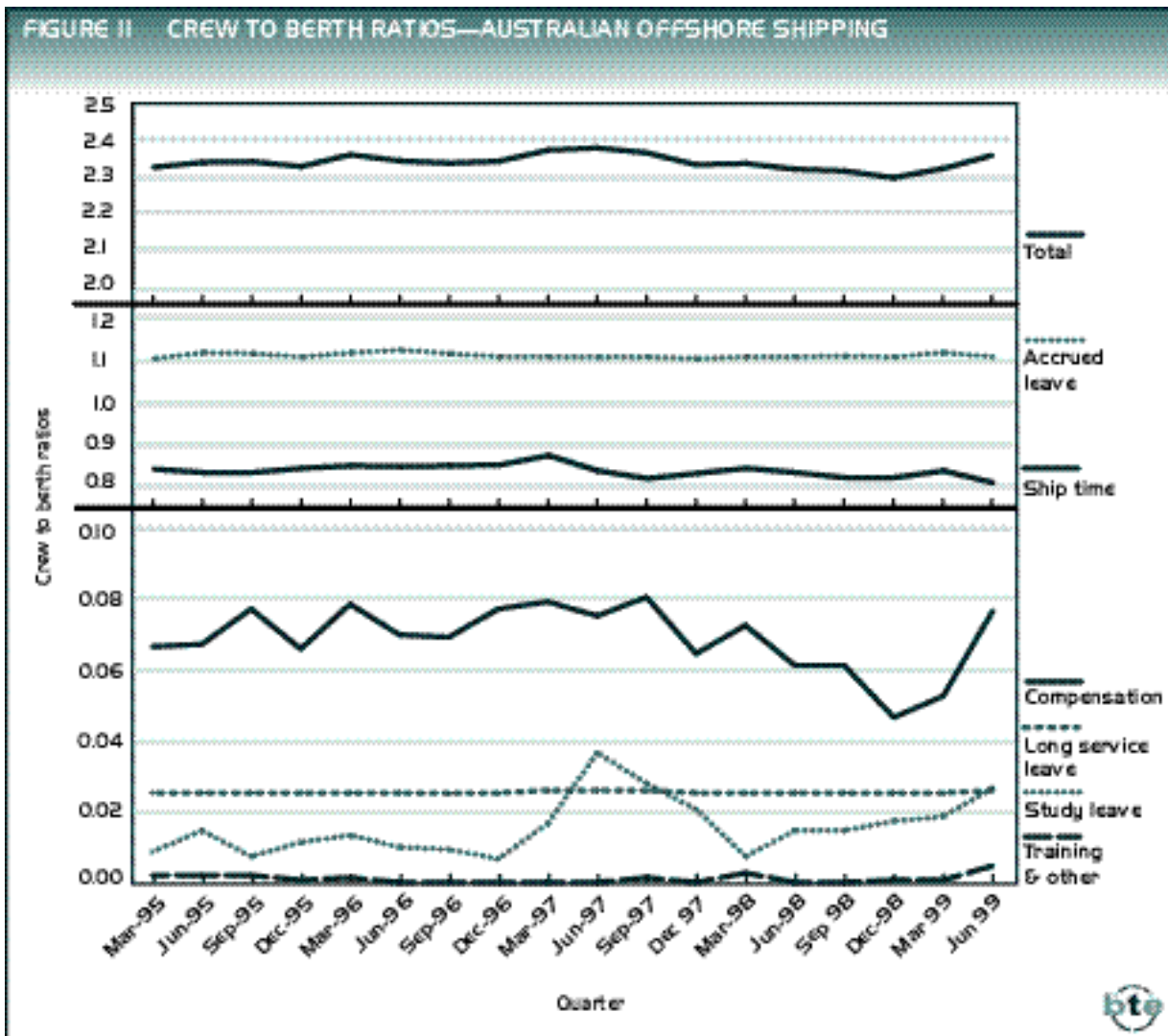


TABLE II MERCHANT SHIPPING CREW TO BERTH RATIOS BY ACTIVITY AND CREW CLASSIFICATION, JUNE QUARTER 1999^p

Crew type	Ship time	Accrued leave	Compensation	Long service leave	Study leave	Training & other	Total ^a
Deck officers	1.006	1.153	0.080	0.038	0.035	0.002	2.314
Engineers	1.005	1.153	0.025	0.038	0.105	0.019	2.345
All officers	1.006	1.153	0.049	0.038	0.074	0.012	2.331
Integrated ratings	1.006	1.153	0.212	0.039	0.000	0.003	2.414
Catering crew	1.003	1.153	0.169	0.039	0.000	0.002	2.366
All ratings	1.005	1.153	0.192	0.039	0.000	0.002	2.391
All crew	1.005	1.153	0.115	0.039	0.040	0.007	2.359
Previous quarter	1.019	1.158	0.079	0.038	0.028	0.001	2.323
Initial level ^b	1.021	1.151	0.100	0.038	0.013	0.003	2.327

p preliminary

a. Components may not sum to totals due to rounding.

