

S Stevedoring productivity



Table 1 presents the December quarter 1997 to December 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 December 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, while the national crane rate productivity in the December quarter 1999, as measured by the five-port average, exceeded the rate for the December quarter 1998, it was lower than rates achieved for the first three quarters of 1999. On the other hand, the elapsed labour and net ship rates improved slightly when compared with the September quarter 1999, reflecting higher crane intensities (the number of cranes used per ship).



- the five-port average *crane rate* (productivity *per crane* while the ship is worked) was 19.0 containers per hour for the December quarter compared with 19.6 in the September quarter;
- the five-port average *elapsed labour rate* (productivity *per ship* based on the time labour is aboard the ship) was 23.6 containers per hour for the December quarter compared with 23.1 in the September quarter; and
- the five-port average *net ship rate* (productivity *per ship* while the ship is worked) was 29.0 containers per hour for the December quarter compared with 28.9 in the September quarter.

Crane rates fell by about 2 per cent at Melbourne and by about 8 per cent at Sydney. The fall in the five-port average crane rate productivity for the December quarter 1999 mainly reflects a combination of labour shortages and equipment breakdowns at the P&O terminal at Melbourne and, on the basis of media reports during the December quarter, a combination of a go-slow campaign and continuing equipment damage at the Patrick terminal at Sydney. Terminal productivity in both Sydney and Melbourne was also hampered by congestion resulting from the unusually high volume of container traffic during the lead-up to Christmas. The crane rates at Brisbane, Adelaide and Fremantle improved during the final quarter of 1999 compared with the September quarter 1999.

The *Brisbane* average crane rate was 18.8 containers per hour in the December quarter, up from 18.6 in the September quarter. The Brisbane elapsed labour rate of 20.3 containers per hour and the net ship rate of 25.1 containers per hour were both up on the September

Articles in this issue

• Stevedoring productivity	1
• Waterfront reliability	7
• Port Interface Cost Index	11
• Port performance—non-financial	16
• Port performance—financial	17
• Crew to berth ratios	19



quarter figures. The average proportion of elapsed time not worked decreased to approximately 19 per cent.

The *Sydney* average crane rate was 16.6 containers per hour in the December quarter, down from 18.0 in the September quarter. The Sydney elapsed labour rate of 22.5 containers per hour and the net ship rate of 27.6 containers per hour were both down on the September quarter figures. The average proportion of elapsed time not worked decreased to approximately 18 per cent, the lowest recorded in nearly four years.

The *Melbourne* average crane rate was 20.3 containers per hour in the December quarter, down from 20.8 in the September quarter. The Melbourne elapsed labour rate of 25.4 containers per hour and the net ship rate of 30.8 containers per hour were both up on the September quarter figures. The average proportion of elapsed time not worked decreased to approximately 17 per cent.

The *Adelaide* average crane rate was 23.2 containers per hour in the December quarter, up marginally from 23.0 in the September quarter. The Adelaide elapsed labour rate of 30.6 containers per hour and the net ship rate of 33.1 containers per hour were both up on the September quarter figures. The average proportion of elapsed time not worked remained steady at approximately 7 per cent.

The *Fremantle* average crane rate was 21.2 containers per hour in the December quarter, up from 20.7 containers per hour in the September quarter. The elapsed labour rate of 21.7 containers per hour and the net ship rate of 30.7 containers per hour were both up on the September quarter figures. The average proportion of elapsed time not worked increased to approximately 29 per cent.

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 December quarter 1999 five-port total showed ship visits decreased by 7 per cent, while container throughput increased by 8 per cent, compared with the September quarter. Only at Brisbane did container throughput fall below the September quarter 1999 figure. Compared with the December quarter of the previous year, the five-port figure for container ship visits decreased by about 4 per cent, while the five-port figure for container throughput increased by about 15 per cent.

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

- Brisbane was down 3 per cent on the September quarter figure, and up 11 per cent compared with the December quarter 1998;
- Sydney was up 15 per cent on the September quarter figure, and up 26 per cent compared with the December quarter 1998;
- Melbourne was up 7 per cent on the September quarter figure, and up 15 per cent compared with the December quarter 1998;
- Adelaide was up 9 per cent on the September quarter figure, and down 1 per cent compared with the December quarter 1998; and
- Fremantle was up 10 per cent on the September quarter figure, and down 5 per cent compared with the December quarter 1998.



TABLE I CONTAINER TERMINAL PERFORMANCE INDICATORS—PRODUCTIVITY IN CONTAINERS PER HOUR

Port/indicator	Quarter								
	Dec-97	Mar-98	Jun-98	Sep-98	Dec-98	Mar-99	Jun-99	Sep-99	Dec-99
Five ports									
Ships handled	963	909	845	1020	942	942	958	979	909
Total containers	467 122	421 769	406 938	493 502	477 744	448 224	469 742	506 696	548 504
Crane rate	18.5	18.8	18.7	19.1	18.9	19.9	20.3	19.6	19.0
Elapsed labour rate	20.5	20.0 ^a	20.7 ^a	20.7 ^a	21.9 ^a	23.1 ^a	24.0 ^a	23.1	23.6
Net ship rate	24.3	23.4	24.7	24.2	26.9	28.2	29.0	28.9	29.0
Brisbane									
Ships handled	177	170	168	192	180	176	193	224	208
Total containers	58 014	49 197	58 939	70 200	67 691	61 204	71 008	77 914	75 199
Proportion of 40-foot containers	0.22	0.20	0.26	0.24	0.24	0.23	0.24	0.27	0.26
Crane rate	16.8	18.0	17.3	18.2	16.8	18.3	18.9	18.6	18.8
Elapsed labour rate	16.8	16.4	17.1	18.7	19.6	21.2	21.4	19.5	20.3
Net ship rate	19.6	19.1	20.2	21.9	22.9	24.7	25.9	24.7	25.1
Elapsed time not worked (per cent)	15	14	15	15	14	14	18	21	19
Sydney									
Ships handled	266	238	219	267	230	221	243	259	244
Total containers	157 430	137 600	130 513	160 007	155 063	142 767	154 062	170 684	195 544
Proportion of 40-foot containers	0.28	0.28	0.29	0.31	0.31	0.31	0.32	0.33	0.33
Crane rate	18.4	17.5	16.9	16.5	15.7	17.7	18.2	18.0	16.6
Elapsed labour rate	21.9	19.9	20.2	19.2	18.9	22.6	22.2	23.1	22.5
Net ship rate	27.7	25.7	26.2	24.2	24.6	29.5	28.7	29.4	27.6
Elapsed time not worked (per cent)	21	23	23	21	23	24	24	21	18
Melbourne									
Ships handled	281	276	234	309	274	271	282	278	266
Total containers	178 302	166 284	147 122	187 696	170 056	161 894	167 942	183 058	195 723
Proportion of 40-foot containers	0.25	0.25	0.26	0.29	0.29	0.28	0.28	0.32	0.31
Crane rate	18.8	19.5	19.2	20.2	21.5	21.5	21.8	20.8	20.3
Elapsed labour rate	19.9	20.1	21.0	21.8	24.3	23.6	25.8	24.5	25.4
Net ship rate	22.6	22.7	24.2	24.5	30.7	28.8	31.0	30.2	30.8
Elapsed time not worked (per cent)	12	12	13	11	21	18	17	19	17
Adelaide									
Ships handled	66	60	66	63	74	73	66	62	62
Total containers	20 773	18 163	23 293	21 444	26 319	24 221	24 445	23 969	26 090
Proportion of 40-foot containers	0.21	0.23	0.20	0.19	0.24	0.29	0.21	0.18	0.17
Crane rate	21.4	22.5	23.1	23.2	23.2	23.2	23.1	23.0	23.2
Elapsed labour rate	29.2	29.6	30.4	29.0	29.3	28.5	30.0	29.4	30.6
Net ship rate	30.1	30.7	31.5	30.3	30.4	30.7	31.1	31.5	33.1
Elapsed time not worked (per cent)	3	4	3	4	4	7	4	7	7
Fremantle									
Ships handled	173	165	158	189	184	201	174	156	129
Total containers	52 603	50 525	47 071	54 155	58 615	58 138	52 285	51 071	55 948
Proportion of 40-foot containers	0.22	0.25	0.24	0.26	0.24	0.25	0.26	0.27	0.28
Crane rate	18.9	19.6	21.5	22.2	20.7	21.4	21.7	20.7	21.2
Elapsed labour rate	18.9	na	na	na	na	na	na	20.4	21.7
Net ship rate	23.2	21.1	23.9	23.8	25.5	25.6	26.6	28.0	30.7
Elapsed time not worked (per cent)	18	na	na	na	na	na	na	27	29

