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

waterline

issue 37 September 2004

waterline issue 37 September 2004

in brief

- In January–June 2004, total cargo throughput and total container traffic reached new records of 57.7 million tonnes and 2.140 million teus respectively (page 19).
- The five-port average crane rate increased steadily from 27.2 containers per hour in the December quarter 2003 to 27.7 in the March quarter 2004, reaching a record 28.2 containers per hour in the June quarter 2004 (page 3).
- The five-port average vessel working rate also increased over the period from 33.3 containers per hour in the December quarter 2003 to 33.7 in the March quarter 2004 and to 34.1 in the June quarter 2004 (page 3).
- The five port total of container moves increased from 698 685 in the March quarter 2004 to a record 737 231 in the June quarter 2004 (page 3).
- Harbour towage charges decreased at Sydney (page 20).
- The national port interface cost index for exporting a container has fallen to $572/teu in 2001 constant prices (page 10).
- Berth availability was 91.0 per cent in the March Quarter 2004 and 92.7 per cent in the June Quarter 2004 (page 23).
- The tonnage of cargo estimated to be moved under coastal permits decreased from 7.5 million tonnes for July–December 2003 to 6.9 million tonnes for January–June 2004 (page 21).
- Total ship visits increased by 3.6 per cent in the year ended June 2004 (page 17).

Waterline is 10 years old

July 2004 marks the 10th anniversary of *Waterline*. This issue contains a special feature on the changing face of the waterfront from 1993 to 2004 as reported in the pages of *Waterline*.

internet

addresses

Download this issue of *Waterline* and back issues:
http://www.btre.gov.au/wline.htm

Bureau of Transport and Regional Economics home page:
http://www.btre.gov.au

STEVEDORING PRODUCTIVITY

Table 1 presents the June quarter 2002 to June quarter 2004 indicators of stevedoring productivity at the five major Australian container ports, expressed in container moves per hour. Figures 1 to 6 present these data over the June quarter 1998 to June quarter 2004 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.

National crane rate productivity, as measured by the five port average, increased to 27.7 containers per hour in the March quarter 2004 (6.1 per cent higher than the March quarter 2003 rate of 26.1). In the June quarter 2004, the crane rate rose again by 1.8 per cent to 28.2 containers per hour (2.5 per cent higher than the June quarter 2003 rate of 27.5).

In summary:

- the five-port average crane rate (average productivity per crane while the ship is worked) was 27.8 in the September quarter 2003, 27.2 in the December quarter 2003, 27.7 in the March quarter 2004, and 28.2 containers per hour for the June quarter 2004, a new record;
- the five-port total of container moves increased from 698 685 in the March quarter 2004 to a new record high of 737 231 moves in the June quarter 2004, an increase of 0.4 per cent on the previous record in December 2003 of 734 597 containers;
- the five-port average vessel working rate (productivity per ship based on the time labour is aboard the ship) was 34.4 in the September quarter 2003, 33.3 in the December quarter 2003, 33.7 in the March quarter 2004, and 34.1 containers per hour in the June quarter 2004, which was 4.9 per cent higher than the rate of 32.5 achieved in the June quarter 2003.

The *Brisbane* (P&O Ports, Patrick) average crane rate increased from 25.7 in the December quarter 2003 to 26.3 in the March quarter 2004, and again to 27.3 containers per hour in the June quarter 2004, a new record. The vessel working rate also increased from 26.3 containers per hour in the December quarter 2003 to 27.0 in the March quarter 2004, and to a new record of 29.7 in the June quarter 2004.

The *Sydney* (P&O Ports, Patrick) average crane rate increased from 26.2 in the December quarter 2003 to 26.7 in the March quarter 2004, and again to 27.5 containers per hour in the June quarter 2004. The vessel working rate increased to 33.1 containers per hour in the December quarter 2003 to 36.2 in the March quarter 2004, and decreased to 35.9 in the June quarter 2004.

The *Melbourne* (P&O Ports, Patrick) average crane rate increased from 28.6 in the December quarter 2003 to 29.3 in the March quarter 2004, and again to 29.4 containers per hour in the June quarter 2004. The vessel working rate fell from a record 38.1 containers per hour in the December quarter 2003 to 36.5 in the March quarter 2004 and decreased further to 36.3 in the June quarter 2004.

The *Adelaide* (CSX World Terminals) average crane rate decreased from 28.2 in the December quarter 2003 to 28.1 in the March quarter 2004, and increased to 28.3 containers per hour in the June quarter 2004. The vessel working rate fell from a record 33.7 containers per hour in the December quarter 2003 to 32.8 in the March quarter 2004, and decreased further to 31.5 in the June quarter 2004.

The *Fremantle* (P&O Ports, Patrick) average crane rate was 27.0 in the December quarter 2003 and March quarter 2004, and increased slightly to 27.1 containers per hour in the June quarter 2004. The vessel working rate fell from 28.8 containers per hour in the December quarter 2003 to 28.0 in the March quarter 2004, and increased to 28.6 in the June quarter 2004.

Overall, stevedoring (or crane-rate) variability was reasonably stable over the December 2003 to June 2004 quarters, except for Fremantle, where the stevedoring variability rate of 52 per cent in the December quarter 2003 dropped to 41 per cent in the March quarter 2004 and again to 38 per cent in the June quarter 2004.

Teus per hour

Table 16 on page 27 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. The trend towards a larger proportion of 40-foot containers continues, increasing from 33 per cent of the five-port total in June 2002 to 38 per cent in June 2004.

Waterline 37 September 2004

TABLE 1 CONTAINER TERMINAL PERFORMANCE INDICATORS— PRODUCTIVITY IN CONTAINERS PER HOUR

	Quarter								
Port / Indicator	**Jun-02**	**Sep-02**	**Dec-02**	**Mar-03**	**Jun-03**	**Sep-03**	**Dec-03**	**Mar-04**	**Jun-04**
Five ports									
Ships handled	868	858	856	821	822	841	850	801	825
Total containers	591 247	645 506	685 458	643 406	639 157	686 067	734 597	698 685	737 231
Crane rate	26.9	26.4	26.0	26.1	27.5	27.8	27.2	27.7	28.2
Vessel working rate	30.7	31.9	30.7	31.6	32.5	34.4	33.3	33.7	34.1
Crane time not worked (per cent)	27	28	29	27	28	29	28	28	28
40-foot containers (per cent)	33	36	37	35	36	39	39	38	38
Ship rate	42.1	44.0	43.4	43.4	45.1	48.3	46.1	46.7	47.6
Throughput pbm	83	90	96	90	90	96	103	98	103
Brisbane									
Ships handled	211	216	216	206	184	192	194	179	175
Total containers	94 230	103 537	107 692	98 482	92 872	107 257	114 580	106 652	110 300
Crane rate	27.2	26.1	26.7	25.5	26.7	25.5	25.7	26.3	27.3
Vessel working rate	23.2	24.2	24.1	24.7	27.0	24.9	26.3	27.0	29.7
Crane time not worked (per cent)	38	36	40	35	34	36	35	36	34
40-foot containers (per cent)	29	32	34	32	34	37	38	37	37
Stevedoring variability (per cent)	54	53	57	52	54	58	52	57	54
Ship rate	37.2	37.9	40.4	38.1	41.1	39.2	40.6	42.2	44.8
Throughput pbm	59	64	67	61	58	67	71	66	69
Sydney									
Ships handled	203	204	210	211	217	228	238	221	231
Total containers	172 599	200 825	215 863	201 358	194 177	215 321	236 567	217 419	231 556
Crane rate	27.4	26.3	25.2	25.9	27.2	28.0	26.2	26.7	27.5
Vessel working rate	34.3	35.8	32.7	33.5	35.4	37.8	33.1	36.2	35.9
Crane time not worked (per cent)	26	25	26	25	26	27	27	25	25
40-foot containers (per cent)	37	38	40	38	40	41	42	41	42
Stevedoring variability (per cent)	46	59	56	48	50	41	49	54	51
Ship rate	46.1	47.4	44.2	44.8	48.0	51.8	45.5	48.2	47.7
Throughput pbm	89	103	111	104	100	111	122	112	119
Melbourne									
Ships handled	251	250	243	229	235	240	241	223	244
Total containers	221 786	239 564	250 679	234 243	240 028	246 024	259 334	254 261	273 495
Crane rate	26.7	26.9	26.1	26.1	27.8	28.5	28.6	29.3	29.4
Vessel working rate	31.9	33.4	32.0	33.7	33.0	37.2	38.1	36.5	36.3
Crane time not worked (per cent)	28	28	29	26	27	28	26	28	30
40-foot containers (per cent)	33	36	37	36	37	39	39	38	39
Stevedoring variability (per cent)	62	66	63	63	52	57	58	62	66
Ship rate	44.0	46.7	45.3	45.6	45.1	52.0	51.6	50.5	52.0
Throughput pbm	121	131	137	128	131	135	142	139	150
Adelaide									
Ships handled	59	55	58	50	58	62	63	60	60
Total containers	32 735	28 815	30 214	29 401	32 093	35 221	36 954	35 100	35 207
Crane rate	24.0	23.3	24.0	25.9	27.4	28.0	28.2	28.1	28.3
Vessel working rate	34.3	32.6	34.0	36.2	36.0	31.1	33.7	32.8	31.5
Crane time not worked (per cent)	8	6	11	12	15	18	13	13	13
40-foot containers (per cent)	28	30	30	28	25	26	29	25	26
Stevedoring variability (per cent)	na	na	na	na	na	na	na	na	na
Ship rate	37.1	34.5	38.2	41.3	42.4	37.7	38.7	37.9	36.1
Throughput pbm	70	61	64	63	68	75	79	75	75
Fremantle									
Ships handled	144	133	129	125	128	119	114	118	115
Total containers	69 897	72 765	81 010	79 922	79 987	82 244	87 162	85 253	86 673
Crane rate	27.4	27.1	28.1	27.5	28.1	28.1	27.0	27.0	27.1
Vessel working rate	26.7	26.5	28.9	27.8	28.6	30.4	28.8	28.0	28.6
Crane time not worked (per cent)	25	30	30	31	35	32	31	31	31
40-foot containers (per cent)	34	36	37	34	33	38	37	36	34
Stevedoring variability (per cent)	40	35	36	44	49	46	52	41	38
Ship rate	35.5	37.7	41.2	40.5	44.1	44.9	41.7	40.6	41.6
Throughput pbm	54	56	63	62	62	64	67	66	67

na not available

pbm per berth metre

Notes 1. The definitions used in compiling the stevedoring productivity data are detailed in Waterline 33, pages 15-17.

2. The data in this table are expressed in container moves per hour and therefore are not directly comparable with the teus per hour data in table 16.

3. Crane time not worked is the difference between the ship and elapsed rates as percentage of the ship rate.

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

Waterline 37 September 2004

CONTAINER TERMINAL PRODUCTIVITY

FIGURE 1 FIVE MAJOR PORTS

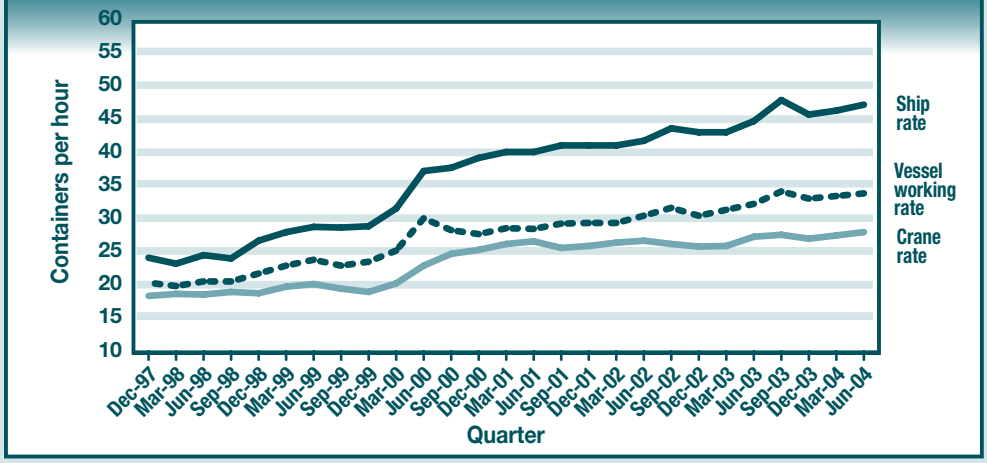


FIGURE 2 BRISBANE

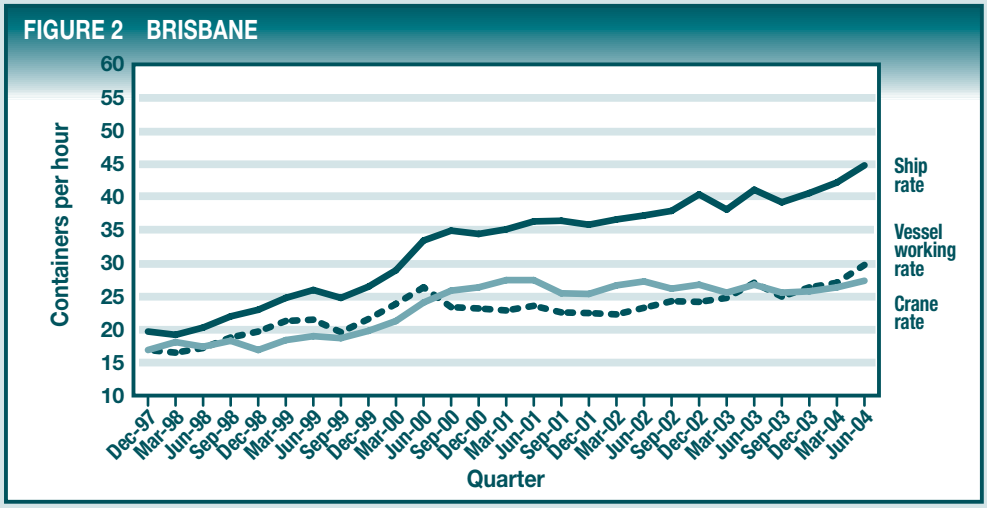
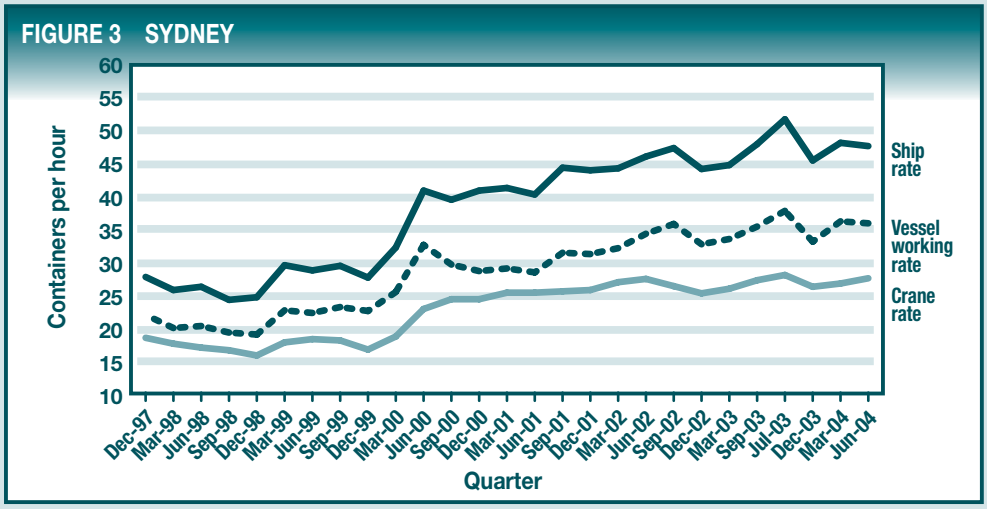


