issue 31

waterline

JUNE 2002

BUREAU OF btre TRANSPORT & REGIONAL ECONOMICS

in brief

in brief

- The five-port average crane rate improved to 26.6 containers per hour for the March quarter 2002.
- No change was recorded in the five-port elapsed labour rate (29.6 containers per hour) and in the ship rate (41.4 containers per hour).
- In 2001, the overall tonnage of cargo moved under coastal permits increased by 32 per cent, to 13 million tonnes, compared with 2000.
- Berth availability was 96 per cent in the March quarter.

at a glance

at a glance

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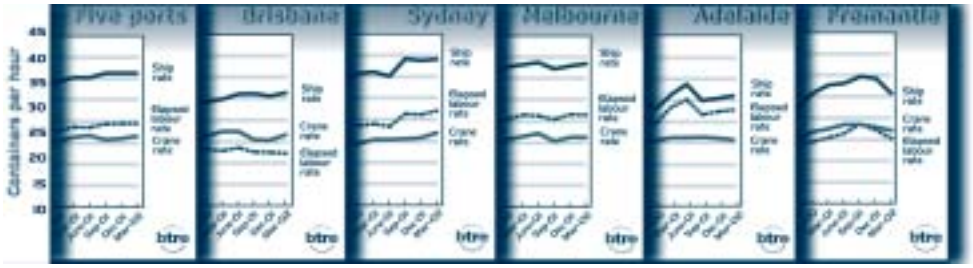
at a glance

at a glance

graphs

Container terminal productivity—pages 4 & 5



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change of name

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STEVEDORING PRODUCTIVITY

Table 1 presents the March quarter 2000 to March quarter 2002 indicators of stevedoring productivity at the five major Australian container ports, expressed in *container moves per hour*. Figures 1 to 6 present these data for the March quarter 1996 to March quarter 2002 period. The data for Brisbane, Sydney, Melbourne and Fremantle are weighted averages for the container terminals operated by P&O Ports and Patrick. The Adelaide data are for the CSX World Terminals container terminal.

The Bureau has received amended data from Fremantle for the December quarter. As a result, the national crane rate productivity has been amended to 26.1 containers per hour, from 26.3 containers per hour as published in the last issue. The ship rate has been amended to 41.4 containers per hour from 41.6 containers per hour. The elapsed labour rate remains unchanged.

National crane rate productivity, as measured by the five-port average, has increased in the March quarter 2002 compared with the December quarter 2001. The elapsed labour rate and the ship rate have not changed.

In summary:

- the five-port average *crane rate* (productivity *per crane* while the ship is worked) was 26.6 containers per hour for the March quarter 2002, compared with 26.1 in the December quarter 2001;
- the five-port average *elapsed labour rate* (productivity *per ship* based on the time labour is aboard the ship) of 29.6 containers per hour remained unchanged in the March quarter 2002; and
- the five-port average *ship rate* (productivity *per ship* while the ship is worked) of 41.4 containers per hour remained unchanged in the March quarter 2002.

The *Brisbane* (P&O Ports, Patrick) average crane rate was 26.6 containers per hour in the March quarter 2002, up from 25.3 in the December quarter 2001. The elapsed labour rate of 22.2 containers per hour was down, and the ship rate of 36.6 containers per hour was up, compared with the previous quarter's figures.

The *Sydney* (P&O Ports, Patrick) average crane rate was 26.9 containers per hour in the March quarter 2002, up from 25.7 in the December quarter 2001. The elapsed labour rate of 32.1 containers per hour and the ship rate of 44.3 containers per hour were both up compared with the previous quarter's figures.

The *Melbourne* (P&O Ports, Patrick) average crane rate of 26.3 containers per hour remained unchanged in the March quarter 2002. The elapsed labour rate of 31.5 containers per hour was down, and the ship rate of 43.4 containers per hour was up, compared with the previous quarter's figures.

The *Adelaide* (CSX World Terminals) average crane rate was 25.5 containers per hour in the March quarter 2002, down from 25.9 in the December quarter 2001. The elapsed labour rate of 32.5 containers per hour and the ship rate of 35.8 containers per hour were both up compared with the previous quarter's figures.

The *Fremantle* (P&O Ports, Patrick) average crane rate was 27.1 containers per hour in the March quarter 2002, down from 27.9 containers per hour in the December quarter 2001. The elapsed labour rate of 25.2 containers per hour and the ship rate of 35.8 containers per hour were both down compared with the previous quarter's figures.

Teus per hour

Table 6 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 1 CONTAINER TERMINAL PERFORMANCE INDICATORS—PRODUCTIVITY IN CONTAINERS PER HOUR