na not available

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

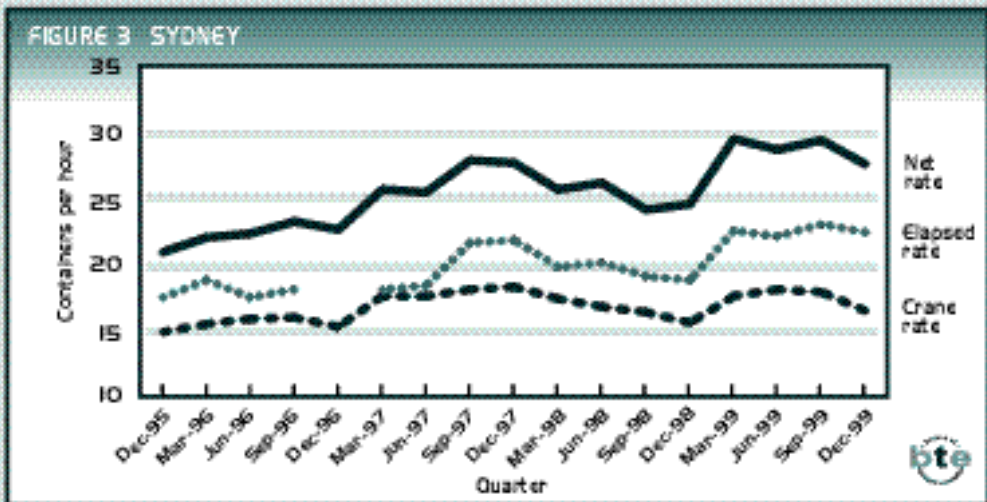
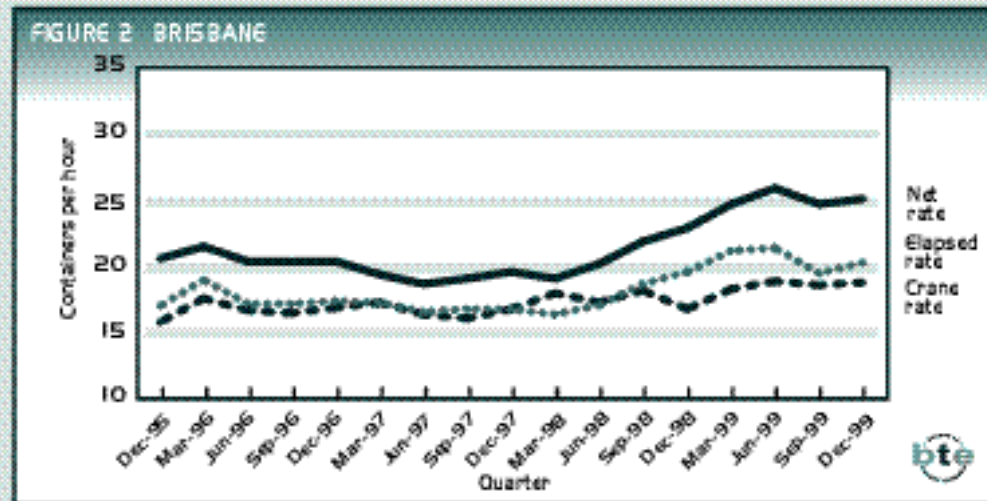
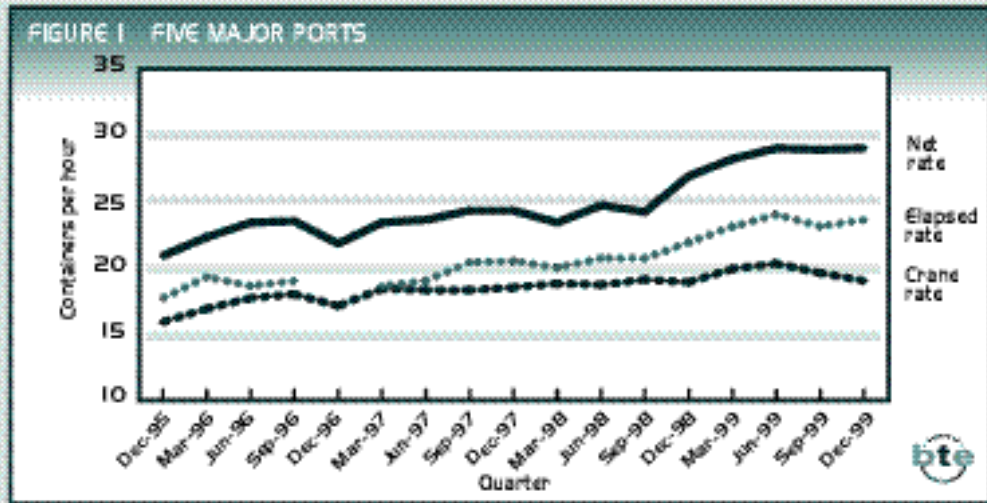
- Notes
1. The June quarter 1998 figures do not include data for Patrick covering the 8 April to 7 May 1998 period of the major industrial dispute with the MUA.
 2. The data in this table are expressed in containers per hour and therefore are not directly comparable with the teus per hour data in table 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

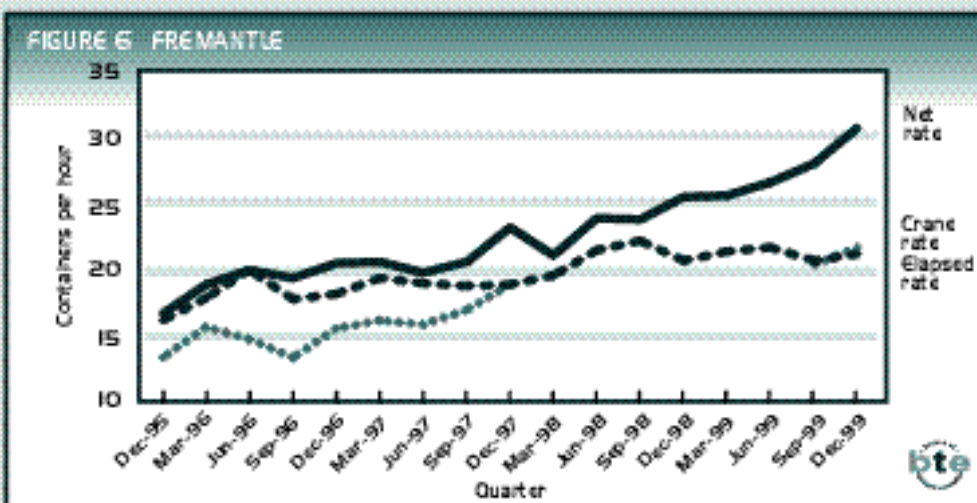
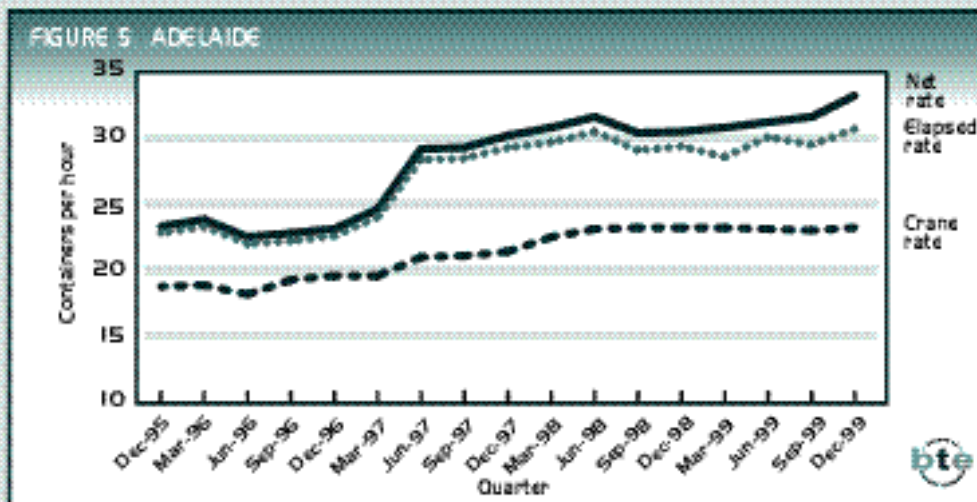
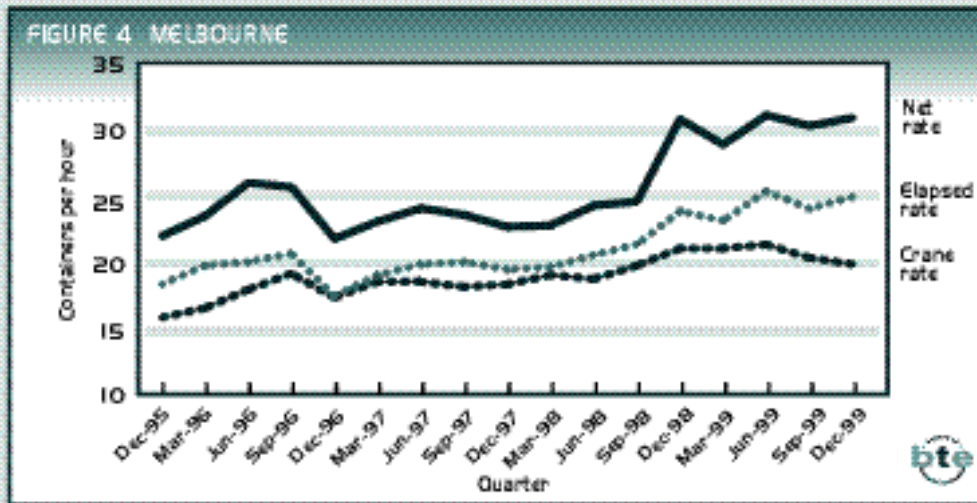


