Utilisation of Urban Road Freight Vehicles

Occasional Paper

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Utilisation of Urban Road Freight Vehicles

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FOREWORD

In 1979, the Transport Industry Advisory Council asked the Bureau of Transport Economics to review the utilisation of urban road freight vehicles, giving special attention to matters raised by Mr R.C. Davis in a paper presented to the Australian Road Transport Federation in 1969.

The approach used in the review was to discuss problems with vehicle operators and other participants in the urban freight transport system, explore the underlying causes of the problems and look for possible remedies. This paper presents the results of the review.

A preliminary paper was presented to a meeting of the Transport Industry Advisory Council and a second version was used as a discussion paper at a recent conference of the Australian Road Transport Federation. The Bureau would like to acknowledge the help of many members of both bodies who provided constructive comments on the paper, as well as the large number of people in the urban freight industry, who contributed views and information.

The review was carried out by Ms A. Currie of the Planning and Technology Branch under the direction of Dr K. Tronson.

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Canberra
1980

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SUMMARY

This paper is the result of a limited review of the utilisation of freight vehicles in urban areas undertaken at the request of the Transport Industry Advisory Council. It is based on discussions with vehicle operators and other participants in the urban freight transport process.

It should be noted that vehicle utilisation is not an end in itself (the desirable level of utilisation being dependent on the market being served and the costs of serving it), but it is an important indicator in assessing the performance of the industry.

An examination of commodities carried and industries served by urban freight transport revealed that nearly half the tonnage moved is in the form of bulk products (sand and gravel, petroleum, cement, etc), though, in past studies, attention has been focused on the problems of general freight carriers to the exclusion of the others. The current review revealed that problems faced by carriers of bulk materials tend to be different from those faced by carriers of general goods.

A number of possible parameters which may be used as a measure of vehicle utilisation were examined - both in terms of their suitability in comparing the different operations which compromise urban road freight transport and in terms of the availability of the basic data necessary for their use. Average annual vehicle kilometres was finally selected for the present work, although far from ideal in a theoretical sense, since it was the only acceptable measure derivable from currently available data.

From the latest data available (1976) it is clear that the average annual distance travelled by urban freight vehicles varies little between capital cities, though there is some evidence that usage increases with city size (i.e. utilisation

is higher in Melbourne and Sydney than in the other capitals). Analysis is also indicated that hire-and-reward operators achieve a much higher annual utilisation than do ancillary operators (i.e. those who use trucks as part of their own business).

Interviews were undertaken to identify the major constraints on high utilisation as perceived by the various participants in the transport field. Problems were found to arise in four main areas:

- access to load/unload points via public streets;
- inefficient loading/unloading arrangements lending to queues;
- mismatch of hours; and
- delays on the road.

Access problems are most common in the narrow streets of old business areas and in old buildings with poor vehicle docking facilities. Detention at load/unload point is common due to both inadequate equipment and staffing/operating arrangements. Mismatch of hours covers a host of problems and wasted time is commonplace. Delays on the road were found to be a serious problem for bulk carriers, but a lesser one for general carriers. The latter were much more concerned about end point delays. Also bulk carriers were much more affected by street closures, bans on heavy vehicles, etc.

Having identified the problems as perceived by the various parties involved an examination was made of the underlying causes of the problems.

It was found that many of the problems of utilisation arise from the complexity of the system and the fact that each individual involved is trying to optimise his own operation which he may succeed in doing at the expense of others with a weaker bargaining position (in this case usually the vehicle operator).

There are also a multitude of regulatory and institutional constraints which affect the operator, covering;

- working conditions;
- customs requirements;
- vehicle limits; and
- usage of the city infrastructure.

Often such regulations are imposed to protect the community at large, but it is not apparent that due consideration is always given to the additional costs imposed by such measures. Similarly some regulations would seem overdue for review and updating to match current technological and other developments.

A major area of weakness appears to be a lack of awareness of the cost and importance of goods movements among manufacturers, architects, planners and designers as well as among regulators arising, at least in part, from an inadequate data base.

It is clear that while significant advances have been made over the last ten years, by the industry itself and by governments, the basic underlying problems remain unchanged. Many of these problems arise from market failures and are not within the powers of government to correct without a very high degree of interference with the market. Such problems are most effectively dealt with by the participants themselves - with the government role being to improve the data base and information flows as well as ensuring that regulation does not hamper the process of adjustment.

CHAPTER 1 - INTRODUCTION

In 1969 Mr R.C. Davis presented a paper to the Australian Road Transport Federation in which he contended that many forces beyond the control of the individual transport operator severely curtailed the use of general freight transport equipment in the urban area. A transcript of that paper is included as Appendix I to the present work.

In 1979 the Bureau of Transport Economics (BTE), in response to a request from the Transport Industry Advisory Council, undertook a review of the utilisation of urban commercial road freight vehicles, giving special attention to matters raised by Davis.

This paper presents the results of that review. It examines utilisation problems reported by vehicle operators and other participants in the transport process, and discusses both the underlying causes of these problems and possible remedies. Many of these remedies were either suggested by participants during interviews or are already functioning in some sectors of urban road freight transport. Specific matters raised in the Davis paper are also reviewed to give some idea of the changes that have occurred in urban road freight transport in the last 10 years.

It is appropriate at this point to emphasise that maximisation of vehicle utilisation is not the primary goal of a fleet operator. Assuming that his overall goal is profit maximisation then vehicle utilisation is only one factor contributing to this. In fact optimal utilisation would be less than 100 per cent in almost all instances. However a utilisation below optimal reduces the operator's potential profit, and the basis of this paper is the feeling among operators that, because of external influences, utilisation is less than is generally desirable.

Basically there are four components which together determine total vehicle utilisation. They are:

- average load/capacity ratio (load factor);
- proportion of loaded running in total kms run;
- given a mean speed in transit; time spent loaded and in transit as proportion of the total time the vehicle is nominally available; and
- mean speed when in transit.

The first two factors are largely under the control of the operator, though they are influenced by the level of service he wishes to provide. The third component, while under some degree of control by the truck operator, is influenced strongly by external factors (slow end point operations, poor loading facilities, queues at service points, etc.). The fourth component is largely beyond the control of the operator, being dependent on factors such as street congestion.

The focus of the present paper is on the third and fourth components of utilisation, i.e. on the factors where the operator does not have complete control. That is, the focus is on the interactive aspects of urban freight operations where parties other than the truck operator may cause, and solve, problems in optimal utilisation of vehicles. This is not to underestimate the importance of the first two components, but they are dominated by choice of vehicle and fleetsize to match the task and planning of truck routing, factors under the control of the operator.

Discussion is confined to the freight carrying urban road vehicle. Other sectors such as couriers, hire cars and taxis have a different set of difficulties and are not discussed here.

There is very little contemporary data on urban freight transport available[1] and until recently most papers on the subject of urban goods movements were either theoretical or anecdotal as any other approach was frustrated by lack of data.

In an attempt to give the paper a firmer basis, the study team has considered the little data available, and has also had discussions with participants in the industry and their customers. Most of the interviews were conducted in Melbourne and this has resulted in a heavy emphasis on Melbourne's problems in the paper. This was unavoidable as the study team did not have sufficient time at its disposal to also cover Sydney in depth.

As a general comment, the problems restricting urban commercial vehicle utilisation are similar in both Melbourne and Sydney. However Sydney suffers to a greater degree, due to a more difficult urban physical geography, the intermingling of residential and industrial land uses, and a large proportion of bulk movements such as coal in its total road task.

In this paper problem areas are highlighted and where possible the relative importance of the different causes of utilisation loss have been assessed. The agencies by which changes can be made are considered, but no quantitative analysis of the costs of the present inefficiencies, or benefits of possible improvements have been made.

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(1) "Excluding the SATS, ... the existing transportation survey data would develop statistics for travel parameters which are representative of trips made some ten years ago", Rankine & Hill Consulting Engineers, Urban travel parameters study. Phase one: Inventory, prepared for the BTE, Feb 1975.

CHAPTER 2 - URBAN FREIGHT BACKGROUND

COMMODITIES CARRIED AND INDUSTRY SERVED BY URBAN FREIGHT TRANSPORT

In 1975-76, urban internal freight movement by road was estimated to be approximately 310 million tonnes[1]. Table 2.1 shows the breakdown according to commodity. Nearly half the tonneage was bulk products such as sand and gravel, petroleum, cement and concrete. The rest was what is generally classed as non-bulk, though some of it requires specialised equipment and loading.

This distinction is interesting, because while it has been often pointed out that urban goods movement has received little consideration in plans for urban transport, bulk road movements have rarely been considered at all. Davis' paper, for example, considered a set of problems faced by general freight carters. Bulk road urban freight has its own particular set of problems.

Table 2.2 provides a breakdown of the urban task by industry served. Appendix II provides more detail on this topic.

VEHICLES USED IN URBAN FREIGHT TRANSPORT[2]

Table 2.3 shows the urban Australian transport task in tonne kilometre terms apportioned to various classes of vehicles.

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(1) Australian Bureau of Statistics (ABS), Survey of Motor Vehicle Usage 1976, full version on microfiche.

(2) The following description is in terms of tonne kilometres performed and tonnes carried. Figures of vehicle kilometres generated by freight movements in urban areas cannot be obtained from the ABS Survey, due to the extensive use of light commercial vehicles for other than freight carrying purposes.

TABLE 2.1 - ROAD FREIGHT MOVEMENTS IN CAPITAL CITIES CLASSIFIED BY COMMODITY 1975-76

(million tonnes)

	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	NT & ACT	TOTAL
Livestock	0.4	1.8	1.0	0.9	0.9	0.2	0.0	5.2
Fruit & vegetables	1.4	2.1	0.8	1.0	1.2	0.1	0.0	6.6
Other agricultural	2.2	2.6	1.9	1.7	1.7	0.2	0.0	10.4
Minerals	7.6	0.4	4.3	0.3	0.4	0.5	0.0	13.5
Sand, gravel etc	26.9	22.0	9.8	19.9	14.5	3.7	3.4	100.1
Processed food	7.5	7.5	2.8	2.7	3.0	0.4	0.5	24.3
Timber & products	2.9	2.3	0.8	1.3	1.0	0.6	0.2	9.1
Fertilisers	0.5	0.4	0.5	0.5	0.8	0.1	0.0	2.7
Petroleum & products	9.4	3.8	2.7	2.2	1.5	0.5	0.7	20.8
Cement, concrete & products	8.5	8.7	3.7	4.4	4.1	1.1	1.3	31.8
Iron, steel & manufacturers	13.4	6.2	2.2	4.8	2.6	0.4	1.0	30.6
Other manufacturers	24.6	19.7	5.4	5.5	5.5	1.3	1.1	63.0
Other	7.9	14.2	4.8	3.1	2.0	0.5	0.8	33.2
Not stated	1.4	2.4	0.8	0.4	0.2	0.5	0.1	5.7
TOTAL	114.6	93.9	41.4	48.6	39.4	10.0	9.2	357.1

Source: ABS, Survey of Motor Vehicle Usage 1976, Table 31, includes Main type of operation - within capital city,
- between capital city and rest of State,
- intercapital.

TABLE 2.2 - ROAD FREIGHT MOVEMENTS IN CAPITAL CITIES CLASSIFIED BY INDUSTRY SERVED 1975-76 (a)
(million tonnes)

	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	NT & ACT	TOTAL
Agriculture and forestry	2.8	3.0	1.7	2.1	2.9	1.4	0.2	14.0
Mining	9.1	4.2	5.0	2.1	2.4	0.3	0.2	23.2
Manufacturing	11.4	12.2	4.3	4.9	3.4	0.9	0.2	37.2
Building and construction	26.1	20.5	8.0	13.4	11.3	2.1	2.9	84.1
Wholesale & retail	16.2	13.0	5.1	3.9	4.7	0.8	0.6	44.3
Road transport	30.0	26.4	11.5	15.1	8.5	2.3	1.7	95.5
Government	10.6	7.2	2.8	6.0	4.9	1.8	3.0	36.1
Other	8.2	6.8	3.0	1.2	1.2	0.2	0.4	21.0
Not stated	0.2	0.7	0.2	0.0	0.2	0.3	0.1	1.7
TOTAL	114.6	93.9	41.4	48.6	39.4	10.0	9.2	357.2

(a) Where a vehicle's usage was reported as 'used in own business' the industry served is the industry of the owner of the vehicle. Where the vehicle's usage was reported as 'hire and reward', the industry served is the industry of the main client. If there was no main client, industry is shown as 'road transport'.

Source: ABS, Survey of Motor Vehicle Usage 1976, Table 30,
Main type of operation - within capital city,
- between capital city and rest of State,
- intercapital.

TABLE 2.3 - TOTAL ANNUAL TONNE KILOMETRES, BY TYPE OF VEHICLE AND AREA OF OPERATION: AUSTRALIA, 1975-76

(million tonne kilometre)

	Capital City	Provincial Urban	Rest of State	Total State of Registration	Interstate Total	Australia
Utilities and panel vans	821.0	160.0	554.0	1 535.1	41.4	1 576.5
Rigid trucks						
- 2 axles	3 618.1	574.1	3 534.2	7 726.4	228.4	7 955.1
- 3 axles	1 096.9	170.8	874.9	2 142.6	138.1	2 280.7
- more than 3 axles	510.7	192.5	538.8	1 242.9	101.3	1 343.3
- axles not stated	161.3	59.1	276.4	495.7	9.3	506.1
Articulated trucks with						
- 4 axles or less	1 917.1	530.7	3 926.0	6 373.8	2 512.7	8 886.8
- 5 axles	1 327.4	529.9	3 345.2	5 202.4	2 396.5	7 599.4
- 6 axles	744.9	486.9	1 879.4	3 111.3	2 553.6	5 664.9
- more than 6 axles	35.2	59.1	297.6	391.9	23.0	414.9
- axles not stated	67.6	39.6	207.7	315.0	159.7	474.7
TOTAL	10 300.2	2 802.5	15 434.3	28 537.2	9 164.0	36 702.3

Source: ABS, Survey of Motor Vehicle Usage, 1976.

Nearly one third of total tonne kilometre performed on Australian roads takes place in the seven State Capitals. Only 8 per cent of this urban task is performed by utilities and panel vans(1).

In Melbourne 42 per cent of tonne kilometre is performed by rigid two axle trucks but an even larger percentage, 46 per cent is performed by rigid trucks with more than two axles or by semi-trailers(2).

In Sydney the proportion of tonne kilometre performed by these larger trucks is even higher at 53 per cent. From the above proportions it can be seen that the delivery of small consignments and other light transport tasks, which are often considered the major transport tasks in the urban environment, are in fact only a small proportion of the total task in tonneage terms, although small loads generate a large proportion of the actual vehicle kilometres. Unfortunately there are no suitable data in the ABS survey to allow reasonable estimates of the vehicle kilometres generated by these small loads trips, however in Melbourne in 1964, 23 per cent of internal truck trips carried a load of less than 100 kg, excluding empty running(3).

