issue 33

waterline

DECEMBER 2002

BUREAU OF btre TRANSPORT & REGIONAL ECONOMICS

in brief

in brief

- The five-port average crane rate decreased slightly to 26.4 containers per hour for the September quarter 2002 from 26.9 containers per hour for the June quarter.
- The five-port elapsed labour rate increased to 31.9 containers per hour.
- The five-port ship rate increased to 44.0 containers per hour.
- The overall tonnage of cargo for 2001/02 moved under coastal permits decreased by 5 per cent to 11.5 million tonnes.
- Berth availability was 93 per cent in the September quarter.

Waterline IN THE ELECTONIC AGE

Waterline in the electronic age

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at a glance

at a glance

upcoming changes to WATERLINE

upcoming changes

Waterline's format has remained largely unchanged since the first issue was produced in 1994. However, there have been many changes in the maritime industry in that time. The Bureau believes that Waterline needs to change too if it is to remain useful.

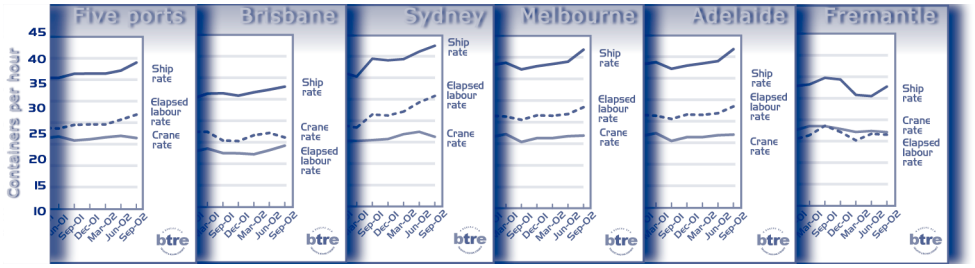
The Bureau intends to develop a new set of indicators targeting the land-side performance of the sea-land interface. The views and cooperation of industry will be sought to determine which indicators would be most useful and feasible to measure, and to supply data. More details will be given in Waterline 34 in March 2003.

Following the publication of Waterline 34, the Bureau will produce Waterline biannually instead of quarterly. Those articles that regularly feature in the March and September issues will continue to appear in those issues. The Coastal Shipping Permits articles will be moved to the March and September issues.

If you wish to comment on these changes please contact the Bureau at waterline@dotars.gov.au.

The Waterline Team

Container terminal productivity—pages 4 & 5



in this issue

in this issue

STEVEDORING PRODUCTIVITY

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

In summary:

- the five-port average crane rate (productivity per crane while the ship is worked) was 26.4 containers per hour for the September quarter 2002, compared with 26.9 in the June quarter 2002;
- the five-port average elapsed labour rate (productivity per ship based on the time labour is aboard the ship) was 31.9 containers per hour for the September quarter 2002, compared with 30.7 in the June quarter 2002;
- the five-port average ship rate (productivity per ship while the ship is worked) was 44.0 containers per hour for the September quarter 2002, compared with 42.1 in the June quarter 2002; and
- the number of containers moved in the September quarter reached record levels for all ports except Adelaide.

The *Brisbane* (P&O Ports, Patrick) average crane rate decreased to 26.1 containers per hour in the September quarter 2002, from 27.2 in the June quarter 2002. The elapsed labour rate of 24.2 containers per hour and the ship rate of 37.9 containers per hour were both up compared with the previous quarter's figures.

The *Sydney* (P&O Ports, Patrick) average crane rate decreased to 26.3 containers per hour in the September quarter 2002 from 27.4 in the June quarter 2002. The elapsed labour rate of 35.8 containers per hour and the ship rate of 47.4 containers per hour were both up compared with the previous quarter's figures.

The *Melbourne* (P&O Ports, Patrick) average crane rate increased to 26.9 containers per hour in the September quarter 2002 from 26.7 in the June quarter 2002. Both the elapsed labour rate of 33.4 containers per hour and the ship rate of 46.7 containers per hour were up compared with the previous quarter's figures.

The *Adelaide* (CSX World Terminals) average crane rate decreased to 23.3 containers per hour in the September quarter 2002, from 24.0 in the June quarter 2002. The elapsed labour rate of 32.6 containers per hour and the ship rate of 34.5 containers per hour were both down compared with the previous quarter's figures.

The *Fremantle* (P&O Ports, Patrick) average crane rate decreased to 27.1 containers per hour in the September quarter 2002, from 27.4 containers per hour in the June quarter 2002. The elapsed labour rate of 26.5 containers per hour was down, and the ship rate of 37.7 containers per hour was up compared with the previous quarter's figures.

Teus per hour

Table 8 presents the stevedoring productivity indicators in terms of teus per hour. These data are retained in Waterline for the purpose of long-term historical comparison. They are not directly comparable with the data in table 1 because indicators based on teus per hour may be affected by changes in the mix of 20-foot and 40-foot containers from one period to the next.

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

	Quarter								
Port / Indicator	**Sep-00**	**Dec-00**	**Mar-01**	**Jun-01**	**Sep-01**	**Dec-01**	**Mar-02**	**Jun-02**	**Sep-02**
Five ports									
Ships handled	840	814	787	813	825	846	824	868	858
Total containers	531 700	545 075	472 797	502 037	575 130	591 070	544 135	591 247	645 506
Crane rate	24.9	25.5	26.4	26.8	25.8	26.1	26.6	26.9	26.4
Elapsed labour rate	28.5	27.9	28.8	28.7	29.5	29.6	29.6	30.7	31.9
Ship rate	38.0	39.5	40.4	40.4	41.4	41.4	41.4	42.1	44.0
Elapsed time not worked (per cent)	25	29	29	29	29	29	29	27	28
40-foot containers (per cent)	33	34	34	32	33	33	33	33	36
Brisbane									
Ships handled	187	179	167	188	175	198	202	211	216
Total containers	80 366	83 082	63 177	84 854	81 935	88 669	78 160	94 230	103 537
Crane rate	25.8	26.3	27.4	27.4	25.4	25.3	26.6	27.2	26.1
Elapsed labour rate	23.3	23.1	22.8	23.5	22.5	22.4	22.2	23.2	24.2
Ship rate	34.9	34.4	35.1	36.3	36.4	35.8	36.6	37.2	37.9
Elapsed time not worked (per cent)	33	33	35	35	38	37	39	38	36
40-foot containers (per cent)	29	30	30	28	29	27	28	29	32
Sydney									
Ships handled	223	211	201	202	208	206	196	203	204
Total containers	173 988	176 106	148 316	152 650	179 506	184 559	167 278	172 599	200 825
Crane rate	24.3	24.3	25.3	25.3	25.5	25.7	26.9	27.4	26.3
Elapsed labour rate	29.6	28.6	29.0	28.4	31.4	31.2	32.1	34.3	35.8
Ship rate	39.5	40.9	41.3	40.3	44.4	44.0	44.3	46.1	47.4
Elapsed time not worked (per cent)	25	30	30	29	29	29	28	26	25
40-foot containers (per cent)	37	37	37	34	35	37	37	37	38
Melbourne									
Ships handled	227	218	214	215	243	249	234	251	250
Total containers	189 306	189 580	170 250	174 149	214 752	221 647	205 435	221 786	239 564
Crane rate	25.0	25.8	26.5	27.2	25.4	26.3	26.3	26.7	26.9
Elapsed labour rate	30.5	30.5	31.5	31.3	30.5	31.6	31.5	31.9	33.4
Ship rate	40.1	42.7	43.2	43.7	42.2	42.9	43.4	44.0	46.7
Elapsed time not worked (per cent)	24	29	27	28	28	26	28	28	28
40-foot containers (per cent)	34	35	33	31	33	33	33	33	36
Adelaide									
Ships handled	62	63	57	57	57	57	54	59	55
Total containers	26 836	27 800	25 051	25 928	28 369	28 857	24 505	32 735	28 815
Crane rate	25.3	25.3	26.0	26.0	26.1	25.9	25.5	24.0	23.3
Elapsed labour rate	32.1	29.3	33.1	34.9	31.4	32.1	32.5	34.3	32.6
Ship rate	35.5	32.6	36.1	38.5	34.7	35.2	35.8	37.1	34.5
Elapsed time not worked (per cent)	10	10	8	9	10	9	9	8	6
40-foot containers (per cent)	15	27	29	28	23	27	30	28	30
Fremantle									
Ships handled	141	143	148	151	142	136	138	144	133
Total containers	61 204	68 507	66 003	64 456	70 568	67 338	68 757	69 897	72 765
Crane rate	24.9	26.8	27.5	28.5	28.5	27.9	27.1	27.4	27.1
Elapsed labour rate	24.1	24.4	25.4	26.4	28.6	27.2	25.2	26.7	26.5
Ship rate	32.1	35.9	37.8	38.2	39.8	39.4	35.8	35.5	37.7
Elapsed time not worked (per cent)	25	32	33	31	28	31	30	25	30
40-foot containers (per cent)	35	36	36	33	32	35	30	34	36