Note These figures are based on the data contained in table I. Readers should refer to the notes in that table.

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



CONTAINER TERMINALS' PRODUCTIVITY



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

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

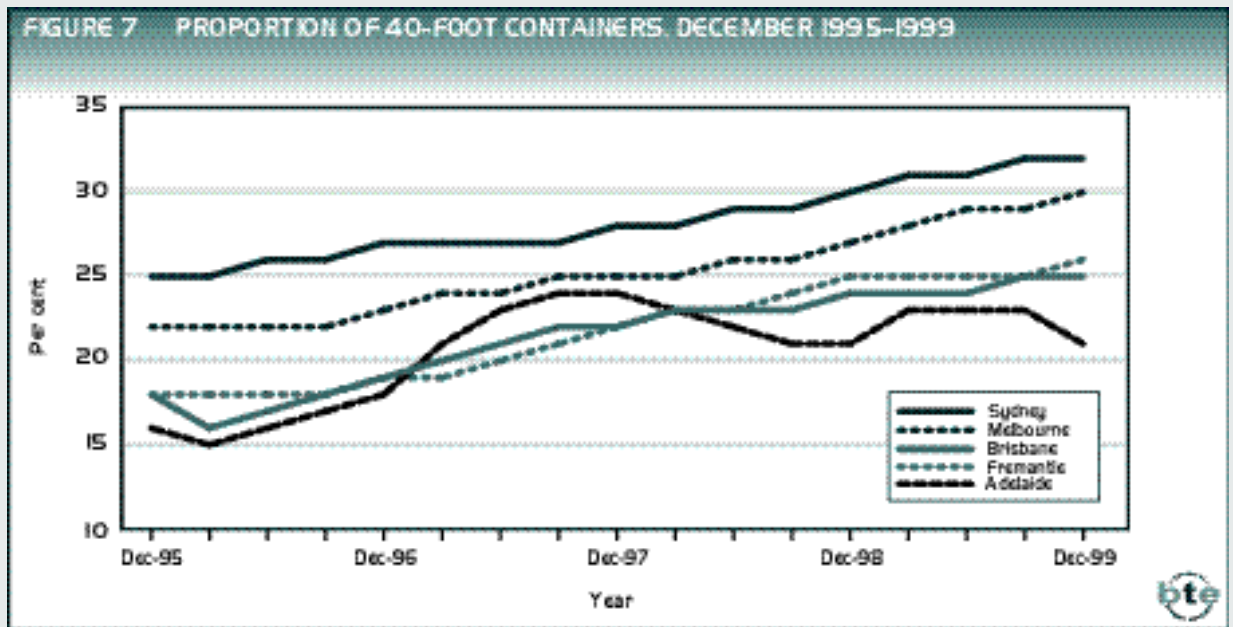




Proportion of 40-foot containers

In this issue of *Waterline*, table 1 includes the proportion of 40-foot containers exchanged at each of the five container ports. When compared with the December quarter 1995 (which was the first quarter stevedoring productivity was presented in *Waterline* based on container lifts) the proportion of 40-foot containers has increased at all ports.

Figure 7 shows that the two major ports have tended to each exchange a higher proportion of 40-foot containers than the individual three smaller ports; in addition, the proportion at Sydney always exceeded that at Melbourne in any quarter. Overall, on a five-port-average basis, the proportion of 40-foot containers has increased from 22 per cent in the December quarter 1995, to 30 per cent in the December quarter 1999.



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

Teus per hour

Table 12 on page 23 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.





WATERFRONT RELIABILITY

The *Waterline* reliability indicators provide partial measures of the variability of waterfront performance for container traffic at major Australian ports. They 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 information on berth availability, pilotage and towage for a sample of ship calls in the December quarter 1999. It indicates the extent to which selected port services were available at the scheduled or confirmed time.

The sample for the December quarter 1999 covers 273 ship calls, equivalent to 30 per cent of total ship calls at the major container terminals during the period. The proportion of ship calls covered at individual ports ranges from 23 per cent at Brisbane to 44 per cent at Adelaide. The sample includes calls by container ships operating to and from Europe, the Mediterranean, the Middle East, North America, Asia and New Zealand.

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 88 per cent in the December quarter 1999. This was down from the figure of 93 per cent that was recorded in the September quarter 1999. The decline in berth availability mainly reflected performance problems and associated congestion at several container terminals.

Caution should be used in undertaking inter-port comparisons of the berth availability data, as there is significant variation between ports in sample sizes and ship call patterns. Figure 8 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 21 hours in the December quarter 1999. This was similar to the figure of 22 hours that was recorded in the previous quarter. The average waiting times in these quarters were

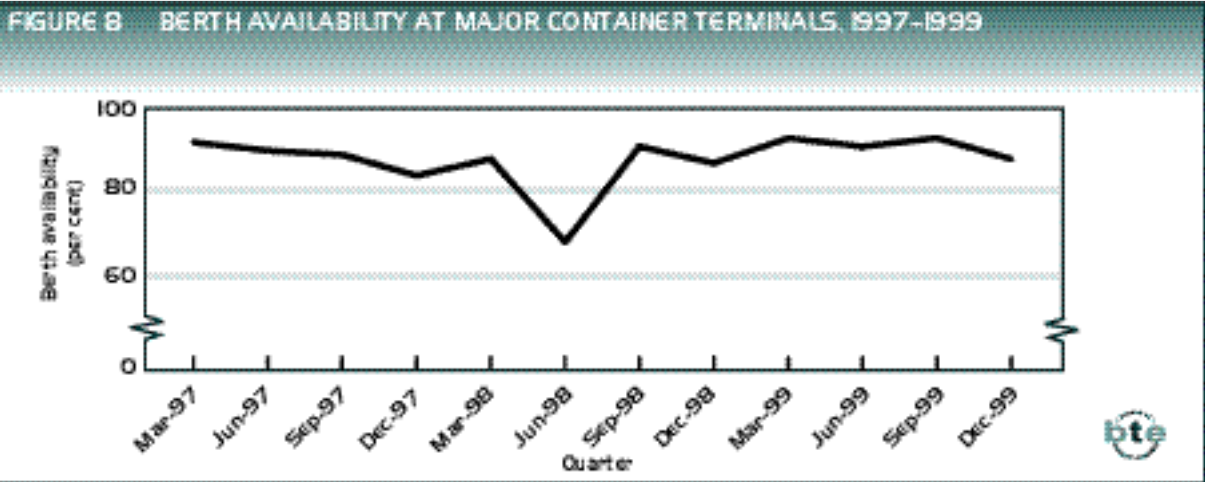
TABLE 2 AVAILABILITY OF BERTH, PILOTAGE AND TOWAGE SERVICES AT THE SCHEDULED/CONFIRMED TIME, DECEMBER QUARTER 1999

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	37	2	0	1	2	1	2	2	47
Pilotage	47	0	0	0	0	0	0	0	47
Towage	47	0	0	0	0	0	0	0	47
Sydney									
Berth availability	65	1	2	0	1	1	7	7	84
Pilotage	84	0	0	0	0	0	0	0	84
Towage	84	0	0	0	0	0	0	0	84
Melbourne									
Berth availability	70	0	1	1	0	2	2	4	80
Pilotage	80	0	0	0	0	0	0	0	80
Towage	79	0	0	0	0	1	0	0	80
Adelaide									
Berth availability	26	0	0	0	0	0	1	0	27
Pilotage	27	0	0	0	0	0	0	0	27
Towage	27	0	0	0	0	0	0	0	27
Fremantle									
Berth availability	32	0	0	0	0	3	0	0	35
Pilotage	35	0	0	0	0	0	0	0	35
Towage	35	0	0	0	0	0	0	0	35
Five ports									
Berth availability	230	3	3	2	3	7	12	13	273
Pilotage	273	0	0	0	0	0	0	0	273
Towage	272	0	0	0	0	1	0	0	273

Note Inter-port comparisons should be interpreted with caution as there is significant variation between ports in factors such as sample sizes and ship call patterns.