Port / Indicator	Quarter Mar-00	Jun-00	Sep-00	Dec-00	Mar-01	Jun-01	Sep-01	Dec-01	Mar-02
Five ports									
Ships handled	875	808	840	814	787	813	825	846	824
Total containers	517 533	505 802	531 700	545 075	472 797	502 037	575 130	591 070	544 135
Crane rate	20.4	23.1	24.9	25.5	26.4	26.8	25.8	26.1[r]	26.6
Elapsed labour rate	25.4	30.3	28.5	27.9	28.8	28.7	29.5	29.6	29.6
Ship rate	31.8	37.5	38.0	39.5	40.4	40.4	41.4	41.4[r]	41.4
Elapsed time not worked (per cent)	20	19	25	29	29	29	29	29	29
40-foot containers (per cent)	31	32	33	34	34	32	33	33	33
Brisbane									
Ships handled	219	178	187	179	167	188	175	198	202
Total containers	77 992	71 679	80 366	83 082	63 177	84 854	81 935	88 669	78 160
Crane rate	21.2	24.0	25.8	26.3	27.4	27.4	25.4	25.3	26.6
Elapsed labour rate	23.8	26.3	23.3	23.1	22.8	23.5	22.5	22.4	22.2
Ship rate	28.9	33.4	34.9	34.4	35.1	36.3	36.4	35.8	36.6
Elapsed time not worked (per cent)	18	21	33	33	35	35	38	37	39
40-foot containers (per cent)	25	27	29	30	30	28	29	27	28
Sydney									
Ships handled	221	218	223	211	201	202	208	206	196
Total containers	171 164	166 212	173 988	176 106	148 316	152 650	179 506	184 559	167 278
Crane rate	18.6	22.8	24.3	24.3	25.3	25.3	25.5	25.7	26.9
Elapsed labour rate	25.4	32.6	29.6	28.6	29.0	28.4	31.4	31.2	32.1
Ship rate	32.2	40.9	39.5	40.9	41.3	40.3	44.4	44.0	44.3
Elapsed time not worked (per cent)	21	20	25	30	30	29	29	29	28
40-foot containers (per cent)	34	35	37	37	37	34	35	37	37
Melbourne									
Ships handled	247	217	227	218	214	215	243	249	234
Total containers	184 710	178 156	189 306	189 580	170 250	174 149	214 752	221 647	205 435
Crane rate	21.2	23.0	25.0	25.8	26.5	27.2	25.4	26.3	26.3
Elapsed labour rate	25.7	30.7	30.5	30.5	31.5	31.3	30.5	31.6	31.5
Ship rate	32.6	37.6	40.1	42.7	43.2	43.7	42.2	42.9	43.4
Elapsed time not worked (per cent)	21	18	24	29	27	28	28	26	28
40-foot containers (per cent)	32	33	34	35	33	31	33	33	33
Adelaide									
Ships handled	56	56	62	63	57	57	57	57	54
Total containers	21 803	25 245	26 836	27 800	25 051	25 928	28 369	28 857	24 505
Crane rate	23.1	23.0	25.3	25.3	26.0	26.0	26.1	25.9	25.5
Elapsed labour rate	28.9	30.3	32.1	29.3	33.1	34.9	31.4	32.1	32.5
Ship rate	31.2	34.0	35.5	32.6	36.1	38.5	34.7	35.2	35.8
Elapsed time not worked (per cent)	7	11	10	10	8	9	10	9	9
40-foot containers (per cent)	27	21	15	27	29	28	23	27	30
Fremantle									
Ships handled	132	139	141	143	148	151	142	136	138
Total containers	61 864	64 510	61 204	68 507	66 003	64 456	70 568	67 338	68 757
Crane rate	20.9	23.3	24.9	26.8	27.5	28.5	28.5	27.9[r]	27.1
Elapsed labour rate	25.3	27.5	24.1	24.4	25.4	26.4	28.6	27.2	25.2
Ship rate	31.8	34.1	32.1	35.9	37.8	38.2	39.8	39.4[r]	35.8
Elapsed time not worked (per cent)	21	19	25	32	33	31	28	31	30
40-foot containers (per cent)	30	31	35	36	36	33	32	35	30

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Notes
1. *The definitions used in compiling the stevedoring productivity data are detailed in Waterline 26, pages 2-3.*
2. *Data from CSX World Terminals at Brisbane are incorporated from the December quarter 1999 until June quarter 2001.*
3. *The data in this table are expressed in container moves per hour and are therefore not directly comparable with the teus per hour data in table 9.*
4. *Elapsed time not worked is the difference between the ship rate and elapsed rate as a percentage of the net rate.*

Sources Patrick, P&O Ports and CSX World Terminals.