FIGURE 3 SYDNEY



Note *These figures are based on data contained in table 1. Readers should refer to the notes in that table.*

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

Waterline 37 September 2004

CONTAINER TERMINAL PRODUCTIVITY

FIGURE 4 MELBOURNE

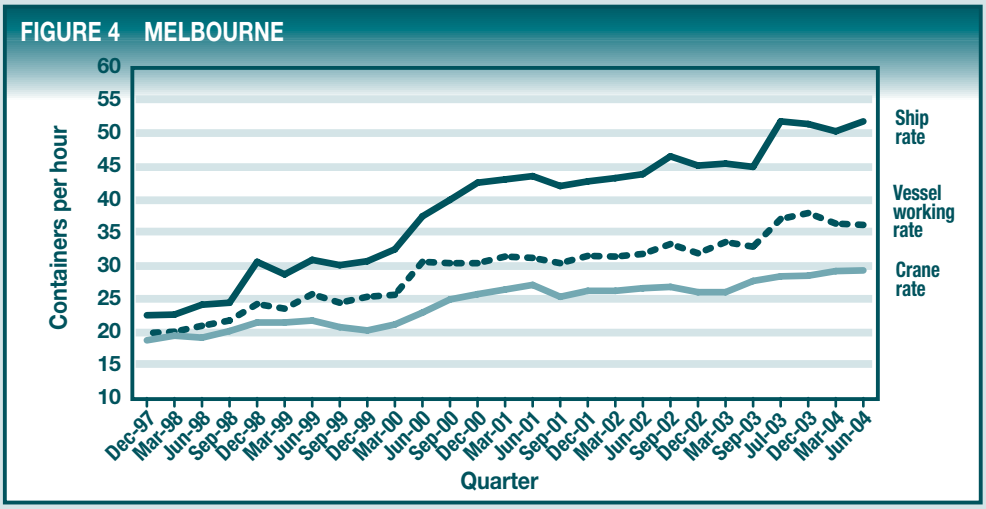


FIGURE 5 ADELAIDE

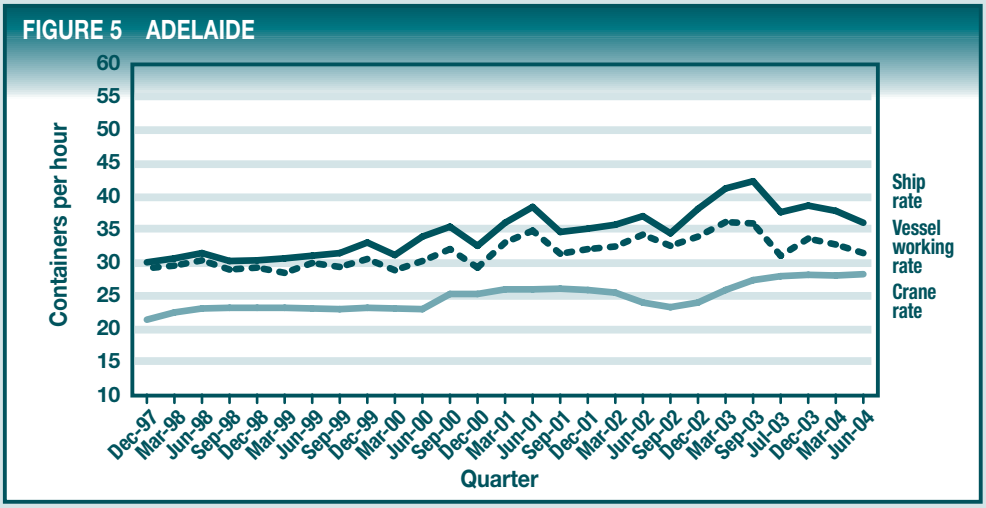
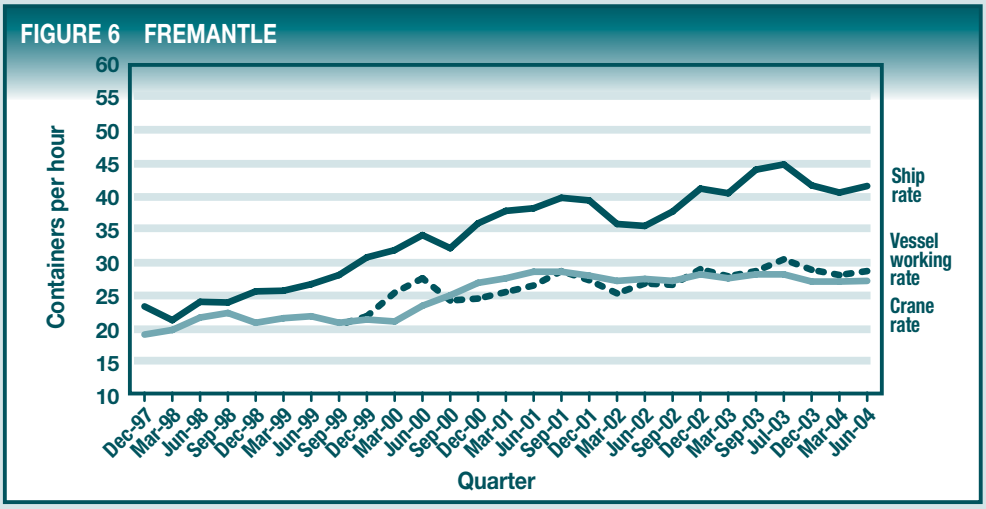


FIGURE 6 FREMANTLE



Note *These figures are based on data contained in table 1. Readers should refer to the notes in that table.*

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

Waterline 37 September 2004

PORT INTERFACE COST INDEX

The port interface cost index provides a measure of shore-based shipping costs (charges) for containers moved through Australian mainland capital city ports. These five ports account for approximately 90 per cent of Australia's container traffic. Data for July–December 2003 and January–June 2004 are presented in tables 2 to 6. 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.

TABLE 2 PARAMETERS USED IN THE PORT INTERFACE COST INDEX, 2003–04

	Brisbane		Sydney		Melbourne		Adelaide		Fremantle	
	Jul-Dec 2003	Jan-Jun 2004	Jul-Dec 2003	Jan-Jun 2004	Jul-Dec 2003	Jan-Jun 2004	Jul-Dec 2003	Jan-Jun 2004	Jul-Dec 2003	Jan-Jun 2004
Vessel size GT 17 215										
Average Teus exchanged[a]										
All	662	629	795	977	957	1243	552	504	1027	1167
Loaded	551	504	674	823	870	1071	466	369	826	985
Empty	111	125	121	154	87	173	86	136	202	182
Loaded inwards	370	318	434	537	456	549	114	120	658	406
Loaded outwards	182	185	240	286	414	522	352	249	168	579
Ship call parameters[a]										
Number of port calls	8	4	3	2	4	2	3	1	3	3
Elapsed berth time (hrs)	27	26	31	27	28	35	19	18	31	31
Vessel size GT 37 394										
Average Teus exchanged[b]										
All	1143	1263	1846	1783	1879	1921	618	653	726	726
Loaded	773	859	1383	1280	1473	1560	453	499	588	522
Empty	370	404	463	503	405	360	165	154	138	204
Loaded inwards	418	498	994	885	885	862	149	188	321	311
Loaded outwards	355	361	389	396	588	698	305	311	268	211
Ship call parameters[b]										
Number of port calls	4	3	4	3	4	3	3	2	6	4
Elapsed berth time (hrs)	36	34	40	36	36	38	19	20	24	24

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

Port and related charges

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

Tables 3 and 4 provide the port and related charges at the five mainland capital city ports for the 15 000 to 20 000 GT range and the 35 000 to 40 000 GT range respectively, for July–December 2003 and January–June 2004. Port and related charges comprise ship-based charges and cargo-based charges.

Ship-based charges

While overall ship-based charges changed little in January–June 2004, there were some significant changes in charges per teu, mainly reflecting the variation in the average number of teus exchanged per ship call.

Compared to the previous period, the overall changes in total ship-based charges per teu in January–June 2004 for ships in the 15 000 to 20 000 GT range were:

- *Brisbane* — 13 per cent increase;
- *Sydney* — 19 per cent decrease;
- *Melbourne* — 23 per cent decrease;
- *Adelaide* — 13 per cent increase; and
- *Fremantle* — 12 per cent decrease.

For ships in this range, the average number of teus exchanged decreased by 5 per cent at Brisbane and 9 per cent at Adelaide, but increased by 23 per cent at Sydney, 30 per cent at Melbourne and 14 per cent at Fremantle when compared to the previous period.

Waterline 37 September 2004

TABLE 3 PORT AND RELATED CHARGES FOR SHIPS IN THE 15 000-20 000 GT RANGE, 2003–04

	Brisbane		Sydney		Melbourne		Adelaide		Fremantle	
	Jul-Dec 2003	Jan-Jun 2004	Jul-Dec 2003	Jan-Jun 2004	Jul-Dec 2003	Jan-Jun 2004	Jul-Dec 2003	Jan-Jun 2004	Jul-Dec 2003	Jan-Jun 2004
Ship-based charges ($/teu)										
Conservancy	1.92	4.05	-	-	-	-	3.15	5.34	-	-
Tonnage	-	-	9.29	7.56	5.45	4.19	8.48	9.09	2.71	2.39
Pilotage	9.38	9.87	4.17	3.39	6.84	5.26	5.15	5.64	2.24	1.97
Towage	13.47	14.18	11.21	9.12	9.57	7.36	27.58	30.19	4.89	4.31
Mooring, unmooring	2.81	2.95	3.97	3.14	1.10	0.84	-	-	0.86	0.75
Berth hire[a]	-	-	-	-	-	-	-	-	-	-
Total[b]	27.58	31.07	28.64	23.21	22.96	17.66	44.36	50.25	10.70	9.42
Cargo-based charges ($/teu)										
Wharfage										
Imports	28.6	28.6	66	66	31.24	31.24	58.3	58.3	49.5	49.5
Exports	28.6	28.6	49.5	49.5	31.24	31.24	58.3	58.3	49.5	49.5
Harbour dues	46.2	46.2	-	-	-	-	-	-	-	-
Berth charge	-	-	-	-	-	-	-	-	15.29	15.29
Total port and related charges ($/teu)[b]										
Loaded imports	102	106	95	89	54	49	103	109	75	74
Loaded exports	102	106	78	73	54	49	103	109	75	74
Charges per ship visit ($/visit)										
Total ship-based charges	18255	19529	22771	22684	21962	21962	24481	25337	10995	10995
Empty teus[c]	1727	1951	-	-	-	-	-	-	-	-

- 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 2.

Sources BTRE estimates based on: ship call data supplied by relevant port authorities/corporations, and price schedules of relevant port authorities/corporations, towage operators and pilotage service providers.

TABLE 4 PORT AND RELATED CHARGES FOR SHIPS IN THE 35 000-40 000 GT RANGE, 2003–04

	Brisbane		Sydney		Melbourne		Adelaide		Fremantle	
	Jul-Dec 2003	Jan-Jun 2004	Jul-Dec 2003	Jan-Jun 2004	Jul-Dec 2003	Jan-Jun 2004	Jul-Dec 2003	Jan-Jun 2004	Jul-Dec 2003	Jan-Jun 2004
Ship-based charges ($/teu)										
Conservancy	4.84	4.38	-	-	-	-	4.97	5.42	-	-
Tonnage	-	-	8.69	8.99	6.03	5.90	10.52	10.43	8.34	8.34
Pilotage	7.82	7.08	3.05	3.16	4.42	4.33	6.64	6.28	3.17	3.17
Towage	9.86	8.92	5.14	5.32	5.21	5.10	31.71	30.01	10.26	10.26
Mooring, unmooring	1.62	1.47	2.13	2.02	0.56	0.55	-	-	1.21	1.21
Berth hire[a]	-	-	-	-	-	-	-	-	-	-
Total[b]	24.14	21.85	19.01	19.49	16.22	15.87	53.83	52.14	22.98	22.98
Cargo-based charges ($/teu)										
Wharfage										
Imports	28.6	28.6	66	66	31.24	31.24	58.3	58.3	49.5	49.5
Exports	28.6	28.6	49.5	49.5	31.24	31.24	58.3	58.3	49.5	49.5
Harbour dues	46.2	46.2	-	-	-	-	-	-	-	-
Berth charge	-	-	-	-	-	-	-	-	15.29	15.29
Total port and related charges ($/teu)[b]										
Loaded imports	98.94	96.65	85.01	85.49	47.46	47.11	112.13	110.44	87.77	87.77
Loaded exports	98.94	96.65	68.51	68.99	47.46	47.11	112.13	110.44	87.77	87.77
Charges per ship visit ($/visit)										
Total ship-based charges	27597	27597	35091	34766	30475	30475	33270	34049	16684	16684
Empty teus[c]	5775	6315	-	-	-	-	-	-	-	-

- 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 2.