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





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

well above the figures of 11 hours and 14 hours that were recorded in the first two quarters of 1999.

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 for pilotage and virtually 100 per cent for towage in the December quarter 1999. The data presented in table 2 indicate that these services were provided within one hour of the confirmed time in all but one of the surveyed cases.

The towage indicator shows the extent to which towage services were available at the confirmed ship movement time specified in the tug booking. It therefore does not reflect the effects of industrial action in the towage sector during the December quarter 1999, as tugs could not be booked to provide services during these periods.

Other waiting time

The six 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 December quarter 1999, 54 per cent 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 September quarter 1999 was 52 per cent. The average duration of other waiting time incidents was 11 hours per incident in the December quarter 1999, compared with 8 hours per incident in the previous quarter.

Table 3 summarises the data on other waiting time incidents in the December quarter 1999. The shipping lines identified a total of 209 incidents (affecting 148 ship calls) for the sample of ship calls over this period. These incidents involved 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 two-thirds of the total hours attributed to other ship waiting time in the December quarter 1999:

- Awaiting stevedoring labour (33 per cent);
- Port closed due to public holidays (14 per cent);
- Late ship arrival (12 per cent);
- Completion of stevedoring earlier than forecast (9 per cent).

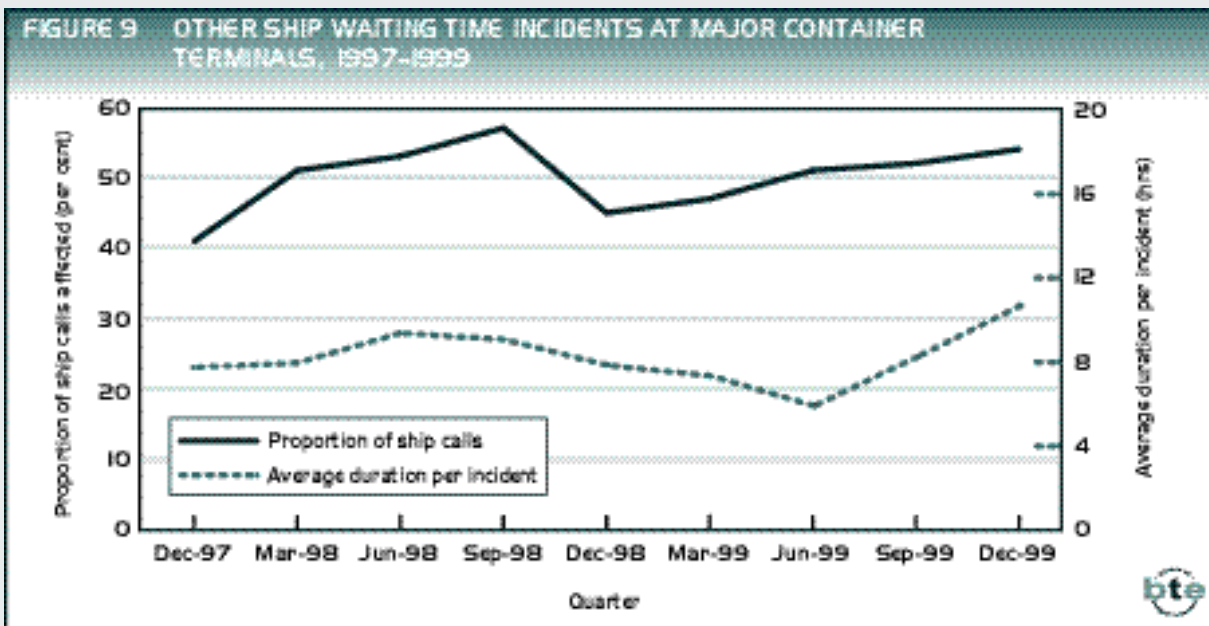
TABLE 3 OTHER SHIP WAITING TIME INCIDENTS AT THE FIVE MAINLAND CAPITAL CITY PORTS, DECEMBER QUARTER 1999

Incident type	(Number of incidents)							Total no. of incidents
	Ship waiting time (hrs)							
	1	2	3	4	5-10	11-20	>20	
Awaiting labour	11	16	8	5	22	6	7	75
Stevedoring finished early	11	18	11	5	7	0	0	52
Pilot/tug booking not at preferred time	3	5	3	2	1	2	0	16
Early ship arrival	0	1	4	0	4	2	0	11
Crane breakdown	3	3	3	0	0	1	0	10
Ship repairs or maintenance	1	1	1	2	1	2	2	10
Late ship arrival	0	1	0	0	1	1	1	4
Industrial action	0	0	0	0	3	1	0	4
Stevedoring finished late	0	0	0	0	1	1	0	2
Weather or tides	1	2	0	1	2	0	0	6
Other	3	1	2	0	3	1	9	19
Total incidents	33	48	32	15	45	17	19	209^a

a. These incidents affected 148 of the 273 ship calls covered in table 2.
Sources Data for a sample of ship calls provided by shipping lines.



Figure 9 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.

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. Compared with the previous



quarter, the stevedoring rate indicator increased at Brisbane and Sydney, and was unchanged at Melbourne.

Cargo receipt is the proportion of receipts (exports) completed by the stevedore's cut-off time. It provides a partial measure of one factor that can affect container terminal performance. Compared with the previous quarter, the cargo receipt indicator increased at Sydney. It did not change significantly at the other two ports for which complete data are available.

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, this indicator declined at Brisbane and Sydney. It did not change significantly at the other two ports for which data are available.

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*. There was little change in this indicator at the four ports for which data are available.

TABLE 4 STEVEDORING AND SHIP ARRIVAL RELIABILITY INDICATORS, SEPTEMBER AND DECEMBER QUARTERS 1999

Indicator	(per cent)									
	Brisbane		Sydney		Melbourne		Adelaide		Fremantle	
	Jul-Sep	Oct-Dec	Jul-Sep	Oct-Dec	Jul-Sep	Oct-Dec	Jul-Sep	Oct-Dec	Jul-Sep	Oct-Dec
Stevedoring										
Stevedoring rate	44	50	48	62	46	46	na	na	na	38
Cargo receipt	91	91	77	82	96	94	na	na	na	97
Ship arrival										
Advice at 24 hrs	63	52	53	46	na	na	59	57	52	54
Advice inside 24 hrs	93	93	93	94	na	na	93	90	90	88

na not available
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 January–June 1999 and July–December 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 in 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 container ship (Lloyd's ship classification UCC). The representative ship was selected from the ship-size range 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, 1999

Indicator	Brisbane		Sydney		Melbourne		Adelaide		Fremantle	
	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec
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	399	443	772	930	888	1080	560	619	394	400
Loaded	310	353	621	769	742 ^r	908	433	493	312	327
Empty	89	90	151	161	146 ^r	172	127	126	82	73
Loaded inwards	132	171	393	492	388 ^r	492	175	191	156	179
Loaded outwards	178	182	228	277	354 ^r	416	257	302	156	148
Ship call parameters^a										
Number of port calls	4	4	3	3	4	4	10	6	10	7
Elapsed berth time (hrs)	24	24	40	48	38	42	20	22	21	21

^r revised
^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, depend on 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





TABLE 6 PORT AND RELATED CHARGES, 1999

Indicator	Brisbane		Sydney		Melbourne		Adelaide		Fremantle	
	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec
Ship-based charges (\$/teu)										
Conservancy	5.70	5.13	-	-	-	-	1.53	1.39	1.01	-
Tonnage	-	-	8.69	7.22	5.90	4.16	7.26	6.84	6.42	6.33
Pilotage	12.86	11.57	4.07	3.38	6.18	5.08	4.20	3.79	5.30	5.23
Towage	19.03	17.12	9.49	7.88	7.75	6.37	21.98	19.86	12.48	12.31
Mooring, unmooring	4.29	3.86	4.08	3.38	1.06	0.87	-	-	2.79	2.75
Berth hire ^a	-	-	-	-	10.18	9.41	-	-	-	-
Total ^b	41.87	37.68	26.33	21.86	31.07	25.89	34.97	31.88	27.99	26.62
Cargo-based charges (\$/teu)										
Wharfage										
Imports	26.00	26.00	60.00	60.00	33.00	25.90	53.00	53.00	47.30	47.30
Exports	26.00	26.00	45.00	45.00	33.00	25.90	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	110	106	86	82	64	52	88	85	89	88
Loaded exports	110	106	71	67	64	52	88	85	89	88
Charges per ship visit (\$/visit)										
Total ship-based charges	16702	16702	20334	20334	27576	27959	19574	19745	11039	10641
Empty teus ^c	1268	1283	0	0	584 ^r	0	0	0	631	562
-	<i>not applicable</i>									
r	<i>revised</i>									
a.	<i>Charged by stevedores and itemised separately from basic stevedoring charge.</i>									
b.	<i>Components may not sum to totals due to rounding.</i>									
c.	<i>Sum of wharfage, harbour dues and berth charge per empty teu, multiplied by average exchange of empty teus.</i>									
<i>Note: Port and related charges are based on the parameters described in table 5.</i>										
<i>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.</i>										



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 January–June 1999 and July–December 1999. Port and related charges comprise ship-based charges and cargo-based charges.