CONTAINER TERMINAL PRODUCTIVITY

FIGURE 1 FIVE MAJOR PORTS

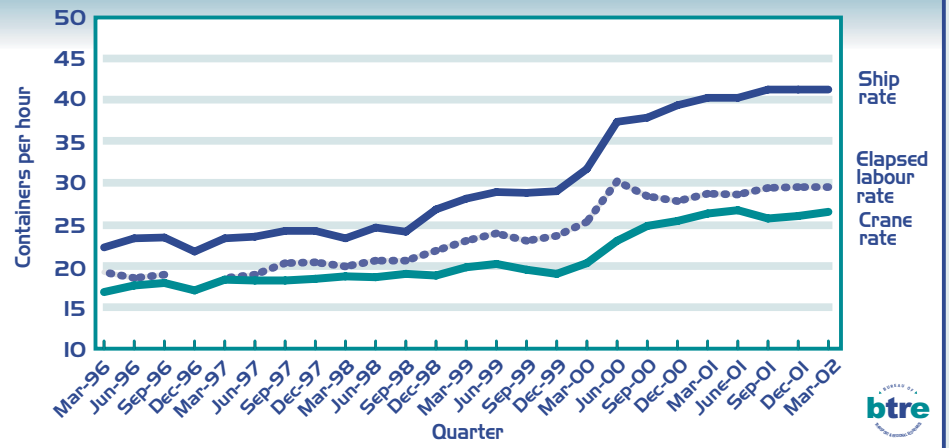


FIGURE 2 BRISBANE

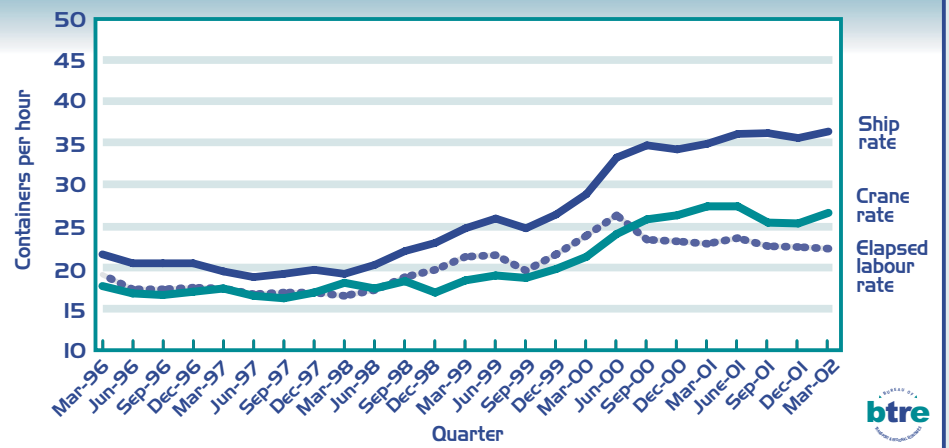
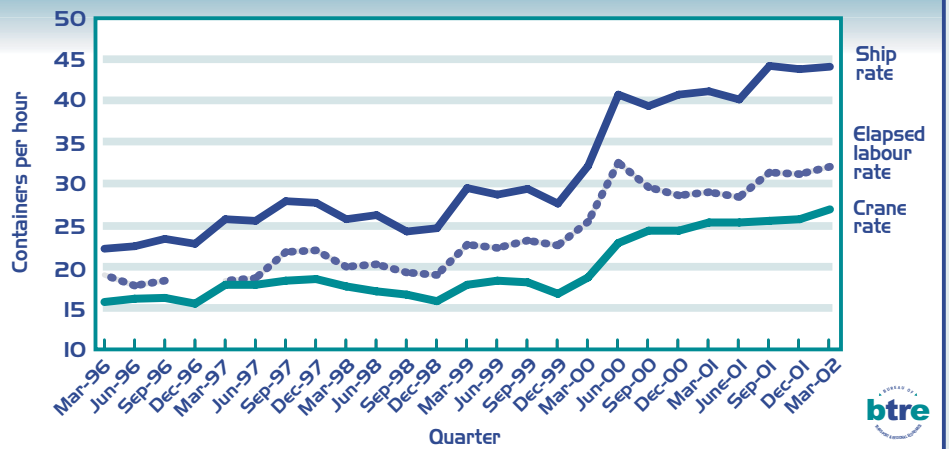


FIGURE 3 SYDNEY



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

Sources *Patrick, P&O Ports and CSX World Terminals.*

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CONTAINER TERMINAL PRODUCTIVITY

