

SEPTEMBER 1996 ISSUE NO. 8

WATE

BUREAU OF TRANSPORT AND COMMUNICATIONS ECONOMICS

FROM THE DIRECTOR

This issue of *Waterline* includes the regular articles on stevedoring performance, port interface costs and port performance. A feature article provides an overview of the non-containerised general cargo sector.

The Bureau is currently developing indicators of waterfront reliability for regular inclusion in future issues of *Waterline*. A workshop with major industry participants in July provided a solid basis for the work in this area.

Stephen Hunter Director

IN BRIEF

Stevedoring performance

Overall productivity at Australia's major container terminals declined in the June quarter.

The five port average crane rate was 20.1 teus per hour, down from 20.3 teus per hour in the March quarter. The net rate fell marginally to 26.8 teus per hour (from 26.9 teus per hour). The elapsed rate declined to 22.0 teus per hour (from 23.2 teus per hour). Crane rates declined at Melbourne (19.6 teus per hour) and Brisbane (19.9 teus per hour), and increased at Sydney (20.3 teus per hour). They were unchanged at Adelaide (21.5 teus per hour) and Fremantle (21.2 teus per hour).

Net rates fell at Brisbane, Melbourne and Adelaide. They increased at Sydney and Fremantle. Elapsed rates fell at all ports except Fremantle (increase) and Melbourne (no change).

Average crane intensity at the five ports was 1.35 in the June quarter. The average proportion of elapsed time not worked increased to 17.7 per cent (from 13.8 per cent).

Port Interface Cost Index

Between July–December 1995 and January–June 1996, the national Port Interface Cost Index declined by 1.0 per cent for an import teu and by 0.5 per cent for an export teu. In real terms, the declines were 2.3 per cent for imports and 1.8 per cent for exports. Several factors contributed to the changes in the national index. Ship-based charges per teu rose in all ports as a result of reductions in average teu exchanges. Customs brokers' fees declined in three ports. Road transport charges fell in two ports and increased in one port.



Port performance

The total tonnage of cargo handled at the five mainland capital city ports increased by 9.6 per cent in January–June 1996 compared with the previous half-year. Container traffic (teus) was virtually unchanged over this period (table 6).

Employment at the four port authorities for which comparable data are available fell by 1.7 per cent in the January–June period. The median and 95th percentile turnaround times for container ships declined at all of the ports.



Non-containerised general cargo

Around 12.4 million tonnes of non-containerised general cargo were handled at Australian ports in 1994/95. Non-containerised cargo accounted for 22 per cent of Australia's overseas general cargo and 51 per cent of coastal general cargo.

There were significant improvements in stevedoring productivity for non-containerised general cargo during the WIRA process. The limited data that are available indicate that the upward trend has not continued across this sector of the waterfront in the post-WIRA period.



STEVEDORING PERFORMANCE INDICATORS

Figures 1 to 6 provide information on stevedoring performance at Australia's major container terminals over the period to the end of the June quarter 1996. Time series data on container terminal performance from the *Waterline* database are contained in table 9.

The stevedoring performance data for Brisbane, Sydney, Melbourne and Fremantle are averages for the terminals operated by P&O Ports and Patrick at each port. The Adelaide data cover the SeaLand terminal.

The information on stevedoring productivity in figures 1 to 6 and table 9 is expressed in teus per hour. Table 1 presents the data for the last three quarters in terms of containers per hour.

Five port average

Overall productivity at Australia's major container terminals declined in the June quarter 1996. The five port average figures particularly reflect changes in performance at Melbourne and Sydney, as the averages are weighted by teu throughput at each port.

The five port average crane rate (productivity per crane while the ship is worked) was 20.1 teus per hour in the June quarter, down from 20.3 teus per hour in the previous quarter (figure 1).

The five port average net rate (total productivity while the ship is worked) fell marginally to 26.8 teus per hour in the June quarter from 26.9 teus per hour in the March quarter. Average crane intensity was 1.35, compared with 1.32 in the previous quarter.

The five port average elapsed rate (productivity based on the time the ship is available to be worked) was 22.0 teus per hour in the June quarter, down from 23.2 teus per hour in the March quarter. On a per crane basis the figure fell to 16.3 teus per hour, from 17.5 teus per hour in the previous quarter.

The five port average figure for the proportion of elapsed time not worked was 17.7 per cent in the June quarter. This was above the March quarter figure of 13.8 per cent.

Brisbane

Stevedoring performance in Brisbane declined slightly during the June quarter (figure 2).

The crane rate was 19.9 teus per hour, down marginally from 20.0 teus per hour in the previous quarter.

The net rate fell marginally to 24.3 teus per hour in the June quarter from 24.4 teus per hour in the March quarter. Average crane intensity was unchanged at 1.22.

Brisbane's elapsed rate was 20.5 teus per hour in the June quarter, down from 21.3 teus per hour in the March quarter. On a per crane basis, the figure fell to 16.8 teus per hour from 17.5 teus per hour in the previous quarter.

The average proportion of elapsed time not worked in Brisbane was 15.8 per cent in the June quarter, up from 12.6 per cent in the March quarter.

Sydney

Sydney's crane rate and net rate improved in the June quarter but there was a decline in the elapsed rate (figure 3).

The crane rate was 20.3 teus per hour, up from 19.8 teus per hour in the previous quarter.

The net rate in Sydney increased to 27.7 teus per hour in the June quarter from 27.5 teus per hour in the March quarter. Average crane intensity was 1.41 compared with 1.39 in the previous quarter.

Sydney's elapsed rate was 20.2 teus per hour in the June quarter, down from 23.5 teus per hour in the March quarter. On a per crane basis, the figure was 14.3 teus per hour compared with 16.9 teus per hour in the previous quarter. The decline in the elapsed rate, despite an increase in the net rate, reflected a rise in the proportion of time not worked. The average proportion of elapsed time not worked in Sydney was 27.1 per cent in the June quarter, up from 14.5 per cent in the March quarter. The June quarter proportion was the highest figure at the port since the June quarter 1994.

Melbourne

In Melbourne, the crane rate and the net rate declined in the June quarter. The elapsed rate was unchanged (figure 4).

The crane rate was 19.6 teus per hour, down from 20.5 teus per hour in the previous quarter.

The net rate declined to 27.6 teus per hour in the June quarter from 28.3 teus per hour in the March quarter. Average crane intensity was 1.41 compared with 1.38 in the previous quarter.

