Overview of Australian Road Freight Industry: Submission to National Inquiry 1983

Occasional Paper

The main aim of this Occasional Paper is to provide the background to the operations of this industry for consideration by the National Road Freight Industry Inquiry and other interested parties. The paper also identifies and reviews possible solutions to key problems confronting the industry.

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FOREWORD

This Occasional Paper was prepared as a Submission to the National Road Freight Industry Inquiry. The establishment of this Inquiry was announced by the Federal Minister for Transport on 12 September 1983 and the Inquiry is to report to the Minister by 31 July 1984.

The objective in preparing this Submission was that it be made available to members of the Inquiry and to other witnesses and interested parties, early in the life of the Inquiry so that the large quantity of background material in the Submission would be available as a basic input to the Inquiry's deliberations. The Submission was forwarded to the Inquiry in two parts on 19 September and 7 November respectively.

The Occasional Paper is essentially a review article aimed at setting the scene for the Inquiry. It examines the history of the road freight industry, the outcome of a number of previous inquiries, the structure of the industry, the roles of the main participants, and finally identifies a number of key issues which the Bureau of Transport Economics believes the Inquiry will wish to address. The aim has been to clarify the issues and review various options for their solution.

The preparation of the Submission was a team effort by the Economic Assessment Branch with assistance from the Financial Assessment Branch.

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SUMMARY

The road freight transport industry in Australia is a vital and integral part of the national economy undertaking over one quarter of the freight task (in terms of tonne-kilometres performed). Despite being a highly competitive sector of the economy, the industry operates in a complex legal, institutional and political framework which has made it extremely difficult to devise solutions to some of the major problems facing it.

The main aim of this Occasional Paper is to provide the background to the operations of this industry for consideration by the National Road Freight Industry Inquiry and other interested parties. The paper also identifies and reviews possible solutions to key problems confronting the industry.

Road freight has significantly increased its share of the Australian domestic freight task from 20 per cent in 1970–71 to 27 per cent in 1981–82. The commercial vehicle fleet performing the road freight task currently comprises about 50 000 articulated trucks, 500 000 rigid trucks and one million light commercial vehicles. Although smallest in number the articulated truck fleet accounted for about 70 per cent of the road freight task (in tonne-kilometres) in 1981–82. Some preliminary analysis of truck registration data by the BTE indicates that about 85 per cent of all truck fleets (a fleet having the same registered owner) consist of only one truck, and large fleets of say over 50 trucks represent a minor proportion of the truck population. Concerning the distribution of the road freight task, about 35 per cent related to urban travel, 45 per cent to other intrastate travel and 20 per cent to interstate movements.

While road freight activity has clearly suffered in the current economic downturn, the industry has experienced a relatively high growth rate with the road task (in tonne-kilometres) in the 1970s increasing at more than double the growth rate in real GDP. In contrast with other depressed industries, the road transport sector does not appear to suffer from outdated technology, poor management or a declining competitive position in the market, and it is anticipated that the upturn in economic activity will be associated with a resumption of growth in road freight.

The structure of the industry is unique with the dominance of a few large freight forwarders and the large number of owner-drivers. This industry structure is highly competitive and provides a high degree of flexibility in matching supply and demand and in pricing and consumer service policies. This flexibility contributes to the economic efficiency of the industry. The benefits of this flexibility should be carefully assessed in the evaluation of any proposals which might affect the competitive structure of the industry.

However this structure does tend to produce a group of only marginally viable owner-operators who are susceptible to business failure. Bankruptcy statistics indicate an increase in the incidence of bankruptcies in road transport in the late 1970s, but it appears this trend was common to unincorporated businesses as a whole. There has also been a trend to amalgamation and rationalisation of ownership among public companies in the road transport industry.

Governments play a significant role in the operations of the road freight industry. This reflects the national economic and defence significance of the industry, the importance of externalities in the form of accidents, pollution and congestion which

cannot be accounted for through the market mechanism, and the public ownership of most of the road and rail network and the need to finance this investment.

Economic regulation of road transport has now been largely dismantled. The deregulation of interstate traffic commenced with the decision of the High Court in the Hughes and Vale case in 1954. At the intrastate level all States except Tasmania have deregulated or are in the process of deregulating road freight transport. Associated with this has been the release of all but two State rail systems from their common carrier obligations. Overall this appears to have led to an improvement in the efficiency of the freight transport industry.

Major studies of the industry have recommended against the general use of economic regulation in the Australian road transport industry. However, there appear to be two areas of regulation which deserve the highest priority for consideration by government: firstly, the determination and means of enforcement of vehicle operational regulations relating to vehicle dimensions, driving hours, safety and pollution; and secondly, whether quality licensing or similar regulations aimed at establishing quality standards for drivers can be introduced without imposing significant economic costs.

Another major issue facing the Inquiry will be that of the recovery of road costs and the concomitant pricing policy to reflect the use (and road damage occasioned) by the various classes of road users. There is ample evidence that, based on the current indirect pricing regimes of taxation and charges, heavy vehicles are not meeting the costs they impose on Australian roads. Conversely the evidence points to over-recovery of road damage costs from cars and light commercial vehicles. Furthermore, any moves to improve the level of cost recovery from road freight vehicles should desirably be accompanied by similar policies applied to rail so that their prices reflect their true costs and the freight task is optimally allocated between the two modes.