INFRASTRUCTURE AND USAGE

The Report on Roads in Australia (4) estimated that heavy trucks(5) travelled 3130 million vehicle kilometres on

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(1) Utilities and panel vans are passenger cars with modified bodies (ABS definition).
(2) ABS, Survey of Motor Vehicle Usage 1976.
(3) Ogden, K.W., Urban Goods Movement. a thesis prepared for the Department of Civil Engineering, Monash University, February 1977, p.87.
(4) Commonwealth Bureau of Roads (CBR), Report on Roads in Australia 1975, Melbourne, December, 1975.
(5) Heavy trucks in this context are trucks with dual tyres, CBR definition.

arterials in the capital cities in 1973-74. Allowing for various errors of measurement, nearly all commercial freight movement in these cities was along the 6175 km of urban arterial roads[1]. Even on the arterials, movement was highly concentrated, with 55 per cent of all arterial truck travel taking place on only 20 per cent of the arterial network. Therefore, approximately 1400 km of urban arterials carried over half the urban goods task in vehicle kilometre terms and probably an even greater share of the tonne kilometres in 1974-75.

More detailed discussion of road use and congestion is provided in Appendix III.

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(1) CBR, Report on Roads in Australia 1975, Melbourne, December, 1975. Compare with ABS, Survey of Motor Vehicle Usage figures for capital city truck travel (3179 million truck kilometre in 1971, 3377 million truck kilometre in 1976).

CHAPTER 3 - MEASURES OF UTILISATION

BACKGROUND

There are a number of parameters which can be used as a measure of vehicle utilisation. Time loss during the day was the primary concern of Davis and it is clear that the ratio of time loaded and in transit to the total time the vehicle is available would be a good measure of utilisation in this sense. Unfortunately there are problems with this measure, both in terms of data availability and in determining an operational definition of the term itself.

In fact suitable data to estimate this measure are simply not generally available at present and an extensive survey would be needed to obtain it. The introduction of instruments on trucks to record the actual number of hours the vehicle is in motion, its speed, etc. will make the necessary data more accessible in the future, but it does depend on the owner (operator) recording such information on a regular basis. Information of this nature is of direct use in the management of an operation, and thus raises hopes that such records will be maintained in the future, but the fact remains that, at present, the appropriate data is not available.

In addition, in the ABS Survey at least, the official load capacity of utilities and panel vans seems to bear little resemblance to the loads these vehicles are estimated to carry, but the main trouble lies with the denominator 'total time vehicle is available'. If only supply is considered then it will simply be 8760 hours less any repair and maintenance time. However if demand for the truck's services is considered, then perhaps the denominator should become 'total time the vehicle is available and required for revenue earning services'. At this point the whole issue becomes exceedingly complex, as it would be difficult to satisfactorily measure such a factor.

A different approach is necessary if an estimate of vehicle utilisation is to be obtained using currently available data. The one used in this paper, annual average vehicle kilometres, has several advantages:

- it is the measure of utilisation which truck operators commonly use;

- it is likely to be accurately estimated by the owner as it is recorded automatically by the truck;

- the ABS has extensive data on average vehicle kilometres in urban areas classified in several ways;

- this paper is concerned mainly with the hours per day a vehicle can be used actively in revenue earning work. Given the data limitations, distance (km) run per annum is the nearest possible substitute for this measure.

The limitations of this measure must be recognised however. For example route diversions caused by geography or structural or regulatory constraints can increase vehicle kilometres required for an individual task and reduce the effective commercial utilisation of the vehicle.

Geographic and structural causes for diversions such as unbridged waterways and low level bridges are localised and therefore rarely a major problem. However in Sydney and Melbourne some local councils are banning trucks from all but a few streets, or closing streets to eliminate all through traffic. As a result while vehicle kilometres run per vehicle may increase, the actual transport task performed per vehicle may actually fall, though there is no data to refute or confirm this conjecture.

It must also be stressed that vehicle kilometres run is not a direct measure of revenue earning capacity. That of course

depends also on the percentage of loaded to empty running and the ratio of load to capacity for the truck concerned.

Other simple measures were examined, but suffered from even greater defects. For example, annual tonnes per vehicle or annual tonne kilometres per vehicle have three disadvantages:

- they are not as reliable as distance run, as they are owner's estimates;

- they are dependent on vehicle capacity and cannot be compared directly across different sized vehicles; and

- normalising by dividing by capacity is difficult, as for utilities and panel vans registered capacity seems unrelated to the estimated maximum loads carried.

Hence, while annual average vehicle kilometres is far from ideal, it was found to be the only practical measure of utilisation available.

PRESENT VEHICLE UTILISATION AND ITS VARIATION WITH CITY SIZE

It is often claimed that congestion in the larger cities imposes severe limitations on vehicle utilisation, but the data presented below does not support this hypothesis.

If the ABS performance measures presented in Tables 3.1 to 3.3 are used to compare cities of varying sizes, two facts can be noted:

- the average annual distance run per vehicle increases with city size for all classes of commercial vehicles; and

- the percentage load, and the ratio of loaded distance to total distance are not related to city size.

TABLE 3.1 - AVERAGE ANNUAL KILOMETRES PERFORMED PER VEHICLE IN CAPITAL CITIES AND ENVIRONS 1975-76
('000 km)

	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra	AUSTRALIA
Utilities and panels vans	12.6	13.5	10.6	12.0	12.1	10.3	14.0	19.8	12.6
Rigid trucks with tare									
- less than 3 t	15.2	16.8	14.9	12.6	13.7	10.7	11.6	17.9	15.0
- 3 t to 4 t	16.5	17.1	13.4	10.6	10.9	10.2	12.1	27.1	14.8
- 4 t and over	17.2	18.3	16.8	15.7	13.6	15.1	14.0	19.6	16.6
Average for all rigid trucks	16.0	17.3	15.1	13.1	13.3	12.0	12.4	19.5	15.4
Articulate trucks with tare									
- less than 9 t	20.2	17.9	12.5	12.6	13.1	13.6	14.8	10.8	16.8
- 9 t to 11 t	18.4	17.9	17.0	15.5	12.2	13.6	18.6	49.0	17.3
- 11 t and over	22.9	16.7	18.0	14.1	17.0	16.9	18.0	37.5	18.6
Average for all articulated trucks	21.0	17.6	16.6	14.2	14.5	14.5	16.8	34.9	17.7
Other truck types	9.7	8.7	10.3	7.9	6.3	3.6	5.5	10.9	8.5
Average for all trucks excluding utes and panel vans	16.1	16.8	14.9	12.7	12.6	11.2	12.4	20.1	15.1

Source: ABS, Survey of Motor Vehicle Usage 1976, Table 2B.

TABLE 3.2 - RATIO OF LOAD TO CAPACITY FOR LOADED TRUCKS OPERATING IN CAPITAL CITIES 1975-76

(per cent)

Melbourne	Rigid Trucks (Tare in tonnes)			Articulated (Tare in tonnes)		
	Less 3	3-4	4 and over	Less 9	9-11	11 and over
Sydney	46	70	77	76	89	94
Melbourne	43	68	79	82	86	90
Brisbane	37	60	75	78	90	89
Adelaide	46	61	82	76	80	89
Perth	43	65	84	72	81	93
Hobart	41	75	81	84	97	92
Darwin	47	74	76	75	72	100
Canberra	44	56	74	84	92	95
TOTAL AUST	44	66	79	79	87	92

Source: ABS, Survey of Motor Vehicle Usage 1976, Table 40.

TABLE 3.3 - RATIO OF LADEN TO BUSINESS KILOMETRES[a] FOR TRUCKS OPERATING IN CAPITAL CITIES 1975-76

(per cent)

Melbourne	Rigid Trucks (Tare in tonnes)			Articulated (Tare in (tonnes)		
	Less 3	3-4	4 and over	Less 9	9-11	11 and over
Sydney	76	70	61	57	58	56
Melbourne	74	70	63	61	69	64
Brisbane	73	70	64	61	58	57
Adelaide	75	71	59	60	59	59
Perth	70	74	62	62	57	54
Hobart	70	67	62	60	54	53
Darwin	75	83	64	67	48	64
Canberra	69	75	63	51	48	51
TOTAL AUST	75	71	62	59	60	57

(a) Business kilometres includes kilometres travelled for hire and reward and those kilometres chargeable to a business or for which an allowance was received. It excludes 'to and from work' even if paid.

Source: ABS, Survey of Motor Vehicle Usage 1976 , Tables 41 and 42.

This indicates that, although congestion must hinder the vehicle operator in a large city, it does not reduce the average distance run per vehicle below that of an operator in a smaller city. This is probably due to a greater overall demand for services

and longer individual trips lengths. This latter factor seems likely to be a major contributor(1).

VARIATION IN UTILISATION WITH OWNERSHIP

A large majority (80 per cent) of urban commercial vehicles are ancillaries(2) and the average utilisation for this class is low. The owner buys the vehicle to ensure that a truck is always available, and may use it almost exclusively for personal transport. As Table 3.4 shows, even ancillary fleets owned by companies do not match the performance of hire and reward carrier (who performed 41 per cent of tonne kilometres with only 13 per cent of the vehicle fleet).

TABLE 3.4 - USAGE OF TRUCKS IN URBAN AREA - MELBOURNE 1964

(per cent)

	Fleet	Trips	Tonnes	Vehicle km	Tonne km
Hire and Reward	13	17	35	20	41
Ancillary Commercial	54	63	53	59	50
Ancillary Private	27	10	1	14	1
Government	6	10	11	7	8
	100	100	100	100	100

Source: Ogden, Urban Goods Movement, a thesis prepared for the Department of Civil Engineering, Monash University, Feb 1977.

(1) For example, consider two operations in different cities, the numbers here are hypothetical and for demonstrative purposes only. Each truck spends 1 1/2 hours loading and 1 1/2 hours unloading. The truck in the large city travels an average distance of 20 km at 20 km an hour for the trip. The truck in the small city travels 10 km at 30 km an hour. The truck in the large city travels 20 km in 4 hours, the truck in the small city travels 10 km in 3 hours 20 minutes.

(2) Used in own business.

SERVICE LEVEL

Service level is an amalgam of many characteristics, including items such as speed, frequency, punctuality (or reliability), and degree of care in freight handling. As mentioned previously, the level of utilisation achieved is, of necessity, dependent on the level of service provided. In general the higher the level of service provided, the lower will be the utilisation and the higher the cost of the service. This may well be a factor in the low utilisation of ancillary vehicles indicated in Table 3.4 since better service to customers is often cited as a reason for operating an ancillary fleet. This variation in service levels makes any comparison of utilisation across different market segments a difficult process.

Similar problems exist with respect to comparing variations in utilisation over time in a single market segment, though in this case, the problem of changing activity patterns and customer expectations. No quantitative information on this subject is to hand, but it is an issue requiring care when considering changes in utilisation over time or in different geographical locations.

CONCLUSION

It is clear that no totally satisfactory measure of vehicle utilisation can be developed at present because of the shortage of essential data and conceptual problems associated with levels of service. However, the simple measure of average annual vehicle kilometres does serve as a framework for discussing some of the issues facing the industry and the means by which problems can be overcome.

CHAPTER 4 - SURVEY OF PROBLEMS AND ISSUES

This chapter discusses the problems and issues raised by the various people interviewed by the study team. Those interviewed included:

- truck operators (general, smalls, bulk and waterfront);
- the receival and dispatch manager at a large retail store;
- terminal and depot operators at the waterfront; and
- union representatives.

Most of the interviews took place in Melbourne, but some were conducted in Sydney. The problems cited were many and varied, often the same situation was interpreted very differently by different participants. This chapter will first discuss the general problems of urban road freight transport, then consider problems of particular market segments.

GENERAL PROBLEMS OF URBAN ROAD FREIGHT TRANSPORT

There are three main factors affecting the vehicle kilometres attainable by an urban freight vehicle:

- span of hours that the vehicle is employable;
- delays at end points; and
- delays en route.

As transport is a service industry the span of hours a truck is employable is dependent on the customer's work schedule. A few years ago, the import boom and buoyant economic climate ensured that terminals and factories worked early and late with a resultant wide span of possible delivery hours. Now many

customers are working only one shift and are becoming increasingly cost conscious. Customers are reluctant to pay their employees overtime and so afternoon deliveries, especially on Fridays, are less and less welcome.

The operator must also accommodate the hours of the dispatcher. For example most dispatchers operate from 7.30 am onwards, though many operators would prefer earlier opening.

The driver's day is fairly flexible, starting between 7.00 and 8.30 am going to between 3.30 and 5.00 pm. Most operators of large units are prepared to make extra use of their expensive equipment by paying overtime if the work is available.

The constraints on the working day vary from task to task, for example cement deliveries can start as early as 4.00 am, while some terminal to depot container movements, and deliveries to supermarkets with night packing staff are feasible in the evening. However the operator of general services often finds he can only operate from 7.30 am till 2.00 pm. His capital amortisation costs are spread over a very short span and his unit cost per kilometre run is increased.

Restricted span of hours is not the only source of complaint. There is considerable time loss during the day due to:

- access difficulties;
- queues for service;
- inefficient load/unload processing;
- mismatch of hours; and
- delays on the road.

Access can be a problem in two ways. In the inner city or in the older strip shopping centres, loading docks on the premises are often non-existent and the operator must find an unoccupied street loading zone, or double park. Building regulations specify loading docks for new buildings or where substantial

change of use of old buildings is involved, but this does nothing to alleviate the problem in existing buildings. More on street loading zones are a possibility, but this can conflict with other measures such as the declaration of clearways to facilitate traffic flow.

Even where a loading zone or dock is available, access can still create problems. Large trucks have difficulties negotiating narrow alleys and access ways, and even in modern buildings door height can be inadequate for a large vehicle.

Detention at the actual load/unload point is also common. The customer or depot operator wishes to make maximum use of his staff and equipment, and a line of waiting trucks is his guarantee of continuous employment. Booking systems to regulate demand can be used and they have had considerable success in some areas.

Loading and unloading itself is often slow, using outdated equipment and methods, and docks themselves can be inadequate for the large trucks which move so much of the modern urban freight task. Even in modern office blocks and shopping centres, the dock may be a considerable distance from the customer being serviced.

Paperwork and checking for freight security are also causes of delay at a loading dock. There are no uniform methods of documentation, and it may take some time to ensure that all receipts and dockets are correct.

With high value freight it may take some time to see that all is in order, the load may have to be depalletised and each box checked individually.

Misalignment of hours is another problem, the Transport Workers Union accepts fairly flexible hours of operation and the driver will usually attempt to adapt his hours to the customer being

served. However the multiplicity of awards under which customers, depots and terminals operate, ensures that someone is always having lunch, a tea break or changing shift. Some large dispatchers and receivers employ extra staff to work through breaks, but the practice is not universal.