Melbourne's elapsed rate was 24.4 teus per hour in the June quarter, the same as the March quarter figure. On a per crane basis, there was a decline to 17.3 teus per hour from 17.7 teus per hour in the previous quarter.

The average proportion of elapsed time not worked was 11.7 per cent in the June quarter, down from 13.9 per cent in the March quarter.

Adelaide

Adelaide's crane rate was unchanged at 21.5 teus per hour in the June quarter (figure 5). There were declines in the net rate and the elapsed rate.

The net rate fell to 26.7 teus per hour in the June quarter from 27.2 teus per hour in the March quarter. This reflected a decline in average crane intensity to 1.24, from 1.27 in the previous quarter.

Adelaide's elapsed rate was 26.1 teus per hour in the June quarter, down from 26.6 teus per hour in the March quarter. On a per crane basis, the figure was unchanged at 21.0 teus per hour.

Adelaide continued to have a very low proportion of time not worked. The average proportion of elapsed time not worked was 2.2 per cent in the June quarter, the same as the March quarter figure.

Fremantle

Fremantle's crane rate was unchanged at 21.2 teus per hour in the June quarter (figure 6). There were increases in the net rate and the elapsed rate.

The net rate rose to 23.8 teus per hour in the June quarter from 22.2 teus per hour in the March quarter. This reflected an increase in average crane intensity to 1.15, from 1.05 in the previous quarter.

Fremantle's elapsed rate was 19.1 teus per hour in the June quarter, up from 18.5 teus per hour in the March quarter. On a per crane basis the figure fell to 16.6 teus per hour, from 17.6 teus per hour in the previous quarter.

The average proportion of elapsed time not worked in Fremantle was 20.0 per cent in the June quarter, up from 17.1 per cent in the March quarter.

Containers per hour

Waterline has traditionally reported stevedoring indicators on the basis of teus per hour as this format provides continuity with the earlier data published by WIRA. For the purposes of these indicators, a 40 foot container is classified as two teus.

Issue 7 of *Waterline* provided the first set of stevedoring indicators based on the number of containers per hour. These indicators are particularly useful for analysing performance where there is significant variation in the mix of 20 foot and 40 foot containers. Such variations may occur between ports (for example, in international comparisons) and in individual ports over time.

Table 1 presents the major indicators of stevedoring performance in containers per hour for the last three quarters. It covers the same cellular ship calls as the teu data in table 9.

Since the proportion of 40 foot containers at a port may vary between quarters, the trend for a productivity indicator is sometimes affected by the measurement basis (ie teus or containers). At this stage, the *Waterline* commentary will continue to focus on the teu data as this information is more extensive, dating back to 1989. As the time covered by the container data accumulates, there will be more analysis of these data.

Since the proportion of 40 foot containers at a port may vary between quarters, the trend for a productivity indicator is sometimes affected by the measurement basis (ie teus or containers). At this stage, the *Waterline* commentary will continue to focus on the teu data as this information is more extensive, dating back to 1989. As the time covered by the container data accumulates, there will be more analysis of these data.

	(containers	s per hour)	
	Qua	rter	
Port / indicator	Dec 1995	Mar 1996	Jun 1996
Brisbane			
Crane rate	15.8	17.6	16.7
Elapsed rate	17.0	18.8	17.2
Net rate	20.6	21.5	20.4
Sydney			
Crane rate	15.0	15.8	16.3
Elapsed rate	17.6	18.7	16.4
Net rate	21.0	21.9	22.4
Velbourne			
Crane rate	16.3	17.0	16.2
Elapsed rate	18.8	20.2	20.0
Net rate	21.9	23.4	22.5
Adelaide			
Crane rate	18.8	18.9	18.2
Elapsed rate	22.8	23.3	22.0
Net rate	23.3	23.8	22.5
Fremantle			
Crane rate	16.2	17.9	17.9
Elapsed rate	13.4	15.7	16.3
Net rate	16.7	18.9	20.3
Five ports			
Crane rate	15.9	16.9	16.6
Elapsed rate	17.7	19.3	18.2
Net rate	20.9	22.3	22.0
Sources Patrick, P&O Ports and Se	aLand.		BTCE





PORT INTERFACE COST INDEX

The Port Interface Cost Index provides a measure of shore-based shipping costs for containers moved through Australia's mainland capital city ports. It incorporates the charges of various providers of waterfront-related services. These charges represent costs to shipping lines and shippers.

With the assistance of the AAPMA and the port authorities, the time between the end of the reporting period and publication of the index in *Waterline* has now been reduced to one quarter. This issue of *Waterline* presents data for the January–June 1996 period. The next index, covering July–December 1996, will be published in the March 1997 issue.

The Port Interface Cost Index is calculated for individual ports and on a national basis. It is based on several cost parameters. The major components of the index are port and related charges, stevedoring charges and land-based charges.

Cost parameters

The representative ship used to calculate port and related charges for January–June 1996 was unchanged from the ship used in the previous period (table 2).

The average number of teus exchanged per port call declined at all ports in January–June 1996 compared with July–December 1995. The average exchange for ships in the representative range fell by 12.5 per cent in Brisbane, 11.8 per cent in Sydney, 17.2 per cent in Melbourne, 28.7 per cent in Adelaide and 17.4 per cent in Fremantle.

Port and related charges per ship visit

The port and related charges in the Port Interface Cost Index comprise ship-based and cargo-based components. The ship-based charges are State government, tonnage, pilotage, towage, mooring/unmooring and berth hire charges. The cargo-based charges are wharfage, harbour dues and berthing charges.

The last two rows in table 3 provide information on total ship-based charges and empty teu charges per ship visit for the representative ship. Information on port and related charges per teu (ie charges per ship visit divided by average teu exchange) is presented in the rest of the table.

Table 3 indicates that total ship-based charges *per ship visit* were unchanged in Brisbane, Sydney and Fremantle between July–December 1995 and January–June 1996. Charges per ship visit declined in the other two ports. In Melbourne, the decline reflected a reduction in the tonnage (channel use) charge from \$0.59 per tonne to \$0.40 per tonne and a reduction in (time-based) berth hire charges due to lower average berth time. In Adelaide, total ship-based charges per ship visit declined as a result of lower average State government charges per ship visit (due to a higher average number of port calls during the period) and lower tonnage charges (due to lower average berth time).

The tonnage charge in Sydney was reduced by 10.9 per cent from 1 July 1996. This reduction will be incorporated in the next Port Interface Cost Index, covering July–December 1996, which will be reported in the March 1997 issue of *Waterline*.