CHAPTER 1—HISTORICAL BACKGROUND

The road freight industry in Australia has developed rapidly over a relatively short period of time. Its development has been strongly influenced by the growth in national economic activity, by technical and organisational changes within the road freight industry, and by important changes in the legal and regulatory framework within which it operates.

This chapter provides a brief chronological summary of major events in the development of the industry.

EARLY DEVELOPMENT OF THE ROAD TRANSPORT INDUSTRY

Prior to World War II, coastal shipping handled the bulk of interstate trade in Australia, and intrastate haulage was predominantly by rail.

State railway systems were oriented to intrastate traffic and State objectives, such as the development of their major agricultural industries. The early growth of intrastate road haulage in the early 1930s was seen as a potential threat to State railway finances, and led to the establishment of a complex framework of State government regulation of road haulage. For example, regulations applied to the commodities which could be carried and the routes or distances over which they could be hauled. The objective of such regulation was to prohibit, or limit, the carriage by road of certain traffics on routes already served by rail. The existence of poor roads and inadequate road haulage vehicles also served the purpose of limiting the growth of long distance road haulage.

Long distance road haulage developed as a significant sector of the transport industry in Australia after World War II. Industrial growth in the war and immediate post-war periods resulted in a marked expansion in the demand for transport services. Coastal shipping was unable to service this demand adequately due to wartime ship losses and other operational factors. The railways also were unprepared for the increased traffic since infrastructure had been allowed to run down during the war period and services were frequently unreliable. These circumstances placed road haulage in a potentially advantageous position for expansion in the post-war period. In addition, petrol rationing was abolished and hauliers were able to obtain better vehicles, commonly war surplus vehicles.

The circumstances of the railway strike of 1949 during which road permits were made freely available, enabled the road hauliers to demonstrate to users, including those previously using rail, the advantages of reliable door-to-door services. This strike appeared to provide a major impetus to growth in the long distance road sector.

FREIGHT FORWARDING INDUSTRY

In 1952, several railway systems established the Forwarding Agents Scheme in an attempt to limit the encroachment by the road hauliers into rail freight business. This involved entering into an agreement with major road transport operators under which the line-haul operation was carried out by the railways and the pickup and delivery services at each end by the road hauliers. Shippers were offered a door-to-door freight rate. Road haulage operators provided freight consolidation services, they became freight forwarders. The railways offered the freight forwarders flat freight

rates per tonne on intercapital city services with a prescribed minimum tonnage load per van.

The freight forwarders subsequently have become a major sub-sector of the intercity freight haulage industry with line-haul facilities available to them on coastal shipping and air freight services to a limited extent as well as road and rail. In addition they have expanded their activities to provide a range of specialised freight services, including overnight express, courier, liquid bulk, dry bulk, refrigerated, insulated and low density freight services. They have also expanded into associated activities such as wharf and local transport, customs services, storage and warehousing, equipment maintenance and materials handling (Rimmer 1977).

From 1960 onwards the freight forwarders increasingly employed road hauliers on a sub-contract basis rather than retain large vehicle fleets. They also introduced freight equipment which was easily transferable between road and rail, and obtained exclusive access to goods terminals on railway property. Road hauliers attempted to improve efficiency by introducing better road haulage equipment, particularly by switching from petrol to diesel driven vehicles.

The National Freight Forwarders' Association (NFFA) was established in 1962 with the aim of stabilising the rate of return in the industry by facilitating a degree of industry concentration. Freight rate schedules, based on average cost plus a profit margin of 15 per cent, were recommended to State sub-committees. The scheduled (recommended) freight rates in practice served as a maximum, and discounting and special quotes for consignments over two tonnes were common. The attempt by the Association to fix minimum prices in the form of agreed schedules of freight rates was thwarted as a result of rulings under the *Trade Practices Act 1974*.

The introduction of the *Interstate Drivers Award* in 1963 further encouraged the freight forwarders to employ owner-drivers and also discouraged operations by medium sized fleet owners. The result of this was an increase in the importance of the owner-driver sector of the industry.

HUGHES AND VALE CASE

In 1954 the decision of the Privy Council, on appeal from the High Court of Australia, in the Hughes and Vale case resulted in the States no longer being able to tax the activities of interstate road hauliers. At the same time, it was held that a levy on vehicles to cover legitimate road maintenance costs within the State was permissible.

Prior to the Hughes and Vale case, the States applied ton-mile taxes to interstate road haulage in an attempt to limit the extent of goods movements over, rather than within, their borders. After the Hughes and Vale judgement, these taxes could only be levied for road maintenance purposes. As a result, road maintenance charges were introduced, initially in Victoria in 1956, and eventually in all States except Tasmania. The charges were levied on a ton-mile basis and were applied to vehicles with load capacities in excess of specified limits in each State. The charges related to travel by commercial vehicles within the State concerned, irrespective of the origin of the vehicle.

The net effect of the new circumstances was substantial reductions in the size of the ton-mile levies and an increase in the profitability of interstate road haulage. New entrants were attracted to the interstate road haulage industry which resulted in increased competition, both within the road haulage industry, and between road and rail.

ROAD DEREGULATION IN THE 1970s

The major economic regulation of road haulage through State government restrictions on entry and distance travelled and associated fees had been largely dismantled

on the mainland by the end of the 1970s. This marked the end of an era which began in the 1930s and throughout which the policy of all State governments was to promote long distance transport by rail, and prohibit or restrict competition from road transport.