Notes 1. The definitions used in compiling the stevedoring productivity data are detailed on pages 15–17.
2. Data from CSX World Terminals at Brisbane are incorporated from the December quarter 1999 until June quarter 2001.
3. The data in this table are expressed in container moves per hour and therefore are not directly comparable with the teus per hour data in table 8.
4. Elapsed time not worked is the difference between the ship and elapsed rates as a percentage of the net rate.

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

CONTAINER TERMINAL PRODUCTIVITY

FIGURE 1 FIVE MAJOR PORTS

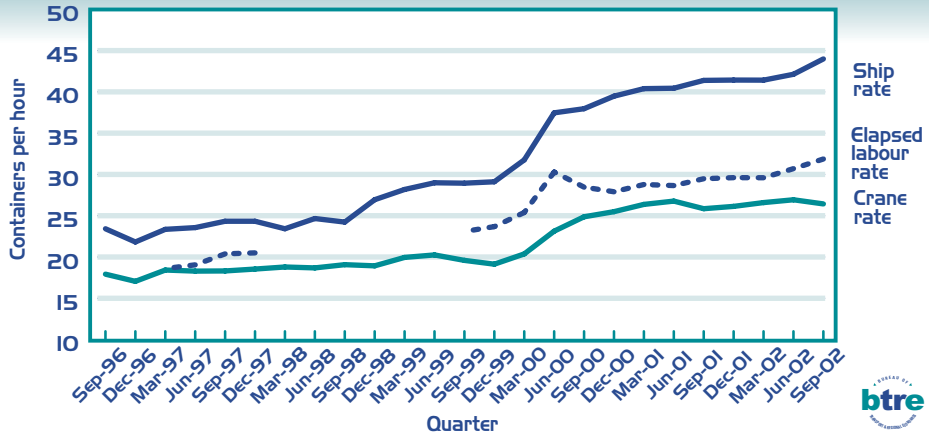


FIGURE 2 BRISBANE

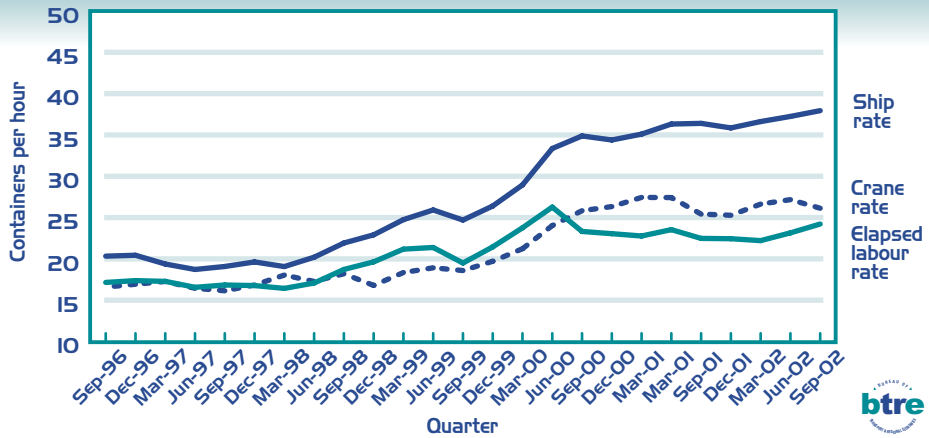
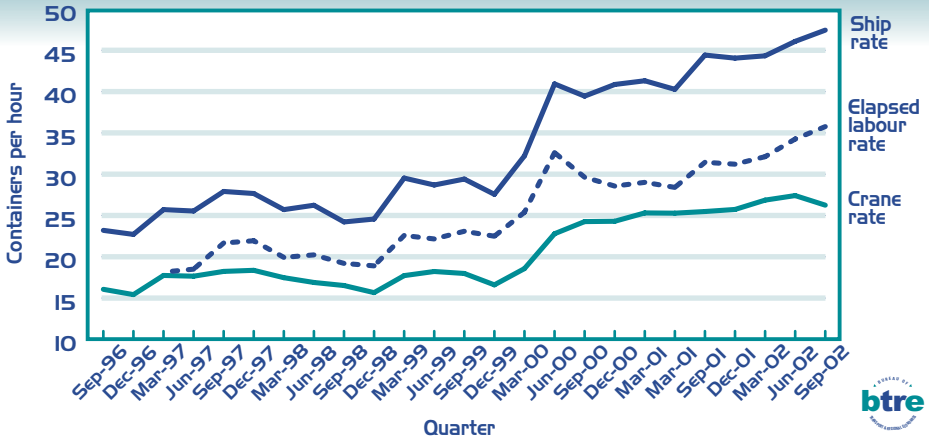