Table 3 indicates that, for an operator of a vessel similar in size to the representative ship, Fremantle (\$17 902) had the lowest total ship-based charges per ship visit in January–June 1996. It was followed by Brisbane (\$19 840) and Adelaide (\$19 853).

Port and related charges per teu

The level of *ship-based charges per teu* provides an indication of the impact of ship-based charges on shippers. This measure is affected by the total charges per ship visit and by the number of teus exchanged per visit. With a given level of charges per ship visit, a reduction in the number of teus exchanged will result in a higher charge per teu to bring the ship into the port. Conversely, an increase in the average exchange will reduce the cost per teu with a given level of charges per ship visit.

Ship-based charges per teu increased at all of the ports in January–June 1996 compared with the previous period. The changes were 14.3 per cent in Brisbane, 13.4 per cent in Sydney, 2.9 per cent in Melbourne, 35.0 per cent in Adelaide and 21.1 per cent in Fremantle. These increases resulted from the significant reductions in average teu exchanges. The decline in tonnage and (time-related) berth hire charges per ship visit at Melbourne limited the rise in ship-based charges per teu at that port to a relatively small amount.

Cargo-based charges for loaded containers were unchanged at all ports in the January–June period. A 60 per cent reduction in Sydney's wharfage on empty containers (from \$25 to \$10 per teu) was announced in June 1996 but did not take effect until the July–December period. Similarly, a 20 per cent reduction in Melbourne's wharfage on loaded and empty containers (eg from \$46.75 per teu to \$37.40 per teu for direct cargo) took effect from 1 July 1996. Both of these reductions will be incorporated in the next Port Interface Cost Index, covering July–December 1996, which will be published in the March 1997 issue of *Waterline*.

Overall, there were significant increases in *port and related charges per teu* (ship-based charges plus cargo-based charges) in the five ports during the first half of 1996. On a teu basis, port and related charges for loaded export containers rose by 6.1 per cent in Brisbane, 5.2 per cent in Sydney, 1.4 per cent in Melbourne, 18.3 per cent in Adelaide and 9.5 per cent in Fremantle.

Stevedoring charges per teu

The stevedoring charges used in this issue of *Waterline* are preliminary figures obtained from the Australian Competition and Consumer Commission (ACCC). The final figures will be published in the Commission's next report on stevedoring costs and terminal handling charges.

The preliminary estimates indicate that the national weighted average revenue for the ACCC's sample of container terminal operations was \$203 per teu in 1995. The stevedoring charges in table 4 will be updated when the ACCC releases figures for 1996.

Land-based charges per teu

The land-based charges in the Port Interface Cost Index are customs brokers' fees and road transport charges. Changes in these components are detailed in table 4.

The Bureau's survey of customs brokers indicates that, in January–June 1996, fees for import containers declined by \$6 per teu in Melbourne and by \$4 per teu in Adelaide and Fremantle. Fees for import containers were unchanged in Brisbane and Sydney. For export containers, customs brokers' fees fell by \$2 per teu in Melbourne and were unchanged in the other ports.

Road transport charges decreased by \$20 per teu in Sydney and by \$1 per teu in Melbourne in January–June 1996 compared with the previous period. There was an increase of \$13 per teu in Adelaide following a rise in rates paid to contractors. Road transport charges in Brisbane and Fremantle were unchanged.

Indexes for individual ports

Table 4 provides details of the Port Interface Cost Index for individual ports in January–June 1996 and the previous half-year. It indicates that shore-based shipping costs (charges) per teu declined in Sydney and Melbourne. There were increases in Brisbane, Adelaide and Fremantle.

The sources of change in the index for each port between July–December 1995 and January–June 1996 are shown in figure 7. Increases in port and related charges per teu affected the index in all ports, and were the only source of change in Brisbane. Customs brokers' fees contributed to the changes in the index for imports and exports in Melbourne and for imports in Adelaide and Fremantle. Changes in road transport charges had major effects in Sydney and Adelaide, and made a small contribution to the change in the index for Melbourne.

National index

Data on the national Port Interface Cost Index are presented in table 5. In overall terms, the index declined by 1.0 per cent for an import teu and by 0.5 per cent for an export teu over the period. In real terms, the reductions were 2.3 per cent for imports and 1.8 per cent for exports, using the implicit price deflator for gross non-farm product.

The changes in the national index between the July–December and January–June periods reflected higher port and related charges per teu in all ports, lower customs brokers' fees in three ports and changes in road transport charges in three ports. Since the national index is an average (weighted by teu throughput at each port) for the five ports, developments in Sydney (particularly the reduction in road transport charges) and Melbourne have a major impact on the national outcome.

TABLE 2 PARAMETERS	USED IN	THE PORT	INTERFAC	E COST IN	DEX, 1995/9	6				
	Bri	sbane	Sy	dney	Mell	oourne	Ad	delaide	Fre	mantle
	Jul–Dec 1995	Jan–Jun 1996	Jul–Dec 1995	Jan–Jun 1996	Jul–Dec 1995	Jan–Jun 1996	Jul–Dec 1995	Jan–Jun 1996	Jul–Dec 1995	Jan–Jun 1996
Vessel size										
GRT	17215	17215	17215	17215	17215	17215	17215	17215	17215	17215
NRT	8372	8372	8372	8372	8372	8372	8372	8372	8372	8372
LOA (metres)	-	-	-	-	176	176	-	-	-	-
Teus exchanged ^a										
Total	392	343	848	748	815	675	302	215	340	281
Loaded	302	264	703	620	688	570	235	168	280	231
Empty	90	79	145	128	127	105	67	47	60	50
Loaded inwards	106	92	442	390	-	-	82	59	-	-
Loaded outwards	196	172	261	230	-	-	153	109	-	-
Primary produce	-	-	-	-	-	-	46	33	-	-
Ship call parameters ^a										
Number of port calls	3	3	3	3	3	3	2	3	5	5
Elapsed berth time (hrs)	29	22	49	41	41	33	21	15	29	22
- not required.										
a. Mean value for ships be	etween 15 00	00 and 20 000) grt.							
Sources BTCE estimates b	ased on shi	o call data sup	oplied by port	authorities ar	nd other port se	ervice providers	5.			BTCE