South Australia and New South Wales were the first States to dismantle their economic regulations on intrastate road haulage. Between 1969 and 1976, New South Wales moved from a situation of extensive regulation to one very close to a free market situation, although all road haulage operations are still required to be licensed under the terms of the *State Transport (Co-ordination) Act.*

In Queensland, the system of fees based on load capacity and distance for intrastate road transportation of goods over distances of more than 40 kilometres in competition with rail was abolished on 1 November 1977. More recently the necessity to obtain a permit for general goods carriage has been waived in Queensland.

Western Australia, following recommendations contained in the Southern Western Australia Transport Study (SWATS 1977), introduced a seven year plan of progressive deregulation of intrastate freight in 1980. While licences are still required, the restrictions on area of operation have been greatly reduced and trip permit fees abolished.

The Victorian intrastate regulations comprised a radial based licensing system and trip permit fees. In 1976, the Victorian Government announced that legislative control of commercial goods traffic on road would be removed in five years in line with the recommendations of the Bland Report (Bland 1972). Since 1 July 1981, the permit system has been waived, except for several bulk items.

Tasmania has retained strong regulatory control over road transport with a complex system of licensing and trip permit fees. New applications for 'carrier' and 'cart' licences may be rejected by the State Transport Commission on the ground of objections raised by existing licence holders.

The major moves to partial or total deregulation of intrastate road haulage in all mainland States over the past decade or so are expected to have given a significant boost to medium and long haul road freight transport. This is reflected in a significant increase in roads' share of the total freight task measured in tonne-kilometres (see Chapter 3). An equally important result is that road transport has gained a much larger share of the general merchandise and less than container load (LCL) type freight, while rail has become more specialised in bulk commodity transport.

THE 1979 BLOCKADE

During the 1970s road hauliers operating as sub-contractors to the freight fowarders experienced a cost-price squeeze. The Bureau of Transport Economics (BTE) has estimated that operating costs per tonne-kilometre faced by the owner-drivers more than doubled between 1973 and 1979 while rates paid by freight forwarders to sub-contractors increased by 45 per cent (BTE 1979c, p15) and actually fell in real terms (Department of Transport and Construction 1983, p30). The cost increases were greatest for maintenance, followed by fuel and wages. The scheduled freight forwarder rates to users kept pace with the movement in the general level of prices over this period.

Compounding the problems of the owner-driver in this situation was the influx of new entrants to the industry at about that time. New investment in the industry was encouraged by the 40 per cent investment allowance on new rigs available for income taxation purposes. In addition, the oversupply situation led to falling resale values for second-hand vehicles, and hindered exit from the industry of owner-drivers in financial difficulties, as the finance commitment of the rig owner was frequently greater than the resale value of the vehicle.

A blockade was organised and began on 2 April 1979 with six owner-drivers parking

their vehicles on the Hume Highway at Razorback Mountain. Within several days blockades had been set up at Yass, Albury, Mudgee and Mount Victoria in New South Wales, and a little later also in Queensland and South Australia. In Western Australia highways were not blockaded but owner-drivers met and parked alongside major east-west road links so that the possibility of a blockade was present.

The major specific grievance to emerge early in the New South Wales area of the dispute related to road maintenance charges levied by the State Government. However, the dissatisfaction was a reflection of the prevailing economic conditions in the industry. The Queensland Government agreed to the removal of road maintenance charges the day the blockade was set up in that State. The New South Wales Government did not respond in this way but passed legislation (which was not proclaimed) providing for fines for obstruction of the traffic. As the dispute developed other demands were made for a moratorium on truck repayments, regulation of entry by a licensing system, minimum freight rates, an increase in the maximum gross vehicle weight from 36 to 38 tonnes, no penalties against protesting drivers and the quashing of outstanding fines for the failure to pay road maintenance charges.

The Commonwealth initially regarded the dispute as a State matter. However, criticism of road maintenance charges generally and the concern by the States for some fiscal alternative did involve the Commonwealth.

A conference of State Transport Ministers met in Melbourne on 7 April 1979, chaired by the Commonwealth Minister for Transport, to consider the demands of the owner-drivers. The Melbourne Conference proposed the abolition of road maintenance charges from 1 July 1979, the setting of minimum freight rates, an increase in the gross vehicle weight limit to 38 tonnes, the examination by the States of a uniform system for licensing and a moratorium on finance companies' repossession of vehicles. Eventually drivers in all States accepted conditions set up at the Conference, and the blockades were lifted on 9 April 1979.

The 1979 blockade was instrumental in causing a thorough review of the road freight industry, and in particular the roles of Commonwealth and State governments in the industry. For example, the question of taxation of interstate road freight was brought to a head with the abolition of road maintenance charges; the fragmented nature of industry representation was referred to the Hay Committee; questions of licensing and quality controls were considered; and considerable efforts made to upgrade business advisory services to vehicle operators. These issues are examined later in this Submission.

LONG-TERM GROWTH FACTORS

This historical background of the road freight industry has concentrated largely on specific events which represent landmarks in its development. In addition to these specific events, there were a number of continuing developments which were equally important to the long-term growth of the industry. In particular there was:

- strong growth in demand for fast, reliable, door-to-door freight services;
- improvement in operating capacities of road vehicles;
- marked upgrading of Australia's trunk road system; and
- an improved range of services, and quality of service offered, by developments in organisation and management.