Ship-based charges

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

- the elimination of conservancy dues at Fremantle;
- a 14 per cent decrease in tonnage charges at Melbourne;
- a 22 per cent decrease, per loaded teu, in wharfage charges at Melbourne; and
- the elimination of the wharfage charge on empty containers at Melbourne.

However, changes in the parameters on which ship-based charges are calculated can also cause significant fluctuations in the cost per teu or the cost per ship visit. The greatest parameter-based changes in July–December 1999 resulted from the fall in charges per teu as a consequence of the increase in the average number of teus exchanged per ship at all five ports. On a *per teu basis*, the overall changes in ship-based charges in July–December 1999 were:



- at *Brisbane*, a 10 per cent fall in ship-based charges per teu—resulting from an 11 per cent increase in the average teu-exchange;
- at *Sydney*, a 17 per cent fall in ship-based charges per teu—resulting from a 20 per cent increase in the teu-exchange;
- at *Melbourne*, a 17 per cent fall in ship-based charges per teu—resulting from a 14 per cent decrease in tonnage charges and a 22 per cent increase in average teu-exchange;
- at *Adelaide*, a 9 per cent fall in ship-based charges per teu—resulting from an 11 per cent increase in the average teu-exchange; and
- at *Fremantle*, a 5 per cent fall in ship-based charges per teu—resulting from the elimination of conservancy dues and a 1 per cent increase in average teu-exchange.

Countering the fall in costs per teu, the *per ship-visit charge* rose in Melbourne and Adelaide as a result of 12 per cent increases in the elapsed berth time. Changes in the elapsed berth time affect the berth hire charge in Melbourne and the tonnage charge in Adelaide.

While caution should always be used when making inter-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

Apart from at Melbourne, where wharfage for a loaded teu fell from \$33.00 to \$25.90 per unit, and for an empty teu fell from \$4 per unit to zero, there were no changes in port and related cargo-based charges in July–December 1999. However, it should be noted that charges such as those on empty containers are not included in the Port Interface Cost Index 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 July–December 1999:

- at *Brisbane*, fell by about 4 per cent, solely due to the 10 per cent decrease in the ship-based component;
- at *Sydney*, fell by about 5 per cent for imports and 6 per cent for exports, solely due to the 17 per cent decrease in the ship-based component;
- at *Melbourne*, fell by about 19 per cent, due to the 22 per cent decrease in wharfage charges and the 17 per cent decrease in the ship-based component;
- at *Adelaide*, fell by about 4 per cent, solely due to the 9 per cent decrease in the ship-based component; and
- at *Fremantle*, fell by about 2 per cent, solely due to the 5 per cent decrease in the ship-based component.





TABLE 7 PORT INTERFACE COSTS, 1999

Indicator	(\$/teu)									
	Brisbane		Sydney		Melbourne		Adelaide		Fremantle	
	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec
Imports										
Ship-based charges	42	38	26	22	31	26	35	32	28	27
Cargo-based charges	68	68	60	60	33	26	53	53	61	61
Stevedoring	181 ^r	181 ^p	181 ^r	181 ^p	181 ^r	181 ^p	181 ^r	181 ^p	181 ^r	181 ^p
Customs brokers' fees	123	123	152	152	138	138	132	132	141	141
Road transport charges	185	185	289	293	251	252	168	169	199	199
Total imports^a	600^r	596	707^r	707	634^r	623	569^r	566	610^r	609
Exports										
Ship-based charges	42	38	26	22	31	26	35	32	28	27
Cargo-based charges	68	68	45	45	33	26	53	53	61	61
Stevedoring	181 ^r	181 ^p	181 ^r	181 ^p	181 ^r	181 ^p	181 ^r	181 ^p	181 ^r	181 ^p
Customs brokers' fees	77	77	111	111	89	89	73	73	69	67
Road transport charges	185	185	289	293	251	252	168	169	199	199
Total exports^a	553^r	549	651^r	651	585^r	574	511^r	508	538^r	535
<i>p</i>	provisional pending updating of the ACCC stevedoring charge.									
<i>r</i>	revised									
<i>a.</i>	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.									



Stevedoring charges per teu

At the beginning of 1999 the Australian Competition and Consumer Commission (ACCC) resumed monitoring the prices, costs and profits of container stevedoring companies at the major Australian container ports. Its findings can be found in the ACCC *Container Stevedoring Monitoring Report*, October 1999.

Estimates provided by the ACCC indicate that the national weighted average revenue per teu for its sample of significant container terminal operations (Brisbane, Sydney, Melbourne, Adelaide, Fremantle and Burnie) was \$181 for the February–June 1999 period. As a result, appropriate revisions have been made to the January–June 1999 port interface cost index figures as published in *Waterline 20*. As the stevedoring charges for the July–December 1999 period have not been released, a provisional cost of \$181 per teu has been used in this issue of *Waterline*.

Land-based charges per teu

The average charges for customs brokers' fees and road transport charges for the January–June and July–December 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.

During the July–December 1999 period there was a one per cent rise in both import and export aggregate average customs brokers' fees at Melbourne, and a fall of 3 per cent in export fees at Fremantle. Any minor changes in customs brokers' fees at Brisbane, Sydney or Adelaide amounted to less than half of one per cent.



Apart from a one per cent rise in Sydney, there were no other changes in average road transport charges during July–December 1999. 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 on this parameter and, to some extent, help explain the significant difference between road transport charges at Melbourne and Sydney compared with Brisbane, Adelaide and Fremantle.

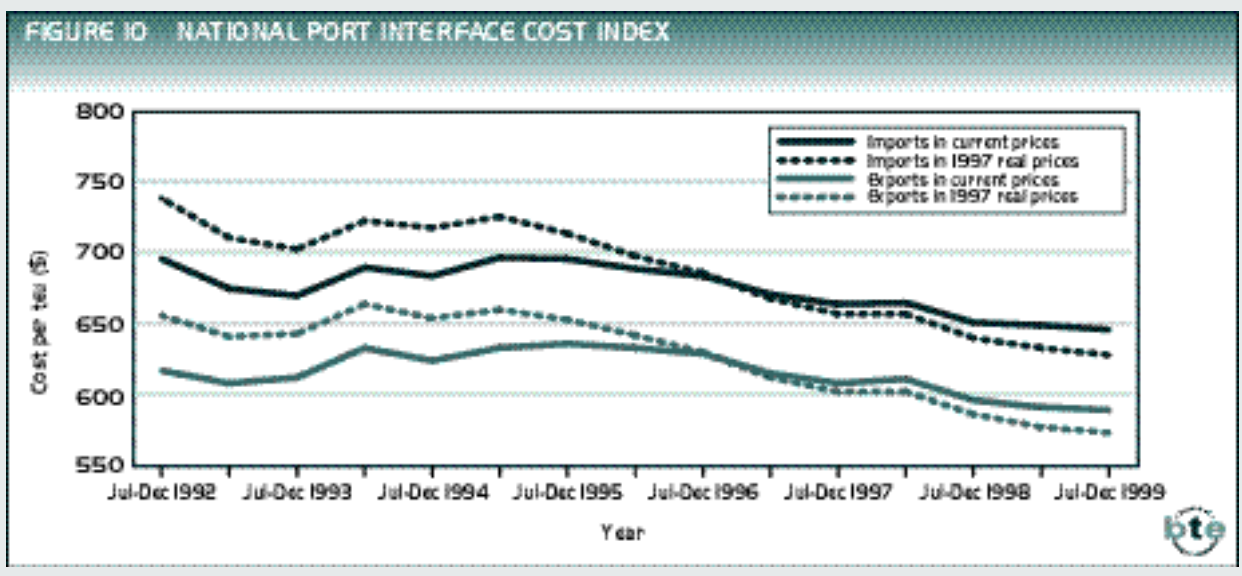
In *Waterline 18*, the BTE reported that it had received numerous comments from road transport operators in Sydney about increasing congestion and terminal delays. Although most operators surveyed since then have reported that the situation has improved, there is still anecdotal evidence of occasionally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

Indices for individual ports

Table 7 indicates that, between January–June and July–December 1999, there were falls in total port interface costs ranging from 0.03 per cent to 1.82 per cent across the five 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 July–December 1999 period, care should also 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 10 provides the National Port Interface Cost Index back to 1992. In overall terms, there was little movement in the national index between the January–June and July–December 1999 periods. In fact, in current prices, national import charges decreased by 0.5 per cent to \$646 per teu, while export charges decreased by 0.4 per cent to \$589 per teu in July–December 1999.