b. Initial level for September quarter 1993.

Source Data provided by ship operators.





The accrued leave ratio for the June quarter fell to 1.153, compared with 1.158 in the March quarter.

Ship time also represents a significant part of the offshore crew to berth ratio and reflects days paid for ship duty (which may include travelling time and days signing on and off). The ship time ratio fell to 1.005 in the June quarter, compared with 1.019 in the March quarter.

Other components of the offshore crew to berth ratio were:

- compensation leave, which rose to 0.115, compared with 0.079 in the March quarter, representing an increase of about 46 per cent compared with the previous quarter;
- long service leave, which rose marginally to 0.039, compared with 0.038 in the March quarter;
- study leave, which rose to 0.040, compared with 0.028 in the March quarter; and
- training and other leave, which rose to 0.007, compared with 0.001 in the March quarter.



ABBREVIATIONS

AAPMA	Association of Australian Ports and Marine Authorities
ABS	Australian Bureau of Statistics
ACCC	Australian Competition and Consumer Commission
BTE	Bureau of Transport Economics
GRT	Gross Registered Tonnage
MSC	Mediterranean Shipping Company
MUA	Maritime Union of Australia
NRT	Net Registered Tonnage
teu	Twenty-foot equivalent unit

DEFINITIONS

Elapsed time —the total time over which the ship is worked, measured from labour aboard to labour ashore.

Elapsed rate —the number of containers or teus moved per elapsed hour.

Net time —the elapsed time minus the time unable to work the ship due to award shift breaks, ship's fault, weather, awaiting cargo, industrial disputes, closed holidays, or shifts not worked at the ship operator's request.

Net rate —the number of containers or teus moved per net hour.

Crane rate —the number of containers or teus moved per net crane hour.



Issue number 21 of Waterline is due for release mid December 1999

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**TABLE 12 CONTAINER TERMINAL PERFORMANCE INDICATORS, SELECTED AUSTRALIAN PORTS—
PRODUCTIVITY IN TEUS PER HOUR**