FIGURE 3 SYDNEY



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

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

CONTAINER TERMINAL PRODUCTIVITY

FIGURE 4 MELBOURNE

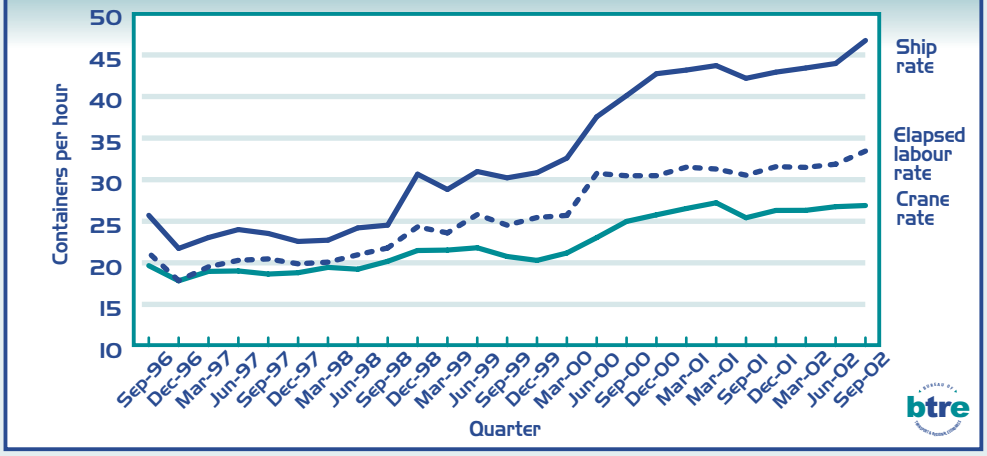


FIGURE 5 ADELAIDE

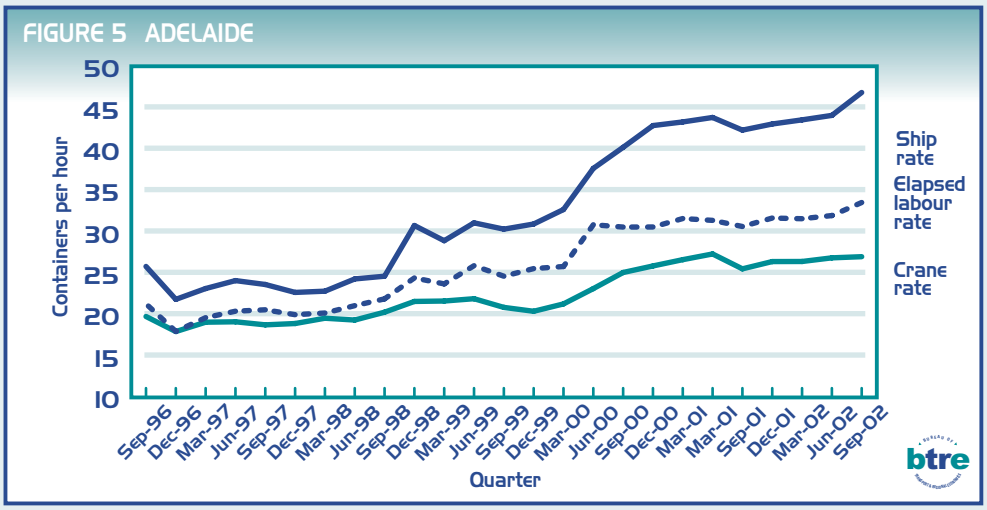
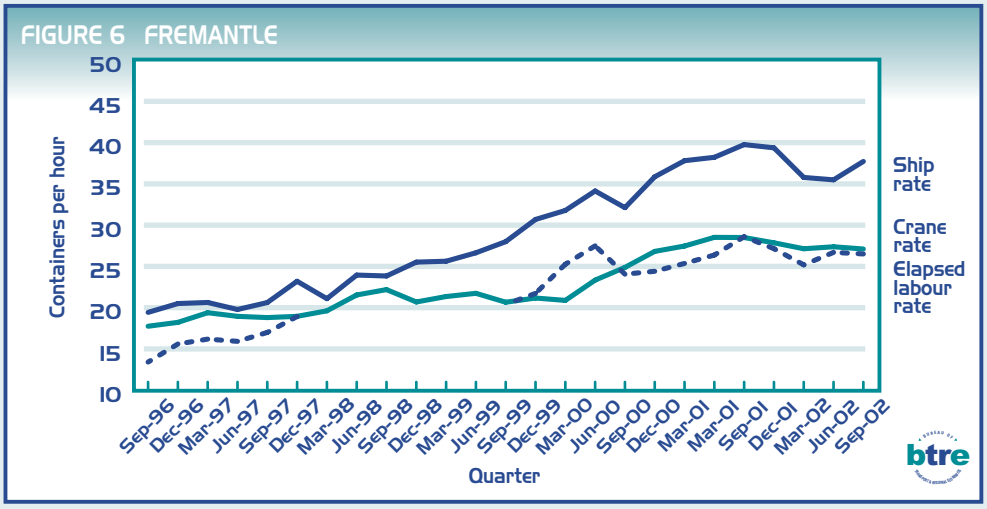


FIGURE 6 FREMANTLE



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

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

WATERFRONT RELIABILITY

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

Berth availability, pilotage, towage

Table 2 presents information on berth availability, pilotage and towage for a sample of ship calls in the September quarter 2002. It indicates the extent to which selected port services were available at the scheduled or confirmed time.

The sample for the September quarter 2002 covers 192 ship calls, equivalent to around 22 per cent of total ship calls at the major container terminals during the period. The proportion of ship calls covered at individual ports ranges from 14 per cent at Brisbane to 29 per cent at Sydney. The figures for Brisbane should be treated with caution due to the low proportion of ship calls included in the data. The sample for the five ports includes calls by container ships operating to and from Europe, the Mediterranean, the Middle East, North America, Asia and New Zealand.

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

(Number of ship calls)

Port/operation	Delay (hrs) 0	1	2	3	4	5–10	11–20	>20	Total no. of ship calls	Availability indicator (per cent)
Brisbane										
Berth availability	28	0	0	0	1	1	0	1	31	
Pilotage	31	0	0	0	0	0	0	0	31	
Towage	31	0	0	0	0	0	0	0	31	
Sydney										
Berth availability	58	0	0	0	0	0	1	0	59	
Pilotage	59	0	0	0	0	0	0	0	59	
Towage	59	0	0	0	0	0	0	0	59	
Melbourne										
Berth availability	49	1	0	0	0	3	2	2	57	
Pilotage	57	0	0	0	0	0	0	0	57	
Towage	57	0	0	0	0	0	0	0	57	
Adelaide										
Berth availability	13	0	0	0	0	0	0	1	14	
Pilotage	14	0	0	0	0	0	0	0	14	
Towage	14	0	0	0	0	0	0	0	14	
Fremantle										
Berth availability	28	0	1	0	0	0	2	0	31	
Pilotage	31	0	0	0	0	0	0	0	31	
Towage	31	0	0	0	0	0	0	0	31	
Five ports										
Berth availability	176	1	1	0	1	4	5	4	192	93.2
Pilotage	192	0	0	0	0	0	0	0	192	100.0
Towage	192	0	0	0	0	0	0	0	192	100.0

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

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

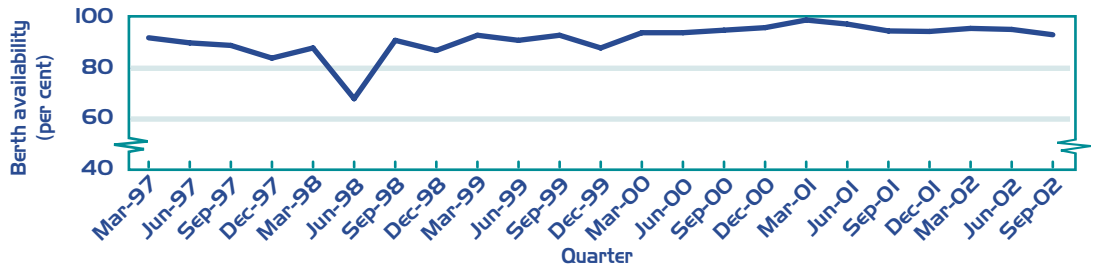
The *berth availability* indicator measures the proportion of ship arrivals where a berth is available within four hours of the scheduled berthing time. Figure 7 shows that berth availability for the sample of ship calls was 93 per cent in the September quarter 2002. This was lower than in the previous quarter. Caution should be used in undertaking inter-port comparisons of the berth availability data, as there is significant variation between ports in sample sizes and ship call patterns.

Average waiting time for ships unable to obtain a berth within four hours of the scheduled berthing time was 16 hours in the September quarter 2002, a slight increase over 15 hours in the previous quarter.

The average berth waiting time for the December quarter 2001 published in Waterline 30 and 31 was incorrect. The average berth waiting time was 14 hours, not 13 hours as stated. The BTRE regrets any inconvenience caused by this error.

The *pilotage* and towage indicators reported in *Waterline* measure the proportion of ship movements where the service is available to the ship within one hour of the confirmed ship arrival/departure time. The proportion was 100 per cent for the pilotage indicator in the September quarter 2002, the same as in the previous quarter. The proportion was also 100 per cent for the towage indicator in the September quarter 2002, also the same as in the June quarter 2002. Performance has been at similar levels since the first data (covering the March quarter 1997) were published in *Waterline*.