CHAPTER 2—PREVIOUS STUDIES

This chapter reviews 12 studies into important broad aspects of the Australian road transport industry. These studies provide a useful introduction to most of the issues facing the National Road Freight Industry Inquiry.

The following section lists these studies with brief details of who commissioned them and their objectives. This is followed by a summary of the major recommendations, classified by subject heading, flowing from the reviews as a group. This approach was adopted because of the degree of repetition among the studies; the reader seeking the recommendations of individual studies is referred to Appendix I which provides a summary of each of the 12 studies.

AN OVERVIEW

The studies were classified according to whether they related to the road freight industries in individual States or in Australia as a whole.

State level studies

The need to balance concern for the operators of the modes of transport (particularly road and rail) with at least an equal concern for the users of transport services formed the *raison d'etre* for most of these studies.

Board of Inquiry into the Victorian Land Transport System (Bland 1972)

This study was initiated by the Victorian Government in November 1970. The study concentrated upon goods transport and its main objectives included studying the land transport system, the effects of existing transport regulation and the impact of any proposed changes on both the industry and government finances.

Victorian Transport Study (Lonie 1980)

In June 1979, Mr Lonie was appointed to carry out a study examining all transport within, and to and from Victoria. The Legislative Assembly of the Parliament of Victoria believed that the objective of such a study should be to produce a co-ordinated transport system capable of meeting the needs of all residents having regard to the effect of transport on the balanced development of the State.

Southern Western Australia Transport Study (SWATS 1977)

The Western Australian Cabinet commissioned the Director-General of Transport and the Commissioner of Railways to jointly direct a study of transport policy in the southern half of the State in May 1975. The study objective was to investigate updating of policies governing the use of all transport having particular regard to resources, and the sequence necessary to change from current to recommended policies.

Commission of Enquiry into the NSW Road Freight Industry (McDonell 1980)

In August 1978, the New South Wales Minister for Transport constituted this enquiry into the road transport industry (other than passenger transport). Within the enquiry's wide range of objectives, particular reference was to be accorded to the case of owner-drivers, the licensing system and/or other forms of control over entry, the

industry's contribution towards the cost of road construction and maintenance, and the implementation of the National Association of Australian State Road Authorities (NAASRA) recommendations to increase road vehicle limits.

Pricing Tasmania's Roads (Transport Economics Centre 1981)

This study was funded jointly by the Governments of Tasmania and the Commonwealth under the Transport Planning and Research Programme, and was completed in June 1981. It was concerned with the subject of road pricing and cost recovery. The study calculated marginal costs of road usage by various vehicle types taking into account their relative pavement destructiveness and relative pavement width and depth requirements. The principle of the inverse of the price elasticity of demand was used to recommend recovery of other joint road costs.

Australia-wide studies

A common theme throughout these studies was that of tackling a range of issues related to the road transport industry from a national perspective.

A Study of the Economics of Road Vehicle Limits (NAASRA 1976)

This study was undertaken by NAASRA to examine the performance and operational characteristics of commercial vehicles in the mainland States. The broad objectives of the study included estimation of the relationships between the costs of road haulage and the mass characteristics of commercial vehicles, changes in vehicle operating costs and road pavement costs (depending on vehicle or axle loadings).

Road User Charges in Australia: An Assessment of the Existing System and Guidance for Future Policy (Affleck 1976).[1]

This study was commissioned by a sub-committee of State and Commonwealth government officers appointed by the Australian Transport Advisory Council (ATAC) in 1976. The study's main objective was to provide advice on the broad principles to be followed in future consideration of road pricing in Australia in view of the results arrived at by two earlier committees. These results related to the problems of administration and enforcement associated with the road maintenance charges and the implications of recommended increases in road vehicle limits.

The Independent Inquiry into Representation for Long Distance Owner-Drivers (Hay 1980).

This study was announced in November 1979 by the Commonwealth Minister for Transport. It was headed by Sir David Hay to investigate the need for changes in the prevailing arrangements for representation for owner-drivers. Particular emphasis was to be given to factors and arrangements (apart from controls on entry and freight rates) which could be considered by governments and by the industry to facilitate the establishment of an effective and comprehensive representation system.

Cost Recovery in Australian Transport 1974-75 (BTE 1977)

In February 1976, the Commonwealth Minister for Transport directed the BTE to investigate the comparative levels of cost recovery in the various modes and operational areas of Australian transport. The specific objectives of this inquiry included determination of the historical levels of cost recovery, examination of alternative charging methods for increasing cost recovery and the impacts on transport costs of differing rates of cost recovery between modes in the performance of specific tasks.

1. Although F. Affleck and Associates obtained estimates of avoidable and common costs relating to the use of arterial roads in South Australia (one rural and one urban), the study is included in the Australia-wide studies because of the general nature of its objective.

The Long Distance Road Haulage Industry (BTE 1979c)

The Commonwealth Minister for Transport requested the BTE in April 1979 to investigate the structure, market conduct and performance of the domestic long distance freight industry (particularly the long distance road transport sector and intermodal competition faced by it). In addition, the BTE was required to assess possible variations in the market share of long distance road freight resulting from changes in freight rates, and the inter-relationship between the freight forwarding section of the industry and road transport owner-drivers and sub-contractors.