Sources BTRE estimates based on: ship call data supplied by relevant port authorities/corporations, and price schedules"of relevant port authorities/corporations, towage operators and pilotage service providers.

Waterline 37 September 2004

Compared to the previous period, the overall changes in total ship-based charges per teu in January–June 2004 for ships in the 35 000 to 40 000 GT range were:

- *Brisbane* — 9.5 per cent decrease;
- *Sydney* — 3 per cent increase;
- *Melbourne* — 2 per cent decrease;
- *Adelaide* — 3 per cent decrease; and
- *Fremantle* — no change.

In the 35 000 to 40 000 GT range, the average number of teus exchanged rose at all ports in the January–June 2004 period when compared to the previous period except Sydney, which decreased by 2 per cent and Fremantle, which remained unchanged. The increases were 10.5 per cent at Brisbane, 2 per cent at Melbourne, and 6 per cent at Adelaide.

Fremantle has the lowest ship-based charges on a per ship visit basis for ships in the 15 000 to 20 000 GT range while Melbourne has the lowest charges in the 35 000 to 40 000 GT range.

Cargo-based charges

Apart from small annual increases in wharfage charges at Melbourne, there have been no changes in cargo-based charges for the past two years.

Stevedoring charges per teu

The stevedoring charges per teu used in this issue of *Waterline* are those published in the most recently available ACCC report on stevedoring prices (2002–03 data reported in Report No. 5 of November 2003). As the report does not include charges beyond the first half of 2003, the stevedoring charges included in the port interface cost index are provisional figures and will be updated in *Waterline* 38.

Land–based charges per teu

Average customs brokers' fees and road transport charges for July–December 2003 and January–June 2004 are included in tables 5 and 6. These charges are based on data provided by some 30 customs brokers and 30 road transport operators.

Customs brokers' fees for imports are higher than fees for exports, reflecting the more complex clearance procedures for import containers. During January–June 2004 the average customs broker fee for imports increased by 3 per cent at Melbourne, decreased by 2 per cent at Adelaide and remained the same at Brisbane, Sydney and Fremantle. For exports the average fee increased by 5 per cent at Brisbane, 1 per cent at Sydney, and decreased by 5 per cent at Melbourne, 16 per cent at Adelaide, and 4 per cent at Fremantle.

Road transport charges increased at Brisbane (4 per cent), Melbourne (1 per cent), Adelaide (3 per cent), Sydney (7 per cent) and Fremantle (5 per cent). One of the parameters used to estimate road transport charges is the time taken to move containers between the wharf and the customer's warehouse. Both distance and traffic congestion impact on this parameter and, therefore, help explain the significant difference between road transport charges at Melbourne and Sydney compared with Brisbane, Adelaide and Fremantle.

Indices for individual ports

Table 5 indicates that for ships in the 15 000 to 20 000 GT range, between July–December 2003 and January–June 2004, costs per teu for import and export containers increased at Brisbane (2.1 per cent and 3.1 per cent respectively), Sydney (2.5 per cent and 2.6 per cent) and Fremantle (1.4 per cent and 1 per cent respectively. At Melbourne, import costs increased by 0.5 percent, while export costs decreased by 1 per cent, and at Adelaide, import costs increased by 1.5 per cent while export costs decreased by 0.5 per cent.

Table 6 indicates that for ships in the 35 000 to 40 000 GT range, costs per teu for import and export containers between July - December 2003 and January - June 2004 increased at Brisbane (1.3 per cent and 2.1 per cent respectively), Sydney (3.2 percent and 3.6 per cent), and Perth (1.5 per cent and 1.1 per cent). Import costs per teu at Melbourne increased by 1.1 per cent, while export costs fell marginally by 0.1 per cent. At Adelaide, import costs increased marginally by 0.2 per cent while export costs fell by 1.8 per cent. 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.

Waterline 37 September 2004

TABLE 5 PORT INTERFACE COSTS FOR SHIPS IN THE 15 000–20 000 GT RANGE, 2003–04

	Brisbane		Sydney		Melbourne		Adelaide		Fremantle	
	Jul–Dec 2003	Jan–Jun 2004	Jul–Dec 2003	Jan–Jun 2004	Jul–Dec 2003	Jan–Jun 2004	Jul–Dec 2003	Jan–Jun 2004	Jul–Dec 2003	Jan–Jun 2004
Import										
Ship-based charges	28	31	29	23	23	18	44	50	11	9
Cargo-based charges	75	75	66	66	31	31	58	58	65	65
Stevedoring[p]	169	169	169	169	169	169	169	169	169	169
Customs brokers' fees	132	132	134	134	130	134	128	125	153	153
Road transport charges[r]	214	223	337	360	306	310	191	196	192	202
Import total[a]	**617**	**630**	**734**	**752**	**659**	**662**	**590**	**599**	**590**	**598**
Export										
Ship-based charges	28	31	29	23	23	18	44	50	11	9
Cargo-based charges	75	75	50	50	31	31	58	58	65	65
Stevedoring[p]	169	169	169	169	169	169	169	169	169	169
Customs brokers' fees	99	104	111	112	81	77	92	77	75	72
Road transport charges[r]	214	223	337	360	306	310	191	196	192	202
Export total[a]	**584**	**602**	**695**	**713**	**610**	**604**	**554**	**551**	**512**	**517**

a. Components may not sum to totals due to rounding.
p. Provisional, updated annually after the release of the ACCC stevedoring monitoring report.
r. July–December figures revised since previous issue.

Notes 1. *Based on parameters described in table 2.*
2. *Waterline data on customs brokers' fees and road transport charges are collected for the purpose of monitoring trends in charges over time. They should not be used for inter-port comparisons, as sample characteristics may vary between ports.*
3. *The stevedoring charge used in Waterline is monitored by the ACCC and is the weighted average for Brisbane, Sydney, Melbourne, Adelaide, Fremantle and Burnie ports. Stevedoring charges vary between ports but detailed data for individual ports are not publicly available.*

Sources BTRE estimates based on: ship call data supplied by relevant port authorities/corporations; price schedules of relevant port authorities/corporations, towage operators and pilotage service providers; surveys of customs brokers and road transport operators; and stevedoring charge data supplied by the ACCC.

TABLE 6 PORT INTERFACE COSTS FOR SHIPS IN THE 35 000–40 000 GT RANGE, 2003–04

	Brisbane		Sydney		Melbourne		Adelaide		Fremantle	
	Jul–Dec 2003	Jan–Jun 2004	Jul–Dec 2003	Jan–Jun 2004	Jul–Dec 2003	Jan–Jun 2004	Jul–Dec 2003	Jan–Jun 2004	Jul–Dec 2003	Jan–Jun 2004
Import										
Ship-based charges	24	22	19	19	16	16	54	52	23	23
Cargo-based charges	75	75	66	66	31	31	58	58	65	65
Stevedoring[p]	169	169	169	169	169	169	169	169	169	169
Customs brokers' fees	132	132	134	134	130	134	128	125	153	153
Road transport charges[r]	214	223	337	360	306	310	191	196	192	202
Import total[a]	**613**	**621**	**689**	**748**	**653**	**660**	**600**	**601**	**602**	**611**
Export										
Ship-based charges	24	22	19	19	16	16	54	52	23	23
Cargo-based charges	75	75	50	50	31	31	58	58	65	65
Stevedoring[p]	169	169	169	169	169	169	169	169	169	169
Customs brokers' fees	99	104	111	112	81	77	92	77	75	72
Road transport charges[r]	214	223	337	360	306	310	191	196	192	202
Export total[a]	**581**	**593**	**685**	**710**	**604**	**603**	**563**	**553**	**524**	**530**

a. Components may not sum to totals due to rounding.
p. Provisional, updated annually after the release of the ACCC stevedoring monitoring report.
r. July–December figures revised since previous issue.

Notes 1. *Based on parameters described in table 2.*
2. *Waterline data on customs brokers' fees and road transport charges are collected for the purpose of monitoring trends in charges overtime. They should not be used for inter-port comparisons, as sample characteristics may vary between ports.*
3. *The stevedoring charge used in Waterline is monitored by the ACCC and is the weighted average for Brisbane, Sydney, Melbourne, Adelaide, Fremantle and Burnie ports. Stevedoring charges vary between ports but detailed data for individual ports are not publicly available.*

Sources BTRE estimates based on: ship call data supplied by relevant port authorities/corporations; price schedules of relevant port authorities/corporations, towage operators and pilotage service providers; surveys of customs brokers and road transport operators; and stevedoring charge data supplied by the ACCC.

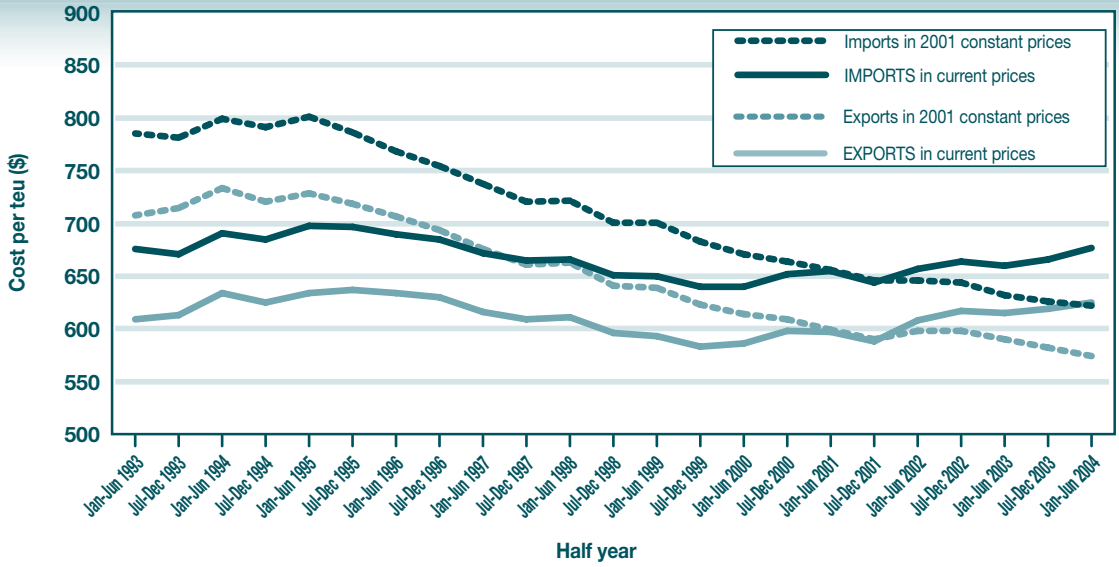
Waterline 37 September 2004

National index

Figure 7 provides the national port interface cost index for ships in the 15 000 to 20 000 GT range from 1992 onwards. In current prices, the national index for imports increased from $665 per teu in July-December 2003 to $676 in January - June 2004, and the index for exports increased from $618 per teu to $624 per teu.

In real terms (2001 prices), the national cost index per import teu has by decreased 21 per cent since 1993, and by 19 per cent per export teu.

FIGURE 7 NATIONAL PORT INTERFACE COST INDEX FOR SHIPS IN THE 15 000–20 000 GT RANGE, 1993–2004



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

Table 7 shows the national port interface cost index from July–December 2001 for ships in the 35 000 to 40 000 GT range. The national index for imports increased from $661 per teu in July–December 2003 to $674 per teu in January–June 2004 in current prices. The index for exports increased from $614 to $623 per teu in current prices.

TABLE 7 NATIONAL PORT INTERFACE COST INDEX FOR SHIPS IN THE 35 000–40 000 GT RANGE, 2001–2004

	Jul–Dec 2001	Jan–Jun 2002	Jul–Dec 2002	Jan–Jun 2003	Jul–Dec 2003	Jan–Jun 2004
IMPORTS in current prices	643	654	660	653	661	674
Imports in 2001 prices	645	643	641	625	621	619
EXPORTS in current prices	588	603	610	608	614	623
Exports in 2001 prices	589	592	592	583	577	572

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

Waterline 37 September 2004

WINDOW ON THE WATERFRONT: A DECADE OF WATERLINE

Introduction: the changing face of Waterline

2004 is the 10th anniversary of *Waterline*. The inaugural issue of *Waterline* was released on 27 July 1994 as "a biannual publication that will make available the results of the Bureau's continuing waterfront monitoring program". *Waterline's* purpose was to report on the progress of waterfront reform and emerging industry trends using rigorous methodologies.

This article tracks the changing face of the waterfront from 1993 to 2004 as reported in the pages of *Waterline*.

The choice of the Bureau to undertake reporting of waterfront performance information in *Waterline* was the natural result of its involvement in maritime research for the Australian Government over the preceding two decades. In its various guises as the Bureau of Transport Economics (BTE), Bureau of Transport and Communication Economics (BTCE), and now Bureau of Transport and Regional Economics (BTRE), the Bureau has published 56 Reports, Occasional Papers, Working Papers and Information Sheets on various aspects of the maritime industry since 1975, and 14 since 1994, not including *Waterline*.

Selected BTRE maritime publications

2004 *Australian Sea Freight 2001–2002*, Information Paper 50

2002 *Australia's Seaborne Containerised Freight* — Forecasts to 2010–11, Working Paper 50

2001 *Regional Impact of the Port of Gladstone,* Working Paper 47

2001 *Regional Impact of the Port of Mackay,* Working Paper 46

2000 *Coastal Freight in Australia 1998–99,* Information Paper 46

1995 *Review of the Waterfront Industry Reform Program,* Report 91

1994 *Adequacy of Transport Infrastructure: Seaports,* Working Paper 14.3

1993 *Port Interface Cost Index,* Report 84

The late 1980s had seen significant waterfront reform under the Waterfront Industry Reform Authority (WIRA) process. The Bureau contributed to this process by developing the Port Interface Cost Index (or PICI), first published in 1993 as Report 84.

The focus of early issues of *Waterline* was on the PICI, together with port authority financial and non–financial performance data and stevedoring performance for containerised cargo. Then, as now, all performance indicators were prepared from data provided by the industry, and *Waterline* owes its success to the assistance of the many industry participants who have contributed data over the years.