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



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

Other waiting time

The five shipping lines that supplied information for table 2 also provided data on other ship waiting time. This category incorporates waiting time that is attributable to factors other than the unavailability of a berth, pilot or towage service at the scheduled/confirmed time. The data on other ship waiting time reported in *Waterline* exclude ship schedule adjustments.

Table 3 summarises the data on other waiting time incidents, which had a duration of at least one hour, in the September quarter 2002. The shipping lines identified a total of 127 incidents (affecting 97 ship calls) for the sample of ship calls over this period. These incidents involved both ship-related and waterfront factors.

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

(Number of incidents)

	Ship waiting time (hrs)							Total no. of
Incident type	1	2	3	4	5–10	11–20	>20	incidents
Awaiting labour	5	11	7	4	19	10	3	59
Stevedoring finished early	1	1	4	1	4	0	0	11
Crane breakdown	6	3	1	1	0	0	0	11
Stevedoring finished late	2	3	1	2	1	0	0	9
Weather or tides	4	0	2	0	2	0	0	8
Pilot/tug booking not at preferred time	4	2	1	1	0	0	0	8
Other	0	1	3	1	1	0	0	6
Early ship arrival	1	1	0	0	1	2	1	6
Ship repairs or maintenance	0	3	0	2	0	1	0	6
Late ship arrival	0	0	0	0	0	2	1	3
Industrial action	0	0	0	0	0	0	0	0
Total incidents	**23**	**25**	**19**	**12**	**28**	**15**	**5**	**127[a]**

a. These incidents affected 97 of the 192 ship calls covered in table 2.

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

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 September quarter 2002 was the category of awaiting labour, which accounted for 57 per cent of total waiting time. Late ship arrival accounted for 9 per cent of total waiting time, and early ship arrival was related to a further 9 per cent of total waiting time.

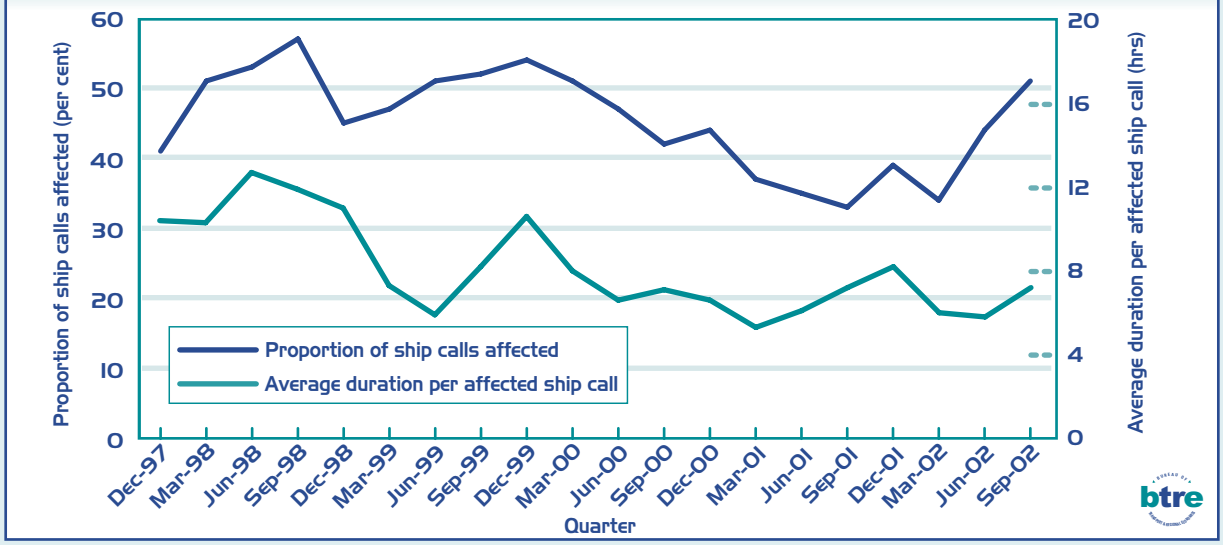
In the September quarter 2002, 51 per cent of ship calls in the sample were affected by other waiting time incidents that had a duration of at least one hour, up from 44 per cent in the June quarter 2002. The average duration of other waiting time incidents was 7.2 hours per affected ship call in the September quarter 2002, an increase over 5.8 hours per affected ship call in the previous quarter.

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

Stevedoring

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

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



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

Stevedoring rate provides a partial indicator of the variability of stevedoring productivity at each port. It measures how consistently each port achieved its average crane rate for the quarter. Stevedoring rate is defined as the proportion of ship visits where the average crane rate for the ship is within two containers per hour (plus or minus) of the quarterly average crane rate for the terminal. The stevedoring rate in the September quarter 2002 changed little at Brisbane compared with that for the June quarter 2002, while falling at Fremantle. There were increases at Melbourne and Sydney.

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 September quarter 2002 increased slightly at Sydney, changed little at Brisbane, was unchanged at Fremantle, and fell slightly at Melbourne compared with the previous quarter.

Ship arrival

Table 4 includes data for two indicators of ship arrival advice. Data were not available for Melbourne for the June quarter 2002 or the September quarter 2002.

The first indicator is the proportion of ship arrivals within one hour (plus or minus) of the most recently advised arrival time available to the port authority/corporation *at 24 hours prior to actual arrival*. Compared with the previous quarter, this indicator fell at Adelaide and Sydney, and rose at Brisbane and Fremantle, in the September quarter 2002.

The second indicator is the proportion of ship arrivals within one hour (plus or minus) of the last scheduled arrival time *advised inside the 24 hours prior to actual arrival*. In the September quarter 2002 this indicator fell at all four ports providing data.

TABLE 4 STEVEDORING AND SHIP ARRIVAL RELIABILITY INDICATORS, JUNE AND SEPTEMBER QUARTERS 2002

(per cent)

Indicator	Brisbane		Sydney		Melbourne		Adelaide		Fremantle	
	Apr–Jun	Jul–Sep	Apr–Jun	Jul–Sep	Apr–Jun	Jul–Sep	Apr–Jun	Jul–Sep	Apr–Jun	Jul–Sep
Stevedoring										
Stevedoring rate	54	53	46	59	62	66	na	na	40	35
Cargo receival	97	96	85	87	94	92	na	na	94	94
Ship arrival										
Advice at 24 hrs	61	66	58	51	na	na	59	44	52	56
Advice inside 24 hrs	96	90	98	93	na	na	93	91	89	87

na *not available*

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

BENCHMARKING TECHNOLOGY ON THE AUSTRALIAN WATERFRONT: IMPLICATIONS FOR AGRICULTURAL EXPORTERS

This is a condensed version of a report prepared by Access Economics in conjunction with Maunsell Australia for the Rural Industries Research and Development Corporation. The full report is available on the RIRDC website — www.rirdc.gov.au.

The uptake of container-related technology and management systems within stevedoring and its ship and shore-side interfaces is a key determinant of service quality and costs for exporters. The aims of this study, which focuses on containerised wool, meat, dairy and cotton exports, were to examine:

- the contribution of technology to improvements in waterfront performance;
- the achievements of Australian service providers in introducing and implementing new technologies; and
- the extent to which there may still be a gap between technological performance here and overseas.

Auckland and Tauranga (New Zealand), Oakland (USA), Vancouver (two terminals within the one Canadian port), Felixstowe (UK), Durban (South Africa), and Manila (Philippines) were selected as the international comparator ports for this study. These ports were chosen on the basis that they were:

- of similar size, and had broadly equivalent agricultural throughput, to Melbourne, Sydney and Brisbane;
- major destination points for ships that also call at Australian ports; and
- prepared to supply relevant data to Maunsell Australia.