The Road Transport Business: A Guide to Some Financial Aspects (BTE 1980b)

This study was undertaken by the BTE in response to requests from various sections of the long distance road haulage industry in late 1979. The study was prepared as a guide for persons considering entering, and current operators in, the road transport industry. It outlined certain key factors in business success and identified some simple techniques to assist in increasing trucking profitability.

Some Characteristics of Truck Ownership in Australia (BTE 1981b)

Lack of adequate information on road transport operations has been a continuing problem in transport research. The objective of this study was to develop a statistical procedure for identifying road fleet structure and operators at a State level so that a range of information relating to the ownership and concentration of the Australian road transport fleet could be examined.

MAJOR RECOMMENDATIONS

Despite the varied nature, scope and objectives of the above studies, a few common themes become apparent in their main recommendations.

The road freight industry

A common theme throughout the majority of the State studies and the relevant Australia-wide studies was recognition of the existence of substantial competition within the different sectors of the road freight industry. Furthermore, the industry structure is highly disaggregated (the majority of fleets consisting of one or two vehicles often operating in conjunction with some other primary business activity).

A major problem referred to, particularly in the long distance haulage sector of the industry, was the financial plight of the owner-driver. In the late 1970s this sector suffered from oversupply and the increases in rates paid to owner-drivers did not keep pace with the increases in operating costs. It was suggested that conditions of competition and pricing among freight forwarders and their sub-contractors need to be investigated.

Rail/road competition

In the long run, the scope for competition between rail and road modes should be progressively extended through the deregulation of both rail and road freight transport. In addition, railways should confine their interstate freight activities to the handling and loading of wagon and train lots only. Finally, some studies maintained that the common carrier obligation of the railways should be abolished.

Many pricing practices in transport have developed over time. For example, historic price structures have been subject to blanket type adjustment over time and particular levies/subsidies introduced to overcome short term phenomenon have gained a permanent place as part of the price structure.

Diversion of traffic between rail and road modes should not be pre-determined but rather should be the outcome of the choices of transport users made in an environment where each mode is highly efficient and neither mode enjoys any policy advantage over the other or hidden community subsidies.

Regulation

Commonwealth and State regulations can be identified as economic or non-economic in nature. Regardless of the nature of regulations they all have economic implications extending to the supply, quality and costs of freight services. A common theme throughout the State studies was that the intensely competitive conditions prevailing within the road freight industry had a significant destabilising effect on the industry. This instability resulted in business failure and widespread lapses in safety and operating standards. Most of the regulatory devices were considered by the various studies, and a brief summary of the main recommendations is given below.

Economic regulation

Direct control of the freight industry by economic regulation (for example, limiting availability of alternative transport options, financial support and regulation of freight rates) was not favoured on two grounds. Firstly, direct controls were considered likely to be largely ineffective in determining, for example, the impact of the road freight system on markets traditionally held by rail. Secondly, the prevailing interpretation of Section 92 of the Constitution prevents the use of economic regulation involving the restriction of trade in matters which affect interstate freight movements. Nonetheless, most studies maintained that attainment of the highest 'practical' level of economic efficiency requires a mixture of regulation and competition.

Non-economic regulation

Non-economic regulation relates to safety and safe driving, driving hours and rest periods, licensing of drivers, environmental damage and pollution, speed, and vehicle dimensions. Most of the State studies maintained that non-economic regulation of road transport should be confined to an absolute minimum and based on clear proof that it is needed in the public interest. Regulation of safety and of other essential standards (particularly by 'quality' licensing) were the most prominent non-economic regulatory methods recommended in these studies.

Safety

On an exposure basis (when allowance is made for number of vehicles and distance travelled) heavier trucks (articulated followed by rigid trucks) were found to have a higher fatality and injury accident rate than other vehicle types. Proposed safety measures should be protective for truck drivers as well as reducing the dangers for other road users.

Quality licensing

Most of the State studies recommended abolition of the then existing economic licensing systems and introduction of a system of operator competancy regulation. This 'quality' licensing would involve consideration of several financial and business competancy factors prior to registration to improve safety and quality of service aspects in trucking.

Cost recovery and road charges

Most of the above studies recommended that both road and rail modes should bear their real costs (or after taking into account community subsidies, be equally placed cost-wise). A BTE study using 1974-75 data indicates that road freight and rail freight were both subject to significantly less than full cost recovery of the financial costs of providing these services (BTE 1977). Moreover, each class of road users should meet the costs of road construction and maintenance, attributable to the particular vehicle class. In particular, on the basis of relative responsibilities, large and heavy vehicles inflict more damage than they pay for.

The issue of road charges was considered because promotion of efficiency and rationalisation in the freight transport industry depends on appropriate pricing policies and the industry meeting its costs. Despite varied cost definitions and itemisation procedures, there seemed to be a general awareness that for both economic efficiency and financial objectives a road charging mechanism should consist of the following three components. These are, a variable charge related closely to avoidable road costs, a fixed charge levied on road users which would not significantly affect decisions on road usage, and where necessary a variety of other fixed charges imposed for general revenue purposes (without affecting the efficiency of resource allocation).