Delays on the road arise from a number of causes:

- traffic volume;
- road configuration;
- traffic management (or mismanagement); and
- detours and closures.

There is much data on traffic volume, but little data on the resulting traffic speeds. The NRMA and the RACV have run tests on passenger car speeds on major arterials in peak hours, but this has very limited application to commercial vehicles with very different acceleration characteristics and usage patterns.

Urban commercial vehicle movement is spread throughout the day and therefore the impact of the rush hours is not as pronounced as on the highly peaked private car movement. Commercial vehicles are heavily concentrated on a few specific routes, however these routes are usually the main arterials where traffic flow is slow throughout the day.

The localiased nature of freight vehicle movement makes any general comment difficult. For example in Melbourne the Johnston Street Bridge was widely commented upon as reducing point to point travel times in the port area, while street closures in the port area had increased traffic delays on the remaining available roads.

Traffic management procedures also affect the speed of travel. For example strictly enforced clearways will add two extra traffic lanes and greatly relieve congestion. Large commercial vehicles have very slow acceleration and therefore their transit

times are particularly sensitive to disruption in traffic flow such as poorly synchronised traffic lights.

A report on goods flows in the Sydney area [1], lists many petty annoyances which hinder the efficient flow of heavy vehicle traffic. However the major complaints of enroute delays were of diversions either due to structures such as low bridges, or local council bans and restrictions.

Local council resistance to movement of trucks in local streets is increasing in both Sydney and Melbourne. Closures can be implemented by banning vehicles over a certain weight from residential streets or by physically closing one end of a street. This causes a number of problems. The distances point to point are increased, and there is increased congestion on the available roads. Access to the area can be a problem and in Sydney operators complain that it has become very difficult for trucks to get through some suburbs at all.

Most non-bulk operators are not particularly concerned with road congestion as such, it is not their main source of delays as trip end delays are often of far greater magnitude; but they are concerned at the increasing number of truck bans. If the trend continues without co-ordinated planning at the city wide level, routes for trucks could become extremely circuitous in some areas.

PROBLEMS OF THE WATERFRONT

The waterfront has its own peculiar problems due to the very irregular and peaked demand generated by the ships. Although containerisation was first introduced ten years ago, the

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(1) W.D. Scott and Co Pty Ltd, Empirical Investigation of Issues Arising from Urban Goods Workshop, (2 vols), unpublished report to the CBR, Melbourne, 1975.

waterfront is still in the process of adjusting to it and to modern computer technology.

It also has a reputation for having a greater share of difficulties than any other urban road transport area. A common comment was, 'We don't do dock work any more, there are too many problems'.

Container Terminals

Much import general cargo is containerised and container terminals(1) now form a major interface between the docks and the land transport system. Many of the difficulties associated with terminals stem from the different modes of operation of the waterfront and road transport. When unloading ships, the terminals operate their wharfside operation twenty four hours a day, seven days a week, and this is their primary responsibility. They operate landside for two shifts a day five days a week. The terminals are geared to shift work and start and end of shifts are inflexible, hours for trucks are 7.30 am to 9.30 pm. This does not suit many truck operators who would prefer an earlier start and finish, while terminal operators are equally disgruntled about poor utilisation of the afternoon shift.

Another source of contention is the three day free availability period. Containers are unloaded and their numbers are published in the Daily Commercial News. The owner has three days to collect them before penalty charges are imposed.

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(1) A container terminal unloads containers from ships and holds them for collection. Less than container load (LCL) containers are forwarded to a depot for break bulk operations. In Sydney, some terminals with insufficient on-site storage space, forward nearly all containers by rail to a remote holding area for collection.

Documentation for import cargo is antiquated and out of touch with the needs of modern transport. The new fast container ships with their rapid turnaround have left a documentation procedure evolved in the days of sail far behind. The documentation process is cumbersome, involved and slow, and documents are often not finalised until the second or third day of the three day period. There is a rush to pick up containers before extra charges are imposed, with the inevitable congestion and delay to all concerned. The carriers would prefer to have the three day period extended, but terminal operators contend that the three days is ample time.

Container Depots

Some containers carry freight for more than one customer. These less than container load (LCL) containers are forwarded to a depot for unpacking.

The LCL depot is therefore both a receiver and dispatcher. Containers are picked up from the terminal, usually in the slack evening hours and unpacked and palletised. The containers are then listed as available in the Daily Commercial News and the same three day pick up period as for FCL applies. LCL constitutes only 20 per cent of containers, but LCL depots generate large numbers of truck movements. It is estimated that one LCL container generates up to six truck movements, and most trucks pick up more than one consignment. If a booking system is not in use, large delays are common.

The documentation problems are acute. A driver may have twenty pieces of paper for a multiple pick up, and if the paper work for one item is incorrect he must return again for the incorrectly documented item. Most import agents have an employee whose only job is ensuring that the documentation is correct and complete. Both delays and documentation problems have been reduced at many depots by a booking system which requires the relevant papers to be lodged the day before collection.

Cargo security is a problem in LCL depots. A driver is technically responsible for his freight once he accepts it and a conscientious driver will often depalletise valuable freight to ensure that everything is in order. This causes delays to other drivers and ties up the bay at which he is docked. Other drivers will sometimes depalletise cargo to enable them to get it all in a single load, with the same delays to other users of the depot.

PROBLEMS ASSOCIATED WITH DELIVERIES AND SMALL CONSIGNMENTS

The trend in manufacturing and retailing is towards large deliveries. The corner shop and the small manufacturing concern are disappearing. Though fragmentation of the manufacturing task is common, with different components being manufactured in different areas, the shipments are usually large.

The small load, multiple origin-destination task is the kind of task most often associated with the urban area. However small consignments would constitute at maximum 20 per cent of the urban tonneage transport task, although they generate a far higher proportion of the vehicle movements.

Parking and access to customer's premises is often a problem, especially in old fashioned strip shopping centres and the CBD. Small consignments are picked up and delivered to many places where goods movements are infrequent. Many offices, hotels, retail shopping centres and blocks of flats have inadequate provision for load/unload operations. Clearways can cause problems in some areas too.

Distribution usually takes place in the morning and can be planned in an efficient and organised manner. Collection, usually in the afternoon, is inherently less organised but two way radio is helping in the planning of pick-up rounds.

The amount of revenue earning work a pick-up vehicle can perform is determined by:

- density of calls;
- distance of the service area from the central depot; and
- congestion and detention.

Congestion has been listed last; with most delivery rounds, the denser demand in the CBD more than outweighs street congestion and detention caused by inadequate access. Low utilisation of vehicles in terms of calls per day will usually result from operation in an outer suburban area, where the lack of street congestion is outweighed by the scarcity of customers and the distance between them.

The emphasis of the business is on service, so that conflict of hours is not a problem. Labour costs are very high compared to the operating costs of the vehicles, so that there is more concern over efficient utilisation of labour than vehicles.

FEATURES OF BULK TRANSPORT MOVEMENTS

One third to half the produce moved in the urban area are bulk. The largest category is construction materials (crushed stone, sand and earth), but cement, concrete and petroleum also generate large flows.

Construction materials do not necessarily move along major arterials. They move from the production point to the construction site and the pattern shifts according to shifts in major construction projects. Bulk materials in general are highly sensitive to road congestion as the load/unload time is usually short, making road congestion the major component of total delays.

Often the only major cause of detention is street congestion or diversion due to axle load restrictions. The low intrinsic value of the produce make any lowering of transport productivity a matter of acute concern. However the large heavy trucks which carry bulk products are prime targets for diversions, bans and restrictions to truck routes. In discussion, bulk transport operators were the only operators to cite street congestion and closure as a major source of concern.

Sand, gravel and cement carriers are regulated by the construction industry hours. They start extremely early (often from 4am onwards) and often find that they cannot usefully employ drivers for the last few hours of the day shift. Concrete has even more problems, it has similar hours of demand and a limited product life.

Petroleum products are another major bulk movement, but differ in many respects from other bulk products. They can be moved by pipeline in the urban areas, as for example from Westernport to Melbourne. Distribution to retail outlets is by road, but orders are placed in advance and a day's schedule can be planned and adhered to. For motor spirit, delivery does not require the attendance of the service station owner and so there is no bar to night deliveries.

This is an extremely efficient branch of the industry. Most of its customers are regular patrons with a steady demand. A tanker can deliver industrial supplies during the day, and deliver to service stations at night(1). The constant demand allows pre-planning of routes and maximum use of vehicles. They are operated for two shifts a day and maintenance is carried

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(1) Receivers of petroleum products usually have arranged convenient access to storage tanks, which minimise delays to the delivering vehicle. Similarly oil deliveries will seldom have to compete for dock space.

out in the lay-off period. Most drivers have evolved an optimum route and worked out the best time to deliver product to a site. The trend to bigger service stations with large reserves has made the task even easier. It is interesting to note that the NAASRA study shows that large articulated tankers of the sort used for motor spirit deliveries are averaging about 100 thousand km per annum in urban areas, whereas premix concrete trucks average only 30 to 40 thousand kilometres(1). The advantages of extended operating hours are reflected in the higher utilisation of the tankers.

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(1) NAASRA, Study of the Economics of Road Vehicle Limits, Commercial Vehicle Surveys, Study Team Report R4, January 1976.

CHAPTER 5 - SOURCES OF UTILISATION PROBLEMS

The previous chapter outlined the problems and issues raised by participants in urban road freight transport. This chapter will try to clarify the underlying sources of these problems, and then illustrate the argument with an example.

THE BASIC SOURCES OF URBAN FREIGHT TRANSPORT PROBLEMS

Urban freight transport is very complex and has a multitude of participants. Truck operators are only a part of the process, dispatchers and receivers and the general public are all concerned in the urban freight process. Each individual or concern is intent on optimising his own operation within the constraints set by society. In doing so he may impose costs on somebody else(1). Just how many costs he can pass on depends on the relative bargaining power of himself and the other participants, which in turn depends on such factors as the number of concerns involved in that particular aspect of urban freight movement, the degree of competition and financial expertise. Truck operators who are a highly diverse group, very fragmented and competitive, are in a poor bargaining position. They feel they are forced to adjust to the requirements of other participants in the urban goods process without adequate recompense.

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(1) For example, a receiver who optimises his dock operation by only employing enough men and equipment to clear the day's business while operating at full capacity, will impose costs in terms of long delays on the truck operator delivering goods.

'Imposed' costs cause problems not just for the recipient, but for the entire community. They distort the cost price structure and can lead to an inefficient total use of resources(1).

Truck drivers are not the only participants who suffer 'imposed' costs. For example the dispatcher who finds his dock occupied for an extra half hour while a truck driver depalletises cargo to squeeze on an extra item, or the receiver who finds his clerical staff working overtime on ill prepared or deficient receival documentation are both suffering costs imposed by another party(2).

'Imposed' costs are not confined to active participants in the urban goods process. Costs are imposed by trucks on the community and vice versa. The truck delayed in commuter traffic is suffering a cost imposed by other road users, conversely truck noise and traffic are costs imposed by trucks on the community.

Whether unhindered truck movement is of benefit to the community as a whole is a matter for investigation, but local communities sometimes perceive that trucks cause a nuisance far outweighing any benefits the local group may receive as part of the general community. The militancy of these groups is therefore scarcely surprising and heavy vehicle bans and restrictions are the result.

While problems caused by the passing on of costs to weaker, less organised or less astute particpants are important, they are

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(1) Some of these 'imposed' costs are external costs in the true economic sense that the marginal private cost is less than the marginal social cost. Truck noise disturbing residents is an example of a true external cost. However most of these 'imposed' costs are not true external costs.

(2) It must be realised that some of these apparent 'imposed' costs are not passed on in practice. The cost cutting receiver who keeps trucks waiting secure in the knowledge that demurrage is rarely exacted, may be paying a hidden demurrage in higher unit freight charges.

not the only class of problems generated by urban freight road transport.

There are a multitude of regulatory and institutional constraints which affect the transport operator. These include:

- working conditions;
  - span of hours,
  - overtime provisions,
  - work conditions,
  - division of labour,

- customs regulations and documentation requirements;

- vehicle regulations;
  - load limits,
  - dimensions,

- usage of city infrastructure;
  - road space,
  - parking.

These regulations have certainly been imposed for a purpose, and those concerning vehicle dimensions and infrastructure usage have often been designed to alleviate or control costs to the community generated by truck movements(1). However these regulations have often been implemented without consideration of the extra costs imposed on freight movement compared with the benefits obtained by specific groups in the community.

Similarly some of the regulations, for example those concerning customs documentation, are badly in need of review and updating to match the technological change that has taken place in the industry.

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(1) The local council bans on truck movements are a good example of these regulatory constraints.

The last set of problems are perhaps the most intractable of all. These are generated by poor information and lack of awareness of the cost and importance of urban goods movement. These problems occur in many forms:

- the management of an establishment which while running its plant as a model of efficiency, fails to consider transport as an important component of total costs;

- the architect or town planner who makes inadequate provision for access to offices or blocks of flats or a shopping mall, not to mention factories and warehouses;

- the road designer who gives insufficient consideration to road geometry, turning circles, widths and so on; and

- the traffic engineer who does not sufficiently consider the special problems of trucks in stopping and accelerating.

All these factors; the numerous 'imposed' costs passed onto the weakest party; the legislative and regulatory constraints; and the poor information flow and general low awareness of urban road freight transport; generate problems which hinder the efficient use of labour and equipment throughout the urban goods task.

AN ILLUSTRATION

An actual example of problems arising from a particular transport task may help to illustrate the points made in the discussion.

Consider the unloading from a ship of an FCL container and its transport to the receiver.

The sequence of events is:

- the container is unloaded from the ship at the terminal;

- notification of availability published in Daily Commercial News, the customer has three days to collect before extra charges are imposed;

- the customs agent pays duty and finalises the documents;

- the transport operator with the documents picks up the container;

- he delivers to the customer;

- the container is unpacked; and

- the empty is returned by the operator to the container park.

The sequence may seem straight forward, but conflicts of interest arise.

Many of these conflicts, staffing levels, noise and truck traffic in residential streets, have already been discussed and will not be commented upon again, however the following problems have features distinctive to waterfront work and will be discussed in detail.

The terminal operates two shifts a day for truck pick up, 7.30 am to 9.30 pm and is geared to shift operation rather than simple overtime. At least one terminal contacted employed extra men to work through meal breaks to ensure continuous service to trucks.

Except in rare cases (for example an extra midnight shift put on to move a single large consignment) the terminal operator cannot charge the recipients of the containers directly for out of hours labour, so his hours are fixed.

Similarly, he is not concerned by the presence of truck queues as long as the day's business can be cleared in an orderly fashion, so he has nothing to gain by higher staffing levels.