Data is provided by port authorities and corporations, towage operators and pilotage service providers, customs brokers and road transport operators, shipping lines and stevedoring companies. Some data is collected directly by the Department of Transport and Regional Services under its regulatory role of issuing coastal shipping permits. Several of the data bases used in *Waterline* were begun prior to 1994, but most have been developed and/or significantly improved during the intervening decade.

By October 1995, *Waterline* had become firmly established as a key reference document on waterfront performance, and switched to quarterly publication. *Waterline* also began featuring regular special reports on aspects of the industry, including waterfront issues, bulk cargo and handling facilities, overseas liner shipping and benchmarking against overseas ports, "to facilitate a more informed debate".

Throughout *Waterline*'s history, new indicators have been added and established indicators have been removed. In December 1996, *Waterline* began reporting on crew to berth ratios in Australian shipping and port charges. At the same time, discussions commenced with industry on development of a shipping reliability indicator, which began regular publication in June 1997. March 1998 saw the addition of reporting on single voyage permits, and continuing voyage permits were added in June 1999. In June 2000, reporting of crew to berth ratios was discontinued as the original objective, to assist the

shipping industry better understand the cost involved in crewing ships, was considered to have been largely achieved.

In March 2003, the Bureau flagged a review of the *Waterline* indicators, and sought industry comment on a number of proposed new indicators – Ship Visits by GT, Harbour Towage Charges, Terminal Land Use Rate and a new waterfront schedule reliability measure. March 2003 also saw electronic publishing of *Waterline* on the BTRE's website in PDF and HTML as the principal distribution medium, and only a limited number of hard copies of each issue is now printed.

People behind Waterline

Essential to the production of *Waterline* is an effective research team within the Bureau. The driving force behind the development and launch of *Waterline* was Anthony Carlson, with the support of the then Deputy Executive Director, Leo Dobes, and the man who developed the PICI, Neil Gentle. Anthony bedded down the first four issues, moved for a while onto other tasks, and returned to produce issues 14 through 21.

Kym Starr took over management of *Waterline* for issues 5 though 13, assisted by Norman Wuest and Gita Curnow. Gita continued to do most of the processing on subsequent issues under the managing eye of Joe Motha and Christine Williams. Shelby Canterford replaced Gita for issues 27 to 34, when the current team of Desiree Campbell, Michael Simpson, Peter Hoss and, more recently, Tony Carmody, took over. At times, various other members of the Bureau have contributed towards *Waterline*, including Winton Brocklebank, Anthony Casey, Sue Elderton, Neil Gentle, Maurice Haddad, Neil Kelso, Paul Merner, Greg Piko, Michael Rush, Tim Risbey, Simon Stratton and Emily Tomlinson.

We take this opportunity to thank all those who have been involved with *Waterline* and contributed to its success over the past decade. A very special mention should go to our desktop publishers, Tom Smith and Jodi Hood, and to Jean Penny who left the Bureau in 2002.

Industry Structure and Performance

A key characteristic of Australia as an island continent is the location of its major cities around deepwater ports and the importance of the waterfront industry to Australia's economic development. Historically the major participants in the waterfront industry have been waterside workers or stevedores, stevedoring companies and governments, both state and federal.

When *Waterline* began publication in 1994, there had already been major changes to the size and structure of the workforce on the waterfront, in particular a considerable reduction in the number of waterside workers as a consequence of containerisation and increased mechanisation. The number of waterside workers on the Australian waterfront had reduced by almost two thirds from 17,688 in 1970 to 6,080 by 1985. By 1993, it had dropped a further third to an estimated 3,800.

This decline has continued over the ten years of *Waterline*, with employment standing at approximately 3000 in early 1998. Rationalisation of employment after 1998 was assisted by funding from the Maritime Industry Finance Company which provided a total of 1,487 voluntary redundancy payments to waterside workers. Current figures on the number of waterside workers are not available; the job description for waterfront workers has changed considerably and stevedores are more flexible and deployable to a variety of activities. That said, stevedoring employment today is estimated to be just over 2,000, with as much as 50% of the workforce being permanent part-time.

The major stevedoring companies have also undergone significant changes over the past decade, reflected in the different sources of industry information for *Waterline*. In July 1994, the key operators were Conaust Pty Ltd (owned by P&O Australia Ltd), Australian Stevedores (subsequently subsumed into Patrick Stevedoring), F G Strang Pty Ltd (also subsumed into Patrick Stevedoring) and the Fremantle Port Authority. The major stevedoring companies in 2004 are P&O Australia Ltd., Patrick Stevedoring, Toll Stevedoring and CSX World Terminals in Adelaide. Container handling in most capital city ports is performed by Patrick and P&O, the exception being Adelaide, where CSX World Terminals is the principal stevedoring company.

Stevedoring Performance Indicators

Waterline's stevedoring performance data represents only a partial picture of stevedoring performance. *Waterline* has routinely reported on productivity, rather than reliability, the absence of which can impose significant direct and indirect costs on ship operators and cargo owners. Additionally, the performance of other port and transport service providers can contribute to ship delays that may not be reflected in the stevedoring performance data (particularly the impact of industrial disputes elsewhere in the port or at the interface).

Waterline introduced new definitions of net and crane rates that were not strictly comparable with the previous WIRA definitions. The new indicators better reflected the changes that had occurred in work practices during the WIRA period:

WIRA	Waterline (1994–1997)
Gross time – the elapsed time [being the total time the ship is alongside the berth offering for work, whether worked or not, measured from 'labour first ordered' to 'last labour ashore'] minus the time unable to work the ship due to ship's fault, weather, awaiting cargo, industrial disputes, closed holidays, or shifts not worked at shipowner's request	*Net time* – WIRA's gross time less award shift breaks
Crane Rate – the number of teus moved per crane gross [time] hour	*Crane Rate* – the number of teus moved per crane in net [time] hours

Stevedoring performance was initially measured in *Waterline* as a crane rate in teus per hour. As a result of the WIRA reform program, the five ports average container crane rates had increased steadily from 12.8 teus per hour in 1989 to 20.1 teus per hour by September 1992, the increase being largely attributed to the implementation of improved work practices contained in new enterprise agreements. However, by the December quarter 1993, the national crane rate had fallen to an average of 19.9 teus per hour. It was not until the March quarter 1996 that the national crane rate again exceeded 20 teus per hour.

There was a perception during this period that the deteriorating stevedore performance was due in large part to the number of industrial disputes. However, there were other factors, such as the redevelopment of the Conaust terminal at East and West Swanson Docks in Melbourne during much of 1994–95. The BTCE Report 91 on the review of the waterfront industry reform program (1995) found that restructuring of waterfront labour arrangements had actually lessened the impact of disputes, if not the frequency. This was because under the new arrangements, most disputes tended to disrupt only one company and/or one port, and rationalisation of the waterfront unions meant that industrial disputes tended to be more concentrated rather than a rolling dispute involving several unions in sequence.

Consequently, small improvements in the average performance of the five ports often masked significant variations in performance between ports and terminals, and did not indicate the reliability of individual ports. During 1994–95, Adelaide's performance was the most consistent, with a small upward trend apparent in the reported crane rates. The new container crane at East Swanson Dock and straddle carriers at both East and West Swanson Docks contributed to improved crane rates and crane intensity at Melbourne as the Swanson Dock redevelopment came on line during 1995.

By the September quarter 1995, the average time to stevedore 560 teus was 24.9 hours compared with 24.2 hours at the end of the WIRA period three years earlier. However, during the December quarter 1995, there were work stoppages at all of the terminals in response to an industrial dispute involving CRA Ltd at Weipa, as well as local factors that affected one or more terminals, including congestion, civil works, a shortage of space on northbound vessels and changes in work arrangements following enterprise bargaining.

From March quarter 1996, stevedoring productivity as measured in teus per hour increased slowly but steadily, reaching 25.5 teus per hour in the March quarter 1999. In June 1996, *Waterline* began reporting stevedore performance in containers per hour in addition to teus per hour, to reflect the changing mix in 20 foot and 40 foot containers (measured as two teus). In the March quarter 1996, the percentage of 40 foot containers to 20 foot teus at the five mainland capital city ports had varied between 14 and 26 per cent depending on the port, with an average across the five ports of around 21 per cent. By December quarter 2003, the percentage of 40 foot containers had almost increased to 40 percent in all ports except Adelaide, which had increased to around 30 per cent.

From the March quarter 1997, discussion of stevedoring performance in *Waterline* switched to container moves per hour, which was considered a more rigorous basis for productivity comparisons than teus per hour. This was because the trend in the industry was to base charges on container lifts rather than teus, and the definition was changed to use actual crane operating time as the denominator. At that time, the five ports crane rate for the December quarter 1996 was 17.1 container moves per hour compared to 21.2 teus per hour, and an estimated 16 container moves per hour in July 1994. Performance measured in containers lifted per hour follows a similar trend to teus per hour, as would be expected.

Stevedoring performance, whether measured in teus or container moves per hour, remained relatively static until late 1997 when the Australian Government again revisited the issue of waterfront reform. The Government's seven objectives for waterfront reform were:

- an end of overmanning and restrictive work practices;
- higher productivity;
- greater reliability;
- reduction of injury and fatality levels;
- lower costs;
- effective use of technology;
- improved training.

The Australian Government reached agreement with Patrick Stevedores and P&O Ports to adopt these seven objectives and their associated performance measures, which included achieving a national crane rate of 25 container moves per hour.

1998–99 was a difficult period of major structural adjustment in the waterfront industry, with new enterprise agreements and changes to work practices. Despite industrial disputes, particularly in Sydney, during this restructuring, *Waterline* data showed the five ports crane rate averaged 18.8 container moves per hour between March quarter 1997 and March quarter 1999, and was sustained around this mean by consistent and steadily improving performances at Melbourne, Adelaide and Fremantle. Performances at Brisbane and Sydney were variable, with container moves per hour ranging from 16.1 to 18.4 at Brisbane and between 15.7 and 18.4 at Sydney. From June quarter 1999, all five ports showed a steady improvement in the crane rate, with only occasional setbacks due to temporary problems being experienced in individual ports.

Brisbane, Melbourne and Adelaide broke the 25 container moves per hour benchmark in the September quarter 2000, and all ports have been consistently above this figure since the March quarter 2001, with the exception of Adelaide, which dropped below 25 in the latter half of 2002 while they underwent an equipment upgrade. The five port crane rate has consistently exceeded 25 container moves per hour since the December quarter 2000 – a total of 15 consecutive quarters to June quarter 2004.

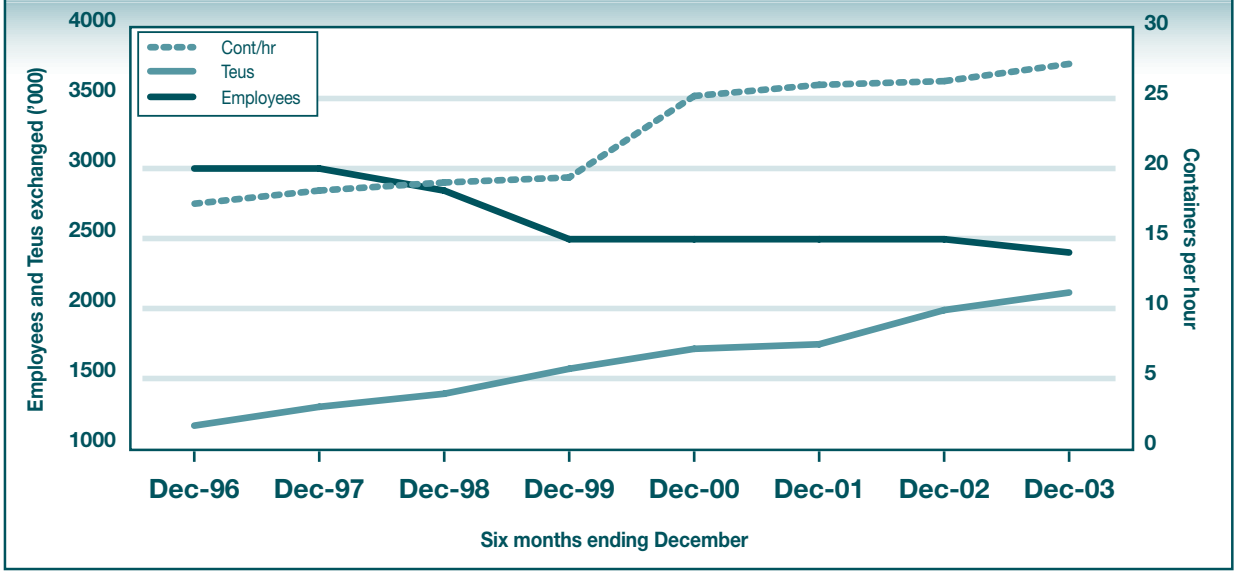
Further improvement in the measuring of stevedoring performance was achieved in the March quarter 2001, when after detailed consultation with the industry, greater consistency in the collection of stevedoring productivity data was achieved. It is worth noting, however, that it is always difficult to maintain consistency both overall and between companies over time, because of changes in management arrangements, work practices and technology.

Figure 8 shows productivity on the waterfront, measured by the number of waterside workers, container lifts per hour and twenty foot equivalent units (teus) exchanged, for the July–December half yearly periods 1996 to 2003. It can be seen that over this period the workforce declined by more than 20 per cent. Container lifts increased to more than 25 lifts per hour up to the December quarter 2000 and have remained in excess of that level. In contrast, the number of teus has continued to increase, largely explained by the increasing proportion of 40 foot containers, particularly at the east coast ports.

Other Waterfront Performance Indicators

The main concerns in 1994 were assessing whether the waterfront was becoming more efficient as a result of the various micro economic reforms and whether these productivity improvements were being passed on to users in the form of lower costs.