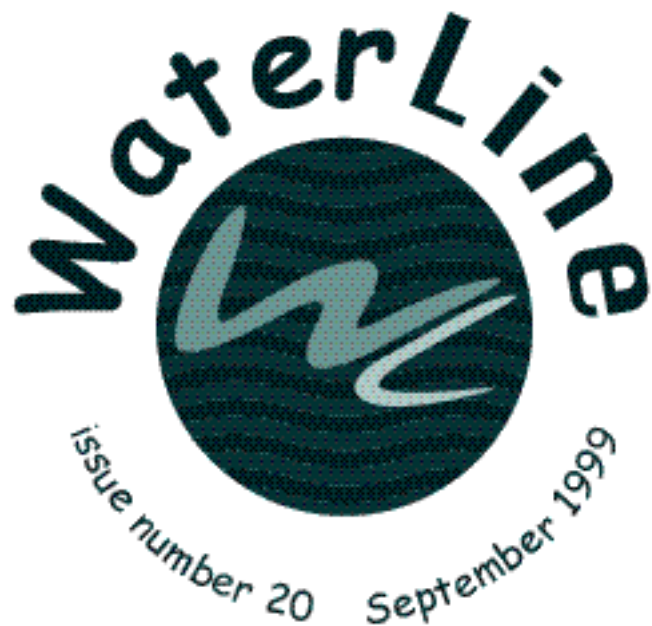
	Mar-96	Jun-96	Sep-96	Dec-96	Mar-97	Jun-97	Sep-97	Dec-97	Mar-98	Jun-98	Sep-98	Dec-98	Mar-99	Jun-99
Five ports														
Ships handled	748	827	871	907	865	891	907	963	909	845	1020	942	942	958
Total teus	411538	440098	497140	519206	441697	483372	549247	585474	527881	514409	633107	612019	573444	602501
Crane rate	20.3	21.3	22.3	21.2	22.8	22.8	23.2	23.3	23.5	23.6	24.4	24.2	25.5	25.9
Elapsed rate	23.2	22.6	23.6	na	23.1	23.8	26.0	25.8	na	na	na	na	na	na
Net rate	27.1	28.5	29.1	27.2	29.0	29.5	31.0	30.8	29.6	31.3	31.3	34.7	36.2	37.3
Brisbane														
Ships handled	124	133	140	141	156	164	162	177	170	168	192	180	176	193
Total teus	39037	51008	66115	62904	47471	65572	73184	71043	58857	74023	87373	84200	75444	88311
Crane rate	20.0	19.9	20.6	20.6	20.0	20.5	20.2	20.5	21.6	21.6	22.5	20.9	22.6	23.4
Elapsed rate	21.5	20.5	20.9	21.1	20.3	20.6	21.2	20.8	19.9	21.5	23.6	24.7	26.3	26.7
Net rate	24.4	24.3	25.1	24.9	22.7	23.3	24.0	24.2	23.0	25.4	27.5	28.7	30.6	32.2
Sydney														
Ships handled	206	216	228	249	251	249	243	266	238	219	267	230	221	243
Total teus	146038	148290	156344	174982	158323	167705	183978	201535	176496	168234	209619	203042	187287	203536
Crane rate	19.5	19.9	20.3	19.6	22.3	20.5	23.5	23.5	22.5	21.8	21.6	20.4	23.2	24.0
Elapsed rate	23.8	22.1	23.1	na	22.7	23.6	28.0	28.2	25.6	26.1	25.4	24.8	29.6	29.3
Net rate	28.0	27.9	29.5	28.9	22.7	23.3	36.1	35.5	33.1	33.9	32.0	32.3	38.8	38.0
Melbourne														
Ships handled	228	262	274	282	230	249	268	281	276	234	309	274	271	282
Total teus	162911	170884	203371	202376	162156	177070	208200	223465	207346	185803	242456	219549	206727	215379
Crane rate	20.5	22.3	24.5	22.4	23.6	23.5	23.6	23.6	24.3	24.3	26.1	27.7	27.5	28.1
Elapsed rate	24.4	25.0	26.5	22.1	24.3	25.1	26.0	25.2	25.3	26.8	28.4	31.7	30.2	33.1
Net rate	28.3	31.7	32.2	27.2	28.7	29.7	29.9	28.7	28.6	30.7	31.9	39.7	36.9	39.7
Adelaide														
Ships handled	47	63	70	74	69	65	68	66	60	66	63	74	73	66
Total teus	15955	18803	20519	23351	21963	20933	25982	25188	22260	27975	25493	32556	31326	29569
Crane rate	21.5	21.5	22.7	24.0	24.6	26.0	26.1	26.0	27.5	27.7	27.6	28.7	30.0	27.9
Elapsed rate	26.6	26.1	26.2	27.7	30.2	35.1	35.2	35.4	36.3	36.5	34.5	36.2	36.8	36.3
Net rate	27.2	26.7	26.8	28.3	30.9	36.0	36.2	36.5	37.6	37.8	36.0	37.6	39.7	37.6
Fremantle														
Ships handled	143	153	159	161	159	164	166	173	165	158	189	184	201	174
Total teus	47597	51113	50791	55593	51784	52092	57903	64243	62922	58374	68166	72672	72660	65706
Crane rate	21.2	23.4	20.8	21.5	23.3	22.9	23.1	23.6	24.5	26.7	27.9	25.7	26.6	27.3
Elapsed rate	18.3	17.6	16.0	18.6	19.7	19.5	21.0	22.2	na	na	na	na	na	na
Net rate	22.2	23.5	22.6	24.2	25.0	24.0	25.5	28.8	26.4	29.8	30.2	31.7	32.0	33.4

na not available

- Notes
1. The June quarter 1998 figures do not include data for Patrick covering the 8 April to 7 May 1998 period of the major industrial dispute with the MUA.
 2. Elapsed rates and net rates from March quarter 1997 onwards are not directly comparable with earlier figures (except at Adelaide) due to changes in a terminal operator's information systems.
 3. For data back to the December quarter 1989, refer to Waterline 15.

Sources Patrick, P&O Ports and Sea-Land.





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