The receiver will usually operate normal business hours and many will refuse delivery after 3 or 4 pm in order to allow their receival staff to clear the day's business within normal hours. The receiver is not normally charged demurrage for keeping a truck waiting, so he has little immediate motive for co-operation with the operator.

The truck operator's hours are 7.30 am to 5 pm and overtime. The truck operator usually is in favour of additional out of hours work if it is available, as it extends the use of his trucks and also may avoid traffic congestion.

Another constraint which must be taken into account is that in most instances notification of overtime must be made several hours in advance(1).

Given all these constraints and conflicts in operating modes, all cannot operate precisely as they wish. In the present situation it is usually the truck operator who accommodates to the working hours of the other participants.

The three day free availability period is another point of contention. The owner has three working days from notification of availability of a container, to collect it from the terminal before 'time up' is declared and extra charges for detention are levied.

The terminal operator wishes to clear his terminal as quickly as possible, and the container owner wants his empty returned.

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(1) One depot operator commented that overtime for the day must be notified by 11 am.

Terminal operators claim that three days is plenty of time to organise documentation and collect.

In fact, however, very few containers are collected on the first day, and 50 per cent to 60 per cent of containers are collected on day three. Truck operators tied up in the resulting congestion clamour for five days free availability to lessen congestion.

Late pick up is invariably blamed on late presentation of the documentation to the truck operator, and the delay in documentation is generally ascribed to its cumbersome complexity. However there are several possible reasons for this delay.

The customer may see the three days as three days free storage if he doesn't want the goods immediately. He may also simply not trouble to collect until day three as he knows he has three days before extra charges are imposed. Customs duty has to be paid before documents are finalised and the customer may be unwilling to pay duty until the last possible moment. Or it may be that, as is so often cited, documentation is complex and with all the steps to be taken, it simply is not ready until day three.

The problem is obviously a complex one. It is not just a case of trading off the cost of extending 'time-up' against the supposed reduced delays to trucks. If delays in collection are caused by any of the reasons except insufficient time to complete the documentation, extending 'time-up' without some means of ensuring prompt processing of the documents will only make the problem worse. It will put the terminals to extra expense without greatly reducing the congestion for trucks.

Documentation procedures are certainly in need of updating, and studies are underway in Sydney and Melbourne to review procedures and recommend changes. However, streamlining of procedures while of great potential benefit is unlikely to

provide a complete solution. Some penalty to customers who fail to deliver their documentation to the carrier within a reasonable time before 'time-up' may be required, to ensure that any party who derives an economic advantage by delaying collection pays for the privilege.

CONCLUSION

Many of the problems of the transport industry arise from the complexity of the urban transport task. While each individual will do his best to optimise the use of his men and equipment, he must act in co-operation with other players in the process and the player with the weakest bargaining position (at present the transport operator) will bear the brunt of any adjustments.

The problems discussed above have been raised time and time again and the virtues of co-operation, freer flow of information and greater awareness of the role of freight transport in industry and commerce, have been extolled frequently in the past.

However some of the panaceas so often advanced, have on examination, only limited application, while advances in what seem most intractable problems have been made by innovative organisations.

The next chapter considers some of these innovations as well as the efficacy of a few perennial 'solutions' to the urban freight problem.

CHAPTER 6 - POSSIBLE IMPROVEMENTS TO UTILISATION

The underlying causes of the problems of urban freight transport were discussed in Chapter 5. It was concluded that many of the problems arise from the complexity of the system.

The problems that are purely internal to the transport process are best dealt with by the industry itself. Questions such as manning levels, hours of operation, and waiting times at receival and dispatch points can only be solved by consultation and negotiation between the participants. The Government has a role in providing advice and information if required, and it may modify regulations to facilitate action the industry wishes to take, but its efforts are better directed to problems which extend beyond the industry.

The contribution that government at its various levels can make is discussed in the next chapter. This chapter considers innovations introduced by participants in the urban road freight industry.

DELAYS AT DISPATCH POINTS

Less than container load (LCL) depots for import containers have reduced delays to trucks by the introduction of booking systems. The practice is widespread in both Sydney and Melbourne and first became popular in the import boom of 1975.

Methods vary but the system in general use is 'block booking'. The day is divided into time blocks an hour to 1 1/2 hours long, and a fixed number of trucks are booked into each 'block'. A pre-booked truck arrives within the 'block time' and is served as soon as possible, being given priority over unbooked trucks.

One depot operator interviewed estimated that a booked truck would begin loading within half an hour.

Often periods at the beginning and end of the day operate on the first come first served principle, and some terminals only operate the booking system when they are busy.

The booking must be made, and all relevant documents lodged, the day before. Certain restrictions apply to ensure prompt processing of the booked truck. In some depots with more than one shed, items may only be picked up from one shed, the depot may require that items be loaded as is (not depalletised) or if a driver wishes to depalletise, he must be accompanied by an assistant.

The prelodging of documents allows the depot to spread the workload of its clerical staff more easily, and presumably is also of assistance in determining demand levels for the next day (whether overtime will be required etc). It also eliminates waiting for documents to be processed before pickup.

Owner drivers in general dislike prebooking systems, as they often don't know until late the previous day what their next days work will be. They cannot book and lose priority to booked trucks.

Block booking is preferred as being more flexible than time slotting, which requires that a truck arrive at a specific time or lose its priority.

Other suggestions to increase turn round included greater use of shrink wrapping when freight is loaded into the container. This would reduce the need for a driver to depalletise valuable cargo to ensure that all is in order before loading. Where shrink wrapping is used, turn round for trucks is reported to be greatly improved.

One depot has special docks where drivers who wish to depalletise their cargo are accommodated. The fork lift serves these docks on a 'cut and run' basis, instead of being in constant

attendance. It drops the pallet, leaves the driver to process it and comes back later with the next. The depot reports improved utilisation of its own fork lifts and faster processing of all trucks.

The enormous amount of duplicate paperwork generated at depots and terminals suggests that computerisation would be of benefit. At least one FCL terminal is fully computerised but industrial relations problems and fears for staff redundancy have prevented serious consideration of computer based information processing systems at most depots.

Most detention of LCL trucks now takes place at the receiver(1), but this can be partly ascribed to the success of the present booking systems, as previously delays were of the order of two to four hours.

Financial incentives to relieve congestion, that is differential pricing schemes with a peak hour tariff, are another possibility. However the industry is understandably reluctant to complicate its charging systems, when booking systems seem to be coping reasonably well with the problem.

RECEIVERS

Delays at receiver's docks are frequently mentioned as a problem by transport operators. The interview team discussed receival and dispatch procedures with the transport manager of a large general goods retail store. The store operated its own delivery service and was concerned with improving the efficiency of both receival and dispatch.

Consolidation was considered the path to efficiency. Receivals at the store have been simplified by negotiating a contract with

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(1) Informal estimates of 3 hours detention, comprising half hour pickup, 2 hour receiver, and half hour to deposit the empty, are common.

a 'preferred carrier', and consignees using the preferred carrier receive a lower freight rate. The retail store also benefits. A larger percentage of incoming freight will come via the one carrier. This allows closer co-operation between the carrier and the receiver, better organisation and consolidation of loads, fewer and more suitable trucks, standardised documentation. This leads to faster processing of all receivals.

The receival dock still works on a first come first served basis, as preferential treatment would raise objections from other carriers and relevant unions.

The study team came across no instances of a booking system for receipt of freight. Of course a booking system for deliveries is much more difficult as time of arrival of a trucks depends on loading delays and traffic, however the matter may be worth pursuing with high volume receivers.

Another possible method of relieving congestion at the trip end, is for the operator to charge for delays accruing to his truck. However from the truck operator's view, charging demurrage is usually only a weapon of last resort when negotiation and persuasion have failed. It is extremely difficult to collect demurrage from a client and there is the very real possibility that a client presented with a demurrage bill will take his business elsewhere. As a result demurrage is rarely charged by operators.

INTEGRATING OPERATIONS

One carrier interviewed has solved some of the problems of waterfront work by establishing his own container park. There is a bond store to which FCL containers can be moved straight from the waterfront to await customs clearance. In addition there are ordinary storage areas where containers are kept awaiting customer collection or where export containers are received prior to ship loading.

A container park gives the operator greater control over the demand for his vehicles and he can plan his visits to the terminals to avoid busy periods. The extra vehicle utilisation and more prompt and reliable service to his customers, must be traded off against the cost of the park and the load/unload forklift operation.

Such a park represents a considerable capital investment and is not a solution for the smaller carrier, but the advantages of integration of services a container park provides are substantial.

BETTER COMMUNICATIONS

In any of the measures adopted to increase vehicle utilisation, demand regulation and good information flow play an important part. The examples cited in this chapter have all utilised demand regulation to reduce delays, and many large carriers now use two way radio to keep better track of their fleet and increase utilisation.

One carrier interviewed had a very low trip end detention rate. He estimated that only about half of his detention was accumulated at trip ends as opposed to on the road. The carrier had deliberately concentrated on work where close communication and co-operation with his customers was possible. He operated fleets for a small number of large customers, and employed a sizeable staff of on site supervisors to ensure that problems were solved as they arose and vehicle utilisation was kept high.

NIGHT DELIVERIES - A SOLUTION?

Night deliveries are a favourite topic, town planners would like them to ease traffic problems and transport operators find the idea attractive as its promises extended use of their trucks.

Unfortunately receivers are not in favour of the idea. Most factories and warehouses work business hours and except for very specialised cases, the expenses of keeping a receival dock manned after normal hours is prohibitive.

Special cases where night deliveries do take place include deliveries of motor spirit to garages. Here no staff are required except the driver.

Supermarkets are also switching to night deliveries. The low inventory levels carried by modern supermarkets and the use of night shelf packing teams make evening delivery of goods a reasonable proposition. There are already staff on site. Newsprint can also be delivered at night for the same reason.

Night deliveries are also feasible for large consignments. Consignments of several containers are often moved in a single run from the port at night. For a large consignment it may be worth while for the receiver to keep his dock open late instead of clogging up his dock with a large run in the day. The operator experiences less delays as well.

However these exceptions are only a small proportion of urban goods movement. Newsprint and petroleum are specialised items, and only about 10 per cent of containers moving through the wharf are in consignments of four or more. The scope for night deliveries is very limited.

Night deliveries may come eventually as a result of regulatory action, but the increased cost to most receivers makes it an unlikely voluntary proposition.

ROAD CONGESTION - ITS RELATIVE IMPORTANCE

Road congestion has been discussed more extensively in the next chapter, and Appendix III gives a brief summary of some of the

available data. This section looks at the relative importance of road congestion in causing urban road freight vehicle delays.

Informal estimates of total trip end detention for a simple movement (one pick up, one drop) of general goods run from 2 to 3 hours. Ogden[1] estimated that the average trip length for a heavy truck was between 7km and 9km and that it took approximately 30 minutes. Doubling the average road speed would reduce the transit time 15 minutes. Admittedly the trip end detention includes loading and unloading, but there is obviously more scope for improving utilisation by reducing trip end delays than by general road improvements.

UTILISATION OF TIME SAVINGS

Theoretical estimates of time savings must be viewed with caution. Reducing the transit time on a major arterial by 30 minutes will not necessarily produce 30 minutes of usable savings. The following points must be borne in mind.

An average of 80 per cent of the vehicle fleet operating in urban areas is ancillary, in other words operated by the owner of a business for use in his own business. These vehicles have very low utilisation rates compared with hire and reward vehicles. Many of them are employed on a fixed delivery round or some such procedure and are unlikely to benefit greatly from decreased detention or congestion. The only major cost saving will be the driver if he can be usefully employed on other business. The capital cost saving will not be a consideration unless the fleet is large enough (and nearly 50 per cent of vehicles are in single truck fleets)[2] to make reduction of the number of vehicles possible.

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(1) Ogden, K.W., Urban Goods Movement, a thesis prepared for the Department of Civil Engineering, Monash University, Feb. 1977.

(2) BTE, Some Characteristics of Truck Ownership in Australia, awaiting publication.

With hire and reward operations the case is different. The operator has a powerful incentive to make the best use of his vehicles, but not all time savings can be usefully employed. It is of no use for a truck operator to save 1 hour if he requires 2 more hours to move an extra container a day.

This is not to deride time savings; they are important and every effort must be made to reduce detention and congestion costs. However it must be remembered that simple addition of all time savings will not give a useful indication of the actual benefits involved. Each case must be examined on its own merits.

It is likely (given the high percentage of low mileage ancillary vehicles in the fleet) that achievable savings from increases in average road speed are substantially less than direct computation indicates.

CHAPTER 7 - THE ROLE OF GOVERNMENT

This chapter examines the contribution that can be made by various levels of government to improve vehicle utilisation.

As pointed out in Chapter 5, many of the problems which assail the industry are beyond the scope of government at any level, except as a provider of information and advice. However not all the problems associated with urban goods movement fall into this category.

This chapter first examines the instruments available to Government in efforts to influence urban goods vehicle productivity, then continues with a discussion of specific areas where government action is either being undertaken or might be of benefit.

INSTRUMENTS AVAILABLE TO GOVERNMENT

There are five main types of instrument available to governments in alleviating traffic and transport problems. They are:

- regulation;
- financial incentives and disincentives;
- research and provision of information;
- operational changes to the road system; and
- capital expenditure on infrastructure.

Regulation

Establishment of, or change to, regulation is often a comparatively simple matter for governments at all levels. Since the direct cost is low, modification of regulations is often the first response of governments to developing problems.

Regulation is not cost-free however, and careful consideration of each proposal is needed to ensure that the penalties

associated with side effects are not greater than the benefits arising from the regulatory change. The breadth of view of the regulator is often of great significance. For example, implementation of a truck ban by a Local Council may be successful from the viewpoint of the Council and residents, but may impose additional costs on the rest of the community.

With regard to urban goods movements, regulation is ubiquitous with regulations relating to parking, vehicle dimensions, loading zones, clearways, etc already in use and with scope for regulation covering vehicle bans, night deliveries and land use changes.

All levels of government have some regulatory powers and it is essential that exercise of these powers be co-ordinated to the maximum extent possible.

Financial Measures

Most financial power lies with State and Commonwealth Governments and can be used to provide both incentives and disincentives for particular actions. Taxes, charges for parking, rebates and subsidies are all part of the financial armoury which can be brought to bear on a particular problem.

Financial incentives tend to be less direct in their action than regulation, but may be just as effective in the longer term. However, just as in the case of regulation, it is vital to analyse thoroughly the full ramifications of financial incentives before action is taken.

Research and Provision of Information

By and large it is fair to say that only Commonwealth and State Governments have the resources and power to research, gather and disseminate much of the information which is needed to assist the industry to solve a number of its problems. Research and

information gathering is expensive, but not in relation to the total costs of transport to the community and the collective investment in infrastructure and vehicles.