TABLE 3 PORT AND RELATED CHARGES, 1995/96

	Br	isbane	Syd	dney	Melbe	ourne	Ade	laide	Frema	ntle
	Jul-Dec	Jan–Jun								
	1995	1996	1995	1996	1995	1996	1995	1996	1995	1996
Ship-based charges (\$/teu)										
State government	8.04	9.19	-	-	-	-	5.97	6.98	2.33	2.82
Tonnage	-	-	9.34	10.59	12.46	10.20	13.81	17.18	7.44	9.01
Pilotage	13.08	14.96	4.01	4.55	6.73	8.13	7.78	10.91	6.47	7.83
Towage	25.82	29.52	11.52	13.07	9.02	10.89	40.73	57.12	33.18	40.16
Mooring & unmooring	3.68	4.20	3.71	4.21	3.50	4.22	-	-	3.24	3.92
Berth hire ^a	-	-	-	-	12.08	11.61	-	-	-	-
Total ^b	50.61	57.87	28.59	32.41	43.79	45.05	68.29	92.19	52.65	63.74
Cargo-based charges (\$/teu)										
Wharfage										
Imports	26.00	26.00	60.00	60.00	46.75	46.75	65.00	65.00	49.79	49.79
Exports	26.00	26.00	45.00	45.00	46.75	46.75	62.00	62.00	49.79	49.79
Harbour dues	42.00	42.00	-	-	-	-	-	-	-	-
Berthing	-	-	-	-	-	-	-	-	14.63	14.63
Total port and related charges (\$/teu)										
Loaded imports	118.61	125.87	88.59	92.41	90.54	91.80	133.29	157.19	117.07	128.16
Loaded exports	118.61	125.87	73.59	77.41	90.54	91.80	130.29	154.19	117.07	128.16
Charges per ship visit (\$/visit)										
Total ship-based charges	19840	19840	24241	24241	35689	30411	20625	19853	17902	17902
Empty teus ^c	1283	1126	3625	3200	1727	1428	0	0	486	405

- 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 berthing charges 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 BTCE estimates based on ship call data supplied by port authorities, and price schedules of port authorities, towage operators and pilotage service providers.

TABLE 4 PORT INTERFACE COSTS, 1995/96

	(\$/teu)												
	В	risbane	S	Sydney	Ме	lbourne	Ad	lelaide	Fre	emantle			
	Jul-Dec	Jan–Jun	Jul-Dec	Jul–Dec Jan–Jun		Jan–Jun	Jul–Dec	Jan–Jun	Jul–Dec	Jan–Jun			
	1995	1996	1995	1996	1995	1996	1995	1996	1995	1996			
Imports													
Ship-based charges	51	58	29	32	44	45	68	92	53	64			
Cargo-based charges	68	68	60	60	47	47	65	65	64	64			
Stevedoring ^p	203	203	203	203	203	203	203	203	203	203			
Customs brokers' fees	121	121	153	153	144	138	139	135	139	135			
Road transport charges	175	175	310	290	247	246	142	155	185	185			
Total imports ^a	618	625	755	739	685	679	618	650	644	651			
Exports													
Ship-based charges	51	58	29	32	44	45	68	92	53	64			
Cargo-based charges	68	68	45	45	47	47	62	62	64	64			
Stevedoring ^p	203	203	203	203	203	203	203	203	203	203			
Customs brokers' fees	79	79	108	108	91	89	71	71	71	71			
Road transport charges	175	175	310	290	247	246	142	155	185	185			
Total exports ^a	575	582	694	678	631	630	547	583	576	588			

p Preliminary estimate.

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

Note Based on parameters described in table 2.

Sources BTCE estimates based on: ship call data supplied by port authorities; price schedules of port authorities, towage operators and pilotage service providers; surveys of customs brokers and road transport operators; and stevedoring charges data supplied by ACCC.

TABLE 5	THE NATIONAL PORT I	NTERFACE COS	ST INDEX						
				(\$/teu)					
	Jul-Dec 1992	Jan-Jun 1993	Jul-Dec 1993	Jan-Jun 1994	Jul-Dec 1994	Jan-Jun 1995	Jul-Dec 1995	Jan-Jun 1996	
Imports	696	675	670	690	684	697	696	689	
Exports	617	608	612	633	624	633	636	633	
Sources	BTCE estimates based on: sh towage operators and pilotage and stevedoring charges data	ip call data supplied service providers; supplied by ACCC.	l by port authoritie surveys of custon	es; price schedules ns brokers and roa	s of port authorities ad transport operat	s, fors;		BTCE	

BTCE





Sources BTCE estimates based on: ship call data supplied by port authorities; price schedules of port authorities, towage operators and pilotage service providers; surveys of customs brokers and road transport operators; and stevedoring charges data supplied by ACCC.

PORT PERFORMANCE

Information on aspects of non-financial performance for the five mainland capital city ports and their port authorities during 1995/96 is presented in table 6. The time between the end of the reporting period and publication of the data in *Waterline* has now been reduced to one quarter with the assistance of the AAPMA and the port authorities. The next indicators of non-financial performance, covering July–December 1996, will be published in the March 1997 issue of *Waterline*.

Cargo throughput

Table 6 indicates that *total cargo throughput* (bulk and general cargo) at the five ports increased by 9.6 per cent to 42.8 million tonnes in January–June 1996. The increase relative to the July–December 1995 period reflected higher throughput at all of the ports, with Fremantle accounting for around two-thirds of the increase.

The rise in total cargo throughput in January–June 1996 followed a decline of 3.7 per cent in the previous half-year. Total throughput in January–June 1996 was 5.5 per cent higher than throughput in the corresponding half-year of 1995.

The tonnage of *non-containerised, general cargo* handled at the five ports increased by 3.2 per cent in January–June 1996 compared with the previous half-year. There were increases in cargo at Fremantle, Melbourne and Adelaide.

Container traffic (teus) at the five ports was virtually unchanged in January–June 1996 compared with the July–December 1995 period. Total teus increased at Fremantle (9.1 per cent), Adelaide (6.5 per cent) and Brisbane (4.1 per cent). Traffic declined at Sydney (3.1 per cent) and Melbourne (1.0 per cent). Overall for the five ports, there were increases in empty import teus (20.4 per cent) and full export teus (1.6 per cent), and declines in full import teus (4.0 per cent) and empty export teus (2.0 per cent).

In the financial year 1995/96, a total of 2.1 million teus were exchanged at the five ports. This represented a 4.6 per cent increase on the 1994/95 figure.