While Australia competes with these ports, the objective of this exercise was to compare performance in the application of technologies, rather than to assess the competitive performance of the Australian and comparator ports.

The study found that the ports of Melbourne, Sydney and Brisbane compare favourably to the comparator ports with regard to their application of appropriate technologies, and on some measures are more advanced than the comparator ports. The technologies selected for comparison purposes were considered to be the most modern in existence.

The Vehicle Booking System technologies in use in the Australian ports are at least as good as, if not better than, similar systems in operation in the benchmarked ports. However, there is scope to install systems to facilitate backloading trucks with return containers.

The ports of Melbourne, Sydney and Brisbane are also performing well with regard to the introduction of yard and ship planning software. Patrick Stevedores' proposed introduction of robotic straddle carriers would place it at the forefront internationally.

The ports of Melbourne, Sydney and Brisbane also perform well with regard to the introduction of container tracking and monitoring technology. Australia is at the forefront in implementing state-of-the-art technology for tracking and monitoring refrigerated containers. However, more work is needed to integrate container tracking arrangements across the whole supply chain.

TABLE 5 TRUCK TURNAROUND TIMES AND CRANE HANDLING RATES: SELECTED AUSTRALIAN AND INTERNATIONAL PORTS

	Auckland	Tauranga	Oakland	Vancouver TSI C	Vancouver Centerm	Felixstowe	Manila	Durban	Sydney	Brisbane	Melbourne
Truck turnaround times (minutes)	20	12	27	N/A	18	45	44	35	33	25	30
Crane handling rates (gross lifts per hour)	29	32	30	24	24	21	22	30	28.4	23.5	31.3

Source: Maunsell Australia

The ports of Melbourne, Sydney and Brisbane also performed well in terms of truck turnaround times and crane handling rates. The figures presented below for truck turnaround times in Sydney, Brisbane and Melbourne only apply to Patrick Stevedores' terminals. Vehicle Booking Systems have delivered faster truck turnaround times in Australia and overseas by facilitating efficient yard management. Crane handling rates in Australia have improved significantly since the Productivity Commission published International Benchmarking of the Australian Waterfront in April 1998, and are now close to the average of the comparator ports.

New technologies have delivered substantial productivity gains.

Labour market reforms have underpinned productivity gains on the Australian waterfront and facilitated investment in new technologies. Greater control over their businesses has encouraged stevedores to invest heavily in new technologies and enabled them to secure productivity gains from previous technological investments.

New technologies in container terminals include gate automation, computer–based ship and yard automation systems, the use of GPS systems on yard equipment and the introduction of higher clearance yard equipment. These have enabled higher container stacking and greater utilisation of terminal capacity. Substantial technological advances have been achieved internationally in the monitoring of refrigerated containers, but attaining the full cooperation of all interested parties in Australia has been difficult. Larger ships with improved technologies (such as Dynamic Under Keel Clearance, which enables maximum ship loading for available channel depth) can deliver lower costs. Improvements in supply chain communications and the move to open, digital, internet-based systems that offer paperless trading will allow terminal booking data to be matched to ship booking data, which could lead to faster ship turnaround times and lower costs.

Rail operators have introduced technological improvements such as automated waybill production, integrated wagon booking and master train plan systems. These have reduced transaction costs and transmission errors, and increased the utilisation of rolling stock. While some of those consulted believe that rail is behind in its use of EDI links and general connectivity with the rest of the export supply chain, this situation is expected to change rapidly with rail privatisation.

Best practice road transport operations increasingly involve 24–hour operations. This has allowed the window for truck deliveries to be widened. There have been technological improvements in communications and location tracking, but these new technologies have had less penetration in road transport than in other areas under consideration.

The exporters consulted in this study were generally satisfied with the technologies in place in the stevedoring industry. They emphasised the dramatic improvement over recent years compared with the service they used to receive. There were no complaints that Australia is disadvantaged by lagging competitors in adopting new technologies, or that Australia is backward in attitudes towards new technologies. Exporters believe the changes have helped deliver faster and better services. These have led to lower indirect and compliance costs rather than lower user charges.

There are still issues relating to the wider extension of electronic data interchange (EDI), including backwards up the supply chain and forwards to customers, as well as the participation of financial institutions. Some exporters are concerned about incompatible communications systems between stevedores and shipping companies and the use by shipping companies of a range of different communications technologies.

Exporters are generally satisfied with the service provided, but are concerned that investment in technology further up and down the supply chain has not been as substantial. Some exporters were critical of global shipping lines for not having invested enough in providing communications and information systems to respond to exporters' evolving needs.

The Australian Customs Service has introduced flexible internet-based communications systems that offer the prospect of substantial savings in messaging costs for exporters. Better communications up and down the supply chain should enable exporters to minimise delays and to get their product to the ship in time for sailing. There is broad support for such innovations.

Positive signs for the future include:

- improved productivity stemming from the waterfront reforms;
- the intention by stevedores to move further back up the supply chain;
- recent railway privatisation;
- new rail capacity expected to overcome problems of rail freight having to traverse suburban networks; and
- the advent of system-wide internet-based communications systems flowing from the activities of some key Government agencies.

However, there still appears to be scope for securing further gains from the introduction of new technologies, especially internet-based EDI. The focus in coming years is likely to be how to maximise the benefits from this and other technological investments, further up and down the supply chain.

The uptake of new technologies is being slowed by the lack of an incentive for firms to introduce new technologies in one part of the supply chain given uncertainties as to whether such technologies will be taken up by others. Justifying investment in new technologies can be difficult. A firm investing in new technology runs the risk that the technology will not be taken up by others, especially if competitors have substantial "sunk costs" in their own technologies. This may impede the adoption of the most appropriate system–wide technologies. There may be scope for the public sector to take a lead in some instances. For example, the changes to communications systems being introduced by the Australian Customs Service and the Australian Quarantine Inspection Service are perceived by many exporters as likely to encourage users to introduce communications technologies that are internet–based. They may therefore deliver wider system benefits.

Most exporters believe the rail system is operating reasonably efficiently but some users believe governance arrangements for the rail system have retarded the uptake of the most effective technologies. Bottlenecks (particularly in Central and Western NSW and in efficient port access) and other institutional constraints are perceived as having prevented the introduction of the best technologies. The recent sale of National Rail and FreightCorp to the Toll–Patrick Consortium may help resolve some of the constraints to the uptake of appropriate technology, but not necessarily the infrastructure bottlenecks.

The communications arrangements between road freight service providers, exporters and stevedores do not yet include state–of–the–art internet–based systems. The highly competitive nature of the road freight industry in Australia, with many trucking companies unable to afford the investments that would be required to implement state–of–the–art technologies, may constrain the introduction of systems that would improve communications between transporters, exporters, stevedores and shipping companies.

Similarly, technologies installed by international shipping companies will not necessarily be compatible with communications systems already in use or in prospect in Australia.

Substantial progress has been made in introducing new technologies on the Australian waterfront. The ports of Melbourne, Sydney and Brisbane are at least as good in applying state–of–the–art technologies as similarly situated ports internationally. In some cases Australia is at the leading edge in applying new technologies. However, other countries will continue to apply new and relevant technologies as they seek competitive advantage. There is more to be done further up and down the supply chain in Australia. Australia will need to continue to work hard to ensure that it stays at and preferably ahead of world's best practice for ports of comparable characteristics. There is no room for complacency.

COASTAL SHIPPING PERMITS

In previous issues of Waterline, single voyage permit (SVP) and continuing voyage permit (CVP) charts were published on a quarterly basis. In addition, the SVP summary table (table 6 in this issue) was published for April–September or October–March, depending on the timing of the issue. From this issue forward, the charts and the SVP summary table will be published on a January–June and July–December basis. This will bring the data in line with the new biannual Waterline publishing times of March and September. The January–June 2002 data incorporates the January–March data published in Waterline 31.