FIGURE 4 MELBOURNE

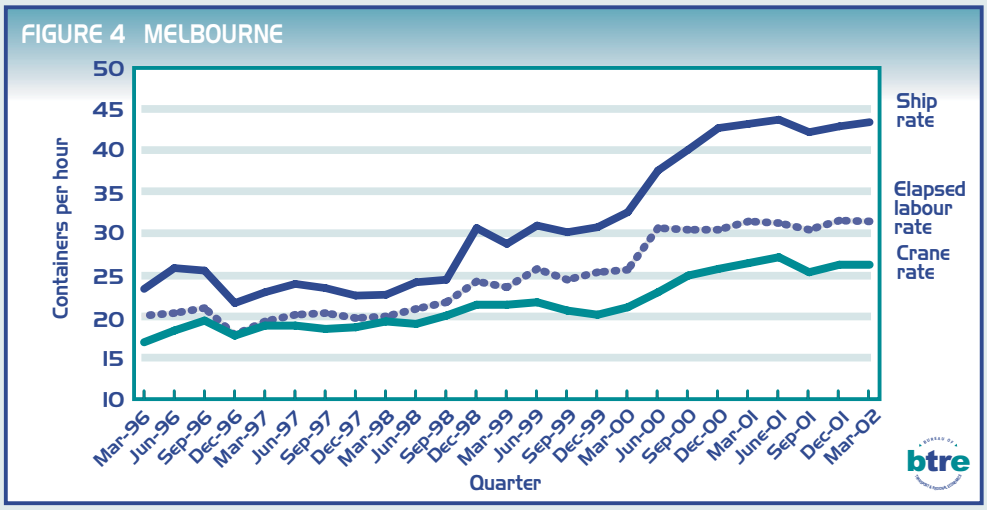


FIGURE 5 ADELAIDE

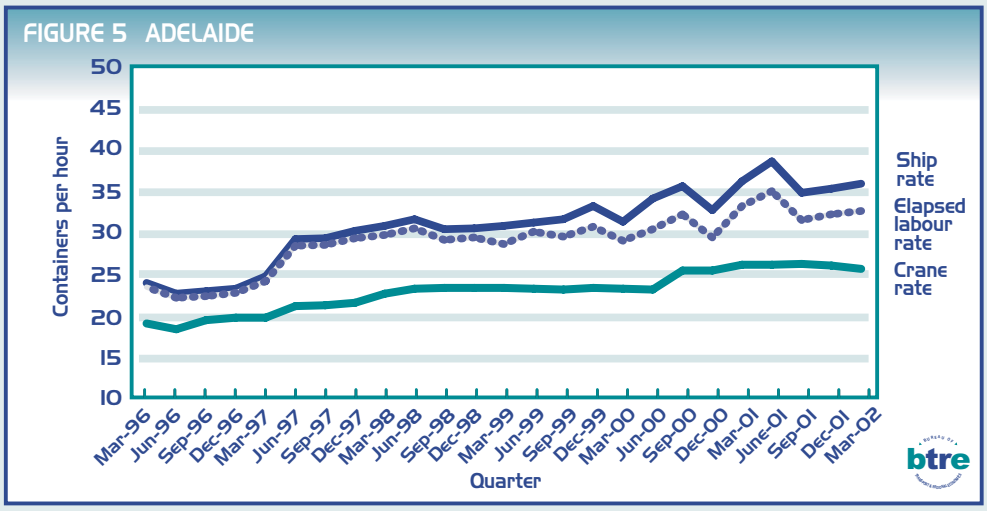
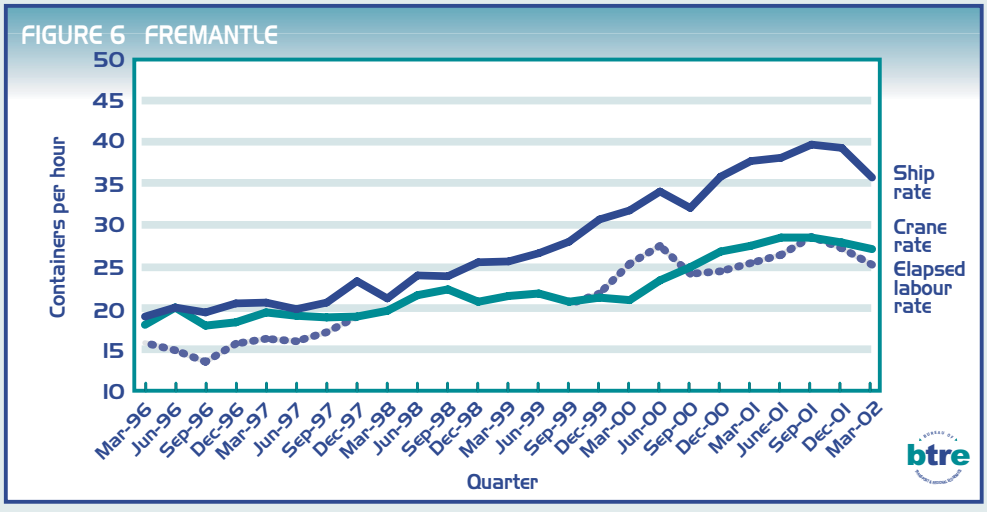


FIGURE 6 FREMANTLE



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

Sources *Patrick, P&O Ports and CSX World Terminals.*

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 March quarter 2002. It indicates the extent to which selected port services were available at the scheduled or confirmed time.

The sample for the March quarter 2002 covers 209 ship calls, equivalent to around 25 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 11 per cent at Brisbane to 48 per cent at Adelaide. The figures for Brisbane should be treated with caution due to the low proportion of ship calls included in the data. The sample includes calls by container ships operating to and from Europe, the Mediterranean, the Middle East, North America, Asia and New Zealand.

TABLE 2 AVAILABILITY OF BERTH, PILOTAGE AND TOWAGE SERVICES AT THE SCHEDULED/CONFIRMED TIME, MARCH QUARTER 2002

(Number of ship calls)

	Delay (hrs)								Total no. of ship calls	Availability indicator (per cent)
Port/operation	0	1	2	3	4	5–10	11–20	>20		
Brisbane										
Berth availability	23	0	0	0	0	0	0	0	23	
Pilotage	23	0	0	0	0	0	0	0	23	
Towage	23	0	0	0	0	0	0	0	23	
Sydney										
Berth availability	56	0	1	0	0	0	0	0	57	
Pilotage	57	0	0	0	0	0	0	0	57	
Towage	56	0	0	1	0	0	0	0	57	
Melbourne										
Berth availability	65	0	0	1	0	0	2	2	70	
Pilotage	70	0	0	0	0	0	0	0	70	
Towage	70	0	0	0	0	0	0	0	70	
Adelaide										
Berth availability	24	0	0	0	0	1	1	0	26	
Pilotage	25	1	0	0	0	0	0	0	26	
Towage	26	0	0	0	0	0	0	0	26	
Fremantle										
Berth availability	30	0	0	0	0	2	1	0	33	
Pilotage	31	1	0	0	1	0	0	0	33	
Towage	33	0	0	0	0	0	0	0	33	
Five ports										
Berth availability	198	0	1	1	0	3	4	2	209	96
Pilotage	206	2	0	0	1	0	0	0	209	99.5
Towage	208	0	0	1	0	0	0	0	209	99.5

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.*

The *berth availability* indicator measures the proportion of ship arrivals where a berth is available within four hours of the scheduled berthing time. Figure 7 shows that berth availability for the sample of ship calls was 96 per cent in the March quarter 2002. This was slightly higher than in the previous quarter. 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.

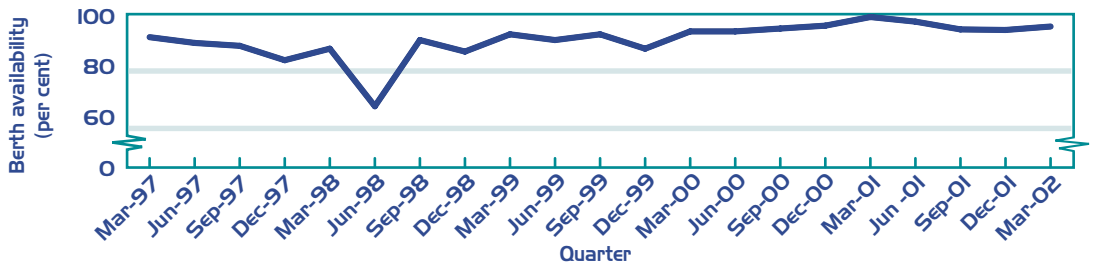
Average waiting time for ships unable to obtain a berth within four hours of the scheduled berthing time was 19 hours in the March quarter 2002, an increase from 13 hours in the previous quarter.