It remains one of the few avenues open to government which does not have potential for counter productive side effects.

Operational Changes to the Road System

This covers primarily traffic system management (TSM) options aimed at general improvement in traffic flows. Since it is concerned with detailed traffic movements it is primarily the concern of State Governments and Local Authorities.

TSM may require regulation in regard to matters such as clearways, etc., but the primary focus is on the traffic system. The system wide view generally taken when planning a TSM scheme reduces (if not eliminates) the danger of unwanted side effects. TSM also has the advantage that it generally involves low cost options.

Capital Expenditure on Infrastructure

Capital investment for, say, road improvements, is often seen as an obvious solution to some transport problems. In many instances it may provide a satisfactory solution and, in some cases, may be the best solution.

In general, governments at all levels and of all political persuasions are likely to regard additional capital investment as a position of last resort, and will seek to exhaust other avenues before embarking on further expenditure.

GOVERNMENT INVOLVEMENT

The remainder of this chapter discusses actions taken by governments in the past which affect the movement of goods in

urban areas, and the scope for government action to assist in overcoming some of the problems identified in this paper.

Information

A major recurring theme in this paper has been the lack of an adequate data base relating to the transport of goods in urban areas, the nature of the operations undertaken, the problems encountered and the potential improvements to be gained from particular actions by the various parties involved.

The problems and causes of detention and delay can be listed, but their individual magnitude and how much utilisable time would accrue from any improvement is a matter of speculation until further research can be undertaken.

Some detailed studies have been carried out by State bodies, but they are not always available to the Commonwealth Government the industry or the general public.

Operators, customers, planners, etc can work efficiently only if they have a satisfactory data base so that their decisions are made in full knowledge of the facts and implications. The general survey work undertaken by the Australian Bureau of Statistics is useful to help identify trends and problems, but it is not adequate for decision making.

Urban freight transport is extremely diverse and simple aggregated or averaged data can be very misleading(1). Useful data are only likely to arise from studies directed at specific problems or traffics; for example the impact of street closures on urban freight costs(2).

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(1) See for example the last section of the previous chapter on utilisation of time savings.
(2) The Urban Transport Study Group in Sydney has undertaken extensive work in this area.

The collection, analysis and dissemination of the necessary data is likely to be a costly exercise, but one that must be undertaken if a coherent attack is to be made on the problems of urban goods movement. In this context it should be noted that much of the information needed is available only from truck operators and others in the industry. The type of data needed would in most cases also be of benefit to the operator as an aid to more efficient use of his vehicles, but while some large concerns keep very complete statistical records, it is not a common practice especially with smaller operators.

If the problems associated with urban goods movements in general (and vehicle utilisation in particular) are to be solved then it is essential for the parties in the industry and analysts in government to co-operate in developing a series of studies aimed at establishing the facts of the situation and the possible impact of specific measures.

Documentation procedures for imports

This is an area long overdue for reform, and the problem is under examination in both Sydney and Melbourne by the Cargo Facilitation Committees. The Melbourne group is undertaking a survey to determine where and why delays occur, and no doubt more streamlined procedures will eventually be recommended. It is up to Government to ensure that useful recommendations are implemented promptly.

Road Investment

Table 7.1 gives an estimate of total expenditure on improvements to urban arterial roads over the period 1974-75 to 1978-79.

TABLE 7.1 - ESTIMATED ACTUAL EXPENDITURE BY ALL LEVELS OF GOVERNMENT ON URBAN ARTERIAL ROADS, 1974-75 TO 1978-79

Activity	Expenditure for Year ($ million at 1976-77 prices)				
	1974-75	1975-76	1976-77	1977-78	1978-79
Construction	289.1	239.0	223.1	247.3	248.0
Maintenance	46.9	53.0	58.3	67.5	71.9
TOTAL	336.0	292.0	281.4	314.8	319.9

Source: BTE, An Assessment of the Australian Road System 1979, Part A, AGPS, May 1979.

The figures given in Table 7.1 include expenditure on all urban arterial roads, not just those in capital cities(1). The fact that this considerable level of sustained investment has been unsuccessful in eliminating congestion on at least some urban arterials is due mainly to the steady growth in demand over the same period. This demand is primarily for private car space, but all suffer the resulting congestion.

The effectivness of additional general road investment in improving overall utilisation of urban freight vehicles is open to doubt. As was indicated earlier in this paper, end point delays appear to be a greater problem at present for many operators, and for these operators potential productivity increases through reductions in travel time may be small compared with increases in productivity to be gained through reductions in end point delays.

(1) In this context urban areas are defined as those with populations greater than 40 000 people.

However traffic congestion is certainly a problem of the first magnitude for all concerned, and governments have turned towards traffic management schemes in conjunction with their traditional capital works to assist in reducing the congestion on urban arterial roads.

Traffic Management

To date traffic management schemes have tended to fall into two categories, those aimed at improving the traffic flow generally and those aimed at improving the flow for particular groups of users. The former include measures like improved traffic light control and restrictions on parking (clearways) while the latter covers such initiatives as the introduction of transit lanes.

Use of options such as clearways often appeals to authorities because they provide increased capacity at little cost to the relevant authority. It may, however, cause loss of patronage to shops and businesses sited on the clearway. Similarly, if deliveries have to be made on streets designated clearways for some periods of the day then this may produce additional problems for some truck operators.

Recent advances in computer technology have allowed the development of extremely sophisticated traffic light control schemes capable of real time adjustment to varying traffic conditions(1).

Synchronised traffic lights have been gradually introduced in Sydney over the past ten years, with resulting improvements in traffic flow and road speeds. For example a test has been reported which indicated that peak hour traffic speeds on the

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(1) Sims, A.G. and Dobinson, K.W., SCAT The Sydney Co-ordinated Adaptive Traffic System Philosophy and Benefits, DMR Traffic Section, 1979.

Spit Bridge route from Neutral Bay to Balgowlah had increased by up to 50 percent over the previous year, following the introduction of traffic signal co-ordination(1). It is possible that some of this gain may have been due to lighter traffic during the second test period, but it is not inconsistent with Sims and Dobinson who reported that a trial of SCAT produced flow improvements of up to 40 percent above travel times for optimised fixed time traffic lights(2).

Transit lanes restricted to specific user groups are the subject of conflicting claims concerning their effectiveness in reducing travel times for user and non user groups. It seems likely that travel times are reduced for users, but increased for the remainder of the traffic. If this is so, then their introduction produces negative effects for truck operators who are excluded from them at present. The possible use of transit lanes by at least light commercial vehicles may well become a point for serious debate in the future.

Planning of Urban Areas

It is clear that, in the past, little provision has been made for the movement of large trucks in many urban areas. In the case of many inner suburbs, planning and building took place before the modern truck developed and before unit loads such as containers were in common use. The alleviation of many of these problems may prove to be prohibitively expensive, but such matters can and should be taken into account in planning developments in outer suburbs or redevelopments in older areas.

This raises the associated, more general problem, of the use of (primarily) residential streets by heavy trucks. Clearly the two functions simply do not mix, and such use of residential streets is never planned, but occurs as a result of a variety

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(1) NRMA, Open Road, April 1978.
(2) Sims and Dobinson, op.cit.

of forces. In some cases there is simply no adequate alternative route to a particular facility, for example access to some dock areas, while, in other cases, residential streets offer an alternative route to a busy arterial, thus saving time. The environmental (in its widest sense) impact of these operations is socially divisive and basically destructive.

Clearly in the longer term the solution lies in careful planning, but, in the short term, it is necessary to look in other directions for possible solutions.

Where truck flows are heaviest, the only solution may be the provision of a special access road for service vehicles only. For example, the provision of an access road to Walsh Bay, Darling Harbour and Pyrmont in the Sydney port area has been planned by the Maritime Services Board and actually recommended by SATS.

The actions by Local Councils to close some roads to heavy trucks is a reflection of the feeling of people in the areas affected. They suffer the impact of truck traffic without any direct, discernible benefit. It is important that these matters be looked at on a system wide basis by government planners to seek a solution which does not unduly penalise either truck operators or residents. Such a solution may not be easy to find. For example, considerable work was done in London in an attempt to define a set of truck routes in order to minimise the total impact of truck traffic, but this came to nothing because of local pressures from those residents located on what were to be designated truck routes. This pressure was intense, even though, in many cases, the increase in traffic (and hence the increase in noise, fumes, etc.) would have been quite small compared with the existing level.

None of these types of problem are soluble by simple government fiat, but governments can play a role in identifying possible

changes and bringing together the parties involved to discuss the options available.

Trip End Delays

Large delays arise in the loading/unloading process due to problems with access or inadequate docks. Local and State Governments control building codes and can assist by making sure that new buildings have adequate docking facilities, but deliveries must still be undertaken to old buildings and even the most modern facilities can be rendered inadequate by changes in vehicle dimensions.

In general, access to newer buildings and shopping centres seems reasonable. The problems are in the narrow lanes and old buildings surrounding the CBD and the older strip type shopping areas.

However this is an area where planners can do little except state that the problems occur and ensure that adequate and flexible access is provided in new buildings or renovated old ones.

Uniform Standards

A major complaint on inadequacy of docking facilities in Victoria is inadequate clearance. The maximum vehicle height recommended by NAASRA is 4.3m and the Victorian standard is 4.0m.

The NAASRA study concluded 'that there would be significant benefits both in the design of pantechnicons and van type vehicles and the transport of low density freight associated with an increase in the height limit in Victoria to the national limit of 4.3m(1).

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(1) NAASRA, A Study of the Economics of Road Vehicle Limits, Summary and Recommendations, Study Team Report R4 October 1975.

CHAPTER 8 - CONCLUDING REMARKS

Discussions with participants in the urban freight transport process, revealed that the major areas of concern for vehicle operators in 1979 were:

- restricted hours of operation, due to constraints imposed by other parties to urban goods movement;
- detention at load and unload points;
- poor access to load and unload points, especially for small consignments; and
- street congestion and diversions due to access restrictions for heavy vehicles, this has a particularly severe impact on bulk transport.

In light of these findings it is appropriate to reconsider the problems and recommendations discussed in the 1969 paper by Davis.

Davis described the many problems facing the transport operator supplying general freight services in the urban area in 1969. They included:

- traffic congestion;
- delays and detention at wharves;
- design of receiving and delivery facilities;
- congestion at railway yards; and
- incompatible hours of work.

Davis expressed concern for present (1969) road congestion and as remedies suggested:

- freeways;
- improvements to roads in wharf area;
- clearways; and
- encouraging commuters to use public transport.

There has been considerable expenditure on urban roads in the last few years, but the evidence shows that roads speeds on major arterials has if anything decreased, especially in peak hours. State governments have made efforts to increase public transport patronage, but this does not seem to have had any impact on the congested urban arterials. A special road dedicated to service vehicles is under consideration for the Sydney waterfront. Davis' suggestions have certainly been tried in varying degrees, but they are not a complete solution. As already discussed, increasing emphasis has been placed on traffic management techniques in conjunction with physical improvements. Indeed, trucks with their slow acceleration benefit even more than private cars from management measures that promote a smooth traffic flow.

Davis predicted 'big changes' on the waterfront and these have occurred. The emphasis has switched from the conventional wharves to the container terminals and depots. Progress has been made by the industry in tackling port interface problems. Booking systems to relieve congestion and establishment of integrated services from container parks are among the innovations in this area.

Railway yards are also no longer the problems they once were. This is partly due to the shift away from rail for intrastate consignments (Table 8.1), but containerisation has also had an impact, enabling faster and more efficient loading and unloading.

TABLE 8.1 - INTRASTATE RAIL FREIGHT TO AND FROM CAPITAL CITIES

(million tonnes)

	1971	1976
Sydney	4 175	2 517
Melbourne	2 901	2 025
Brisbane	1 141	1 536
Adelaide	523	475
Perth	1 297	1 232
TOTAL	10 037	7 785

Source: BTE, Estimates of Interregional Freight Movements 1971-72 and 1975-76.

To reduce delays at trip end points Davis called on both users of transport services and designers of new receival and dispatch facilities to become more aware of the requirements of modern trucks. Davis' points may be reiterated, there are problems and delays at trip ends, local building regulations should be reviewed and all encouragement should be given to better communication between dispatchers, truck operators and receivers.

On the urban planning side, considerations of the requirements of large articulated trucks, when road reconstruction, building renovation or urban redevelopment is undertaken could remove many annoyances and hindrances to efficient utilisation.

Davis was also concerned with time loss due to incompatibility of hours. There are a multitude of awards covering the transport and associated industries, and most of those interviewed during the study seemed to be doing their best to minimise conflict. However incompatibility of hours seemed to be one area where

misunderstanding most easily arises. One of the basic problems was the conflict between terminals operating on a shift system, and other organisations working on a day shift plus overtime basis. Organisations committed to shift work have a fixed span of hours, they can start and finish only at certain times, and with the best will to co-operate they cannot operate flexible hours.

There seems little that Government can do in this area, except facilitate dialogue between the parties concerned.

As this paper has suggested in Chapter 5 many of the problems of urban freight are generated by the sheer complexity of the task. Many of these problems are due to market failures and are not within the powers of governments to correct without a massive interference with the market operation. Such problems are most effectively dealt with by the participants in the industry. The government role here must be to improve information flows and ensure that regulation does not hamper the process of adjustment.

Many of the problems identified seem to arise from communication difficulties between the various participants. It is up to the Government to encourage the dissemination of information and promote discussion between the industry and its users. Hopefully this paper will contribute to this better understanding.

APPENDIX I - TRANSCRIPT OF DAVIS PAPER

Utilisation of Transport Equipment and Services

The dilemmas of the transport operating manager today are -

* How can I use my trucks to the maximum productivity?
* How can I use them 8 hours or more every day?
* How can I see that they are actually productive for 8 hours?
* How can I give these vehicles a maximum load and use them to the maximum of their capacity?
* How can I ensure that my driver, who knows how to pick up goods and how to deliver them, is doing that and that only?
* How can I ensure that the truck and driver do not grind to a halt for hours a day in dense traffic?
* How much is it going to cost me when the client cannot receive the cargo that I am going to deliver to him without detaining the trucks and drivers?
* How can I manage to pick up his goods from the wharves or the railways or some other factory, without undue delay?
* How can I deliver my customer's goods to the Railway Receiving yards without getting caught up in such a mess and a tangle of traffic that the vehicle is immobile and the driver can do only (say) 1/2 hour work in 2 hours?
* How can I organise my driver's time so that when he is working he does not find he is trying to deliver to someone who will not receive, because it is either too early in the day or too late in the afternoon or because his employees are at lunch or tea break?