FIGURE 8 WATERFRONT PRODUCTIVITY



Sources *BTRE (1996 to 2004)*

The Port Interface Cost Index (PICI) provides a measure of the shore-based shipping costs for containers moved through Australia's mainland capital city ports. The PICI is broken down into a number of component port and related charges, based on a representative port call by a container ship in the 15–20 000 GT and 35–40 000 GT ranges:

- Ship-based charges – covering berth hire, conservancy, mooring/unmooring, pilotage, tonnage and towage charges
- Cargo-based charges – covering berth charge, harbour dues and wharfage (for export and import containers)
- Stevedoring charges – is a derived amount based on the average revenue "per lift" measured on a per teu basis and is sourced from the ACCC
- Land based charges – covering customs brokers' and road transport charges

Port and related charges measure whether there is an appropriate balance between ship and cargo based charges per teu. Ship based charges are for services provided by both port authorities and private companies. In 1993, ship based charges were on average 41.5 per cent of total port and related charges, with very little difference between the east and west coast ports. In 2003, ship based charges for ships in the 15 000–20 000 GT range averaged 33 per cent of total port and related charges for imports, with Fremantle being significantly lower at 14 per cent, Brisbane and Sydney averaging around 30 per cent and Adelaide and Melbourne being slightly higher at around 46 per cent. Cargo based charges are only levied by port authorities. In 1993 cargo based charges represented around 60 per cent of port and related charges. By 2003, they had increased to around 70 per cent for ships in the 15 000–20 000 GT range.

Land based charges consist of customs brokers' fees for clearing containers through customs and road transport charges for carriage from wharf to warehouse. Between the December quarter 1992 and December quarter 1993 there was a 50 per cent reduction in these fees and this was attributed to the introduction of optional port of lodgement system in September 1993 which may have led to increased lodgement at ports with the lowest fees.

The reduction in fees has continued over the decade, although at a slower rate. A comparison of the average shore based shipping costs for the five ports in July–December 1993 with those for the same period in 2003 shows that import costs have been reduced by 19 per cent and export costs by 21 per cent giving an average reduction of 20 per cent.

It should be noted that separate indices were developed for each port, and care needs to be exercised when making inter-port comparisons as different operating conditions will influence port costs and the degree of improvement that can be expected from any individual port reform process that has occurred over the decade. Service quality and delay costs are not included in the PICI, and a low cost port may not be consistent with acceptable service quality. For these reasons, *Waterline* has always contained the caveat that it is more

important to consider movements in individual port performance over time, rather than make comparisons between ports at a particular point in time.

Stevedoring charges cover the cost of unloading containers from ships, storage and loading onto land transport. In 1994, the Prices Surveillance Authority suggested that the reduction in the stevedoring workforce from the WIRA period had resulted in a 25 per cent reduction in stevedoring charges, from $254 per teu in 1990 to $191 per teu in 1993. In January–June 2003, stevedoring charges measured in 1993 prices were $130 per teu ($169 per teu in current prices). This reduction in charges is slightly greater, at 32 per cent, than occurred over the three year period 1990 to 1993. It was also accompanied by a 55 per cent reduction in the workforce between 1993 and 2001.

The first edition of *Waterline* in 1994 noted that improvement in the 1992–93 financial performance of mainland capital city port authorities was attributed to a 17 per cent reduction in the number of people employed in the five port authorities and increased port throughput. The concern with financial performance was in line with the concern at the time with the financial performance of government authorities and business enterprises in general. A decade of *Waterline* has seen restructuring, corporatisation and commercialisation of government owned port authorities as a means of improving their financial and operating performance. The reporting of port financial performance in *Waterline* ceased in March 2000. This information was drawn largely from port Annual Reports which had become readily available on port websites.

During the past decade, total cargo throughput at the five ports has increased by 48 per cent, while containerised cargo in terms of teus exchanged has increased by 127 per cent. Clearly, significant productivity gains have been made over the decade — Australian ports are now handling significantly larger quantities of cargo and real costs have fallen.

While improvement in the performance of the stevedoring industry flowed on to shippers in the form of lower prices and improved trading conditions, another impact was faster turnaround time for ships. Ship turnaround time in July–December 1993 ranged from 27.5 hours in Adelaide to 44.5 hours in Melbourne. By July–December 2003, Adelaide still had the quickest ship turnaround time at 23 hours, an improvement of 14.5 per cent. Melbourne still had the longest turnaround time at 35 hours, which represented an improvement of 20 per cent.

Looking to the Future

Generally speaking, changes and productivity improvements on the waterfront have paralleled changes in all areas of the transport industry during the past decade.

The most significant technological change on the waterfront in recent years has been the introduction of containerisation. Minor changes continue as automation replaces earlier manual systems and processes, but the next major technological change expected to affect the waterfront is the super ship, capable of carrying well in excess of 10 000 teus. Studies have found that most of the major Australian ports compare favourably in their application of appropriate technologies to comparable overseas ports which handle similar cargoes. Australia is also at the forefront in implementing the most advanced technology for tracking and monitoring refrigerated containers. Patrick has successfully tested robotic straddle carriers and announced their intention to use them in a fully automated terminal at Brisbane in 2005.

The performance indicators which have appeared in *Waterline* over the past decade reflect both continuity and change. The first issue of *Waterline* contained 28 indicators. Some have since been discontinued and new ones added. In response to recent suggestions from the industry for improved and more holistic indicators, the Bureau has been exploring indicators that would better indicate whole-of-terminal performance. A range of new intermodal indicators are being examined, including a terminal land use rate, truck turn around times, rail throughput and transhipment rates.

Waterline's role in reporting on waterfront and port performance is expected to continue in the future as the demand for strategic data on terminal performance increases. The Bureau is renewing its focus on developing improved and more relevant indicators of overall terminal performance, particularly at the landside/port interface. We seek the industry's continued cooperation in providing the Bureau with statistics that are of benefit to the decision making process in both industry and government.

SHIP VISITS

Table 8 provides the five-port total number of ship visits and the average number of teus exchanged per ship visit for container vessels with sizes ranging from 5 000 to 60 000 GT. Ship visits measures the number of times a ship calls at a port or ports, for example, a ship that sails to Australia 3 times and makes a total of 15 port calls in a year counts as 1 ship, 3 voyages and 15 ship visits.

TABLE 8 FIVE PORT AVERAGE NUMBER OF TEUS EXCHANGED AND TOTAL SHIP VISITS PER 6 MONTH PERIOD FOR SELECTED GT RANGES, WEIGHTED BY NUMBER OF SHIPS

GT	Jun-96	Dec-96	Jun-97	Dec-97	Jun-98	Dec-98	Jun-99	Dec-99	Jun-00	Dec-00	Jun-01	Dec-01	Jun-02	Dec-02	Jun-03	Dec-03	Jun-04
5,000–10,000																	
average teus exchanged	0	0	302	321	347	323	217	369	380	383	456	284	239	188	165	193	333
total ship visits	0	0	189	159	130	145	143	123	88	118	93	77	66	78	75	72	93
10,000–15,000																	
average teus exchanged	576	503	513	569	473	530	546	660	683	702	702	706	712	423	402	485	688
total ship visits	103	112	141	204	172	143	146	183	152	123	106	108	79	59	53	54	40
15,000 – 20,000																	
average teus exchanged	534	547	547	605	539	678	656	768	776	813	825	885	763	837	827	826	971
total ship visits	394	421	337	329	361	309	349	363	255	278	330	293	285	223	184	191	153
20,000 – 25,000																	
average teus exchanged	503	515	425	518	506	598	629	790	754	833	838	830	762	816	886	990	1014
total ship visits	235	247	219	217	200	278	280	249	270	314	276	240	233	241	203	214	199
25,000 – 30,000																	
average teus exchanged	583	566	513	559	608	545	591	740	682	636	869	777	888	1067	1029	1031	959
total ship visits	100	105	103	105	97	125	95	129	153	132	116	129	186	252	298	323	344
30,000 – 35,000																	
average teus exchanged	814	782	808	951	754	695	696	821	912	1041	991	1061	1014	1146	1249	1374	1478
total ship visits	48	130	207	192	206	251	252	180	208	222	187	196	216	232	185	257	247
35,000 – 40,000																	
average teus exchanged	811	739	746	799	793	807	831	945	1071	1149	1111	1223	1262	1401	1395	1445	1474
total ship visits	140	160	188	205	235	246	239	207	193	224	210	197	203	223	214	189	225
40,000 – 45,000																	
average teus exchanged	681	813	716	869	759	894	878	1013	1073	1133	1102	1246	1228	1462	1442	1558	1601
total ship visits	59	75	84	76	91	146	137	148	153	140	158	176	195	172	166	186	181
45,000 – 50,000																	
average teus exchanged	0	0	0	0	35	174	188	233	0	0	0	0	808	936	1198	1270	1379
total ship visits	0	0	0	0	4	3	3	1	0	0	0	0	5	38	82	77	75
50,000 – 55,000																	
average teus exchanged	213	295	254	678	734	810	737	932	1007	1274	1143	1062	1134	1240	996	1044	1366
total ship visits	1	6	5	28	24	61	64	68	56	63	55	56	60	67	61	69	22
55,000 – 60,000																	
average teus exchanged	409	599	513	1139	991	1026	1046	1248	1099	1223	1072	1019	1069	1164	1241	0	0
total ship visits	3	5	5	36	36	25	31	28	29	21	13	17	15	14	3	0	0
Total ship visits	1083	1261	1478	1551	1556	1732	1739	1679	1557	1635	1544	1489	1543	1599	1524	1632	1579

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

Total ship visits increased by 3.6 per cent in the year ended June 2004 compared to the preceding year, with ship visits peaking at 1623 in the six months to December 2003. In most ranges, the number of ship visits varied in each period. The lowest variation was in the mid ranges, while the largest was in the 55 000–60 000 GT range, which registered no visits in both six month periods to December 2003 and June 2004. The average number of teus carried increased in all ranges except the 25 000–30 000 GT range, which fell by 7 per cent.

TABLE 9 SHIP VISITS BY PORT 2003–2004

GT Range	Brisbane	Sydney	Melbourne	Adelaide	Fremantle
5000–10,000	80	12	73	0	0
10,000–15,000	37	23	33	0	1
15,000 – 20,000	95	112	101	29	7
20,000 – 25,000	116	145	105	2	45
25,000 – 30,000	78	175	197	87	130
30,000 – 35,000	105	133	131	30	105
35,000 – 40,000	80	117	109	36	72
40,000 – 45,000	69	79	106	43	70
45,000 – 50,000	48	52	52	0	0
50,000 – 55,000	5	22	21	13	30
above 55,000	0	0	0	0	0

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

Table 9 provides the GT range distribution of ship visits by port for the 2003-04 financial year. The distribution varies between the ports, with a higher percentage of ship visits at Adelaide comprising larger ships (10 per cent higher than Brisbane and 7 per cent higher than Sydney and Melbourne). The 25 000–30 000 GT range had the highest proportion of ship visits in all ports

Waterline 37 September 2004

except Brisbane, where the 20 000–25 000 GT range was the more common, followed by the 30 000–35 000 GT range. The 25 000–30 000 GT range represents 36 per cent of ships visiting Adelaide.

On a national level, 21 per cent of all ship visits were vessels in the 25 000–30 000 GT range, and 84 per cent of ship visits fell within the 15 000 to 45 000 GT ranges. This pattern reflects the slow but steady range 'creep' that has been occurring in recent years as the number of older smaller ships are phased out and many mid–ranged ships are modified to take more 40–foot containers. The average number of teus exchanged has also grown in recent years. Since January–June 2000, tues exchanged in the 15 000–30 000 GT ranges have increased by over 33 per cent and in the 30 000–45 000 GT ranges by over 49 per cent. Increases in the over 45 000 GT ranges have been more variable, while the 5 000 to 20 000 GT ranges are stagnating or in decline.

ABBREVIATIONS and other port service providers.

AAPMA	Association of Australian Ports and Marine Authorities
ABS	Australian Bureau of Statistics
ACCC	Australian Competition and Consumer Commission
BTRE	Bureau of Transport and Regional Economics
CVP	Continuing Voyage Permit
DOTARS	Department of Transport and Regional Services
Five-port	The five mainland capital city ports (Brisbane, Sydney, Melbourne, Adelaide, Fremantle)
GT	Gross Tons, formerly GRT
SVP	Single Voyage Permit
Teu	Twenty-foot equivalent unit
UCC	Fully cellular container vessel