Total cargo moved under SVPs and CVPs fell from 12.1 million tonnes in 2000/01 to 11.5 million tonnes in 2001/02, a decrease of 5 per cent.

Single voyage permits

The Bureau has received revised SVP data for the 2001/02 financial year. As a result, the summary data for July–December 2001, in addition to January–June 2002, are published in Table 6. Due to the increasing difficulty of identifying cargo types, the bulk cargo sub-categories have been modified to remove "Crude oil and feedstocks". All permits issued under this sub-category are accounted for in other sub-categories.

Figure 9 illustrates the number of SVPs issued, and tonnes of cargo carried, between July–December 1990 and January–June 2002. The number of SVPs issued in January–June 2002 decreased by 7 per cent compared with July–December 2001, and by 3 per cent compared with January–June 2001. The associated tonnes of cargo carried decreased by 5 per cent compared with July–December 2001, and by 14 per cent compared with January–June 2001.

On a per annum basis the total number of SVPs issued in 2001/02 was 664, compared with 642 in 2000/01, representing an increase of 3 per cent. Over the same period, SVP cargo fell from 10.1 million tonnes to 9.6 million tonnes, a decrease of 5 per cent.

Table 6 gives a breakdown of SVPs by cargo types for the 2001/02 financial year. General cargo (including containerised cargo) permits continue to lead the tally for SVP permits issued. However, bulk cargo accounts for over 90 per cent of the total tonnage moved under SVPs.

TABLE 6 SUMMARY OF SINGLE VOYAGE PERMITS ISSUED, 1 JULY 2001 TO 30 JUNE 2002

	Jul–Dec 2001		Jan–Jun 2002	
Cargo category	**Permits**	**Tonnes**	**Permits**	**Tonnes**
Bulk cargo				
Petroleum Products	52	1 556 170	42	1 152 500
Liquefied Gas	31	62 300	30	49 650
Other Bulk Liquids	27	269 310	11	78 360
Dry Bulk	109	2 664 521	109	2 971 074
General Cargo	125	376 724	128	432 012
Total	344	4 929 025	320	4 683 596

Note: All data revised

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

Continuing voyage permits

Although CVPs were available, they were rarely requested or issued prior to 1998. However, as shown in figure 10, since 1998 there have been significant fluctuations in both the number of permits issued and the tonnage carried. During 2001/02 there were 89 CVPs issued, compared with 116 in 2000/01. 1.9 million tonnes of coastal trade were moved using CVPs in 2001/02, representing a decrease of 4 per cent compared with 2000/01. One CVP typically extends for a period of six months, and is approximately equivalent to six SVPs.

General information

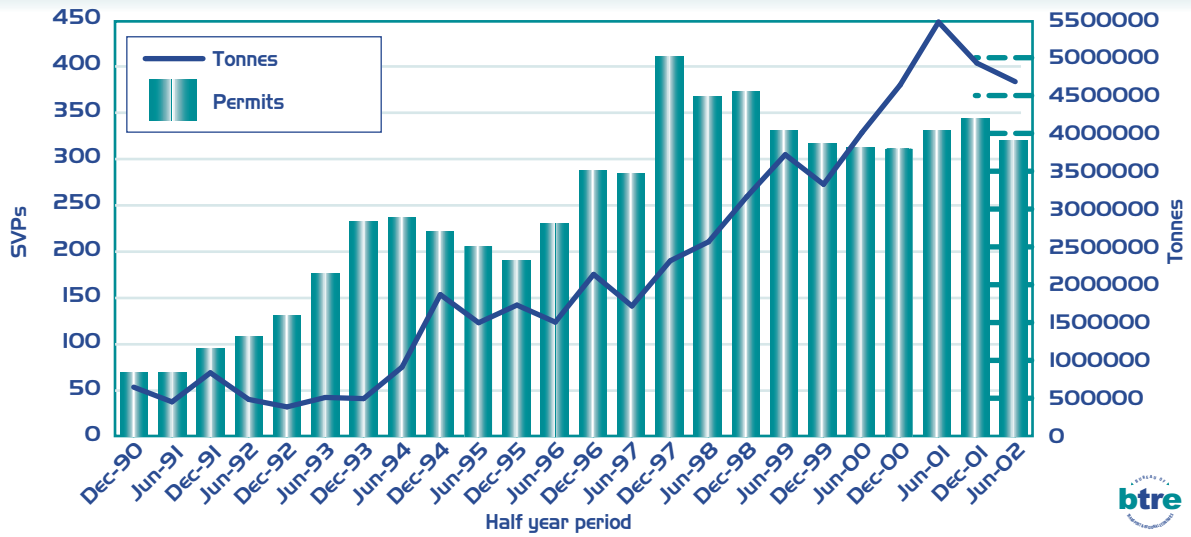
Part VI of the *Navigation Act 1912* provides for licensed vessels to carry passengers and cargo in the coasting trade. The Act does not restrict the class of vessels that may obtain a coasting trade licence. Any ship, regardless of registry, is able to obtain a licence provided the crew is paid Australian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

Ships that obtain a licence must also conform to the requirements of the *Navigation Act 1912*, including specified safety, manning, and crew qualifications, and rehabilitation and compensation provisions. Where suitable licensed vessels are not available, the Act also provides for the issue of single or continuing

voyage permits to unlicensed vessels, where this is considered to be in the public interest. The application fee is $200 for a cargo SVP, $400 for an urgent cargo SVP, and $400 for a CVP. A fee of $22 applies for obtaining a coasting trade licence.

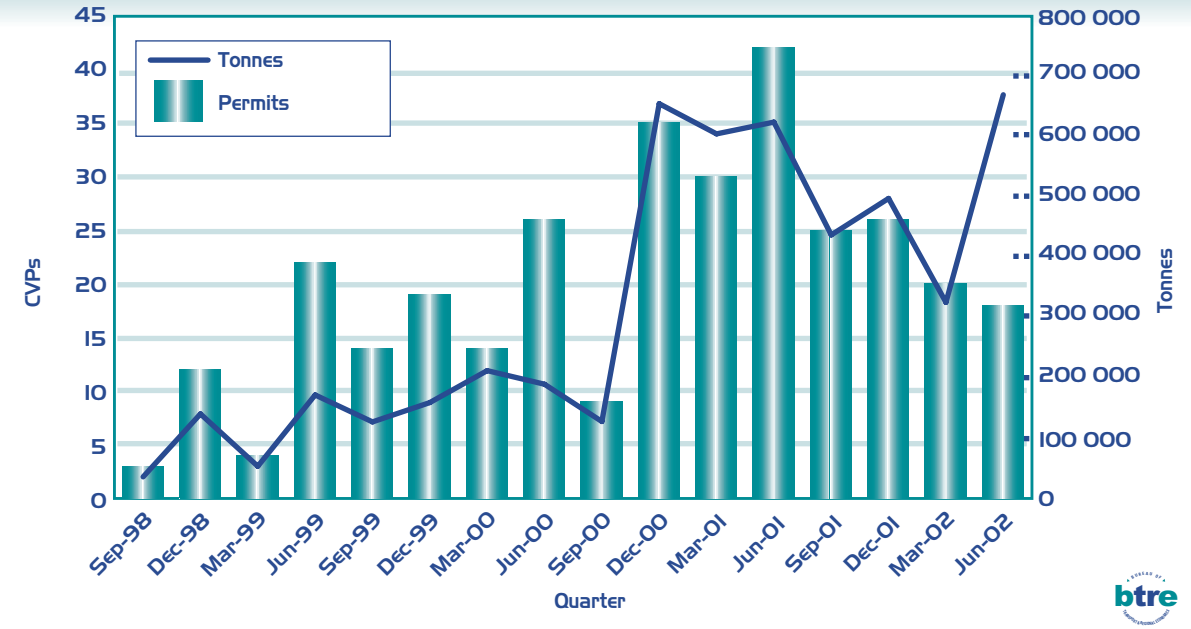
More information on coastal permits can be found on the Department of Transport and Regional Services' internet site at http://www.dotars.gov.au/transreg/str_permits.htm

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



Source Transport Regulation Division, Department of Transport and Regional Services

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



Source Transport Regulation Division, Department of Transport and Regional Services

REVISIONS TO THE PORT INTERFACE COST INDEX

The PICI was last published in Waterline 32. A new index was published for the first time in that issue based on a ship range of 35 000–40 000 GRT. Unfortunately two errors were made in the compilation of the new index. Details of the problems caused and the corrections made are given below. The Bureau apologises for these errors and has taken steps to ensure they do not recur.