Industry representation

It was concluded that the existing arrangements for industry representation were inadequate. In particular, they did not provide a voice for the substantial number of long distance owner-drivers (LDODs) who relied on a number of newer organisations. Consequently, an Australian council of organisations representing LDODs was recommended. It was emphasised that for measures of rationalisation of the road freight industry to proceed smoothly, it would be necessary to develop additional means for consultation at high levels of government, management, union and industry participation.

Financial viability of LDODs

For many truck operators the attractive life style and the glamour of driving a 'big rig' seem to relegate financial matters to a secondary position. However, financial difficulties can be created by the inability to predict future demand and anticipate price movements in some of the components of total operating costs (for example, Commonwealth and State governments' taxes on fuel, investment allowance and registration fees).

Information, training and research

In summary the main recommendations from previous studies on information, training and research comprise:

- improvement of the information base relating to freight transport;
- continuation and further development of existing educational and training assistance programs for LDODs (such as small business advisory services, and management training packages); and
- further research with respect to updating of costs including:
  - —identifying the effects of variations in road system characteristics and combination of vehicles on operating efficiency and road maintenance costs; and
  - —inter-modal operations.

CHAPTER 3—STATISTICAL BACKGROUND

During the year ending 30 September 1982. commercial motor vehicles performed more than 60 billion tonne-kilometres in the task of transporting freight throughout Australia. This is a 120 per cent increase on the level of road freight activity estimated 11 years earlier and represents approximately 27 per cent of the total Australian domestic freight task (that is, freight tonne-kilometres performed by road, rail, sea and air between points of origin and destination located within Australia).

This chapter examines the main trends in the Australian road freight task as it has developed since the early 1970s[1]. Using the available data collections, the current size and usage of the total commercial vehicle fleet, as well as individual fleets comprising one, two or more vehicles, are considered. Discussion of the vehicle fleet leads to a consideration of the road freight task and in particular, aspects of it related to the matter of urban versus long distance road transport and the mix of commodities transported by road. Growth in road freight activity is assessed in the light of historical developments in road funding in Australia and comparisons made between Australian and overseas experiences. Brief reference is also made to the level of investment in the road freight industry although practically no information on this aspect is available.

This statistical background is confined to a description of the freight task and the vehicles employed to convey it. Details of the number of operators and the structure of ownership in the industry are provided in Chapter 4.

THE AUSTRALIAN DOMESTIC FREIGHT TASK

Total freight by mode

The domestic freight task, performed by the modes of road, rail (government and non-government), coastal shipping and air, is summarised in Table 3.1. The table quotes two indicators of freight activity—'tonnes consigned' and 'tonne-kilometres performed'—for each of four years during the period 1970-71 to 1981-82. While tonnes consigned describes the total mass of freight moved, tonne-kilometres are also included to indicate differences between modes in the average length of journey[2].

Table 3.1 indicates the dominance of the road mode with respect to tonnes of freight consigned (accounting for between 70 and 80 per cent of the 'all modes' total). However, when journey length is considered, the share of tonne-kilometres performed by road is significantly less than that performed by coastal shipping and rail (which together comprise about 75 per cent of the 'all modes' total). This is mainly due to the shorter average journey length of road, particularly when compared with the sea mode.

During the period 1970-71 to 1981-82, tonnes consigned and tonne-kilometres performed by road increased at average annual rates of 3.0 and 7.4 per cent

1. The paucity of reliable and sufficiently detailed information precludes a discussion of trends in earlier periods.

2. Tonne-kilometres performed are calculated as the sum over all journeys of journey length (in kilometres) multiplied by the number of tonnes consigned.

TABLE 3.1—AUSTRALIAN DOMESTIC FREIGHT TASK BY MODE, 1970-71, 1975-76, 1978-79 AND 1981-82

Mode	*1970-71*		*1975-76*		*1978-79*		*1981-82*[a]	
	Number	*Per cent*	*Number*	*Per cent*	*Number*	*Per cent*	*Number*	*Per cent*
Tonnes consigned (million)								
Road[b]	720.5	79	756.4	74	912.6	78	na	na
Rail[c]	151.6	17	212.7	21	216.6	18	250.5	na
Sea[d]	39.9	4	48.1	5	48.1	4	43.5	na
Air[e]	0.1	–	0.1	–	0.1	–	0.1	na
Total	912.1	100	1 017.3	100	1 177.4	100	na	na
Tonne-kilometres ('000 million)								
Road[b]	27.3	20	36.7	18	48.1	23	60.1	27
Rail[c]	39.0	28	57.1	29	57.6	27	64.8	29
Sea[d]	72.0	52	104.9	53	105.0	50	98.2	44
Air[e]	0.1	–	0.1	–	0.1	–	0.1	–
Total	138.4	100	198.8	100	210.8	100	223.2	100

a. Figures for road, rail and air are preliminary.
b. Years ending 30 September 1971, 1976, 1979 and 1982.
c. Total government and non-government rail.
d. Changes in the annual collection of sea statistics, implemented in 1971-72 and 1980-81, imply that the 1970-71 figure is not directly comparable with later figures and the 1981-82 figure is not directly comparable with earlier figures.
e. Freight and mail carried by scheduled carriers only. The BTE estimates that, in 1978-79, General Aviation carried 132 000 tonnes of freight and performed approximately 58 million tonne-kilometres.
– nil or rounded to zero
na not available

Sources: ABS (1973), ABS (1978a), ABS (1981b),ABS (1982c), ABS (1983c), BTE (1983a), Department of Transport (1983), Department of Aviation (1983a), Department of Aviation (1983b)

respectively[1]. The freight task performed by rail has also increased throughout this period with both indicators growing at average annual rates of 4.7 per cent. Changes in the annual collection of sea transport statistics disguise the real trends in freight moved by this mode, however activity since the mid 1970s appears to have remained relatively stable at about 48 million tonnes consigned and just over 100 billion tonne-kilometres performed per annum.