The data in table 6 cover all containers handled at the five mainland capital city ports. They include movements at all terminals and multi-purpose berths, whether by lifting or by movement across the ramps of roll-on/roll-off ships. Table 6 therefore provides a more comprehensive measure of container traffic than table 9 which only includes containers lifted on and off fully cellular ships at major container terminals in the five ports.

Employment

Table 6 includes data on port authority employment at the five ports. Comparable data for the July–December 1995 and January–June 1996 periods are available for only four of the ports, as there was substantial restructuring of port operations in Melbourne during the January–June period.

Total employment at the other port authorities (Brisbane, Sydney, Adelaide and Fremantle) fell by 16 (1.7 per cent) in January–June 1996 compared with the July–December 1995 period. A fall of almost 7 per cent at Adelaide was the largest single change during the period.

Ship turnaround time

The median turnaround time for ships calling *at container terminals* declined in all of the ports in January–June 1996 compared with the July–December 1995 period. The reductions in average teu exchanges, noted in the earlier article on the Port Interface Cost Index, would have contributed to these declines.

The indicator of median turnaround time is based on total time in port (usually measured from port boundary to port boundary). It is not directly comparable with the estimated stevedoring time for a 560 teu exchange (based on time between labour first ordered and last labour off the ship) that has also been reported in previous issues of *Waterline*.

In the January–June 1996 period, the 95th percentile ship turnaround time declined significantly in all of the ports. This figure indicates the turnaround time that is equalled or bettered by 95 per cent of ships using a particular port. It provides a partial indicator of the variability of ship turnaround time in each port.

TABLE 6 NON-	6 NON-FINANCIAL PERFORMANCE INDICATORS, SELECTED AUSTRALIAN PORTS, 1995/96											
	Bris	bane	Syd	ney	Melbo	urne	Adelaid	le	Fremantle	e	Five Ports ^o	;
Indicator	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun
	1995	1996	1995	1996	1995	1996	1995	1996	1995	1996	1995	1996
Total cargo throughput ('000 tonnes)	9214 ^r	9575	9884	10268	8830	9025	2268	2616	8874	11330	39071 ^r	42815
Non-containerised												
general cargo ('000 tonnes) ^a	339	332	490	382	900	933	126	133	237	380	2091	2159
Containerised ca (teus exchanged	irgo)											
Full import	37075	39286	178643	167875	202013	193089	10291	9004	42041	41908	470063	451162
Empty import	22435	24942	7583	10170	31168	36082	5155	6030	7883	12165	74224	89389
Full export	54646	55527	109955	107105	185724	186167	16824	19167	38980	44661	406129	412627
Empty export	8037	7491	51574	51809	45015	43884	1317	1567	8048	6994	113991	111745
Total teus	122193	127246	347755	336959	463920	459222	33587	35768	96952	105728	1064407	1064923
Average total employment	228	229	239	243	d	287 ^e	230	214	218	213	na	1186
Turnaround time (hrs) ^b												
Median result	33.7	26.8	47.9	39.0	42.7	35.8	26.1	20.2	32.9	28.4	-	-
95th percentile	63.2	48.0	95.2	75.7	104.6	69.6	59.5	48.1	104.5	75.8	-	-
- not applicable na not available. r Revised figur	e.											

a. Excludes bulk cargoes.

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

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

d. Comparable figure is not available for Melbourne in July–December 1995 period due to the subsequent restructuring of the Port of Melbourne Authority.

e. Incorporates Melbourne Port Corporation, Melbourne Port Services Pty Ltd and Port of Melbourne Authority (Shell) employees. Victorian Channels Authority employees are not included. Figure is the total as at 30 June 1996, not an average for the six-month period.

Source AAPMA.

BTCE

NON-CONTAINERISED GENERAL CARGO

The data on stevedoring performance and shore-based shipping costs in *Waterline* concentrate on container traffic. This reflects the high level of containerisation of general (non-bulk) cargo in Australia and the focus of waterfront reform on the container terminals.

While most of the general cargo moved through Australian ports is containerised, significant quantities of general cargo are carried 'loose' or in unitised form. The term 'breakbulk' is often used for this cargo which includes palletised, boxed, coiled and bundled items as well as motor vehicles.

The publicly available information on non-containerised general cargo handled at Australian ports is limited. This article provides an overview of this sector using a range of sources including data provided to the BTCE by stevedores, port authorities, shippers and shipping lines. The data are not as comprehensive or as systematic as the information for containerised cargo that is regularly reported in *Waterline*.

Cargoes

Non-containerised general cargo is broadly defined as all cargo other than bulk cargo (commodities which take the shape of the vessel in which they are held) and cargo in shipping containers. The main types of non-containerised general cargo handled at Australian ports include iron and steel, pine logs, timber, metal ingots, motor vehicles, machinery, paper products and meat.

Many of these cargoes are not well-suited to transport in containers due to their physical characteristics and the weight and/or dimensional restrictions imposed by shipping containers. For certain commodities (eg meat) methods such as palletisation may provide a commercially attractive alternative to containerised transport. In some cases, limited port facilities or transport infrastructure in overseas markets result in a requirement for non-containerised or non-bulk transport (eg sugar or ammonium nitrate in bulker bags).

Table 7 provides information on the tonnages of non-containerised general cargo handled at Australian ports in 1994/95. It indicates that coastal and overseas cargo totalled 12.4 million tonnes in that year.

Around 4.5 million tonnes of coastal non-containerised general cargo was loaded and discharged at Australian ports in 1994/95 (Department of Transport 1995, 7–10). This represented 51 per cent of coastal general cargo in that year. Iron and steel accounted for around 44 per cent of the non-containerised general cargo carried on coastal services.

The remaining 7.9 million tonnes of non-containerised general cargo handled at Australian ports was overseas cargo. This was equivalent to 22 per cent of the 35.3 million tonnes of overseas general cargo handled at Australian ports in 1994/95 (Department of Transport and Regional Development 1995).

Ships

Several types of ships are involved in the transport of non-containerised general cargo.

Conventional cargo vessels are specifically designed to carry diverse forms of dry cargo, and may also carry some containers. Cargo is lifted on and off the ship using cranes or derricks.

Roll-on/roll-off ships are designed to carry motor vehicles and other cargo which can be loaded and unloaded using wheeled transport. These ships carry significant amounts of non-containerised general cargo as well as containers.