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 proportion was 99.5 per cent for the pilotage indicator in the March quarter 2002, virtually unchanged from the previous quarter. The proportion was 99.5 per cent for the towage indicator in the March quarter 2002, slightly lower than in the December quarter 2002. Performance has been at similar levels since the first data (covering the March quarter 1997) were published in *Waterline*.

Other waiting time

The five 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.

FIGURE 7 BERTH AVAILABILITY AT MAJOR CONTAINER TERMINALS, 1997–2002



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

Table 3 summarises the data on other waiting time incidents, which had a duration of at least one hour, in the March quarter 2002. The shipping lines identified a total of 101 incidents (affecting 71 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 largest single source of other ship waiting time in the March quarter 2002 was the category of awaiting labour, which accounted for 24 per cent of total waiting time. Early ship arrival accounted for 14 per cent of total waiting time, and stevedoring finished early was related to a further 10 per cent of total waiting time.

TABLE 3 OTHER SHIP WAITING TIME INCIDENTS AT THE FIVE MAINLAND CAPITAL CITY PORTS, MARCH QUARTER 2002

(Number of incidents)

	Ship waiting time (hrs)							Total no. of
Incident type	1	2	3	4	5–10	11–20	>20	incidents
Awaiting labour	10	7	3	4	5	1	0	30
Early ship arrival	1	4	5	3	1	1	0	15
Stevedoring finished early	1	5	5	2	1	0	0	14
Crane breakdown	4	3	1	1	2	0	0	11
Pilot/tug booking not at preferred time	5	2	0	1	1	0	0	9
Weather or tides	1	1	1	1	3	0	0	7
Other	1	1	0	0	0	3	1	6
Ship repairs or maintenance	0	1	0	0	0	2	0	3
Stevedoring finished late	0	0	2	0	1	0	0	3
Late ship arrival	0	0	1	0	0	0	1	2
Industrial action	1	0	0	0	0	0	0	1
Total incidents	**24**	**24**	**18**	**12**	**14**	**7**	**2**	**101[a]**

a. *These incidents affected 71 of 163 ship calls covered in table 2.*

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

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In the March quarter 2002, 34 per cent of ship calls in the sample were affected by other waiting time incidents that had a duration of at least one hour, down from 39 per cent in the December quarter 2001. The average duration of other waiting time incidents was 6.0 hours per affected ship call in the March quarter 2002, down from 8.2 hours per affected ship call in the previous quarter.

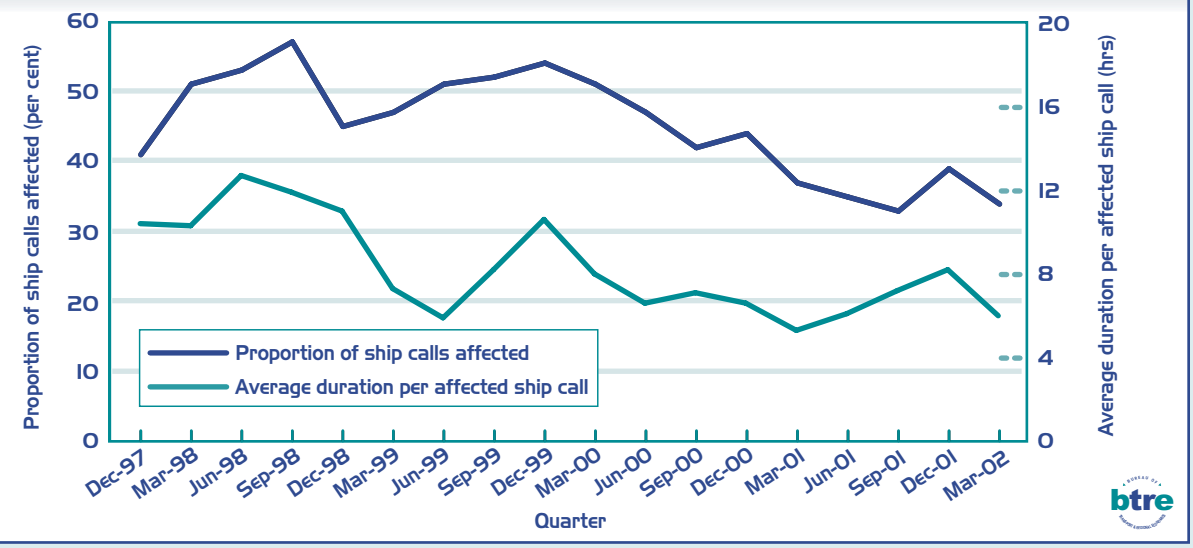
Figure 8 provides information on other ship waiting time over the period since the December quarter 1997. It indicates the proportion of ship calls affected and the average duration of other waiting time per affected ship call in each quarter.

Stevedoring

Table 4 presents the available information on two aspects of stevedoring reliability at major container terminals — stevedoring rate and cargo receival. Data were not available for Adelaide.

Stevedoring rate provides a partial indicator of the variability of stevedoring productivity at each port. It measures how consistently each port achieved its average crane rate for the quarter. Stevedoring rate 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. The stevedoring rate in the

FIGURE 8 OTHER SHIP WAITING TIME INCIDENTS AT MAJOR CONTAINER TERMINALS, 1997–2002



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

March quarter 2002 remained similar at Fremantle and Melbourne compared with that for the December quarter 2001, while there were falls at Sydney and Brisbane.

Cargo receival is the proportion of receivals (exports) completed by the stevedore's cut-off time. It provides a partial measure of one factor that can affect container terminal performance. Cargo receival in the March quarter 2002 changed little compared with the previous quarter at all ports providing data.