In addition to moving up to 80 per cent of all domestic freight, road transport has been moving freight further than ever before. The rate of growth in tonne-kilometres performed by the road mode has:

- exceeded the growth in tonnes consigned, indicating a significant increase in the average distance travelled on Australian roads by each freight consignment[2]; and
- exceeded the growth in tonne-kilometres performed by each of the other surface modes, so that at the end of the period, tonne-kilometres performed by the road mode was only marginally less than that performed by rail.

1. Due to the unavailability of 1981-82 data, growth in tonnes consigned has been calculated over the period 1970-71 to 1978-79.
2. Trends in vehicle kilometres travelled and urban versus long distance road transport are discussed later in this chapter.

Using either measure (tonnes consigned or tonne-kilometres performed) the domestic air freight task represented only a negligible percentage of the total. However, during the study period tonnes consigned and tonne-kilometres performed by the domestic airlines and commuter operators (which together are estimated to account for about half the total air freight task) grew by average annual rates of 4.0 and 2.7 per cent respectively. The air freight task appears to be largely distinct from the freight task performed by the surface modes. By offering substantial reductions in travel time, the air transport industry provides a specialised freight service to sectors of the market subject to high inventory or travel time costs. However, there is active competition between 'overnight' road services and air freight in parts of this specialised market.

Unlike the road mode, statistics describing the movement of all freight by rail, sea and air are published at least annually. Annual details of tonnes consigned and tonne-kilometres performed by these modes from 1970-71 to 1981-82 are given in Appendix II.

Commodity composition by mode

Table 3.2 provides a breakdown by commodity of the tonnages carried by each mode of domestic transport in 1978-79.

TABLE 3.2—ESTIMATED AUSTRALIAN FREIGHT TONNES CONSIGNED BY COMMODITY AND MODE, 1978-79

(million tonnes)

Commodity	Domestic freight					
	Road	Rail		Sea	Air[a]	Total
		Government	Non-government			
Bulk liquids	51	3	–	19	–	73
Coal and coke	39	46	7	2	–	94
Iron ore	1	1	80	8	–	90
Other minerals[b]	293	19	9	10	–	331
Grain	38	12	–	0.1	–	50
Other bulk solids	76	4	19[c]	2	–	101
Non-bulk freight[d]	415	18	–	7	0.27	447
Total	913	103	114	48	0.27	1 186

a. Scheduled operators plus BTE estimate of freight carried by General Aviation.
b. Includes sand and gravel.
c. Sugar cane.
d. Includes iron and steel.
– nil or rounded to zero

NOTE: Figures may not add to totals due to rounding.

Sources: BTE estimates derived from:
ABS (1981a), ABS (1981b), Department of Transport (1981), BTE (1980a), Department of Aviation (1983b).

For domestic freight, rail transport is the major mode for iron ore, sugar cane and coal and coke. Road transport dominates the other categories with major business in the bulk liquids and bulk solids categories, as well as being the predominant mode for non-bulk freight.

Although more recent commodity data for the modes of rail and sea are available, comparable statistics for the road mode are not available until the results of the

1982 Survey of Motor Vehicle Usage are released in full. Furthermore, the data published annually for the rail, sea and air modes are based on a complete examination of operators (all airlines, railways, and shipping lines through the port authorities) while road freight data are collected far less regularly from only a small proportion of operators (approximately 50 000 commercial vehicles—less than 3 per cent of the commercial vehicle population—were surveyed in the 1982 Survey of Motor Vehicle Usage). This paucity of information about the movement of freight on Australian roads persists despite the significant contribution the road mode makes to the total domestic freight task (as described above).

Additional data describing the movement of freight by rail are given in Appendix II. Using the broad commodity categories of Table 3.2, the number of tonnes consigned and tonne-kilometres performed on government and non-government railways are shown for the years ending 30 June 1976, 1979 and 1980. Over the four year period, the freight task performed by government railways steadily increased with significant growth in the movement of coal and coke, other minerals and grains. On the other hand, the task performed by non-government railways (dominated by the movement of iron ore) declined between 1975-76 and 1978-79 but increased substantially in 1979-80.

THE AUSTRALIAN ROAD FREIGHT TASK

Characteristics of the vehicle fleet

Number of vehicles

Freight-carrying vehicles are classified into three broad categories of light commercial vehicles, rigid trucks and articulated trucks[1]. The classification of trucks as rigid and articulated is self evident. Vehicles classified as light commercial are mostly panel vans and utilities. However, this category also includes derivatives of these vehicle types which are also designed for the carriage of goods (such as the Ford Econovan, the Mazda range of vans, and the Mitsubishi L200 and L300 models). The Australian Bureau of Statistics (ABS) collection of the total number of vehicles on register by vehicle type is summarised in Table 3.3.