There are also several types of specialised ships involved in the carriage of non-containerised general cargo in the overseas trades. They include car carriers, reefer ships equipped to carry palletised meat, specialised forest products carriers and livestock carriers.

Ports

Table 7 indicates that six ports handled almost two-thirds of Australia's non-containerised general cargo in 1994/95. The ports, and the major cargoes handled, were:

- Port Kembla (17.1 per cent), mainly iron and steel;
- Melbourne (15.1 per cent), particularly paper and newsprint, iron and steel, and timber;
- Hastings (11.0 per cent), steel coil and slabs;

- Sydney (8.8 per cent), particularly paper and newsprint, iron and steel, and timber;
- Newcastle (6.7 per cent), mainly iron and steel;
- Burnie (5.9 per cent), particularly pine logs, motor vehicles, timber and particle board.

The five mainland capital city ports regularly covered in *Waterline* accounted for 35.7 per cent of the noncontainerised general cargo handled at Australian ports in 1994/95. The *Waterline* data on port non-financial performance indicate that the tonnage of non-containerised general cargo handled at these ports declined by 1.9 per cent between 1993/94 and 1995/96. Declines at Sydney (17.5 per cent) and Adelaide (21.6 per cent) more than offset increases at Brisbane (16.8 per cent), Fremantle (11.2 per cent) and Melbourne (0.9 per cent).

Stevedoring

As non-containerised general cargo includes a diverse collection of commodities, a range of stevedoring techniques is used. The cargo is lifted on and off the ship with cranes or derricks, carried by fork lifts or, in the case of motor vehicles, driven on and off the ship. The stevedoring operation may include the use of hooks, slings, nets, mechanical or magnetic grabs, or vacuum handling equipment. Cargo may be lifted to or from trucks directly under the hook. In some cases, there is significant handling and organisation of the cargo aboard the ship.

The stevedoring of non-containerised general cargo is more labour intensive, and less capital intensive, than container stevedoring (BTCE 1995, 82). Fixed costs account for a smaller proportion of total costs in non-containerised general cargo operations. These characteristics mean that there is scope for small (often specialised) stevedoring companies to operate in this sector of the waterfront. For example, the Strang Group recently announced that it would be participating in a joint venture to operate a forest products facility in Melbourne.

The stevedoring of non-containerised general cargo in Australia is undertaken by various companies, including several shipping lines which service their own ships. The companies with multi-port operations include Patrick (19 ports), P&O Ports (16 ports), BHP Stevedoring (6 ports), Union Stevedoring Services (4 ports), Northern Shipping and Stevedoring (3 ports), Perkins Shipping (2 ports), Brambles Shipping (2 ports) and Victorian Regional Stevedores (2 ports). At least seven other companies provide stevedoring operations in a single port.

Studies of performance

The wide range of non-containerised general cargoes and the variety of ships carrying this cargo make it difficult to monitor performance on a consistent basis over time or between ports. However, some data have been published by the Waterfront Industry Reform Authority (WIRA), the BTCE, the Prices Surveillance Authority (PSA) and the Bureau of Industry Economics (BIE).

The WIRA data indicate that labour productivity for aspects of non-containerised general cargo stevedoring increased between 1989 and 1992 (BTCE 1995, 61–63). Average tonnes handled per person-shift for conventional ships at the five mainland capital city ports increased by 97 per cent for non-reefer cargoes and by 70 per cent for reefer cargoes. The WIRA data also indicate substantial increases in ship working rate productivity for conventional ships over the period.

Systematic data on the performance of non-containerised general cargo stevedoring are not available for the period since 1992. However, on the basis of anecdotal information, the BTCE concluded in 1995 that the substantial average improvements in performance achieved during the WIRA period were being seriously eroded in Sydney and Melbourne (BTCE 1995, 64). It noted that the situation at other ports appeared to be variable.

In 1994, the PSA published some findings on general stevedoring charges for specific types of cargo (including timber, steel and paper) at several Australian ports (PSA 1994, 6–7). It concluded that unit stevedoring costs had declined by an average of 32 per cent between 1991 and 1993, although there had been a marked reduction in the rate of decline from 1992. This finding was based on a limited sample. Anecdotal evidence indicated that other sectors of general stevedoring had not experienced the same rate of productivity growth. The PSA subsequently ceased monitoring general stevedoring charges when industry restructuring and the containerisation of some cargoes reduced the availability of comparable data.

A report published in 1995 by the BIE included information on non-containerised general cargo (BIE 1995, 75–90). The BIE cited benchmarking work undertaken by BHP Transport for a range of commodities including timber, newsprint and steel products. The data indicated that, in late 1994, Australia's non-terminal waterfront charges (ie excluding stevedoring charges) were high by international standards. Stevedoring charges in Australia were consistently higher than the charges at a wide selection of overseas ports, reflecting a combination of low productivity and relatively high wages in Australia.

Other performance data

During the preparation of this article, the BTCE approached a wide range of port authorities, stevedores, shippers and shipping lines for information on non-containerised general cargo. In most cases, the companies were unable to provide consistent data on stevedoring performance due to factors such as the variability of cargo mixes, changes in stevedoring arrangements over time and the absence of systematic records. However, several organisations supplied data for specific ports and commodities.

One company commented on performance at two regional ports. It reported that, compared to the pre-WIRA period, the tonnage of metal products handled per shift at one port had increased by 75 per cent. At the other port, the tonnage of bagged cargo handled per gang shift had increased by 129 per cent. The company noted that these improvements had mainly occurred during the WIRA process and that there had been only limited increases in productivity since 1992.

Further information for the second port was provided by a shipping line. It indicated that, between 1990/91 and 1995/96, tonnes handled per gross gang hour had risen by 49 per cent for random dump stow and by 123 per cent for pre-slung bulker bags.

Some information on landing costs for motor vehicles at Melbourne, Sydney and Brisbane was provided to the BTCE by an industry association. The data indicated that the stevedoring charge per vehicle rose by 9–12 per cent from 1986 to 1990 and then remained unchanged between 1990 and 1995. This was a significant decline in real terms over the latter period.

The industry association also supplied information on the total of wharfage, port service charges (where applicable), harbour dues (where applicable) and stevedoring charges. In Melbourne and Sydney, the total charge per vehicle increased by 33–36 per cent between 1986 and 1990 and then declined by 8–19 per cent over the period to 1995. In Brisbane, the total charge increased by 7 per cent over the initial period and then remained virtually constant.