STEVEDORING PRODUCTIVITY DEFINITIONS

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

Waterline 37 September 2004

TABLE 10 NON-FINANCIAL PERFORMANCE INDICATORS, SELECTED AUSTRALIAN PORTS, 2001–2004

	Jan-Jun 2001	Jul-Dec 2001	Jan-Jun 2002	Jul-Dec 2002	Jan-Jun 2003	Jul-Dec 2003	Jan-Jun 2004
Five ports							
Total cargo throughput ('000 tonnes)	49 139	50 638	51 422	52 110	51 797	54 283	57 713
Non-containerised general cargo ('000 tonnes)[a]	1 557	1 876	1 964	2 143	2 060	2 316	2 285
Containerised cargo (teus exchanged)							
Full import	629 916	767 239	714 041	898 549	834 191	972 737	952 302
Empty import	139 901	144 929	134 785	127 665	117 616	116 179	129 114
Full export	596 836	640 288	632 229	659 965	618 896	651 772	694 261
Empty export	167 603	192 083	213 298	302 462	344 846	373 294	364 000
TOTAL	1 534 256	1 744 539	1 694 353	1 988 641	1 915 549	2 113 982	2 139 677
Average total employment[b]	814	759	795	803	816	865	914
Port turnaround time (hrs)[c]							
Median result	-	-	-	-	-	-	-
95th percentile	-	-	-	-	-	-	-
Brisbane							
Total cargo throughput ('000 tonnes)	11 206	11 642	11 525	12 172	12 399	12 745	12 326
Non-containerised general cargo ('000 tonnes)[a]	250	306	304	316	304	412	392
Containerised cargo (teus exchanged)							
Full import	67 177	88 281	85 688	114 878	107 977	137 111	124 773
Empty import	39 135	37 675	32 112	35 719	28 565	31 633	31 676
Full export	94 922	102 634	95 966	101 229	91 446	104 279	100 760
Empty export	13 143	17 874	21 393	41 581	48 809	56 923	52 117
TOTAL	214 377	246 464	235 159	293 407	276 797	329 946	309 326
Average total employment[b]	218	206	212	215	209	214	225
Port turnaround time (hrs)[c]							
Median result	31	34	32	32	31	35	32
95th percentile	56	53	52	55	49	59	59
Sydney							
Total cargo throughput ('000 tonnes)	11 684	12 462	11 838	12 073	11 485	12 429	12 738
Non-containerised general cargo ('000 tonnes)[a]	241	291	279	319	316	320	307
Containerised cargo (teus exchanged)							
Full import	217 570	270 691	236 594	309 070	277 860	320 061	323 051
Empty import	11 303	13 341	8 853	8 071	6 005	4 503	7 222
Full export	148 651	159 494	147 918	154 314	139 456	149 314	154 195
Empty export	73 591	78 535	94 027	123 810	141 927	154 189	157 721
TOTAL	451 115	522 061	487 392	595 265	565 248	628 067	642 189
Average total employment[b]	192	195	199	198	199	198	198
Port turnaround time (hrs)[c]							
Median result	32	32	30	36	32	32	32
95th percentile	57	68	55	63	58	66	55
Melbourne							
Total cargo throughput ('000 tonnes)	11 078	11 452	12 138	12 388	12 283	12 458	14 222
Non-containerised general cargo ('000 tonnes)[a]	605	753	834	896	930	984	1 032
Containerised cargo (teus exchanged)							
Full import	263 888	310 034	295 343	358 818	337 671	388 339	386 413
Empty import	52 401	60 384	58 936	52 600	52 238	48 478	57 082
Full export	258 077	273 910	279 866	291 272	277 392	276 401	315 000
Empty export	54 013	68 761	73 547	104 266	119 541	127 967	118 038
TOTAL	628 379	713 089	707 692	806 956	786 842	841 185	876 533
Average total employment[b]	89	93	96	95	102	142	170
Port turnaround time (hrs)[c]							
Median result	34	36	35	37	36	35	38
95th percentile	57	68	63	68	62	57	65
Adelaide							
Total cargo throughput ('000 tonnes)	4 039	3 934	4 446	4 130	3 524	4 478	4 982
Non-containerised general cargo ('000 tonnes)[a]	159	189	239	251	171	238	213
Containerised cargo (teus exchanged)							
Full import	17 865	21 097	19 591	21 864	19 015	22 214	19 317
Empty import	11 136	11 714	15 055	11 715	13 050	15 895	14 073
Full export	31 120	34 482	35 793	37 358	33 468	43 874	41 734
Empty export	5 085	4 117	3 377	5 660	6 203	6 757	5 244
TOTAL	65 206	71 410	73 816	76 597	71 736	88 740	80 368
Average total employment[b]	149	98	95	97	95	94	95
Port turnaround time (hrs)[c]							
Median result	19	22	21	19	21	23	24
95th percentile	50	43	43	29	40	41	43
Fremantle							
Total cargo throughput ('000 tonnes)	11 132	11 147	11 476	11 348	12 105	12 173	13 445
Non-containerised general cargo ('000 tonnes)[a]	301	337	309	361	338	361	341
Containerised cargo (teus exchanged)							
Full import	63 416	77 136	76 825	93 919	91 668	105 012	98 748
Empty import	25 926	21 815	19 829	19 560	17 758	15 670	19 061
Full export	64 066	69 768	72 686	75 792	77 134	77 904	82 572
Empty export	21 771	22 796	20 954	27 145	28 366	27 458	30 880
TOTAL	175 179	191 515	190 294	216 416	214 926	226 044	231 261
Average total employment[b]	166	167	193	199	211	217	226
Port turnaround time (hrs)[c]							
Median result	20	21	22	25	25	28	29
95th percentile	47	46	52	60	52	57	63

- not applicable

a. Excludes bulk cargoes.

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

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

Source AAPMA.

Waterline 37 September 2004

PORT PERFORMANCE – NON-FINANCIAL

The January–June 2001 to January–June 2004 non-financial indicators for the five mainland capital city ports are presented in Table 10.

Cargo throughput

Total cargo throughput at the five ports was a record 57.7 million tonnes for January–June 2004 , compared with 54.3 million tonnes for the previous half-year July–December 2003 and 51.8 million tonnes for January–June 2003. This represented an increase of 11.4 per cent in total cargo throughput for the five ports compared with January–June 2003 and an increase of 6.3 per cent compared with July–December 2003.

Compared with January–June 2003, total cargo throughput in January–June 2004 decreased 0.6 per cent at Brisbane, and increased by 10.9 per cent at Sydney,15.8 per cent at Melbourne, 41.4 per cent at Adelaide and 11.1 per cent at Fremantle.

Non-containerised general cargo throughput at the five ports was 2.285 million tonnes for January–June 2004, which represents a decrease of 1.3 per cent on the 2.316 million tonnes throughput for July–December 2003 and an increase of 10.9 per cent on the 2.060 million tonnes throughput for January–June 2003.

Total container traffic throughput for the five ports was a record 2.140 million teus for January–June 2004, which represents a decrease of 1.2 per cent on the 2.114 million teus throughput for July–December 2003 and an increase of 11.7 per cent on the 1.916 million teus throughput for January–June 2003.

Compared with January–June 2003, loaded teus at the five ports increased by 13.3 per cent, with loaded imports increasing by 14.2 per cent and loaded exports increasing by 12.2 per cent.

Harbour Towage Charges

Table 11 provides the publicly available towage charges for the five mainland capital city ports as well as a selection of regional ports effective at 30 June 2003 and the 30 June 2004 for the two representative vessel sizes, 19 999 GRT and 59 999 GRT.

Only three of the ten ports recorded changes to towage charges during the 2003–04 financial year:

Sydney—a 3.7 per cent decrease in the 19 999 GRT vessel size and a 3.6 per cent decrease in the 59 999 GRT vessel size;

Bunbury—a 3.6 per cent increase for both vessel sizes; and

Newcastle—a 5.0 per cent increase for both vessel sizes.

There was some variation in the five port average charge levels between the two periods with the most significant changes being recorded in regional ports - an increase of 1.9 per cent in the 19 999 GRT vessel size and an increase of 2.2 per cent in the 59 999 GRT vessel size.

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

Waterline 37 September 2004

TABLE 11 HARBOUR TOWAGE CHARGES 2003 AND 2004

Capital City Port	Adelaide		Brisbane		Fremantle		Melbourne		Sydney[b]		5 Ports Average	
	30-Jun 2003	30-Jun 2004	30-Jun 2003	30-Jun 2004	30-Jun 2003	30-Jun 2004	30-Jun 2003	30-Jun 2004	30-Jun 2003	30-Jun 2004	30-Jun 2003	30-Jun 2004
Vessel size (GT)												
19 999 GT												
$ Per Tug Rate[a]	3 805	3 805	2 971	2 971	2 761	2 761	3 592	3 592	2 971	2 860	3 220	3 198
59 999 GT												
$ Per Tug Rate[a]	5 109	5 109	4 368	4 368	4 455	4 455	3 988	3 988	3 436	3 313	4 271	4 246

Regional Port	Bunbury		Burnie		Gladstone		Newcastle		Port Kembla		5 Ports Average	
	30-Jun 2003	30-Jun 2004	30-Jun 2003	30-Jun 2004	30-Jun 2003	30-Jun 2004	30-Jun 2003	30-Jun 2004	30-Jun 2003	30-Jun 2004	30-Jun 2003	30-Jun 2004
Vessel size (GT)												
19 999 GT												
$ Per Tug Rate[a]	2 909	3 014	3 080	3 080	1 793	1 793	3 028	3 179	2 416	2 416	2 645	2 696
59 999 GT												
$ Per Tug Rate[a]	4 339	4 494	-	-	3 339	3 339	4 802	5 044	5 377	5 377	4 464	4 563

- Not applicable

a. Cost for each tug to assist a ship arriving at or departing from a berth within the limits of the port at any time.

b. Sydney is represented by tariffs charged at Port Botany only.

Source BTRE estimates based on towage operators' tariff schedules, where there is more than one operator, the charges have been averaged.

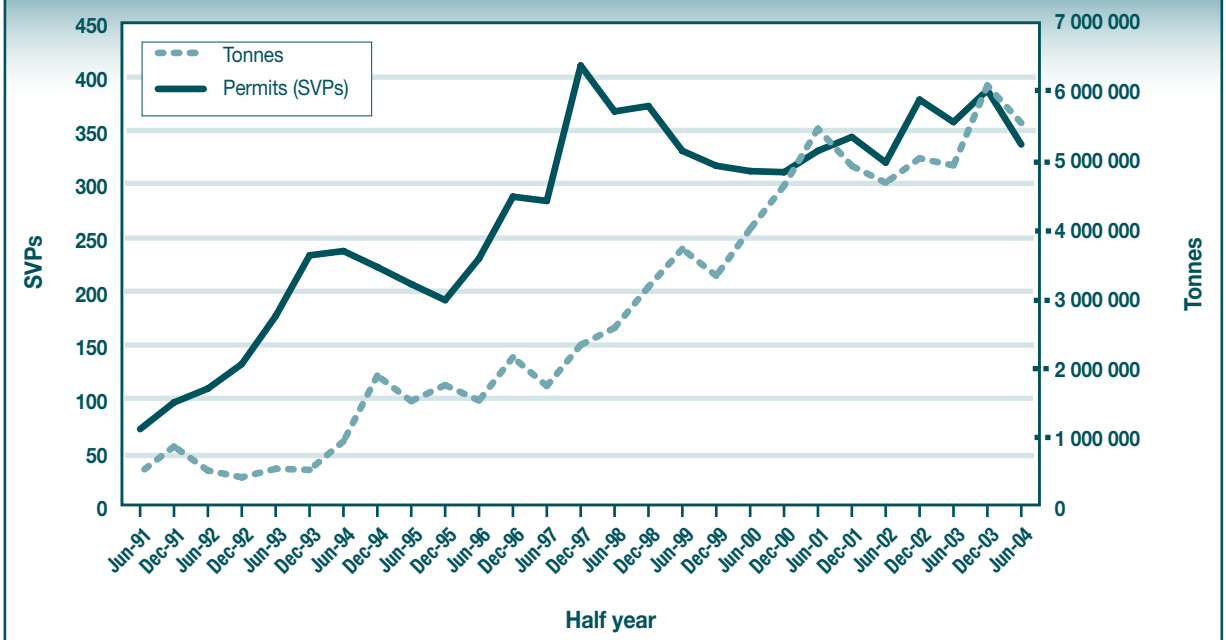
COASTAL SHIPPING PERMITS

Total tonnages of cargo provided by applicants under SVPs and CVPs decreased by 7.8 per cent from 7.5 million tonnes in the last half of 2003 to 6.9 million tones in the first half of 2004.

Single voyage permits

Figure 9 illustrates the number of SVPs issued, and the pre-voyage estimation of tonnes of cargo to be carried, between January–June 1991 and January–June 2004. The number of SVPs issued in January–June 2004 decreased by 13.1 per cent compared with July–December 2003 and by 5.9 per cent compared with the January– June 2003 period. The associated estimated tonnes of cargo to be carried decreased by 9.0 per cent compared with July–December 2003, and increased by 12.6 per cent compared with January–June 2003.

FIGURE 9 TONNES TO BE CARRIED VIA SINGLE VOYAGE PERMITS, 1991–2004



Note *All tonnages are pre-voyage estimates.*

Source *Regulatory Group, Department of Transport and Regional Services.*

Table 12 gives a breakdown of SVPs by cargo types for January–June 2004. General cargo (including containerised cargo) permits continue to lead the tally for SVPs issued. However, bulk cargo accounts for just under 96 per cent of the total tonnage moved under SVPs.

TABLE 12 SUMMARY OF SINGLE VOYAGE PERMITS ISSUED, JANUARY–JUNE 2004

Cargo Category	Permits	Tonnes
Bulk Cargo		
Petroleum Products	46	1 497 569
Liquefied Gas	38	91 580
Other Bulk Liquids	5	20 300
Dry Bulk	119	3 700 848
General Cargo	**129**	**245 719**
Total	**337**	**5 556 016**

Note *Tonnages are the pre-voyage estimation of the tonnes to be carried.*

Source *Regulatory Group, Department of Transport & Regional Services.*

Continuing voyage permits

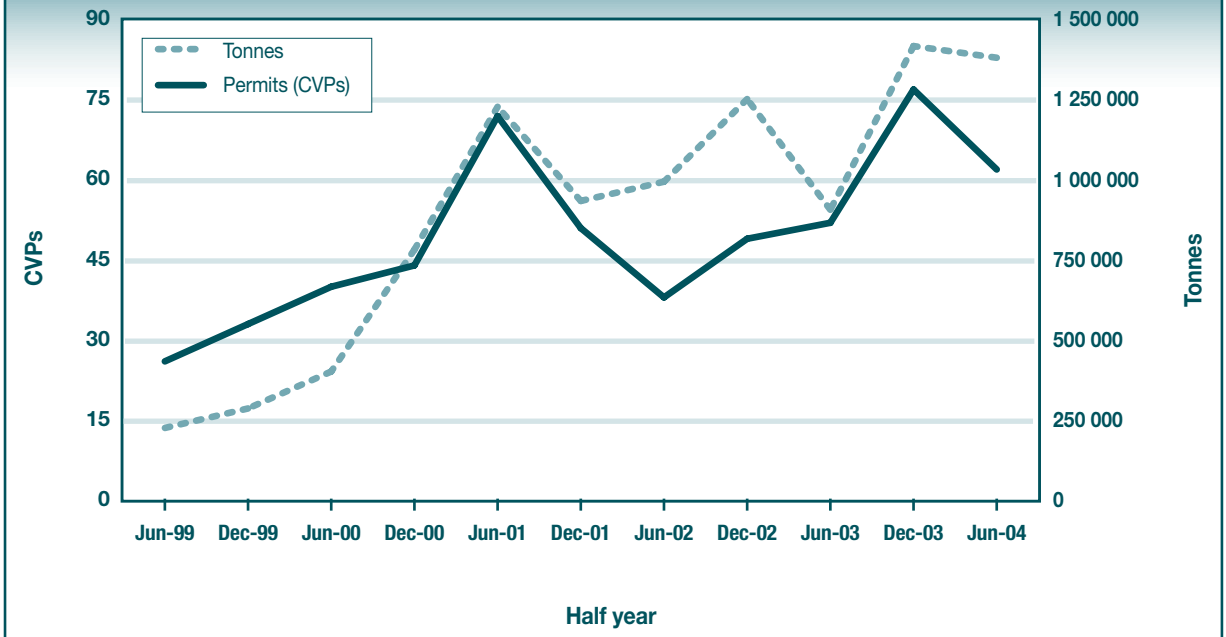
Although CVPs were available prior to 1998, they were rarely requested or issued during this period. Since 1998, there have been significant fluctuations in both the number of permits issued and the tonnage to be carried, as shown in figure 10. In January–June 2004, a total of 1.38 million tonnes were to be carried under CVPs, compared with 1.42 million tonnes in July – December 2003 and 0.9 million tonnes in January–June 2003.