* And how can I organise my driver so that when I send him to the wharf, he will be able to pick up the goods, that he will be able to find them, that because hindered by lack of working space, or vehicle congestion, he will not spend 1/2 hour backing into a suitable position before he can begin to load?
* How can I be sure that he is not going to be delayed because, just as he gets to the wharf, there is a 'smoko'? Or it is the lunch hour for the wharf labourer and the shipping clerk, which starts at 11.30 am, and as the driver's lunch time starts at 12 o'clock, he finds that he has to sit and do nothing before he can legally take his own lunch hour for 1/2 hour - and then 3/4 hour after the wharf is ready to work, he himself has completed his lunch time and he is ready to work.

The carrier has made a great deal of progress in recent years. He has better equipment today than ever. If he is working around the city and the suburbs of our major cities, he is able to carry a bigger payload today then he was 10 years ago. His vehicle is faster and it is less subject to breakdown. Mechanical equipment for loading and unloading his vehicle is in greater supply than it was 10 years ago: forklifts and pallets have made the job easier. He has found that the newly designed factories in the outer suburbs, which have a great deal of space and wide roadways, have far better facilities for loading and unloading his goods than was the case a few years ago, when he mostly worked in areas such as south of Sydney with its old factories and narrow streets, or in Richmond, Carlton, or Brunswick, Melbourne, where the factories and warehouses were never designed to handle modern motor vehicles.

The carrier normally does not lack the skill needed to route his truck to minimise loading time as far as possible and to co-ordinate the many pick-ups and deliveries he is called upon to do in a radius of 15/25 miles of any capital city in Australia. If the carrier could control the environment in which

he works, if it was his choice to decide the conditions under which goods would be picked up and discharged, he would be very happy indeed. But he discovers too often that moving 5 miles can take up to one hour in Sydney's inner suburbs, whereas if he was delivering to the north from, say, Port Adelaide he would probably travel 20 miles in an hour.

This report is designed to highlight the problems the carrier in the capital cities of Australia has to face as we enter the 1970's. The report does not suggest the remedies, but draws attention to the need for careful study of the problems and points to the areas of non-utilisation and under-utilisation. Attention is drawn to 5 major problem areas. Particular reference to any one city or State does not mean that similar conditions in the other States are acceptable. The report is looking at the situation from an Australia-wide point of view and not from the point of view of any one particular city where the Road Transport Associations are responsible for facing up to local conditions. The report, however, probably gives some help and some substance to the kind of complaint that we have so frequently heard: <u>that we cannot get a day's work out of our vehicles</u>.

A builder, if he manages his affairs correctly, having his building operators, bricklayers, carpenters, on site, is able to supervise their activities. He is able to arrange for his supplies to be scheduled to his needs, to get 8 hours employment in every day from every tradesman. The engineer or the factory manager is in a similar position, because his staff is in front of him and he is able to control their activities and he should be able to co-ordinate the service facilities he needs in order to get a full day's work out of every operative.

But this does not apply in the road transport industry. We lose sight of our drivers, other people delay them, they are held up with cars and other trucks at bottlenecks in the traffic. They are out of our control. They are out of our sight for most

of the day and even the most conscientious driver in Australia today finds himself completely frustrated in his efforts to do a day's work.

He is so frequently delayed with circumstances that he cannot cope with, hours of work of those with whom he is working, the conditions of receiving and despatch of goods which have to be accepted because it is the railways, the wharf, or it is his customer. The result is too frequently a 'hands in the air' attitude - 'we cannot do any better'!

Traffic Congestion

One of the most important pieces of legislation from the point of view of the road transport operator in Australia in recent years has been the Commonwealth Road Aids Bill 1969. After many years of languishing, it appears that the city traffic systems in Australia are going to receive a boost. The Commonwealth has increased very considerably its Road Aid grants to the States to the extent of $500m. Over the next 5 years to June 1974 amounting in all to $1250m. The total allocation to urban roads over this period will be $601m, nearly 50 per cent of the total grant. This must be used for the construction and re-construction of the cities' major traffic arteries, expressways, etc. It must not be used for ordinary street construction, which remains the responsibility of local Councils. National highways will receive 16 per cent of the total grant or $187m over the next 5 years. This too promises some overdue improvement in our national highway system throughout Australia.

The grant made specifically for the urban main road systems will do more to improve the traffic congestion situation than anything else that has eventuated in the last 2 decades. It was glad news to us when we learned that the representations to the Commonwealth Government by the Commonwealth Bureau of Roads had received such favourable consideration. It does not matter now that we should say that this is too late --- it is too late! It

might even be said that it is 'too little too late'. However, any major increases in capital finances available for urban traffic systems should not be despised, because we have been compelled to endure niggardly grants for so long.

Estimates of city traffic needs prior to the Commonwealth Roads Aid Act being passed indicated that there would need to be $2400 not $1250m in the next 5 years. However, we are grateful for the great increase and leave it to our Road Authorities to see that it be used wisely.

The President of the RACV, Mr S.V. Lunch, in his annual report makes the claim that road congestion costs the motorists 3 cents per minute. This is not always 3 cents less return to the motorist's earnings. But when a truck is held up in the traffic, it costs 5 to 8 cents actual out-of-pocket for each minute. There are some measurable and important gains to be made by us as carriers when this new city road expenditure begins to prove effective and is felt by the commercial motor interests.

The same report from the President of the RACV indicates that a certain journey of 3 miles which took 10.1 minutes to travel 2 years ago, now takes 17.5 minutes. Who pays for the 7.4 minutes which each traveller spends whenever he does this journey in peak hour traffic? It may be just a loss of leisure time --- Or it may be a serious economic loss to the carrier. Road taxation in the form of Motor Registration and Fuel Tax will be well spent if we can save some of these 7.4 minutes in 3 miles!

The benefits to be gained by the carrier from the development of freeway systems in our major cities can be illustrated in the study made by Mr J.M. Owens, B.E. (Honours), B.Ec., A.M.I.E. (Aust.), on traffic delays in urban areas. He studied the work of a 5-ton truck before and after a freeway system had been installed.

The truck which normally did 40 miles per day before the freeways was able to do 46 miles per day after, an extra 15 per cent mileage. Instead of 20 calls per day, the truck was able to make 23 per day. Instead of 20 trucks, 17 would do the same work.

This study which was completed in 1966 also emphasises that there are very considerable savings to be gained in cost per mile of vehicles which are able to make use of freeways. Cost per mile before 43.4 cents; after 35.7 cents. In terms of cost per mile this is a saving of 7.7 cents, of which 4.1 cents is wages, fuel 1.2 cents and Repairs & Maintenance 1.8 cents per mile. A 25 per cent reduction in fuel cost and a Repairs & Maintenance cost reduction of about 25 per cent are valuable economies for a carrier.

The saving in wages is not a real saving. It is an efficiency. It means that the driver can do so much more work in a day because he is not hampered by traffic delays to the same extent.

The same study makes it clear that greater speeds with greater safety can be achieved in off-peak periods when freeways are available. In terms of cost of fuel per mile, it is clear from the information disclosed that when vehicles are able to achieve reasonable speeds on our road system, the cost of fuel reduces.

This kind of study is very valuable indeed for the road transport industry and should be encouraged by us whenever opportunity offers.

This particular study, carefully executed by Mr Owens and others, covered 20 per cent of Melbourne's metropolitan road system, 53 routes and 404 runs.

The Committee, which met in Sydney to consider the effects of congestion on road transport operators within the city of Sydney, was dismayed to learn that although the Maritime Services Board

is planning to spend many millions of dollars to upgrade the standard of wharves in the Port of Sydney, they knew of no serious or well developed plans to help vehicles get to the wharf area without traversing the same old busy bottlenecks for miles, no matter which way one approached the wharves of Darling Harbour, Walsh Bay, etc. It may be that the NSW Government plans to spend some of their $10.74m grant in 1969/70 (or more than that in 1970/71), to relieve the situation. It was a sad commentary in our national planning when so much will be spent to meet the needs of exporters and importers in the form of new berthing facilities (long overdue as everyone knows), but no effective plans are in hand to allow the road carriers to move these goods to and from the wharves without excessive and inexcusable delays.

One would need to move to some of the very old and overgrown cities in the world to discover another street like Sussex Street in Sydney: one of the most important streets in the city, probably one of the busiest in Australia (it is said to carry the densest traffic in Australia). But this is the main approach for the majority of traffic to the Darling Harbour wharves, including the 7 or 8 newly completed and planned first class wharves in Darling Harbour, when approaching either from the north, west or south. This one-way street with traffic parked on both sides (the parking consistent with the great number of warehouses in the vicinity), a very wide footpath of about 20 ft on each side, has actually little more than 40 ft of roadway!

We are back in the 19th century when we believe that a city can permit the closing of such bridges as the Pyrmont and Glebe Island Bridges to allow movement of ocean-going ships to and from their berths. It is real comfort to learn of the proposed developments of the port of Sydney from the Maritime Services Board, which will eventually mean that these bridges will not need to be closed. But great patience is needed to deal with a situation like this pending fulfilment of plans now on the drawing board, which may take years to eventuate.

How it is possible for carriers to deliver goods to people when there is such a shortage of kerbside space for unloading vehicles in every capital city in Australia? Little Collins Street in Melbourne, in the very heart of the business centre of the city, is closed between Elizabeth and Swanston Streets for an hour every day to vehicle traffic. Another block as far west as Queen Street is now likely to be closed permanently, so that shoppers and pedestrians can move freely in this hub of the city. A similar proposal is being considered by the authorities in Perth: it is suggested that Hay Street and Murray Street be closed to traffic for one block in each street throughout the day, allowing goods to be delivered only before 9 o'clock in the morning and after 4 o'clock in the afternoon. Who is going to pay the extra cost of delivering goods between 6pm and 9am or at other overtime hours? Where will we get if these arteries are gradually being closed?

Clients located in these inner city congested areas expect the same kind of service and feel entitled to the same delivery cost as other clients - and yet, it is sometimes impossible to get closer than 80 to 100 yards to these warehouses, factories and shops because of the insufficient number of parking bays available to the carriers. How does a parcel delivery carrier organise his delivery run when insufficient parking bays means that he must either break the law by double parking or circle the block until he finds a place - then walk some distance with his delivery to the receiving area. Drivers become frustrated to the point of exhaustion trying to deliver in city streets in Australia, where it seems that every possible hindrance is permitted to prevent him doing his job.

It is interesting to note the difference in deliveries per hour between 1960 and 1968. These records come from a Perth light delivery manager.

Date	Area	Average delivery per hour
January 1960	(city	18
	(suburb	14
February 1968	(city	10
	(suburb	11

It is time we realised that roads for which we have paid a very great cost, are not being used for the purpose for which they were originally constructed. A big proportion of the road surface in the most congested areas is not being used for vehicle movement but for car parking. If it were not for the political aspects involved in upsetting the motorists, who call for parking on the side of the road, it would be good sense to provide off street car parking at a reasonable cost and in convenient places and prohibit kerbside parking for motor vehicles. The peak traffic 'clearway' system has been developed along these lines and has proved that it is quite possible to clear the main traffic arteries completely in our main traffic areas, provided some arrangements were made for conveniently parking cars. Unfortunately such a suggestion seems to be politically impossible, because the motorist is used to parking his car very close to the place where he wishes to do his business or visit his friends. Until such time, however, as the authorities are prepared to get tough with the motorists and insist that the roads are to be used for the purpose for which they are built (ie carrying moving traffic) and make certain that every cent in every dollar is spent on developing our roads for moving vehicles, we are wasting a sizeable proportion, perhaps as much as 25 per cent in providing kerbside parking area for motorists.

The Victorian Traffic Commission states that travel time has increased on certain routes in the city of Melbourne up to a maximum of 48 per cent over the 1960 travel time and/or an average of 25 per cent on the routes studied. Delays, which means full stop or 5 miles per hour speed, have increased by approximately 50 per cent between 1960 and 1969.

Road travel seems likely to increase, according to Mr R.F. Russell, Head of the Traffic Engineering and Safety Department of the RACV, by 140 per cent on the 1964 figures by the year 1985.

On 31st December, 1968 there were 1 226 000 registered motor vehicles in Victoria. We have therefore in Victoria one car to every 2.5 head of population. It is not out of the question to believe that inside the next 10 years there will be one car to every 1.9 people, as is the case in USA today.

It will always be in the interest of the transport industry to encourage any Government move to put more people, more commuters, on to our train and bus services. In Australia there will be continuing strong public reaction against increasing road bills and increasing passenger rail deficits. The road transport industry should support the proper development of all rail services where they perform the kind of national service for which they are best suited. Most people will agree that we are outdated when we have a single line for a big proportion of the distance between Melbourne and Sydney, one of the most important rail freight routes in Australia, and a route which the railway use to good economic advantage.

Mr J.G. Westland, Chairman of the Victorian Traffic Commission, states that an adequate freeway system in Melbourne would return 80 per cent of the construction costs in accident savings over a period of 30 years. It will be almost impossible to say what savings would be effected to the carrying industry, quite apart from the private motorist, if such a freeway system was introduced in the near future.

Some have suggested that the only solution is night deliveries. Have they bothered to think about the cost of night deliveries? Not only to the person paying the transport bill, who must also therefore cover the wages penalty for out-of-hours delivery costs, but also to the warehouse, factory or shop that must have

a storeman on duty to receive goods that might or might not arrive. No city in the world has yet found that it is possible to deliver general goods out of normal working hours. It is true that certain special lines such as milk, foodstuffs, goods for chainstores, beer and fuel, can be delivered out of hours by proper organisation. The 'Financial Review' tells us that once upon a time the Emperor of Ancient Rome decreed that all goods traffic must travel at night to cut congestion in the day-time. And thereafter the city on the Tiber resounded to the crunch of wheels and the squeaking of unoiled axles all night long! From my observations, it is not likely that city streets will be less congested on the kerbs at night time than in daytime.

Cities like Brisbane, Adelaide and Perth, also have traffic congestion problems, but they are not as serious as Sydney and Melbourne. In these 3 cities the congestion is usually confined to the peak hours, the morning and late afternoon traffic. There are serious bottlenecks in each of these cities, but plans are in hand (and we hope the money also will soon be in hand) to commence the task of re-routing, re-organising and re-building traffic arteries.

The place of the motor car has been emphasised in providing the kind of roads and traffic facilities needed in the future. But nothing has been specifically provided for commercial vehicles, nor do we see any sign that our interests are being watched. It should not be out of the question in certain industrial areas where there is a particularly heavy flow of commercial traffic that special provision should be made for commercial vehicles.

It would be interesting to make a study of how many hours of effective work a driver with a 5-ton vehicle is able to do in a day. In some cases he can do 8 hours of work - in most cases he cannot - and in many cases it could be reduced to something

between 4 and 5 effective hours of utilisation of driver and vehicle.

The major part of this very great cost as it applies to the road transport industry is, of course, borne by the clients of the carriers. Firms who, for reasons of their own, operate their own vehicles, face exactly the same problems as we do. It is noticeable, however, that carriers get considerably better utilisation out of their vehicles than companies who own their own vehicles, because so often the incentive to overcome the difficulties quickly does not exist.