Parameters used in the Port Interface Cost Index

Many readers have noted that the average numbers of teus exchanged for July–December 2001 had changed from previously published figures. This error occurred because of a change in another area that had unforeseen circumstances. To prevent this from happening again, and to provide readers with more accurate data, the process for calculating these figures has changed.

The parameters are calculated from port call data supplied by the relevant port authorities/corporations. In the past, these data were not complete. The breakdown of loaded/empty and loaded inwards/outwards was calculated by taking the proportion of the different combinations from the non-financial data, published as table 5 in Waterline 32. The average teus exchanged calculated from the port call data was multiplied by the proportions from the non-financial data. The difference in the published data occurred because of a slight change to how the proportions were calculated.

It is now possible to derive the average number of loaded teus exchanged and the loaded inwards/outwards from the port call data supplied by the port authorities/corporations, and future issues will adopt this approach. Table 7 shows the parameters for ships in the 15 000–20 000 GRT range and the 35 000–40 000 GRT range for July–December 2001 and January–June 2002 derived from the port call data.

TABLE 7 PARAMETERS USED IN THE PORT INTERFACE COST INDEX, 2001–2002

	Brisbane		Sydney		Melbourne		Adelaide		Fremantle	
	Jul-Dec 2001	Jan-Jun 2002	Jul-Dec 2001	Jan-Jun 2002	Jul-Dec 2001	Jan-Jun 2002	Jul-Dec 2001	Jan-Jun 2002	Jul-Dec 2001	Jan-Jun 2002
Vessel size GRT 17215										
Average Teus exchanged[a]										
All	493	483	1085	989	1048	916	626	na	784	778
Loaded	419	402	883	809	874	786	542	na	611	618
Empty	73	81	202	180	175	129	84	na	172	160
Loaded inwards	205	222	555	499	439	381	233	na	307	310
Loaded outwards	215	180	328	310	434	405	309	na	304	308
Ship call parameters[a]										
Number of port calls	4	6	3	3	3	4	2	na	5	5
Elapsed berth time (hrs)	24	23	40	35	37	36	22	na	21	24
Vessel size GRT 37394										
Average Teus exchanged[b]										
All	1055	965	1295	1520	1661	1769	732	787	582	561
Loaded	755	733	1112	1217	1394	1512	577	578	478	444
Empty	300	231	184	303	267	258	155	209	104	117
Loaded inwards	300	338	709	776	756	746	210	195	288	262
Loaded outwards	455	395	402	441	638	766	366	382	190	182
Ship call parameters[b]										
Number of port calls	5	4	4	3	4	3	3	3	4	4
Elapsed berth time (hrs)	32	18	30	31	37	34	22	20	21	20

a. Mean value for ships between 15 000 and 20 000 GRT.
b. Mean value for ships between 35 000 and 40 000 GRT.
na Not Available

Note: All data revised

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

Port and Related Charges

There was an error in tables 7 and 8 Port and Related Charges in Waterline 32. The Harbour Dues for Brisbane should read $46.20, not $9.90 as printed. An incorrect cell reference in the final tables was the cause of this error. The total charge figures in tables 7 and 8 and the cargo-based charge figures in tables 9 and 10 are correct.

STEVEDORING PRODUCTIVITY DEFINITIONS

The definitions used by CSX World Terminals, P&O Ports, and Patrick the Australian Stevedore to calculate their quarterly stevedoring productivity for inclusion in Waterline are given below. Figure 11 contains an example to illustrate how these definitions work.

Ships

Only fully cellular ships used as such 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. Such vessels are excluded if used for mixed cargoes of containers and general cargo.

Containers Handled

The total number of containers lifted on/off fully cellular ships.

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.

Elapsed Labour Time

This is the elapsed time between labour first boarding the ship and labour last leaving the ship, less the following non-operational delays:

- No labour allocated to ship
- Closed-port holiday
- Port-wide industrial stoppage
- Break bulk and containers that require manual interventions, eg. use of wires, chains, non-rigid spreaders or other handling gear.*

*When calculating the ship break-bulk time, the time allowed is:

Total Crane Hours spent handling break-bulk divided by Crane Intensity (see below).

Elapsed Crane Time

This is the total allocated crane hours, assuming that the vessel is ready for working, less the following operational and non-operational delays:

- No labour allocated
- Closed-port holiday
- Port-wide industrial stoppage
- Total crane time spent handling break-bulk cargo and containers that require manual intervention, eg. use of wires, chains, non-rigid spreaders or other handling gear
- Award or enterprise agreement breaks as applicable
- Adverse weather
- Delays caused by the ship or its agent
- All portainer breakdowns, including spreader changes
- Other equipment breakdowns which stop portainer crane operations
- Booming up for passing ships

- Handling hatch covers
- Cage work and lashing/unlashing where crane operations are affected
- Crane long-travelling between hatches and crossing accommodation
- Labour withdrawn without operator's agreement including enterprise agreement related industrial stoppages
- Over-dimensional containers requiring additional (rigid) spreader
- Spreader changes
- Waiting for export cargo
- Defective ship's gear (eg. jammed twist-locks, broken cell guides, ballast pumps unable to maintain list/trim, etc.)

Crane Intensity

Crane Intensity is the total number allocated crane hours, divided by the elapsed time from labour first boarding the ship and labour last leaving the ship, less the following delays:

- No labour allocated to ship
- Closed-port holiday
- Port-wide industrial stoppage

Elapsed Labour Rate

The total containers handled divided by the Elapsed Labour Time.

The total TEUs handled divided by the Elapsed Labour Time.

Crane Rate

The total containers handled divided by the Elapsed Crane Time.

The total TEUs handled divided by the Elapsed Crane Time.

Ship Rate

This is the Crane Rate multiplied by Crane Intensity (as defined above).