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 supplied by the ACCC; and ABS gross non-farm product deflator data (cat. no. 5206.0).

**PORT PERFORMANCE—NON-FINANCIAL**

The 1999 non-financial indicators for the five mainland capital city ports are presented in table 8.

Cargo throughput

Total cargo throughput at the five ports was 48.7 million tonnes for July–December 1999, compared with 47.8 million tonnes for the January–June 1999 period. Total cargo throughput increased at Brisbane (5 per cent), Sydney (10 per cent) and Melbourne (3 per cent). It declined at Adelaide (1 per cent) and Fremantle (9 per cent). Overall, this resulted in an increase of 2 per cent in total throughput for the five ports compared with the previous half year, and an increase of 4 per cent compared with July–December 1998.

Non-containerised general cargo throughput at the five ports was 2.58 million tonnes for July–December 1999, compared with 2.37 million tonnes for January–June 1999. This was the outcome of increases at Brisbane (16 per cent), Sydney (12 per cent), Melbourne (6 per cent) and Adelaide (29 per cent); and a small decline at Fremantle (1 per cent). Overall, this resulted in an increase of 9 per cent in non-containerised general cargo throughput for the five ports compared with the previous half year, and an increase of 7 per cent compared with July–December 1998.

Total container traffic throughput for the five ports was 1.57 million teus for July–December 1999, compared with 1.36 million teus for January–June 1999. This represents an increase of 15 per cent. Throughput of loaded teus increased by 17 per cent, with loaded imports increasing by 23 per cent and loaded exports increasing by 11 per cent. Loaded containers increased at Brisbane (15 per cent), Sydney (25 per cent), Melbourne (18 per cent) and Fremantle (3 per cent); and decreased at Adelaide (6 per cent).

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

Indicator	Brisbane		Sydney		Melbourne		Adelaide		Fremantle		Five ports ^d	
	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec
Total cargo throughput ('000 tonnes)	10 663	11 190	11 447	12 543	10 774	11 120	3 129	3 112	11 762	10 698	47 775	48 663
Non-containerised general cargo ('000 tonnes) ^a	520	605	336	375	1 036	1 093	130	167	347	342	2 368	2 583
Containerised cargo (teus exchanged)												
Full import	61 411	80 820	218 094	275 821	241 834	295 480	19 280	17 378	53 309	60 132	593 928	729 631
Empty import	28 334	27 606	13 006	11 319	38 766	42 995	8 552	6 877	14 230	11 960	102 888	100 757
Full export	82 911	85 819	126 359	155 479	220 387	249 443	28 271	27 505	53 159	49 716	511 087	567 962
Empty export	12 881	14 652	70 565	78 921	52 431	60 374	5 384	4 594	13 607	12 480	154 868	171 021
TOTAL	185 537	208 897	428 024	521 540	553 418	648 292	61 487	56 354	134 305	134 288	1 362 771	1 569 371
Average total employment^b	211	220	189	189	78	80	162	156	169	167	808	812
Port turnaround time (hrs)^c												
Median result	33	32	38	43	36	43	18	21	23	25	-	-
95th percentile	65	60	66	84	67	85	26	43	44	50	-	-

- not applicable

na not available

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 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. Components may not sum to totals due to rounding.

Source AAPMA.





Compared with 1998, the annual 1999 five-port total container traffic, measured in teus, increased by 14 per cent.

Employment

Table 8 indicates that *average employment* at the five mainland capital city port authorities/corporations rose by 0.5 per cent in the July–December 1999 period compared with the previous half-year. It declined by 15 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.



PORT PERFORMANCE—FINANCIAL

Financial performance indicators for the five mainland capital city port authorities/corporations during 1997–98 and 1998–99 are presented in table 9.

Earnings and assets, 1998–99

Earnings before interest and tax (EBIT) rose at Port of Brisbane Corporation (51 per cent), Sydney Ports Corporation (13 per cent), and Melbourne Port Corporation (14 per cent). It fell at Ports Corp South Australia (33 per cent), and Fremantle Port Authority (12 per cent).

Operating profit after income tax rose by 48 per cent at Brisbane, by 27 per cent at Sydney, and by 27 per cent at Melbourne. It fell by 49 per cent at South Australia and by 33 per cent at Fremantle.

Average total assets in service rose at Brisbane (5 per cent), Sydney (25 per cent), Melbourne (3 per cent) and Fremantle (4 per cent). At South Australia they fell by 3 per cent.

Return on assets (EBIT as a proportion of total assets) rose at Brisbane (45 per cent), and at Melbourne (11 per cent). It fell at Sydney (10 per cent), at South Australia (31 per cent) and at Fremantle (15 per cent).

Dividends, 1998–99

A special dividend of \$26 million at Melbourne Port Corporation in 1998–99, and a capital dividend of \$11.6 million at Ports Corp South Australia in 1997–98 were excluded from the calculations.

Dividends paid rose at Brisbane (231 per cent), Sydney (7 per cent), Melbourne (1 per cent), and South Australia (17 per cent); but fell at Fremantle (33 per cent).



**TABLE 9 FINANCIAL PERFORMANCE INDICATORS,
SELECTED AUSTRALIAN PORT AUTHORITIES/CORPORATIONS.**

Indicator	(\$/teu)									
	Brisbane		Sydney		Melbourne		Adelaide		Fremantle	
	1997-98	1998-99	1997-98	1998-99	1997-98	1998-99	1997-98	1998-99	1997-98	1998-99
	per cent									
Return on assets ^a	6.3	9.2	12.5	11.3	8.1	9.0	24.5	17.0	20.0	17.01
Dividend payout ratio ^b	25.9	57.9	50.0	42.2	41.7	33.3	23.9	54.9	10.0	10.00
Debt/equity ^c	0.1	0.0	44.4	42.1	25.6	26.0	63.7	48.6	64.9	38.80
	\$ million									
EBIT ^d	27.2	41.2	54.6	61.8	41.3	47.2	25.8	17.4	22.0	19.4
Ave. total assets in service	429.2	448.8	435.9	545.9	507.7	523.0	105.4	102.4	109.9	113.8
Dividends paid	4.8	15.8	12.7	13.6	8.0	8.1 ^e	4.7 ^f	5.5	1.3	0.8
Operating profit ^d	18.5	27.3	25.5	32.3	19.2	24.2	19.6	10.0	12.6	8.4
Total debt	0.3	0.2	150.5	150.7	102.5	99.9	35.0	28.9	33.5	25.2
Total equity	409.8	428.2	339.4	358.0	400.3	383.8	55.0	59.5	51.6	64.9

a. EBIT (earnings before interest and tax) as a proportion of total assets.

b. Dividends paid out as a proportion of operating profit.

c. Total debt as a proportion of total equity.

d. Includes abnormals.

e. A special dividend of \$26 million has been excluded.

f. A capital dividend of \$11.6 million has been excluded.

Source AAPMA.



The *dividend payout ratio* (dividends paid out as a proportion of operating profit) rose at Brisbane (124 per cent) and South Australia (129 per cent), and remained steady at Fremantle. It fell at Sydney (16 per cent) and Melbourne (20 per cent).

Debt and equity, 1998-99

Total debt fell by 30 per cent at Brisbane, by 3 per cent at Melbourne, by 17 per cent at South Australia and by 25 per cent at Fremantle. It remained virtually unchanged at Sydney.

Total equity rose by 4 per cent at Brisbane, by 5 per cent at Sydney, by 8 per cent at South Australia, and by 26 per cent at Fremantle. It fell by 4 per cent at Melbourne.

The *debt/equity ratio* fell by 33 per cent at Brisbane, by 5 per cent at Sydney, by 24 per cent at South Australia, and by 40 per cent at Fremantle. It rose by 2 per cent at Melbourne.