Anecdotal evidence provided by several shipping lines and shippers indicated considerable variation in stevedoring productivity for non-containerised general cargo. Some lines commented that productivity in Australian ports was satisfactory while others stated that they were experiencing pre-WIRA work practices and attitudes. One company noted that ship loading rates in a particular port varied substantially and that they doubled when the best gangs worked the ship.

Data supplied by a shipping line showed considerable variation in stevedoring productivity and charges for palletised meat at five Australian ports during 1995. Gross loading rates averaged 28 tonnes per hour at the port with the lowest rate, and 52 tonnes per hour at the best-performing port. On a net basis (ie excluding any delays in loading), the rates varied between 40 and 54 tonnes per hour. Average stevedoring delays at the ports ranged from 0.6 hours to 10.8 hours per ship visit. Stevedoring charges at the five ports varied between \$21 and \$46 per tonne.

Several shipping lines and stevedores identified a lack of management control over wharf labour as the main reason for unsatisfactory stevedoring performance. A major line stated that shipments of non-containerised general cargo had increased substantially in New Zealand following port reform in that country, and that this had benefited regional ports.

BHP Transport provided data on stevedoring productivity and charges for timber and steel at several ports in Australia (discharge) and New Zealand (loading). The data, which are summarised in table 8, cover the operations of a BHP ship over a six-month period in 1996.

Table 8 indicates that stevedoring charges were considerably lower at the New Zealand ports, with the exception of Auckland. Caution should be used in comparing productivity at the New Zealand and Australian ports, as loading of timber and steel coil is more complex than discharge. Despite this factor, stevedoring productivity for timber was higher at the loading ports in New Zealand.

The impact of differences in loading and discharge is particularly significant in the case of steel coil. Loading the coil involves dropping, stowing and securing, as well as the use of forklifts in the ship's holds. To discharge, the coil is lifted straight out of the hold. This is the main reason for the relatively low productivity reported for steel coil at Tauranga compared with the Australian ports.

Table 8 indicates that gang sizes in Australia were generally higher than those in New Zealand. The relatively large gangs in Adelaide reflect the introduction of continuous stevedoring operations in that port.

Concluding comments

Non-containerised cargo accounts for a significant proportion of the general cargo handled at Australian ports. Stevedoring productivity for non-containerised general cargo improved during the WIRA process. Subsequent data cover

a small number of commodities and ports, and do not provide comprehensive information on trends in performance. However, the available data indicate that the upward trend in performance during the WIRA process has not continued across this sector of the waterfront in the post-WIRA period.

Port	'000 Tonnes	Port	'000 Tonnes
Port Kembla	2 125	Geelong	318
Melbourne	1 871	Portland	316
Hastings	1 366	Launceston	208
Sydney	1 093	Gladstone	166
Newcastle	827	Darwin	146
Burnie	733	Cairns	116
Brisbane	574	Hobart	80
Fremantle	565	Rockhampton	53
Whyalla	420	Port Hedland	42
Townsville	366	Geraldton	27
Devonport	335	Other	341
Adelaide	327	Total	12 415

TABLE 8 STEVEDORING PRODUCTIVITY AND CHARGES FOR TIMBER AND STEEL AT SELECTED PORTS, 1996													
Commodity/port	Lifts per gross gang hour	Tonnes per gross gang hour	Gang size	Stevedoring charge per unit (index)									
Timber													
Sydney (D)	5.3	63	8–10	100									
Melbourne (D)	4.6	55	8–10	127									
Adelaide (D)	5.6	67	14	139									
Auckland (L)	7.9	96	6–8	142									
Tauranga (L)	6.9	83	5	40									
Napier (L)	6.2	75	5	42									
Lyttelton (L)	6.0	72	5	82									
Steel coil													
Sydney (D)	5.3	84	8–10	100									
Melbourne (D)	7.1	114	8–10	120									
Adelaide (D)	5.6	90	14	80									
Tauranga (L)	4.6	74	7	32									
D. Discharge operation L. Loading operation Source BHP Transport				BTCE									