Delays and Detention at Wharves

Carriers have been so conditioned to the usual delays in delivering and picking up cargoes at wharves, that they are far to often regarded as inescapable. We have been drugged - but not by LSD. The $ and ¢ cost has been suffered for so long, circumstances and conditions being such that we believed there was no possibility of there being any relief. Today we have almost given up the fight. The carrier who can look at the ranks by the Sydney wharves and says to himself, 'It has been going on for so long, nothing can be done about it', passes off as inevitable a very expensive and inefficient system of receiving and delivering goods at the wharves of Sydney. Carriers from other States ought to take time off to have a look at the Receiving and Delivering conditions of wharves 33 to 39 South off the Pyrmont Bridge in Darling Harbour. Everyone, including the Maritime Services Board, knows how inefficient, small and exorbitantly expensive these wharves are to the carrier. Of course, only the small ships on the Islands and Papuan trades use these wharves, but quite frankly, these and other wharves on the Sydney waterfront are a millstone around the carriers' necks.

The Maritime Services Board in NSW is aware of the problem and has definite plans for the improvement of these conditions.

Already 4 good berths have been provided on the eastern side of Darling Harbour, 2 more roll-on-roll-off berths are being built and another 3 first-class wharves with greater areas for marshalling cargo and moving vehicles at the back will be built in the near future. The Committee which interviewed the Chairman of the Maritime Services Board in Sydney is satisfied that the Board has plans in hand and is already beginning to execute these to provide new and first-class wharves in the Darling Harbour area and elsewhere in the Port of Sydney.

The plan is to make the Port of Sydney as completely as possible a general cargo handling area. The development of Botany Bay in course of time will be, in the first place, to handle bulk cargoes and then, as the need arises, probably a container berth will be built there. The Board has announced its intention to increase the number of container berths and provision has been made for extension to the White Bay container berth areas and the conversion of Nos. 1, 2 and 3 Glebe Island into a modern container berth. Woolloomoolloo Bay wharves, which as cargo handling wharves were antiquated 40 years ago, will eventually be completely converted into a modern passenger handling area with a view to making Woolloomooloo the Gateway to the City of Sydney.

It is important, however, that we should keep in mind that the Australian wharves and berthing facilities are in the throes of an important revolution. It should be noted that with the introduction of the 'MAHENO', the roll-on-roll-off vessel on the New Zealand trade, there has already been a drastic change in the Wellington, Auckland and Christchurch cargo. The same applies to the 'MARAMA'.

We are just beginning to see the first effects of unitised and containerised cargoes on the Australian waterfront. Without doubt the present overloading of wharves on the Melbourne and Sydney waterfronts where ships are being compelled to unload 5000 to 7000 tons in sheds built for 2000 to 3000 tons, will

disappear. These general cargoes will in course of time be largely containerised and will therefore pass through the special container wharves and terminals, releasing the present wharves to ships with lesser tonnages.

We will see some big changes within the next 2 or 3 years. They are already planned by the harbour authorities. The effect will most certainly be that the least effective and inefficient wharf areas will either not be used or will be modernised for specific purposes.

Design of Buildings' Receiving and Delivery Facilities

We are referring now to the facilities offered by our clients to deliver and receive their goods and the buildings in which they are located.

Many of our industry's clients are located in alley ways and lanes, some receive from or deliver to us regularly large consignments, even full truck loads. The first hazard is to obtain entry into the lane, and the second problem is to get to the point of delivery because of other commercial vehicles in the same lane for the same purpose. Some drivers even have to move dustbins in order to make way in the lane for their vehicles. Similarly, many clients are located in buildings that were never designed to handle the volume of goods currently being moved in and out. The loading bays are inadequate, goods lifts too small and there is inadequate staff to assist the driver.

It is very difficult to make some clients understand that the cost of moving their particular goods is greater than normal. Carriers often have to take the good with the bad and make a similar charge to them all, whether their facilities are adequate or inadequate.

Architects and planning authorities share a major responsibility in ensuring that adequate off street loading and delivery

facilities are incorporated with new buildings being designed. Even some new buildings, presumably of modern design, have proved to be quite inadequate. Architects should consult the State Road Transport Associations before they design some of these factories in our outer suburbs. Some of them are out of date when they are built, from the carrier's point of view.

Unit loading and modern packaging have presented problems of building and store design to many clients. They find their facilities are inadequate although well planned in the first instance. It is not uncommon to discover that it is impossible to place a semi-trailer or a full size container in a client's premises. This causes lengthy delays and irritation on the part of the client when he realises that he must pay some detention cost to the carrier, who prefers speedy delivery without detention.

Congestion at Railway Receiving Yards

One needs to examine the new rail terminal at Kewdale, Perth, to see what can be done. We have so long, as an industry, lived with the Darling Harbour, Spencer Street and Brisbane type of receiving and delivery Yards that we have so despaired of seeing anything that was really efficient, and we have given up protesting. Now, however, a pattern has been set. Even though Kewdale is a few miles out of the city of Perth, it is very close to a large and growing industrial area. The facilities and space offered to the transport operator are second to none at Kewdale. The introduction of the standard gauge railway service from the Eastern States into Western Australia, offered the Western Australian Government a splendid opportunity to re-plan the whole of its goods receiving and delivery rail programme. The result is a world class rail terminal, so necessary to Western Australia, which still is so largely serviced by a 3'6" gauge railway.

The Queensland Government, which is facing similar problems to Western Australia, could well take note of this forward move. Carriers report that delays at the Brisbane yards at certain periods of the day are crippling. The carrier is required to do too much of the loading of the rail vehicles and too often has inadequate space in which to manouvre his vehicle. Such a large area of Queensland and such a large proportion of its population is dependent upon rail services that railway efficiency is very important indeed. The problem with the rail good yards in Australia generally is that they were designed for the horse and cart and have not for the most part yet been modernised.

The Railway Departments have responded to the needs, generally speaking, of the interstate movement of goods, but have so far taken no positive action to bring up to modern, efficient standards the handling of the normal country consignments. Darling Harbour and sections of the Spencer Street goods yards in New South Wales and Victoria respectively are hopelessly out of date and inefficient. It is possible that in the foreseeable future new methods of handling wool consignments may relieve the Darling Harbour position. It will probably also mean that there will be fewer vehicles moving into and out of Darling Harbour rail terminal. In all fairness, one must frankly admit the tremendous problem in re-locating and modernising the Darling Harbour goods yard. The conditions applying even at Cooks River, Alexandria, and other minor goods yards, as well as Darling Harbour, are sub-standard, inefficient and are causing the carrier great delay and under-utilisation of his equipment.

Who pays for this? Of course, the public pays in the long run.

Incompatible Hours of Work

A serious problem to the carrier and one of the major causes for under-utilisation of his equipment is the fact that around the waterfront, rail, wool stores and clients' establishments,

there is a wide variety of starting times, smoko's, lunch times and finishing times.

The Waterside Workers' Federation in 1967 was given new hours of work. This has caused a serious deterioration in the ability of the industry to handle cargoes without paying excessive costs for overtime for clerks, wharf attendants, and the carrier's own drivers and loaders. In NSW, Victoria, South Australia and Tasmania, no matter what the carrier might do, it is impossible to take full utilisation of the hours that the wharf is open because of the new WWF working hours. The industry was not consulted about this change, with the result that it is now a carrier's nightmare to make the best use of the available wharf open times.

The following table will indicate the carrier's problem:

	Start	Smoko	Lunch	Smoko	Finish
Wharf opening hours (WWF hours) (Clerks hours) (1st shift)	7.30pm Newcastle 8am	9.30/ 9.45am	11.45am/ 12.15pm Newcastle 12/2.30pm	2.00/ 2.15pm	3.30pm (actual approx. 3.15) (7 hrs work WWF) (start leaving 2.30pm) Newcastle 4pm

Wharves may be kept open for another hour or more by arrangement with shipping company, sometimes must be paid for.

Carriers

	Start	Smoko	Lunch	Smoko	Finish
NSW	7.00/ 8.30am		Between 12-2pm 1 hour (Newcastle 1/2 hour by arrangement)		4.00/5.30pm

Vic) SA) Tas)	7.00am or later		Between 12-2pm 1 hour		5.30pm or earlier (8 hrs work)
Qld	7-9am	10 min	1 hr between 4-6hrs after start	10 min	4-6pm
WA	7.00am		1/2 hr between 3-5 hrs after start		8 1/2 hrs after start
FEDFA	8.00am		1 hr		5pm
S & P	7.30/ 8.30am	10 min	1/2 or 1 hr 12-2pm	10 min	4.30/5.30pm

Rail

(NSW for Darling Harbour, Cooks River, Alexandria)	Receiving 7.30am to 2pm Delivery 7.30am to 3pm

The problem, which to my knowledge, has not been ventilated to this date is that for hours in any one day it is impossible for the carrier to use his vehicles in such a way that he could take maximum benefit of the hours that the wharves are open. Whilst the receiving and delivery situation at the wharves is choking and there will be more and more unit and container cargoes being handled at off-wharf sites, the fact is that the carrier will always be involved in working cargoes over traditional wharves, even though we expect they will be very much improved in the future on their present condition. No matter what money is spent on rebuilding the wharves, they will remain themselves inefficient unless the hours that they are available to the carrier correspond with the hours at which he is entitled to work his men.

The foregoing table makes no mention of the hours for receiving and delivery of our clients, nor of the hours, although working, our clients will not receive goods. Very often this amounts to 20 per cent of the available 40 hour working week. It is essential that something be done about this situation. The whole

of a city carrier's capital is involved in the 40 hours work per week during which he is permitted to use his drivers without overtime costs. The industry does not object to normal and reasonable overtime in the interest of vehicle utilisation and efficiency. But it does object to under-utilisation of capital assets.

The hours of work for wool stores, wool brokers, wool dumpers, and the like constitute a problem for carriers in certain parts of Australia. It is satisfying to know that one association is bringing weight to bear upon the authorities to amend these times of work to suit reasonable use of vehicles.

Having made a preliminary study of the problem of under-utilisation of vehicles and the inefficient use of them, it seems that there are a number of problems upon which we need to concentrate in the days ahead of us:-

There may, repeat may, be some alleviation of the wharf position in the days to come, if the unitisation of cargo programmes continue to develop and the various harbour authorities develop their wharves as they have planned. ARTF must give its full support to plans for modernising and building new wharves.

There may, repeat may, be some easing of the road congestion problems of the carrier if the money allocated to city roads is used quickly and in such a way as to give the maximum benefit to the commercial and industrial community, particularly in inner suburban and industrial areas. ARTF must support all propaganda and activities that will bring this economic waste to the attention of Federal and State Governments.

It is certainly not asking too much to expect that there will be some sense appearing in the industrial scene, to permit full utilisation of vehicles without competitive and destructive incompatibility in the conditions and hours of employment.

Whatever benefits may be coming to the industry from these directions, it is certain that this industry might continue for the next decade or two without some of these problems reaching a proper solution: the great fear is that the industry will learn to live with these antagonistic inefficiencies. The integrity and the dignity of the industry demands that we should take some strong action to bring all these facts before the responsible authorities in Australia and all who are able to assist. I believe the Department of Shipping & Transport should be aware of these conditions. I believe the Department of Labour & Industry can do something to solve our industrial problems. I believe the Economists in the Department of Trade and the Treasury should be able to measure and confirm the cost burden referred to in the statements we have made in this report and support the need for capital to alleviate the conditions that make transport so expensive.

I believe that the Railway systems, which in many ways are equal to the best in the world, should be encouraged to do more to make the second leg of everything the carrier has to move less expensive for the user. So much we carry either initiates with or finishes with the rail.

Our cities, particularly Melbourne and Sydney, and to a lesser extent Brisbane, could within a decade become like the cities of New York, London, Paris and Tokyo: a nightmare to warehouse and factory managers, because they cannot move their goods except at premium rates. The facilities the carriers must use are so inefficient and outmoded.

October, 1969 R.C. Davis

APPENDIX II - COMMODITY MOVEMENTS IN MELBOURNE AND SYDNEY

MELBOURNE

The major transport data base available for Melbourne is the 1964 survey conducted by the Metropolitan Transportation Committee. This is used extensively in the Melbourne Transport Study[1] of 1969 and Urban Goods Movement a thesis by K.W. Ogden[2]. The data are now 15 years old but the pattern is consistent with the pattern for 1973 shown in Figure II.1.

The pattern of movement is radial, with the CBD being the main focus of intra-urban movements, and the terminal area on its western side being the main focus of external movements. In 1964 approximately 30 per cent of total internal movements were generated within the central area, of which about a fifth were entirely confined to the central area[3].

The terminal area includes:

- Victoria and Appleton docks;
- Princes and Station Piers;
- Melbourne and Dynon rail goods yards; and
- Footscray road truck terminals.

The heaviest activity was within 6 km of Victoria dock, and in this terminal area, freight consisted mainly of manufactured products. The CBD attracted a wider range of commodities but manufactures were also important.

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(1) Wilbur Smith and Associates and L.T. Fraser and Associates Melbourne Transportation Study, prepared for the Metropolitan Transport Committee, Vols 1, 2 and 3, July 1969.
(2) Ogden K.W., Urban Goods Movement, a thesis prepared for the Department of Civil Engineering, Monash University February 1977.
(3) Ogden, op.cit.