Ship arrival

Table 4 includes data for two indicators of ship arrival advice. Data were not available for Melbourne for the December quarter 2001 and the March quarter 2002.

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 improved at Brisbane, Adelaide and Sydney, while remaining similar at Fremantle, in the March quarter 2002.

The second indicator is the proportion of ship arrivals within one hour (plus or minus) of the last scheduled arrival time *advised inside the 24 hours prior to actual arrival.* In the March quarter 2002, this indicator also improved at Brisbane and Sydney, remaining similar at Adelaide and Fremantle.

TABLE 4 STEVEDORING AND SHIP ARRIVAL RELIABILITY INDICATORS, DECEMBER QUARTER 2001 AND MARCH QUARTER 2002

(per cent)

Indicator	Brisbane		Sydney		Melbourne		Adelaide		Fremantle	
	Oct-Dec	Jan-Mar	Oct-Dec	Jan-Mar	Oct-Dec	Jan-Mar	Oct-Dec	Jan-Mar	Oct-Dec	Jan-Mar
Stevedoring										
Stevedoring rate	65	55	66	56	59	59	na	na	36	35
Cargo receival	97	97	84	84	94	94	na	na	96	96
Ship arrival										
Advice at 24 hrs	65	73	60	67	na	na	54	70	52	54
Advice inside 24 hrs	94	97	94	99	na	na	95	96	81	80

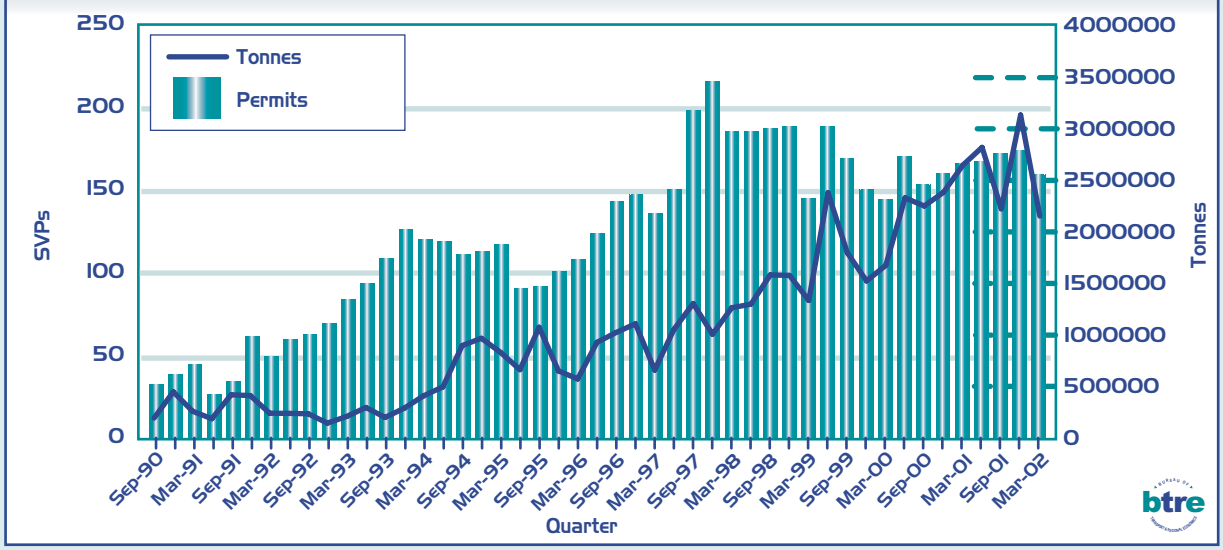
na *not available*

Sources *AAPMA, Patrick and P&O Ports.*

COASTAL SHIPPING PERMITS

Total cargo moved under single voyage permits (SVPs) and continuing voyage permits (CVPs) rose from 9.8 million tonnes in 2000 to 13 million tonnes in 2001 (an increase of 32 per cent).

FIGURE 9 TONNES CARRIED VIA SINGLE VOYAGE PERMITS, 1990–2002



Source *Transport Regulation Division, Department of Transport and Regional Services*

Single voyage permits

Figure 9 illustrates the number of SVPs issued, and tonnes of cargo carried, between the September quarter 1990 and March quarter 2002. The number of SVPs issued in the March quarter 2002 decreased by 9 per cent compared with the December quarter 2001, and by 4 per cent compared with the March quarter 2001. The associated tonnes of cargo carried decreased by 31 per cent compared with the December quarter 2001, and by 19 per cent compared with the March quarter 2001.

The total number of SVPs issued in 2001 was 675, compared with 623 in 2000, representing an increase of 8 per cent. Over the same period, SVP cargo rose from 8.6 million tonnes to 10.8 million tonnes, an increase of 25 per cent.

TABLE 5 SUMMARY OF SINGLE VOYAGE PERMITS ISSUED, 1 OCTOBER 2001 TO 31 MARCH 2002

Cargo category	Permits issued	Tonnes carried
Bulk cargo		
Petroleum products	25	552 250
Crude oil & feedstocks	21	829 887
Liquefied gas	13	26 350
Other bulk liquids	36	185 360
Dry bulk	112	3 110 012
General Cargo	124	344 204
Total	**331**	**5 048 063**