FIGURE II STEVEDORING DIAGRAM

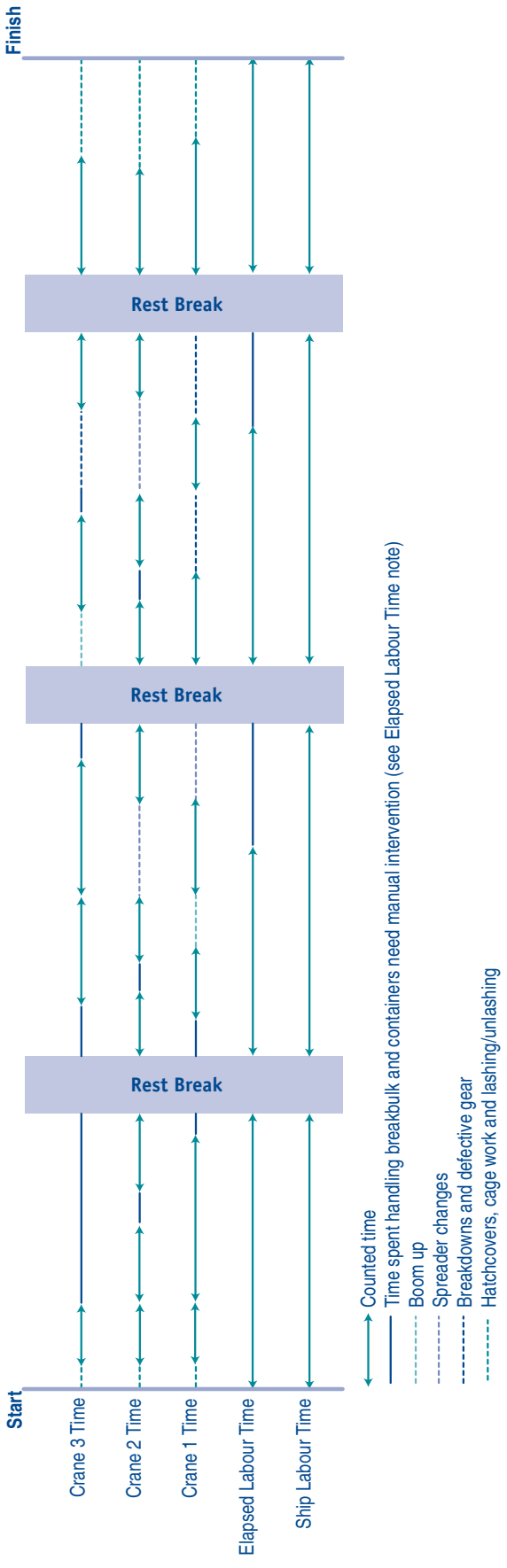


TABLE 8 CONTAINER TERMINAL PERFORMANCE INDICATORS, SELECTED AUSTRALIAN PORTS— PRODUCTIVITY IN TEUS PER HOUR

	Sep-98	Dec-98	Mar-99	Jun-99	Sep-99	Dec-99	Mar-00	Jun-00	Sep-00	Dec-00	Mar-01	Jun-01	Sep-01	Dec-01	Mar-02	Jun-02	Sep-02
Five Ports																	
Ships handled	1020	942	942	958	979	933	875	808	840	814	787	813	825	846	824	868	858
Total teus	633 107	612 019	573 444	602 501	660 593	726 590	678 046	666 967	708 433	731 936	634 003	661 326	762 202	787 093	724 311	788 090	876 522
Crane rate	24.4	24.2	25.5	25.9	25.4	24.8	26.6	30.4	33.2	34.2	35.4	35.2	34.2	34.8	35.4	35.9	35.9
Elapsed rate	na	na	na	na	30.1	30.8	33.3	40.0	38.0	37.6	38.6	37.8	39.2	39.6	39.6	41.1	43.4
Ship rate	31.3	34.7	36.2	37.3	37.7	37.8	41.7	49.5	50.8	53.2	54.3	53.3	55.0	55.4	55.4	56.3	59.9
Brisbane																	
Ships handled	192	180	176	193	224	232	219	178	187	179	167	188	175	198	202	211	216
Total teus	87 373	84 200	75 444	88 311	98 944	106 096	97 431	90 932	103 654	107 812	81 864	108 810	105 746	112 586	100 033	121 920	136 771
Crane rate	22.5	20.9	22.6	23.4	23.3	24.6	26.4	30.5	33.4	34.0	35.5	35.1	32.7	32.1	34.1	35.2	34.6
Elapsed rate	23.6	24.7	26.3	26.7	24.7	27.0	29.8	33.4	30.0	29.7	29.6	30.2	28.7	28.5	28.5	30.0	32.0
Ship rate	27.5	28.7	30.6	32.2	31.2	33.1	36.1	42.3	45.1	44.5	46.1	46.5	46.8	45.5	46.9	48.2	50.2
Sydney																	
Ships handled	267	230	221	243	259	244	221	218	223	211	201	202	208	206	196	203	204
Total teus	209 619	203 042	187 287	203 536	226 784	260 927	229 014	224 445	237 843	240 720	203 217	205 126	242 823	252 521	228 723	235 664	277 733
Crane rate	21.6	20.4	23.2	24.0	23.7	22.1	24.8	30.9	33.1	33.2	34.7	34.0	34.4	35.2	36.8	37.4	36.2
Elapsed rate	25.4	24.8	29.6	29.3	30.6	30.1	34.0	44.1	40.5	39.0	39.7	38.2	42.5	42.7	43.9	46.7	49.4
Ship rate	32.0	32.3	38.8	38.0	38.9	36.8	43.0	55.4	53.9	55.8	56.6	54.1	60.1	60.2	60.7	62.8	65.5
Melbourne																	
Ships handled	309	274	271	282	278	266	247	217	227	218	214	215	243	249	234	251	250
Total teus	242 456	219 549	206 727	215 379	241 775	257 147	243 277	236 306	253 568	255 022	226 612	228 400	285 947	294 753	274 108	295 284	325 945
Crane rate	26.1	27.7	27.5	28.1	27.4	26.5	27.9	30.3	33.5	34.7	35.3	35.7	33.9	35.0	35.1	35.6	36.6
Elapsed rate	28.4	31.7	30.2	33.1	32.4	33.4	33.8	40.5	40.9	41.1	41.9	41.0	40.7	41.9	42.0	42.4	45.5
Ship rate	31.9	39.7	36.9	39.7	39.9	40.4	43.0	49.4	53.8	57.6	57.5	57.3	56.2	57.1	57.9	58.5	63.6
Adelaide																	
Ships handled	63	74	73	66	62	62	56	56	62	63	57	57	57	57	54	59	55
Total teus	25 493	32 556	31 326	29 569	28 271	30 597	27 736	30 551	30 945	35 339	32 251	33 308	34 867	36 633	31 815	41 829	37 317
Crane rate	27.6	28.7	30.0	27.9	27.2	27.2	29.4	27.8	29.1	32.2	33.5	33.4	32.1	32.8	33.0	30.7	30.2
Elapsed rate	34.5	36.2	36.8	36.3	34.7	35.9	36.8	36.7	37.0	37.2	42.6	44.9	38.6	40.8	42.2	43.9	42.2
Ship rate	36.0	37.6	39.7	37.6	37.2	38.8	39.7	41.1	41.0	41.5	46.5	49.5	42.7	44.7	46.5	47.4	44.7
Fremantle																	
Ships handled	189	184	201	174	156	129	132	139	141	143	148	151	142	136	138	144	133
Total teus	68 166	72 672	72 660	65 706	64 819	71 823	80 588	84 733	82 423	93 043	90 059	85 682	92 819	90 600	89 632	93 393	98 756
Crane rate	27.9	25.7	26.6	27.3	26.1	27.2	27.4	30.5	33.5	36.5	37.7	37.9	37.4	37.5	35.4	36.6	36.8
Elapsed rate	na	na	na	na	25.8	27.9	33.0	36.0	32.4	33.6	34.5	35.0	37.8	36.6	32.8	35.7	36.0
Ship rate	30.2	31.7	32.0	33.4	35.3	38.8	41.6	44.7	43.2	48.7	51.3	50.8	52.3	53.0	46.6	47.4	51.2

na not available

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

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

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

abbreviations

abbreviations

abbreviations

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

Merry Christmas

Merry Christmas

and a happy new year

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

issue 33

waterline DECEMBER 2002

DOTARS
DEPARTMENT OF TRANSPORT AND REGIONAL SERVICES

BUREAU OF btre TRANSPORT & REGIONAL ECONOMICS

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