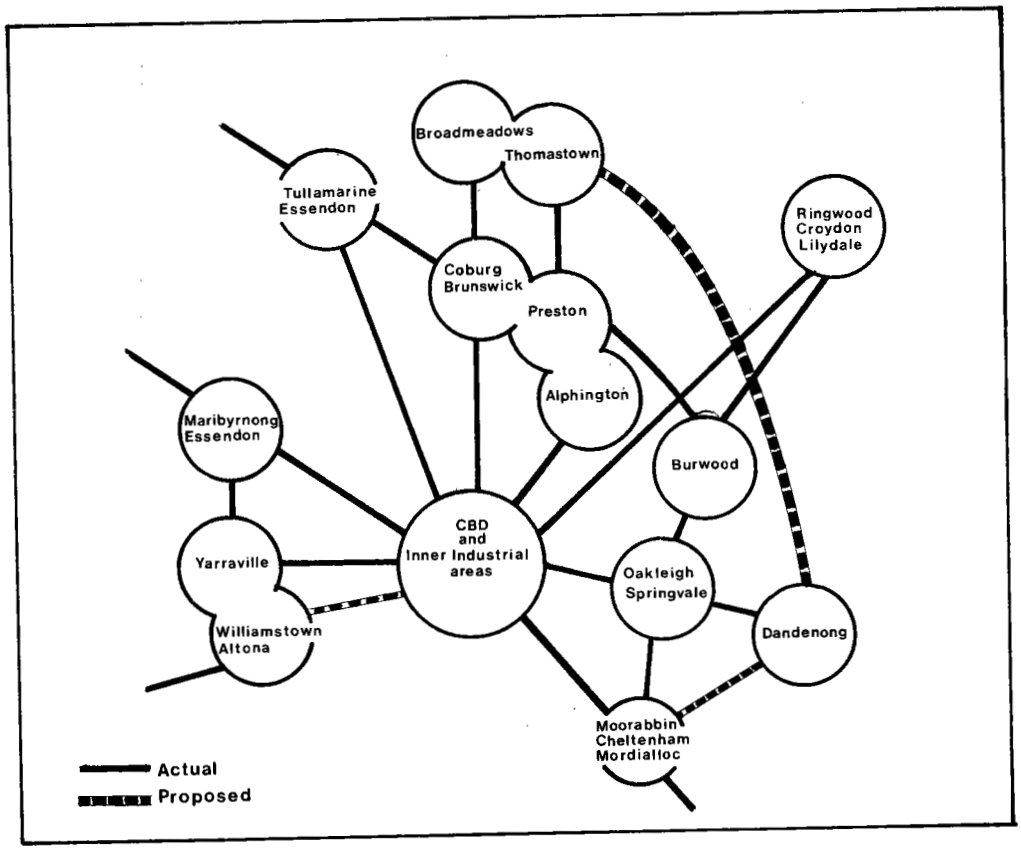

FIGURE II.1

MAJOR TRUCK ROUTES IN MELBOURNE 1973

SOURCE: CBR, Report on Roads in Australia, 1975

The western industrial areas and warehousing in Footscray, Brooklyn, Yarraville, Macauley, Newmarket, Albion, Preston and Dandenong also generated and attracted heavy freight flows. Of the seven principal rail terminals in Melbourne only two, Melbourne and Dynon, generated significant road traffic.

Table II.1 represents an attempt to break down the 94 million tonnes of urban freight moved in Melbourne in 1975-76 into its various components. As different market segments have different utilisation problems, it is important to get some idea of the magnitude of the various tasks, such as bulk movements, movement through rail terminals etc.

TABLE II.1 - SYDNEY AND MELBOURNE ROAD FREIGHT MOVED 1975-76

Task in million tonnes

Commodity Moved	Sydney	Melbourne
Non bulk in/out		
Road in/out	12.8	15.7
Rail in/out	4.4	4.7
Sea in/out	8.4	12.0
Total non bulk in/out	25.6	32.4
Bulk		
Petroleum and products	9.4	3.8
Sand gravel, earth & fill	26.9	22.0
Minerals and fertiliser	8.1	0.8
Total Bulk	44.4	26.6
Other Commodities	44.4	34.9
Total all commodities	114.6	93.9

Source: BTE, Estimates of interregional freight movements 1975-76, AGPS, Canberra, 1978.
BTE, Australian Sea Freight Movements 1975-76, AGPS, Canberra, 1977.
ABS, Survey of Motor Vehicle Usage 1976.

Approximately 27 million tonnes of products such as petroleum, sand and gravel can be definitely designated as bulk. Internal movements of cement and concrete cannot be accurately determined but it is probably at least another 5 million tonnes. Another 32 million tonnes are generated by movements originating or terminating beyond the urban area and are consolidated into large truck loads or containers. Most general shipping cargo is now containerised.

The remainder includes the movement of semi-finished goods between factories, and finished goods to wholesale and retail outlets, a large percentage of these movements will be full truck loads moving directly between origin and destination. Ogden(1) found that even in 1964, 80 per cent of internal tonnes were conveyed on such direct trips, and the 1975-76 National Association of Australian State Road Authorities (NAASRA) study(2) found that load factors were high, with rigid two axle flat tops carrying an average load of 4.1 tonnes. Larger trucks had an average load of approximately 80 per cent of capacity.

To summarise, in Melbourne in 1975-76 about one third of the road freight task in tonnes moved was bulk materials such as gravel, cement or petroleum, another third was container deliveries to and from the port and rail yards or full truck loads to and from external areas. The remaining third was the circulation of non bulk goods within the city and even here large loads were common(3).

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(1) Ogden, op.cit.
(2) NAASRA, Study of the Economics of Road Vehicle Limits, Commercial Vehicle Surveys, Study Team Report R4, January, 1976.
(3) This discussion has been in terms of tonneage only, many urban freight consignments are small loads carried in utilities and panel vans or other light vehicles.

SYDNEY

The data base for Sydney is the Sydney Area Transport Study[1] which uses 1971 data. Figure II.2 shows the main truck routes and Figures II.3 and II.4 present estimates of road freight flows in Sydney in 1971. The main features are the strong east-west flow to and from the CBD and the interchange between the CBD and Mascot and Bankstown. Nearly all the freight flows are concentrated on the southern side of Port Jackson. Road freight is generated and attracted by the band running from Sydney south to Botany with another centre at Auburn.

The rail terminals and ports also generate large amounts of road freight.

A look at Table II.1 shows that Sydney differs slightly from Melbourne in commodities moved. Only about a quarter of the total tonneage is generated by external movements. Bulk movements especially of coal, are more important than in Melbourne, but the proportion of 'other commodities' remains the same at about a third.

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(1) Sydney Area Transportation Study Team, Sydney Area Transport Study, Vol. 4, Freight Transport Systems, 1974.

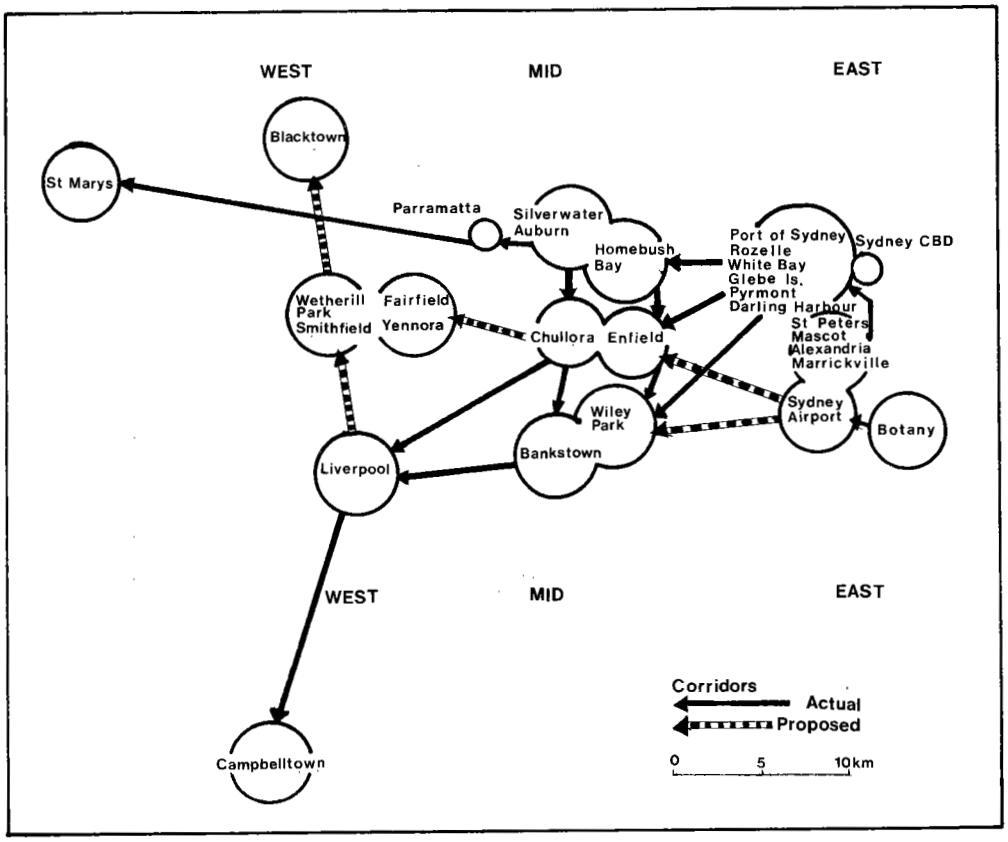

FIGURE II.2

MAJOR TRUCK ROUTES IN SYDNEY 1973

SOURCE: CBR, Report on Roads in Australia, 1975

FIGURE II.3

ROAD FREIGHT FLOWS, NON CBD ORIENTATED SYDNEY 1971

SOURCE: SATS, Sydney Area Transportation Study

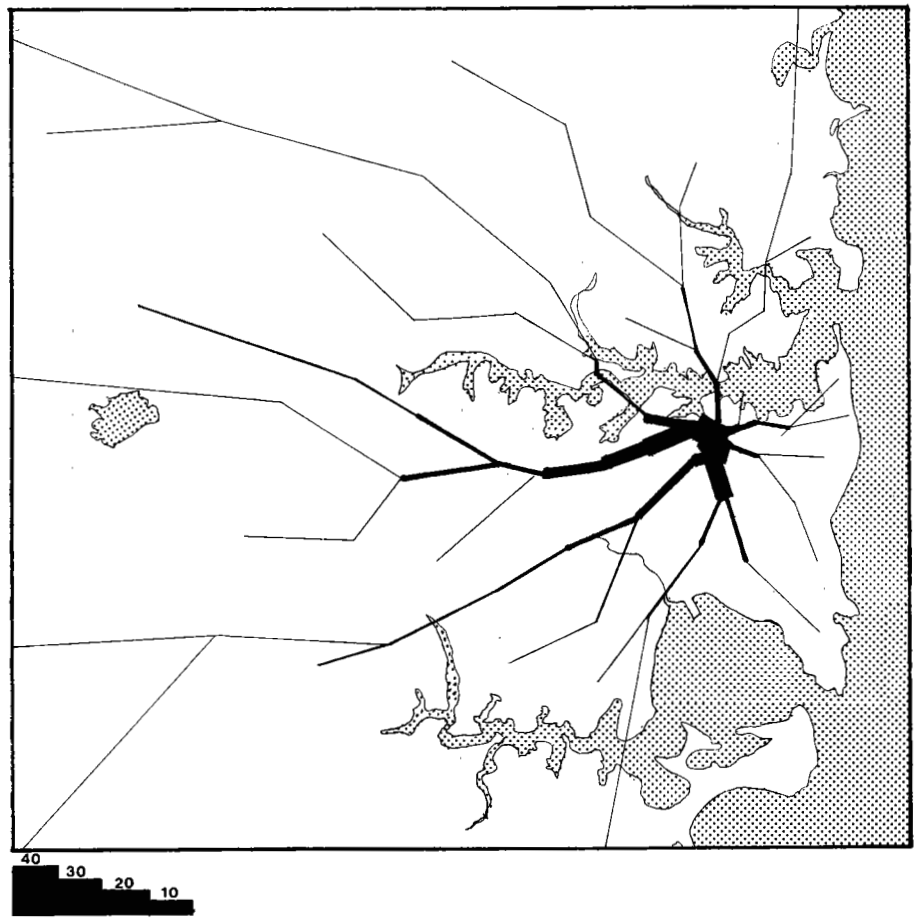

FIGURE II.4

ROAD FREIGHT FLOWS, TO AND FROM CBD SYDNEY 1971

SOURCE: SATS, Sydney Area Transportation Study

APPENDIX III - ROAD CONGESTION AND USAGE

Road congestion is a perennial topic with any road users. It is no doubt a factor in reducing the utilisation of commercial vehicles, however the little evidence to hand suggests that end point detention is a far more significant cause of loss of utilisation than delays en route, at least for general goods movements.

There is no evidence as to the extent of utilisation loss due to street congestion at present, although the introduction of equipment to measure how long trucks spend moving in the traffic stream will hopefully allow this information to be gathered in future.

The only data at present available on road speeds is for private cars on radial arterials in peak hour. It has little relevance to commercial vehicles with very different usage patterns and acceleration characteristics.

This Appendix provides a brief summary of some of the available data on traffic growth and road speeds, however all the comments above on the inadequacy of this data must be borne in mind while reading this Annex.

Table III.1 shows total annual vehicle kilometres for capital cities and environs. Traffic has grown substantially in the period 1970-71 to 1975-76, the main growth being with the private car and other light vehicles.

Table III.2 shows Annual Average Daily Traffic for some of the major arterials in Sydney. Here there are some major routes which have not shown traffic growth at all over the same time period. This probably reflects near-capacity conditions on these routes which may be associated with increases in travel on alternative or by-pass routes.

TABLE III.1 - TOTAL ANNUAL VEHICLE KILOMETRES: CAPITAL CITY AND ENVIRONS

(million vehicle kilometres)

	1970-71	1975-76
Cars and station wagons	35 467	43 123
Utilities and panel vans	3 661	5 296
Trucks	3 180	3 377
Motor cycles	573	784
TOTAL	42 881	52 580

Source: ABS, Survey of Motor Vehicle Usage 1971, and Survey of Motor Vehicle Usage 1976.

TABLE III.2 - ANNUAL AVERAGE DAILY TRAFFIC, SELECTED ROUTES, SYDNEY

('000)

Place	Station Number	1971	1973	1975	1977
Cooks River Bridge	23.001	51	51	51	52
Georges River Bridge	36.001	56	55	56	55
Hume Highway, Ashfield	25.001	22	23	23	22
Parramatta Road, Clyde Railway Crossing	49.001	52	51	50	52
General Holmes Drive, Rockdale	23.002	60	55	57	59
Hume Highway, Villawood	66.021	31	31	34	35
Milperra Road, Milperra Bridge, Liverpool	44.001	38	42	44	48

Source: Department of Main Roads, NSW, County of Cumberland, Traffic Volumes and Supplementary Data, various years.

There is some data on traffic counts, but very little on resulting traffic speeds.

The NRMA has run tests from 1970 onwards, but there seems to be no coherent pattern in the traffic speeds for the times and places available. A sequence of observations is only available on northern arterials, whereas truck flows are concentrated south of Port Jackson. However, some points of interest emerge. Travel speeds were measured on major arterials for the morning peak only and the slowest times were between about 7.30 and 8.30 in the morning; on either side of this the average speed increased markedly. The only route for which consecutive observations for four years were available is Military Road which has had a transit lane introduced. Speed varied from between 10.4 km/hr and 20.2 km/hr depending on the time and year with no coherent pattern. The southern routes showed speeds of between 20 km/hr and 30 km/hr in peak hour, considerably better than the northern routes.

The NRMA has also run tests on Southern routes, General Holmes Drive, Princes Highway Qantas Drive and Illawarra Road(1). These tests were for the morning peak and traffic speeds varied from an average of 20 to 40 km per hour along the various routes. The report concluded that peak hour speeds had improved over 1978 speeds in some areas.

However when the total routes were considered, the General Holmes Drive and Illawarra Road routes had deteriorated while the other routes showed no significant change.

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(1) NRMA, Travel speeds on four southern routes in Sydney, April 1980.