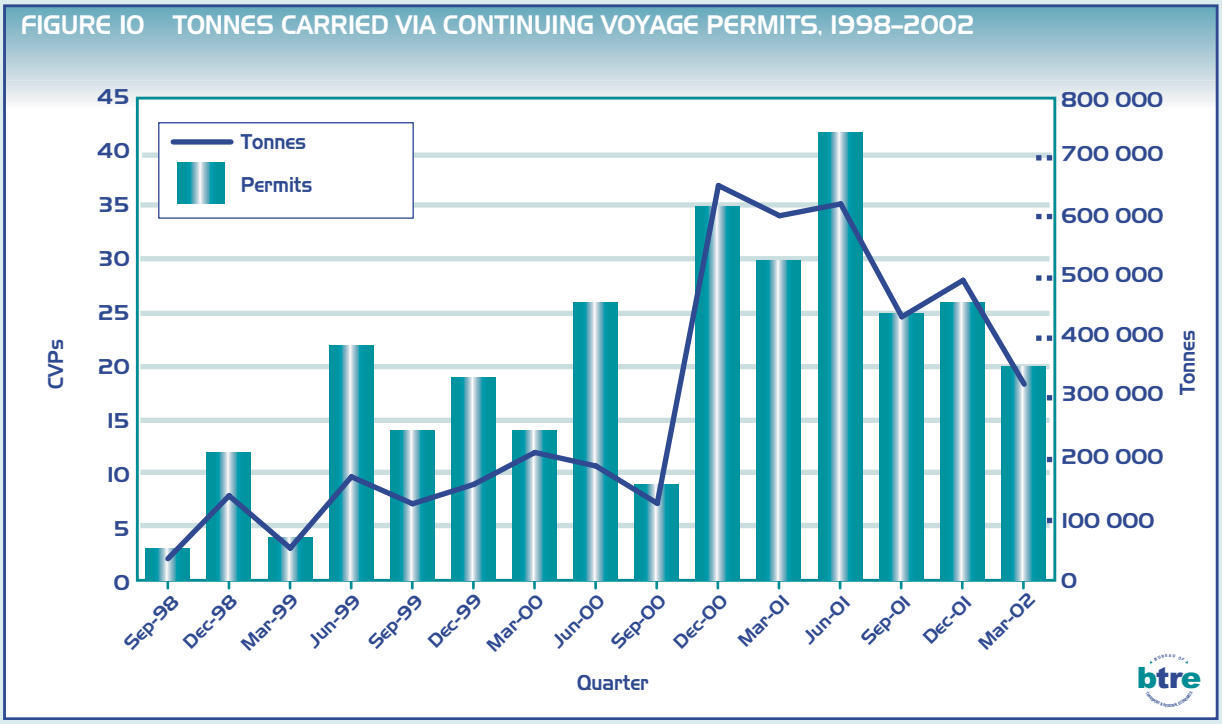
Source *Transport Regulation Division of the Department of Transport and Regional Services.*

Table 5 gives a breakdown of SVPs by cargo types for the six months between 1 October 2001 and 31 March 2002. General cargo (including containerised cargo) permits continue to lead the tally for SVP permits issued. However, bulk cargo accounts for over 93 per cent of the total tonnage moved under SVPs.

Continuing voyage permits

Although CVPs were available, they were rarely requested or issued prior to 1998. However, as shown in figure 10, since 1998 there have been significant quarterly fluctuations in both the number of permits issued and the tonnage carried. During 2001, there were 123 CVPs issued, compared with 84 in 2000. Approximately 2 million tonnes of coastal trade were moved using CVPs in 2001, representing an increase of 83 per cent compared with 2000. Each CVP covers a six-month period, which is equivalent to approximately six voyages that may otherwise have been undertaken under SVPs.

FIGURE 10 TONNES CARRIED VIA CONTINUING VOYAGE PERMITS, 1998–2002



Source *Transport Regulation Division, Department of Transport and Regional Services*

General information

Part VI of the *Navigation Act 1912* provides for licensed vessels to carry passengers and cargo in the coasting trade. The Act does not restrict the class of vessels that may obtain a coasting trade licence. Any ship, regardless of registry, is able to obtain a licence provided the crew is paid Australian wage rates while it is engaged in the coasting trade, and the ship is not in receipt of foreign government subsidies and has not received such a subsidy in the previous twelve months.

Ships that obtain a licence must also conform to the requirements of the Navigation Act, including specified safety, manning, and crew qualifications, and rehabilitation and compensation provisions. Where suitable licensed vessels are not available, the Act also provides for the issue of single or continuing voyage permits to unlicensed vessels, where this is considered to be in the public interest. The application fee is $200 for a cargo SVP, $400 for an urgent cargo SVP, and $400 for a CVP. A fee of $22 applies for obtaining a coasting trade licence.