CVPs issued since the start of 2003 have been for 3 months maximum duration rather than the 6 months allowed previously. One CVP is estimated to be equivalent to three SVPs on average.

Waterline 37 September 2004

In January–June 2004 there were 62 CVPs issued compared with 52 in the same period in 2003, an increase of 19 per cent.

FIGURE 10 TONNES TO BE CARRIED VIA CONTINUING VOYAGE PERMITS, 1999–2004

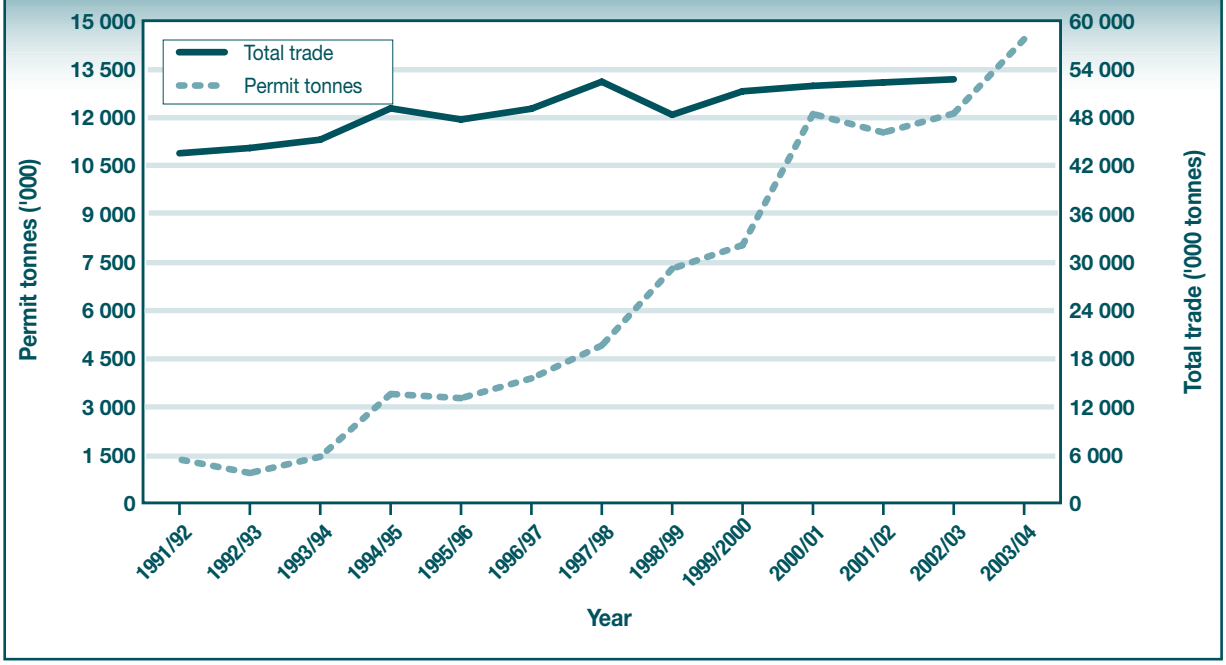


Note *All tonnages are pre-voyage estimates.*

Source *Regulatory Group, Department of Transport and Regional Services.*

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

FIGURE 11 TOTAL COASTAL TRADE, 1991–2004



Note *Total coastal trade figures for 2002–03 are not available at the time of publishing.*

Sources *BTRE estimates and the Regulatory Group, Department of Transport and Regional Services.*

Waterline 37 September 2004

ISPS CODE

All Australian port and vessel operators were compliant with the International Ship and Port Facility Security Code when it came into effect on 1 July 2004.

Of the 2845 Australian and foreign vessels assessed by the Office of Transport Security at the end of August 2004, 6 foreign vessels were issued with Control Directions in accordance with the ISPS Code. Panamanian registered ships accounted for 797 or 28 per cent of the total number of ships assessed.

No security directions were issued on Australian flagged ships or Australian ports over the same period.

WATERFRONT RELIABILITY

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

Berth availability, pilotage, towage

Table 13 presents information on berth availability, pilotage and towage for samples of ship calls in the March and June quarters 2004. The data indicates the extent to which selected port services were available at the scheduled or confirmed time.

TABLE 13 AVAILABILITY OF BERTH, PILOTAGE AND TOWAGE SERVICES AT THE SCHEDULED/CONFIRMED TIME, MARCH AND JUNE QUARTERS 2004

	Number of ship calls Delay in hours									*Number of ship calls Delay in hours*								
	March Quarter 2004									**June Quarter 2004**								
Port/operation	**0**	**1**	**2**	**3**	**4**	**5-10**	**11-20**	**>20**	**Total calls**	**0**	**1**	**2**	**3**	**4**	**5-10**	**11-20**	**>20**	**Total calls**
Five port																		
Berth availability	139	0	1	0	1	8	5	1	155	138	0	0	0	2	4	3	4	151
Pilotage	153	0	0	0	1	1	0	0	155	151	0	0	0	0	0	0	0	151
Towage	155	0	0	0	0	0	0	0	155	151	0	0	0	0	0	0	0	151
Brisbane																		
Berth availability	20	0	0	0	0	2	2	0	24	18	0	0	0	0	1	1	0	20
Pilotage	24	0	0	0	0	0	0	0	24	20	0	0	0	0	0	0	0	20
Towage	24	0	0	0	0	0	0	0	24	20	0	0	0	0	0	0	0	20
Sydney																		
Berth availability	49	0	0	0	0	3	0	0	52	44	0	0	0	2	1	0	1	48
Pilotage	52	0	0	0	0	0	0	0	52	48	0	0	0	0	0	0	0	48
Towage	52	0	0	0	0	0	0	0	52	48	0	0	0	0	0	0	0	48
Melbourne																		
Berth availability	48	0	1	0	0	1	1	1	52	45	0	0	0	0	2	2	3	52
Pilotage	52	0	0	0	0	0	0	0	52	52	0	0	0	0	0	0	0	52
Towage	52	0	0	0	0	0	0	0	52	52	0	0	0	0	0	0	0	52
Adelaide																		
Berth availability	14	0	0	0	1	0	1	0	16	13	0	0	0	0	0	0	0	13
Pilotage	14	0	0	0	1	1	0	0	16	13	0	0	0	0	0	0	0	13
Towage	16	0	0	0	0	0	0	0	16	13	0	0	0	0	0	0	0	13
Fremantle																		
Berth availability	8	0	0	0	0	2	1	0	11	18	0	0	0	0	0	0	0	18
Pilotage	11	0	0	0	0	0	0	0	11	18	0	0	0	0	0	0	0	18
Towage	11	0	0	0	0	0	0	0	11	18	0	0	0	0	0	0	0	18

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 sample for the March quarter 2004 covers 155 ship calls, equivalent to around 19 per cent of total ship calls at the five major container terminals during the period. The proportion of ship calls covered at individual ports ranges from 9 per cent at Fremantle to 27 per cent at Adelaide. The sample for the June quarter 2004 covers 151 ship calls, equivalent to around 18 per cent of total ship calls at the five major container terminals during the period. The proportion of ship calls covered at individual ports ranges from 11 per cent at Brisbane to 22 per cent at Adelaide. The March quarter figures for Fremantle should be treated with caution due to the low percentage of calls captured in the sample. The samples include 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. Figure 13 shows that berth availability for the sample of ship calls was 91 per cent in the March quarter 2004. This was lower than in the previous quarter. Berth availability was

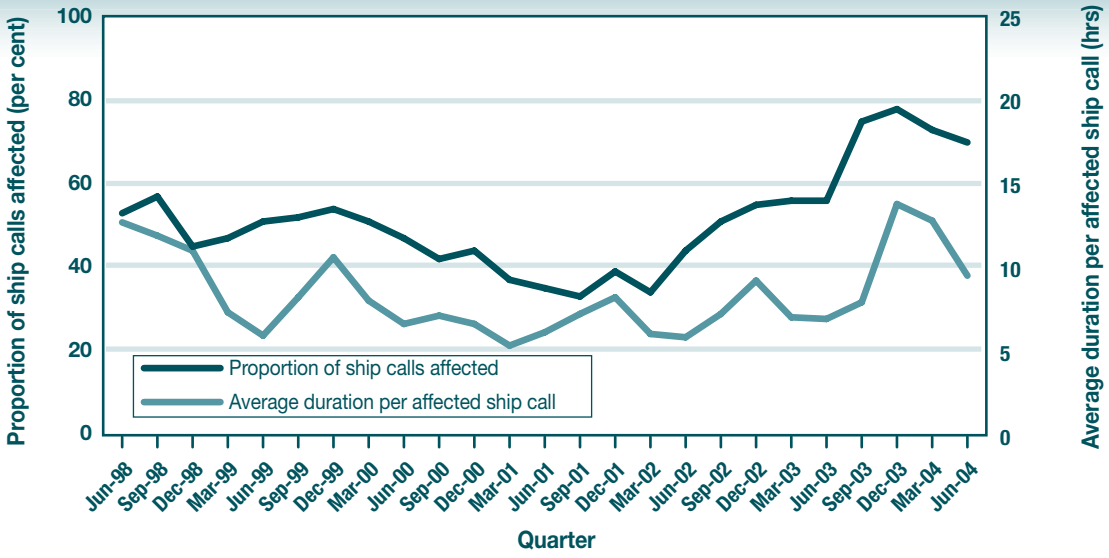
Waterline 37 September 2004

93 per cent in the June quarter 2004. 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 12 hours in the March quarter 2004, an increase from 6 hours in the previous quarter. Average berth waiting time was 18 hours in the June quarter 2004

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 in the March quarter 2004 was 99 per cent for the pilotage indicator, lower than in the previous December quarter 2003, and 100 per cent for the towage indicator, the same as in the previous quarter. The proportion in the June quarter 2004 was 100 per cent for both the pilotage indicator and towage indicators. Performance has been at similar levels since the first data (covering the March quarter 1997) were published in *Waterline*.

FIGURE 12 OTHER SHIP WAITING TIME INCIDENTS AT MAJOR CONTAINER TERMINALS, 1998–2004



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

Waterline 37 September 2004

Other waiting time

The five shipping lines that supplied information for tables13 and 14 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.

TABLE 14 STEVEDORING AND SHIP ARRIVAL RELIABILITY INDICATORS, MARCH AND JUNE QUARTERS 2004

(per cent)

	Brisbane		Sydney		Melbourne		Adelaide		Fremantle	
Indicator	Jan-Mar	Apr-Jun	Jan-Mar	Apr-Jun	Jan-Mar	Apr-Jun	Jan-Mar	Apr-Jun	Jan-Mar	Apr-Jun
Stevedoring										
Cargo receival	94	94	91	91	89	89	na	na	96	96
Ship arrival										
Advice at 24 hrs	51	53	46	50	na	na	60	59	50	50
Advice inside 24 hrs	91	97	94	93	na	na	71	72	90	89

na not available

Sources AAPMA, Patrick and P&O Ports.

Table 15 on page 26 summarises the data on other waiting time incidents which had a duration of at least one hour, in the March and June quarters 2004. The shipping lines identified a total of 178 incidents (affecting 113 ship calls) for the sample of ship calls over the March quarter. They identified 169 incidents (affecting 105 ship calls) in the June quarter. 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 2004 was the category of late ship arrival, which accounted for 46.5 per cent of total waiting time. Stevedoring finished late accounted for 11 per cent of total waiting time, and awaiting labour was related to a further 11 per cent of total waiting time. The largest single source of other ship waiting time in the June quarter 2004 was the category of late ship arrival, which accounted for 29 per cent of total waiting time. Awaiting labour accounted for 14 per cent of total waiting time, and stevedoring finished late was related to a further 14 per cent of total waiting time.

In the March quarter 2004, 73 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 78 per cent in the December quarter 2003. The average duration of other waiting time incidents was 13 hours per affected ship call in the March quarter 2004, down from 14 hours per affected ship call in the previous quarter. In the June quarter 2004, 70 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 average duration of other waiting time incidents was 9.5 hours per affected ship call in the June quarter 2004.

Figure 12 provides information on other ship waiting time over the period since the June 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 14 presents the available information on an aspect of stevedoring reliability at major container terminals — cargo receival. Data were not available for Adelaide.

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 2004 increased at Sydney and Melbourne and fell at Brisbane and Fremantle compared with the previous quarter. Cargo receival in the June quarter 2004 was unchanged at all ports compared with the previous quarter.

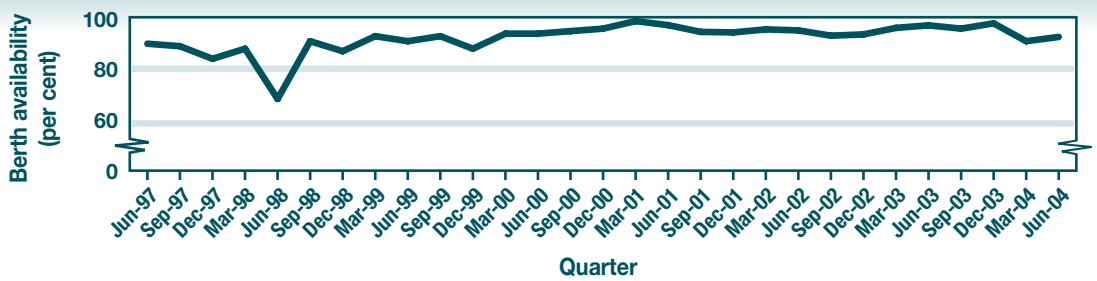
Ship arrival

Table 14 includes data for two indicators of ship arrival advice. Data were not available for Melbourne for the March and June quarters 2004.