CREW TO BERTH RATIOS

This will be the last crew to berth monitoring report in *Waterline*. The BTE's objective in monitoring crew to berth ratios was to help the shipping industry to better understand the costs involved in crewing ships. There is evidence, including that from recent enterprise agreements, that this objective is being achieved. It is therefore considered that there is no need for monitoring to continue. The BTE thanks the Australian Shipowners Association, Australian Metals and Mines Association, the maritime unions and a number of shipping companies for their assistance and cooperation in crew to berth monitoring.

The BTE has monitored 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.

Merchant shipping

Figure 11 presents information on the crew to berth ratio, and its components, for Australian merchant shipping. As the data have not been audited, the December quarter 1999 merchant shipping data in this issue of *Waterline* should be regarded as preliminary. The overall crew to berth ratio for merchant shipping increased to 2.124 in the December quarter 1999, compared with 2.103 in the September quarter, but is lower than the 2.133 figure recorded in the September quarter 1993 when monitoring commenced.

Table 10 shows the individual components of the crew to berth ratio for merchant shipping, by crew classification, for the December 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 rose to 1.046 in the December quarter, compared with 1.034 in the September 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 increased to 0.975 in the December quarter, compared with 0.962 in the September quarter.

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

- compensation leave, which rose to 0.038, compared with 0.036 in the September quarter, representing a rise of 5 per cent compared with the previous quarter, and a fall of about 48 per cent compared with the September quarter 1993 figure when merchant shipping monitoring began;
- long service leave, which fell to 0.035, compared with 0.038 in the September quarter;
- study leave, which fell to 0.022, compared with 0.027 in the September quarter; and
- training and other paid leave, which increased to 0.007, compared with 0.005 in the September quarter.



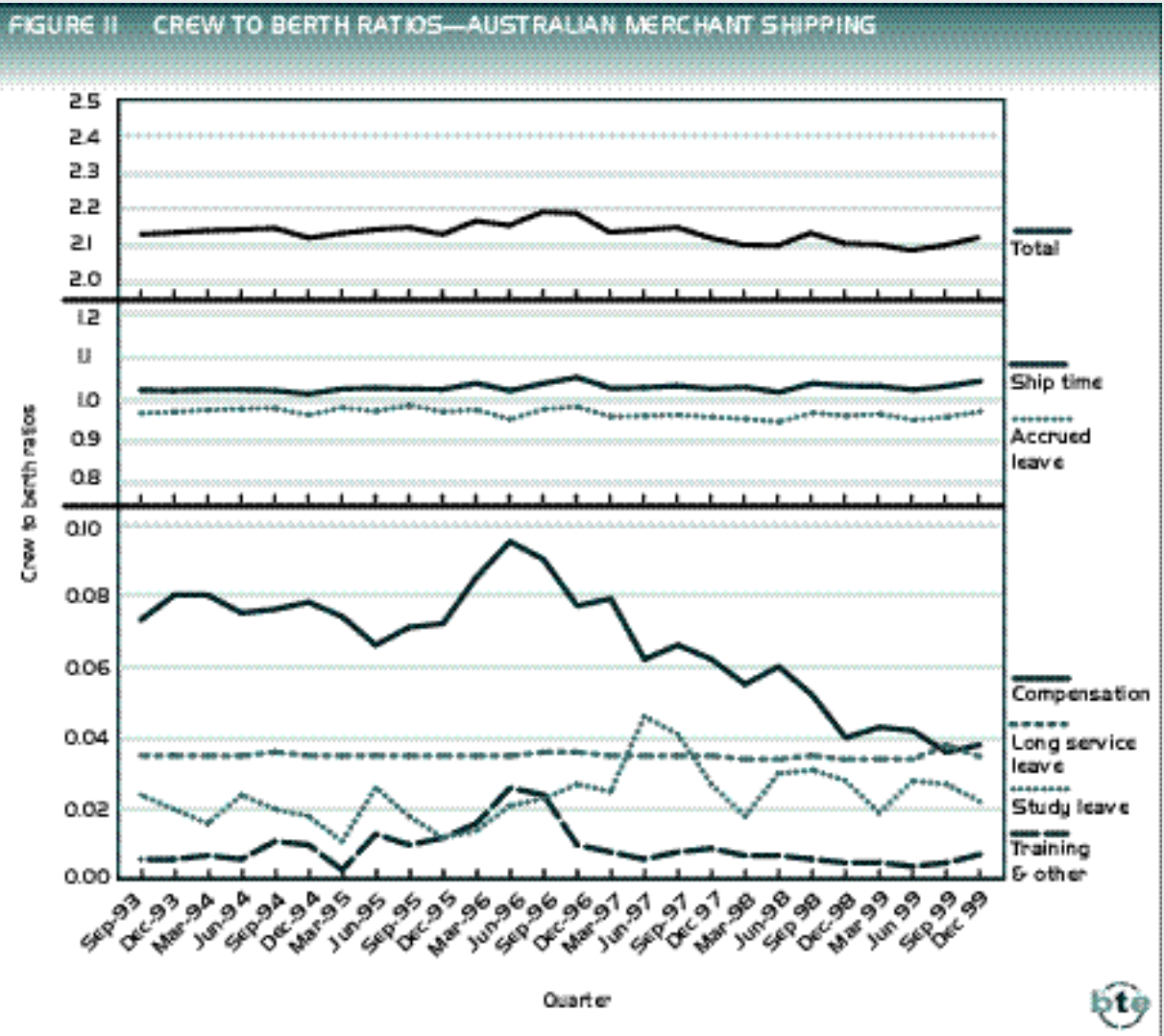


TABLE IO MERCHANT SHIPPING CREW TO BERTH RATIOS BY ACTIVITY AND CREW CLASSIFICATION, DECEMBER QUARTER 1999^p

Crew type	Ship time	Accrued leave	Compensation	Long service leave	Study leave	Training & other	Total ^a
Deck officers	1.060	0.986	0.022	0.036	0.050	0.018	2.172
Engineers	1.060	0.985	0.028	0.035	0.038	0.009	2.155
All officers	1.060	0.985	0.025	0.035	0.044	0.013	2.163
Integrated ratings	1.030	0.964	0.046	0.034	0.000	0.001	2.075
Catering crew	1.045	0.976	0.064	0.035	0.009	0.005	2.133
All ratings	1.034	0.966	0.050	0.034	0.002	0.002	2.088
All crew	1.046	0.975	0.038	0.035	0.022	0.007	2.124
Previous quarter	1.034	0.962	0.036	0.038	0.027	0.005	2.103
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.