TABLE 9	CONTAINER	TERMINAL	_ PERFO	RMANCE	INDIC	ATORS, S	ELECTED	AUSTRA	LIAN PO	RTS, DEC	EMBER O	QUARTER	1991—J	UNE QUA	RTER 19	96		
Dent	Dec-91	Mar–92	Jun–92	Sep-92		Sep-93	Dec-93	Mar–94	Jun–94	Sep-94	Dec-94	Mar–95	Jun–95	Sep-95	Dec-95	Mar-96	Jun–96	Past four
Port																		quarters
Brisbane																		
Ships handle	ed 91	85	96	93	na	106	111	112	140	140	187	136	123	135	132	124	133	524
Iotal teus	36021	28235	39058	45055	na	49622	46529	37820	52983	51596	50574	41723	47065	58851	46439	35833	45172	186295
Crane rate	14.9	17.0	18.0	19.8	na	21.2	21.1	20.4	20.8	20.3	18.9	18.4	18.0	18.6	18.9	20.0	19.9	19.3
Elapsed rate	9 17.8	19.6	21.2	25.6	na	26.6	24.6	20.9	22.6	21.5	19.6	17.8	18.6	19.5	21.0	21.3	20.5	20.6
Net rate	19.6	5 21.1	22.9	27.4	na	29.4	27.5	23.9	25.9	25.7	23.4	20.9	21.6	22.5	24.6	24.4	24.3	24.0
Sydney																		
Ships handle	ed 109	105	109	112	na	205	238	177	240	223	221	218	202	192	203	206	216	817
Total teus	72250	71702	68359	81287	na	124028	139321	116914	129586	142659	152326	144868	140113	148431	143746	127726	127995	547898
Crane rate	17.5	18.6	19.8	20.9	na	19.8	20.4	16.4	18.5	16.9	16.0	18.9	18.1	19.3	18.5	19.8	20.3	19.5
Elapsed rate	9 18.4	19.9	22.9	24.1	na	22.6	22.0	18.7	20.8	19.4	20.3	21.6	20.7	23.4	21.8	23.5	20.2	22.2
Net rate	22.7	26.3	31.2	30.4	na	29.4	28.3	28.3	29.1	25.0	26.3	28.0	26.6	29.9	25.7	27.5	27.7	27.7
Melbourne																		
Ships handle	ed 125	108	121	121	na	235	306	211	265	267	244	265	228	221	227	228	262	938
Total teus	95019	73441	82757	86486	na	129687	143350	153420	158849	159039	180134	173338	152983	161943	173566	152440	157966	645915
Crane rate	14.8	16.7	18.1	19.4	na	22.3	18.9	19.7	19.1	18.5	20.2	20.8	19.4	19.8	19.6	20.5	19.6	19.9
Elapsed rate	e 18.7	19.2	20.9	22.6	na	25.9	20.0	19.5	19.2	17.9	21.5	23.9	23.7	24.1	22.8	24.4	24.4	23.9
Net rate	20.5	22.1	23.9	24.9	na	29.3	22.9	23.8	22.7	21.3	25.8	26.9	25.9	26.6	26.4	28.3	27.6	27.2
Adelaide																		
Ships handle	ed 21	22	20	21	na	21	26	28	34	31	33	35	50	34	42	47	63	186
Total teus	10998	10810	10710	10763	na	9650	12616	13243	12461	13167	15038	16832	21676	14319	17318	15955	18803	66395
Crane rate	18.0	19.8	18.7	19.1	na	19.8	20.9	20.6	19.1	19.8	20.2	21.5	20.2	20.9	21.4	21.5	21.5	21.3
Elapsed rate	25.3	27.2	24.4	25.9	na	23.1	25.5	27.8	24.7	24.6	24.2	24.9	24.9	24.9	26.1	26.6	26.1	25.9
Net rate	25.9	28.2	25.0	27.9	na	26.1	26.6	29.8	25.7	26.0	25.7	25.3	25.7	26.5	26.7	27.2	26.7	26.8
Fromantio																		
Ships handle	-d 77	71	75	72	na	116	115	127	135	121	124	128	136	139	124	143	153	559
Total teus	26522	25403	26572	27690	na	37566	40910	40587	40986	36635	46969	44388	45308	50050	44662	41916	45650	182278
Crane rate	16.4	210	18.6	20.4	na	19.0	19.8	19.8	19.3	21.6	22.9	20.2	19.3	19.5	19.2	21.2	21.2	20.3
Elapsed rate	13.1	16.8	15.1	18.2	na	13.1	15.5	15.2	14.6	14.9	16.5	17.7	15.5	17.7	15.8	18.5	19.1	17.8
Net rate	16.4	21.0	18.6	21.4	na	19.4	21.0	19.8	19.5	21.8	23.4	21.6	20.5	21.1	19.8	22.2	23.8	21.7
Five Ports																		
Shins handle	ad 423	301	421	419	na	683	796	745	814	782	808	782	739	721	728	748	827	3024
Total teus	240810	209591	227456	251281	na	350553	382726	361984	394865	403096	445041	421149	407145	433594	425731	373870	395586	1628781
Crane rate	15 0	18.0	18.7	201201	na	20.0	10 0	18.8	10.2	18 5	18 0	10 0	18.0	19 5	10.2	20.3	20.1	10 8
Flansed rate	17.8	19.4	20.7	23.1	na	23.4	21.0	19.2	19.2	18.9	20.4	21.9	21.2	22.5	21.7	20.3	20.1	22.4
Net rate	20.6	23.3	24.7	26.5	na	28.2	25.3	25.0	25.0	23.4	25.4	26.1	25.0	26.5	25.3	26.2	26.8	26.4
	vailabla	20.0	27.1	20.0	nu	20.2	20.0	20.0	20.0	20.4	20.4	20.1	20.0	20.0	20.0	20.9	20.0	20.4
na nota	valiable.																	

Notes 1. To the end of the September quarter 1992, award shift breaks are included in the measure of time which is used to calculate the net rate and the crane rate. From the September quarter 1993, award shift breaks are excluded from the measure of time in these two indicators. This means that the rates for the earlier period would be higher if they had been prepared on the same basis as the rates for the period from the September quarter 1993.

2. Indicators are for all quay crane operations on cellular ships calling at the container terminals.

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

Sources WIRA, Patrick, P&O Ports and SeaLand.

ABBREVIATIONS

- AAPMA Association of Australian Ports and Marine Authorities
- ABS Australian Bureau of Statistics
- ACCC Australian Competition and Consumer Commission
- BIE Bureau of Industry Economics
- GRT Gross Registered Tonnage
- LOA Length Overall
- NRT Net Registered Tonnage
- PSA Prices Surveillance Authority
- teu Twenty foot equivalent unit
- WIRA Waterfront Industry Reform Authority

PEFINITIONS

Elapsed time-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.

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

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

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

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

REFERENCES

BIE 1995, International Benchmarking — Waterfront 1995, Report 95–16, AGPS, Canberra.

BTCE 1995, Review of the Waterfront Industry Reform Program, Report 91, AGPS, Canberra.

Department of Transport 1995, Sea Transport Statistics, Coastal Freight, Australia, 1994–95, Department of Transport, Canberra.

Department of Transport and Regional Development 1995, Unpublished Data Based on ABS International Cargo Statistics.

PSA 1994, Monitoring of Stevedoring Costs and Charges,

No. 3, PSA, Melbourne.

Steering Committee on National Performance Monitoring of GTEs 1996, *Government Trading Enterprises Performance Indicators 1990-91 to 1994-95, Volume 2: Data,* Industry Commission, Melbourne.

ACKNOWLEDGMENTS

Contributors to this issue of *Waterline* were Kym Starr, Norman Wuest and Gita Curnow. The Bureau is particularly grateful for the cooperation of the Maritime Division of the Department of Transport and Regional Development, the Association of Australian Ports and Marine Authorities, port authorities, the companies which provided data on non-containerised general cargo operations, the customs brokers and road transport operators that responded to the Bureau's survey of fees and charges, and the stevedoring companies Patrick, P&O Ports and SeaLand.

For further information on this publication, please contact Mr Kym Starr on Tel (06) 274 6857, Fax (06) 274 6816, email: kstarr@email.dot.gov.au

This publication is available free of charge from the Manager, Information Services, Bureau of Transport and Communications Economics, GPO Box 501, Canberra, ACT, 2601, Australia. Tel (06) 274 6846.

Internet:

http:/www.dot.gov.au/programs/btcehome.htm

ISSN 1324-4043

© Commonwealth of Australia 1996. This work is copyright. Apart from any use as permitted under the *Copyright Act 1968*, no part may be reproduced by any process without prior written permission from the Australian Government Publishing Service. Requests and inquiries concerning reproduction and rights should be addressed to the Manager, Commonwealth Information Services, Australian Government Publishing Service, GPO Box 84, Canberra, ACT 2601.