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 rose at Adelaide, and fell at Sydney, Brisbane and Fremantle, in the March quarter 2004. In the June quarter 2004, the indicator rose at Sydney and Brisbane, remained unchanged at Fremantle, and fell at Adelaide.

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 2004, this indicator increased at Adelaide, and fell at Brisbane, Sydney and Fremantle. In the June quarter 2004, this indicator increased at Brisbane and Adelaide, and fell at Sydney and Fremantle.

FIGURE 13 BERTH AVAILABILITY AT MAJOR CONTAINER TERMINALS, 1997–2004



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

Waterline 37 September 2004

TABLE 15 OTHER SHIP WAITING TIME INCIDENTS AT THE FIVE MAINLAND CAPITAL CITY PORTS, MARCH AND JUNE QUARTERS 2004

	Number of incidents Ship waiting time (hours)								*Number of incidents Ship waiting time (hours)*							
	March Quarter 2004								**June Quarter 2004**							
Incident type	**1**	**2**	**3**	**4**	**5-10**	**11-20**	**>20**	**Total**	**1**	**2**	**3**	**4**	**5-10**	**11-20**	**>20**	**Total**
Awaiting labour	6	3	7	5	8	4	0	33	8	11	9	3	8	1	0	40
Crane breakdown	13	12	1	2	1	1	0	30	14	12	7	2	5	0	0	40
Early ship arrival	1	0	1	1	1	3	0	7	2	1	0	0	2	3	1	9
Industrial action	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	3
Late ship arrival	4	0	3	2	5	3	9	26	0	1	4	1	5	3	7	21
Pilot/tug booking not at preferred time	2	2	1	0	1	0	0	6	3	3	1	1	0	0	0	8
Ship repairs or maintenance	1	0	0	0	2	0	0	3	0	0	0	0	1	0	0	1
Stevedoring finished early	4	7	3	0	4	2	1	21	3	6	1	0	1	1	0	12
Stevedoring finished late	3	8	2	3	12	2	1	31	3	1	1	2	8	4	1	20
Weather or tides	0	0	3	1	0	2	0	6	1	1	0	1	0	1	1	5
Other	2	2	2	1	4	3	1	15	2	1	0	0	3	3	1	10
Total incidents	**36**	**34**	**23**	**15**	**38**	**20**	**12**	**178[a]**	**36**	**37**	**23**	**12**	**34**	**16**	**11**	**169[b]**

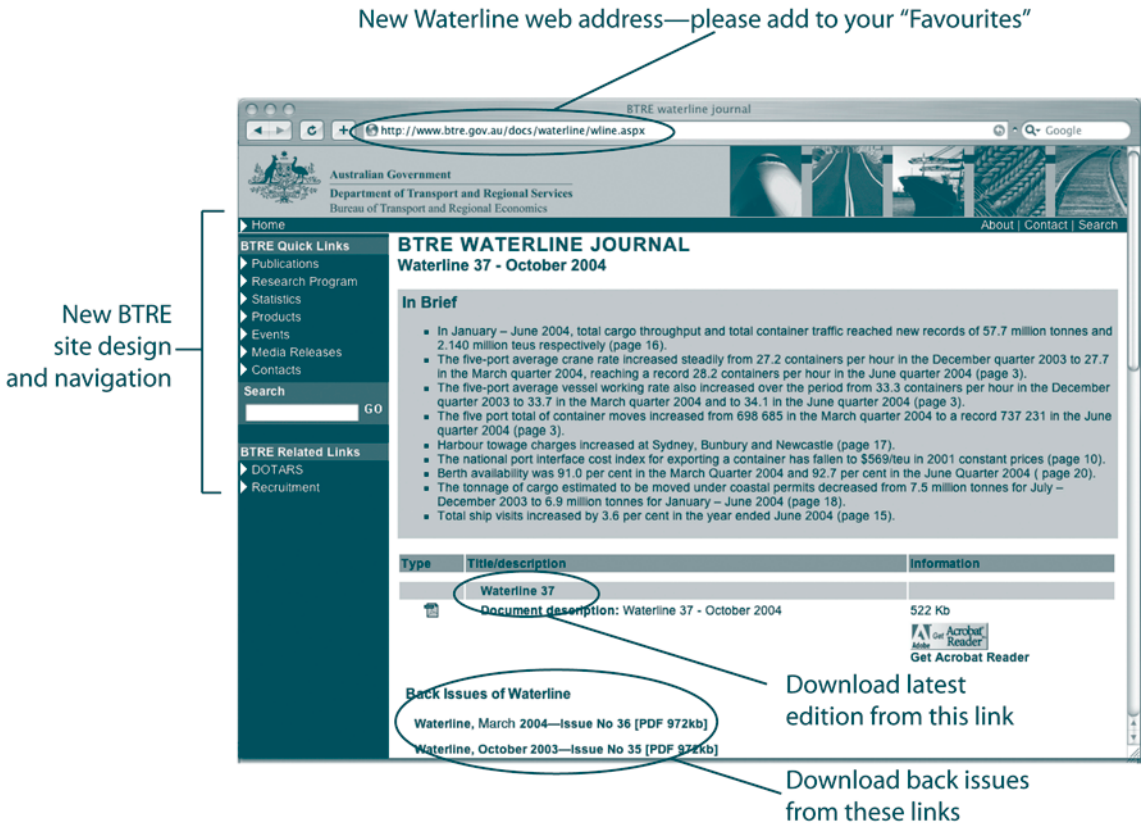
a. These incidents affected 113 of the 155 ship calls in the March Quarter 2004.
b These incidents affected 105 of the 151 ship calls in the June Quarter 2004.

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

WATERLINES NEW WEB ADDRESS AND INTERFACE

Over the past few months, the BTRE has been designing a new website which is expected to go live by the end of October 2004. The new format will make navigation much easier, especially locating your favourite publications, such as *Waterline.*

Current and back issues are easily accessible from the one-stop *Waterline* home page, which also includes highlights from the latest issue. Check out our new BTRE website at the end of October and add the new *Waterline* address http://www.btre.gov.au/docs/waterline/wline.aspx to your list of "Favourites".



Waterline 37 September 2004

TABLE 16 CONTAINER TERMINAL PERFORMANCE INDICATORS, SELECTED AUSTRALIAN PORTS - PRODUCTIVITY IN TEUS PER HOUR

	Jun-00	Sep-00	Dec-00	Mar-01	Jun-01	Sep-01	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Sep-03	Dec-03	Mar-04	Jun-04
Five Ports																	
Ships handled	808	840	814	787	813	825	846	824	868	858	856	821	822	841	850	801	825
Total teus	666 967	708 433	731 936	634 003	661 326	762 202	787 093	724 311	788 090	876 522	938 913	871 089	870 861	952 273	1 023 224	963 667	1 018 623
Crane rate	30.4	33.2	34.2	35.4	35.2	34.2	34.8	35.4	35.9	35.9	35.6	35.3	37.4	38.5	37.8	38.2	39.0
Vessel working rate	40.0	38.0	37.6	38.6	37.8	39.2	39.6	39.6	41.1	43.4	42.2	42.9	44.3	47.9	46.5	46.7	47.3
Ship rate	49.5	50.8	53.2	54.3	53.3	55.0	55.4	55.4	56.3	59.9	59.4	58.8	61.7	67.4	64.4	64.6	66.1
Throughput pbm	93.5	99.3	102.6	88.8	92.7	106.8	110.3	101.5	110.4	122.8	131.6	122.1	122.0	133.4	143.4	135.0	142.7
Brisbane																	
Ships handled	178	187	179	167	188	175	198	202	211	216	216	206	184	192	194	179	175
Total teus	90 932	103 654	107 812	81 864	108 810	105 746	112 586	100 033	121 920	136 771	143 882	130 384	124 854	147 273	158 065	146 104	151 138
Crane rate	30.5	33.4	34.0	35.5	35.1	32.7	32.1	34.1	35.2	34.6	35.6	33.8	35.8	35.0	35.4	36.1	37.5
Vessel working rate	33.4	30.0	29.7	29.6	30.2	28.7	28.5	28.5	30.0	32.0	32.3	32.6	36.3	34.2	36.3	36.9	40.7
Ship rate	42.3	45.1	44.5	46.1	46.5	46.8	45.5	46.9	48.2	50.2	53.9	50.4	55.3	53.7	55.9	57.7	61.5
Throughput pbm	56.6	64.5	67.1	50.9	67.7	65.8	70.1	62.2	75.9	85.1	89.5	81.1	77.7	91.6	98.4	90.9	94.0
Sydney																	
Ships handled	218	223	211	201	202	208	206	196	203	204	210	211	217	228	238	221	231
Total teus	224 445	237 843	240 720	203 217	205 126	242 823	252 521	228 723	235 664	277 733	302 267	278 456	271 501	303 745	336 988	306 080	327 661
Crane rate	30.9	33.1	33.2	34.7	34.0	34.4	35.2	36.8	37.4	36.2	35.2	35.7	38.0	39.4	37.3	37.7	39.0
Vessel working rate	44.1	40.5	39.0	39.7	38.2	42.5	42.7	43.9	46.7	49.4	45.8	46.2	49.5	53.3	47.1	51.0	51.0
Ship rate	55.4	53.9	55.8	56.6	54.1	60.1	60.2	60.7	62.8	65.5	61.7	61.9	67.2	73.0	64.8	67.8	67.7
Throughput pbm	115.6	122.5	124.0	104.6	105.6	125.0	130.0	117.8	121.4	143.0	155.6	143.4	139.8	156.4	173.5	157.6	168.7
Melbourne																	
Ships handled	217	227	218	214	215	243	249	234	251	250	243	229	235	240	241	223	244
Total teus	236 306	253 568	255 022	226 612	228 400	285 947	294 753	274 108	295 284	325 945	342 684	317 711	327 822	342 966	361 225	351 753	379 002
Crane rate	30.3	33.5	34.7	35.3	35.7	33.9	35.0	35.1	35.6	36.6	35.7	35.3	38.0	39.7	39.8	40.6	40.8
Vessel working rate	40.5	40.9	41.1	41.9	41.0	40.7	41.9	42.0	42.4	45.5	43.8	45.7	45.1	51.9	53.0	50.4	50.3
Ship rate	49.4	53.8	57.6	57.5	57.3	56.2	57.1	57.9	58.5	63.6	61.9	61.8	61.6	72.4	71.8	69.9	72.1
Throughput pbm	129.4	138.9	139.7	124.1	125.1	156.6	161.4	150.1	161.7	178.5	187.7	174.0	179.5	187.8	197.8	192.6	207.6
Adelaide																	
Ships handled	56	62	63	57	57	57	57	54	59	55	58	50	58	62	63	60	60
Total teus	30 551	30 945	35 339	32 251	33 308	34 867	36 633	31 815	41 829	37 317	39 354	37 731	40 012	44 510	47 571	43 768	44 335
Crane rate	27.8	29.1	32.2	33.5	33.4	32.1	32.8	33.0	30.7	30.2	31.3	33.2	34.2	35.4	36.4	35.0	35.7
Vessel working rate	36.7	37.0	37.2	42.6	44.9	38.6	40.8	42.2	43.9	42.2	44.3	46.5	44.9	39.4	43.4	40.9	39.7
Ship rate	41.1	41.0	41.5	46.5	49.5	42.7	44.7	46.5	47.4	44.7	49.7	53.1	52.8	47.6	49.9	47.3	45.4
Throughput pbm	65.0	65.8	75.2	68.6	70.9	74.2	77.9	67.7	89.0	79.4	83.7	80.3	85.1	94.7	101.2	93.1	94.3
Fremantle																	
Ships handled	139	141	143	148	151	142	136	138	144	133	129	125	128	119	114	118	115
Total teus	84 733	82 423	93 043	90 059	85 682	92 819	90 600	89 632	93 393	98 756	110 726	106 807	106 672	113 779	119 375	115 962	116 487
Crane rate	30.5	33.5	36.5	37.7	37.9	37.4	37.5	35.4	36.6	36.8	38.4	36.7	37.3	38.7	36.7	36.7	36.3
Vessel working rate	36.0	32.4	33.6	34.5	35.0	37.8	36.6	32.8	35.7	36.0	39.5	37.2	38.3	42.3	40.0	38.2	38.5
Ship rate	44.7	43.2	48.7	51.3	50.8	52.3	53.0	46.6	47.4	51.2	56.2	54.2	59.1	62.5	57.6	55.4	56.1
Throughput pbm	65.6	63.8	72.0	69.7	66.3	71.9	70.2	69.4	72.3	76.5	85.7	82.7	82.6	88.1	92.4	89.8	90.2

pbm per berth metre

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

2. For data back to the September quarter 1993, refer to Waterline 34.

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

waterline issue 37 September 2004

Australian Government

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

acknowledgements

This issue of *Waterline* was compiled by Peter Hoss, Tony Carmody and Desiree Campbell. The Waterfront Reliability article was written by Dr Michael Simpson. Desktop publishing by Jodi Hood.

The BTRE is particularly grateful for the assistance of the Policy and Research Group and the Regulatory Group of the Department of Transport & Regional Services; the Association of Australian Ports and Marine Authorities; individual port authorities/corporations; Queensland Transport; shipping lines; ship operators; customs brokers; road transport operators; pilot, tug and mooring operators; and the stevedoring companies Patrick, P&O Ports and CSX World Terminals.

contact

e-mail / telephone / fax / post

For further information on this publication please contact:

Tony Carmody at waterline@dotars.gov.au
Tel (02) 6274 6823 Fax (02) 6274 6816.

This publication is available free of charge from the Bureau of Transport and Regional Economics:

GPO Box 501, Canberra ACT 2601, Australia waterline@dotars.gov.au
Tel (02) 6274 7210.

internet addresses

Download this issue of *Waterline* and back issues:
http://www.btre.gov.au/wline.htm

Bureau of Transport and Regional Economics home page:
http://www.btre.gov.au/

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

ISSN 1324-4043

PRINTED BY CPP INSTANT PRINTING, CANBERRA