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

TABLE 6 CONTAINER TERMINAL PERFORMANCE INDICATORS, SELECTED AUSTRALIAN PORTS— PRODUCTIVITY IN TEUS PER HOUR

	Mar-98	Jun-98	Sep-98	Dec-98	Mar-99	Jun-99	Sep-99	Dec-99	Mar-00	Jun-00	Sep-00	Dec-00	Mar-01	Jun-01	Sep-01	Dec-01	Mar-02
Five Ports																	
Ships handled	909	845	1020	942	942	958	979	933	875	808	840	814	787	813	825	846	824
Total teus	527 881	514 409	633 107	612 019	573 444	602 501	660 593	726 590	678 046	666 967	708 433	731 936	634 003	661 326	762 202	787 093	724 311
Crane rate	23.5	23.6	24.4	24.2	25.5	25.9	25.4	24.8	26.6	30.4	33.2	34.2	35.4	35.2	34.2	34.8[r]	35.4
Elapsed rate	na	na	na	na	na	na	30.1	30.8	33.3	40.0	38.0	37.6	38.6	37.8	39.2	39.6	39.6
Ship rate	29.6	31.3	31.3	34.7	36.2	37.3	37.7	37.8	41.7	49.5	50.8	53.2	54.3	53.3	55.0	55.4[r]	55.4
Brisbane																	
Ships handled	170	168	192	180	176	193	224	232	219	178	187	179	167	188	175	198	202
Total teus	58 857	74 023	87 373	84 200	75 444	88 311	98 944	106 096	97 431	90 932	103 654	107 812	81 864	108 810	105 746	112 586	100 033
Crane rate	21.6	21.6	22.5	20.9	22.6	23.4	23.3	24.6	26.4	30.5	33.4	34.0	35.5	35.1	32.7	32.1	68.4
Elapsed rate	19.9	21.5	23.6	24.7	26.3	26.7	24.7	27.0	29.8	33.4	30.0	29.7	29.6	30.2	28.7	28.5	57.2
Ship rate	23.0	25.4	27.5	28.7	30.6	32.2	31.2	33.1	36.1	42.3	45.1	44.5	46.1	46.5	46.8	45.5	93.8
Sydney																	
Ships handled	238	219	267	230	221	243	259	244	221	218	223	211	201	202	208	206	196
Total teus	176 496	168 234	209 619	203 042	187 287	203 536	226 784	260 927	229 014	224 445	237 843	240 720	203 217	205 126	242 823	252 521	228 723
Crane rate	22.5	21.8	21.6	20.4	23.2	24.0	23.7	22.1	24.8	30.9	33.1	33.2	34.7	34.0	34.4	35.2	36.8
Elapsed rate	25.6	26.1	25.4	24.8	29.6	29.3	30.6	30.1	34.0	44.1	40.5	39.0	39.7	38.2	42.5	42.7	43.9
Ship rate	33.1	33.9	32.0	32.3	38.8	38.0	38.9	36.8	43.0	55.4	53.9	55.8	56.6	54.1	60.1	60.2	60.7
Melbourne																	
Ships handled	276	234	309	274	271	282	278	266	247	217	227	218	214	215	243	249	234
Total teus	207 346	185 803	242 456	219 549	206 727	215 379	241 775	257 147	243 277	236 306	253 568	255 022	226 612	228 400	285 947	294 753	274 108
Crane rate	24.3	24.3	26.1	27.7	27.5	28.1	27.4	26.5	27.9	30.3	33.5	34.7	35.3	35.7	33.9	35.0	35.1
Elapsed rate	25.3	26.8	28.4	31.7	30.2	33.1	32.4	33.4	33.8	40.5	40.9	41.1	41.9	41.0	40.7	41.9	42.0
Ship rate	28.6	30.7	31.9	39.7	36.9	39.7	39.9	40.4	43.0	49.4	53.8	57.6	57.5	57.3	56.2	57.1	57.9
Adelaide																	
Ships handled	60	66	63	74	73	66	62	62	56	56	62	63	57	57	57	57	54
Total teus	22 260	27 975	25 493	32 556	31 326	29 569	28 271	30 597	27 736	30 551	30 945	35 339	32 251	33 308	34 867	36 633	31 815
Crane rate	27.5	27.7	27.6	28.7	30.0	27.9	27.2	27.2	29.4	27.8	29.1	32.2	33.5	33.4	32.1	32.8	33.0
Elapsed rate	36.3	36.5	34.5	36.2	36.8	36.3	34.7	35.9	36.8	36.7	37.0	37.2	42.6	44.9	38.6	40.8	42.2
Ship rate	37.6	37.8	36.0	37.6	39.7	37.6	37.2	38.8	39.7	41.1	41.0	41.5	46.5	49.5	42.7	44.7	46.5
Fremantle																	
Ships handled	165	158	189	184	201	174	156	129	132	139	141	143	148	151	142	136	138
Total teus	62 922	58 374	68 166	72 672	72 660	65 706	64 819	71 823	80 588	84 733	82 423	93 043	90 059	85 682	92 819	90 600	89 632
Crane rate	24.5	26.7	27.9	25.7	26.6	27.3	26.1	27.2	27.4	30.5	33.5	36.5	37.7	37.9	37.4	37.5[r]	35.4
Elapsed rate	na	na	na	na	na	na	25.8	27.9	33.0	36.0	32.4	33.6	34.5	35.0	37.8	36.6	32.8
Ship rate	26.4	29.8	30.2	31.7	32.0	33.4	35.3	38.8	41.6	44.7	43.2	48.7	51.3	50.8	52.3	53.0[r]	46.6

na not available

r revised

Notes 1. Data from CSX World Terminals at Brisbane are incorported from the December quarter 1999 until June quarter 2001.

2. For data back to the December quarter 1989, refer to Waterline 15.

Sources Patrick, P&O Ports and CSX World Terminals.

Canberra October 2–4 2002

25th Australasian Transport Research Forum *(ATRF);* *incorporating the BTRE* Transport Policy Colloquium

Held over 3 days from Wednesday October 2 to Friday October 4 2002

National Convention Centre Canberra

The 25th *Australasian Transport Research Forum (ATRF) will be hosted by the Bureau of Transport and Regional Economics (BTRE) in Canberra from Wednesday 2 to Friday 4 October 2002.*

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ABBREVIATIONS

AAPMA	Association of Australian Ports and Marine Authorities
ABS	Australian Bureau of Statistics
ACCC	Australian Competition and Consumer Commission
BTRE	Bureau of Transport and Regional Economics
EBIT	Earnings before interest and tax
GRT	Gross Registered Tonnage
MUA	Maritime Union of Australia
NRT	Net Registered Tonnage
teu	Twenty-foot equivalent unit
UCC	Container ship

DEFINITIONS

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

Elapsed labour 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 ship rate—the number of containers or teus moved per net hour.

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

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