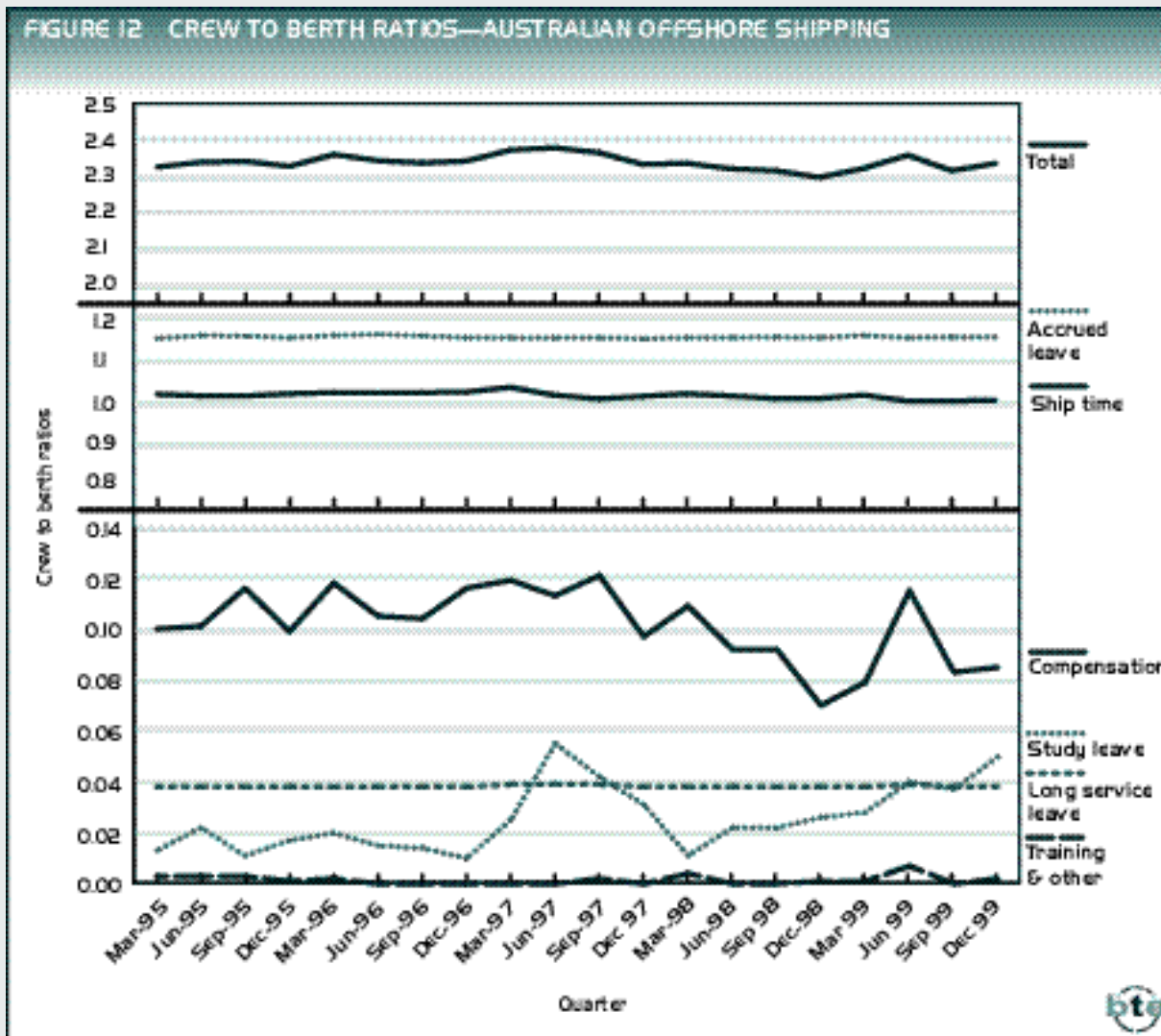


TABLE II OFFSHORE SHIPPING CREW TO BERTH RATIOS BY ACTIVITY AND CREW CLASSIFICATION, DECEMBER QUARTER 1999^p

Crew type	Ship time	Accrued leave	Compensation	Long service leave	Study leave	Training & other	Total ^a
Deck officers	1.007	1.153	0.056	0.039	0.109	0.001	2.364
Engineers	1.005	1.153	0.020	0.038	0.082	0.001	2.300
All officers	1.006	1.153	0.036	0.038	0.093	0.001	2.327
Integrated ratings	1.002	1.147	0.188	0.039	0.000	0.003	2.379
Catering crew	1.015	1.165	0.098	0.038	0.000	0.003	2.319
All ratings	1.009	1.156	0.142	0.038	0.000	0.003	2.348
All crew	1.007	1.155	0.085	0.038	0.050	0.002	2.337
Previous quarter	1.005	1.154	0.083	0.038	0.037	0.000	2.317
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.





Offshore shipping

Figure 12 presents information on the crew to berth ratio, and its components, for Australian offshore shipping. As the data have not been audited, the December quarter 1999 offshore shipping data in this issue of *Waterline* should be regarded as preliminary. The overall crew to berth ratio for offshore shipping rose to 2.337 in the December quarter 1999, compared with 2.317 in the September quarter, and 2.327 in the March quarter 1995 when monitoring commenced.

Table 11 shows the individual components of the crew to berth ratio for offshore shipping, by crew classification, for the December 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. The accrued leave ratio for the December quarter was 1.155, similar to 1.154 in the September 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 increased to 1.007 in the December quarter, compared with 1.005 in the September quarter.

Other components of the offshore crew to berth ratio were:

- compensation leave, which rose to 0.085, compared with 0.083 in the September quarter, representing a rise of about 2 per cent compared with the previous quarter, and a fall of about 15 per cent compared with the March quarter 1995 figure when offshore shipping monitoring began;
- long service leave, which remained steady at 0.038;
- study leave, which rose to 0.050, compared with 0.037 in the September quarter; and
- training and other leave, which rose to 0.002, compared with zero in the September quarter.



ABBREVIATIONS		DEFINITIONS
AAPMA	Association of Australian Ports and Marine Authorities	Elapsed time —the total time over which the ship is worked, measured from labour aboard to labour ashore.
ABS	Australian Bureau of Statistics	Elapsed labour rate —the number of containers or teus moved per elapsed hour.
ACCC	Australian Competition and Consumer Commission	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.
BTE	Bureau of Transport Economics	Net ship rate —the number of containers or teus moved per net hour.
EBIT	Earnings before interest and tax	Crane rate —the number of containers or teus moved per net crane hour.
GRT	Gross Registered Tonnage	
MUA	Maritime Union of Australia	
NRT	Net Registered Tonnage	
teu	Twenty-foot equivalent unit	
UCC	Container ship	

**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	Sep-99	Dec-99
Five ports																
Ships handed	748	827	871	907	865	891	907	963	909	845	1020	942	942	958	979	909
Total teus	411538	440098	497140	519206	441697	483372	549247	585474	527881	514409	633107	612019	573444	602501	660593	715413
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	25.4	24.6
Elapsed rate	23.2	22.6	23.6	na	23.1	23.8	26.0	25.8	na	na	na	na	na	na	30.1	30.7
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	37.7	37.7
Brisbane																
Ships handed	124	133	140	141	156	164	162	177	170	168	192	180	176	193	224	208
Total teus	39037	51008	66115	62904	47471	65572	73184	71043	58857	74023	87373	84200	75444	88311	98944	94919
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	23.3	23.6
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	24.7	25.7
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	31.2	31.7
Sydney																
Ships handed	206	216	228	249	251	249	243	266	238	219	267	230	221	243	259	244
Total teus	146038	148290	156344	174982	158323	167705	183978	201535	176496	168234	209619	203042	187287	203536	226784	260927
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	23.7	22.1
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	30.6	30.1
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	38.9	36.8
Melbourne																
Ships handed	228	262	274	282	230	249	268	281	276	234	309	274	271	282	278	266
Total teus	162911	170884	203371	202376	162156	177070	208200	223465	207346	185803	242456	219549	206727	215379	241775	257147
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	27.4	26.5
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	32.4	33.4
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	39.9	40.4
Adelaide																
Ships handed	47	63	70	74	69	65	68	66	60	66	63	74	73	66	62	62
Total teus	15955	18803	20519	23351	21963	20933	25982	25188	22260	27975	25493	32556	31326	29569	28271	30597
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	27.2	27.2
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	34.7	35.9
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	37.2	38.8
Fremantle																
Ships handed	143	153	159	161	159	164	166	173	165	158	189	184	201	174	156	129
Total teus	47597	51113	50791	55593	51784	52092	57903	64243	62922	58374	68166	72672	72660	65706	64819	71823
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	26.1	27.2
Elapsed rate	18.3	17.6	16.0	18.6	19.7	19.5	21.0	22.2	na	na	na	na	na	na	25.8	25.8
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	35.3	38.8

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.





ACKNOWLEDGMENTS

This issue of Waterline was compiled by Gita Curnow. The reliability article was written by Kym Starr. The crew to berth data were prepared by Tim Risbey. Desktop publishing by Thomas Smith.

The BTE is particularly grateful for the assistance of the Cross-Modal & Maritime Transport Division of the Department of Transport & Regional Services; the Association of Australian Ports and Marine Authorities; individual port authorities/corporations; shipping lines; ship operators; the Australian Shipowners Association; the Australian Mines & Metals Association; customs brokers; road transport operators; pilot, tug and mooring operators; and the stevedoring companies Patrick, P&O Ports and Sea-Land.

For further information on this publication please contact:

Gita Curnow at gita.curnow@dotrs.gov.au tel (02) 6274 6067 fax (02) 6274 6816.

This publication is available free of charge from the Bureau of Transport Economics, GPO Box 501, Canberra ACT 2601. Australia bte@dotrs.gov.au Tel (02) 6274 7210.

Copies may also be downloaded from our internet site

<http://www.bte.gov.au>

The Bureau of Transport Economics operates within the Commonwealth Department of Transport and Regional Services

ISSN 1324-4043

© Commonwealth of Australia 2000. This work is copyright. Apart from any use as permitted under the *Copyright Act 1968*, no part may be reproduced by any process without prior written permission. Requests and inquiries concerning reproduction and rights should be addressed to the Manager, Legislative Services, AusInfo, GPO Box 84, Canberra ACT 2601.

INDEMNITY STATEMENT: The Bureau of Transport Economics has taken due care in preparing these analyses. However, noting that data used for the analyses have been provided by third parties, the Commonwealth gives no warranty as to the accuracy, reliability, fitness for purpose, or otherwise of the information.