Registration statistics are, however, subject to two important qualifications. Firstly, the change in vehicle classification procedures used by the ABS led to a break in the commercial vehicle series between June 1976 and June 1977 (refer footnotes (b) and (c) of Table 3.3). As a result, the average rate of growth in each of the categories of light commercial vehicles, rigid trucks and articulated trucks over the entire study period (1972-82) is not directly estimable. Instead, the overall rate of growth has been inferred from those calculated for the two sub-periods (1972-76 and 1977-80) with the assumption of 'normal' growth in 1977.

Secondly, criteria used in the process of vehicle classification vary between the States and Territories' motor vehicle registration authorities. While variation in the classification of rigid and articulated trucks is not expected to be significant, some inconsistencies in the classification of the many makes and models of light commercial-type vehicles currently available are apparent[2]. The imprecise nature of the category of light commercial vehicles should be borne in mind when considering any State registration statistics or the Australian total given above.

Notwithstanding the above qualifications, it is worthy of note that the number of

1. Other types of commercial vehicles such as truck type vehicles which are designed for purposes other than freight carrying (for example, mobile libraries, garbage trucks and hearses) and buses (including privately owned vehicles registered as micro-buses) are not considered here.

2. For example, in the Australian Capital Territory one of the conditions for classifying a vehicle as light commercial is that its tare weight is less than 2 tonnes but in New South Wales no such weight restriction is formally defined and used. Likewise, a vehicle in the Australian Capital Territory must have seating for at least 10 persons before it is classified as a micro-bus, while in New South Wales a micro-bus can be a vehicle able to seat at least one but no more than 16 persons.

TABLE 3.3—NUMBER OF MOTOR VEHICLES ON REGISTER IN AUSTRALIA BY MAJOR VEHICLE TYPES,[a] 1972-1982

('000)

At 30 June	Vehicle type					
	Cars and station wagons	Light commercial	Rigid trucks	Articulated trucks	Total light commercial and trucks	Total
1972	4 147	550	378	33	961	5 108
1973	4 375	575	395	34	1 004	5 379
1974	4 627	602	413	36	1 506	5 678
1975	4 859	631	430	38	1 098	5 957
1976	5 073	672	457	41	1 170	6 243
1977[b]	5 243	794	386	40	1 220	6 463
1978	5 462	847	405	41	1 293	6 755
1979	5 657	880	421	43	1 444	7 001
1980	5 799	905	437	45	1 386	7 186
1981	6 021	957	459	47	1 462	7 483
1982	6 294	1 029	493	50	1 572	7 866
Average annual growth (per cent)						
1972-76	5.2	5.1	4.9	5.8	5.0	5.1
1977-82	3.7	5.3	5.0	4.6	5.2	4.0
1972-82	4.3	5.2[c]	4.9[c]	5.1[c]	5.0[c]	4.4

a. Cars and station wagons, light commercial vehicles, rigid trucks and articulated trucks but excluding other truck type vehicles, buses, motor cycles and other vehicles such as tractors, plant and equipment, caravans and trailers.

b. Between June 1976 and June 1977 the ABS altered its approach to classifying commercial vehicles by moving away from its own definitions of vehicle type to the adoption of vehicle type data as recorded by the registration authorities in each state and territory. As a comparison of the 1976 and 1977 statistics reveals, the change in procedures resulted in a marked shift in the distribution of vehicles by vehicle type. After allowing for estimated 'normal' growth in the size of each commercial vehicle fleet during the twelve months to 30 June 1977, it is evident that the change in classification procedures substantially increased the number of light commercial vehicles on register and reduced the size of each of the truck fleets.

c. Without a detailed analysis of the classification change, the rates of growth in the size of each of the fleets of light commercial vehicles, rigid trucks and articulated trucks over the period 1972-82 are not directly estimable. Figures given are based on the projection of average 1972-76 rates of growth to 1977 and then changing to the average 1977-82 rates of growth thereafter.

NOTE: Figures may not add to totals due to rounding.

Source: ABS (1982b)

vehicles in each of the categories of light commercial vehicles, rigid trucks and articulated trucks has, since 1972, increased at an average rate of approximately 5 per cent per annum; slightly greater than the average rate of growth of 4.3 per cent per annum in passenger vehicles. The size of the light commercial and rigid truck fleets increased steadily throughout the period while the average rate of growth in articulated trucks declined somewhat in the latter half of the period. At the same time, a slight drop in the average rate of growth of the passenger car fleet is also apparent.

Table 3.3 also indicates that, for each of the three types of commercial vehicles considered, rates of growth in 1982 (the most recent year of data available) were noticeably higher than the long term averages described above. In that year, the number of light commercial vehicles and rigid trucks on register increased by

approximately 7.5 per cent, while the articulated truck fleet grew by 6.6 per cent[1]. However, such high rates of growth are not expected to be sustained and when figures become available, growth in 1983 may well prove to be below average.

Truck size

An indication of changes in the size of freight carrying trucks over time can be gained from two Surveys of Motor Vehicle Usage (SMVU) conducted in 1976 and 1979[2]. Estimates of the number and distribution of trucks, in use in the years ending 30 September 1976 and 1979, classified by tare weight are given in Table 3.4.

TABLE 3.4—ESTIMATED NUMBER OF TRUCKS BY VEHICLE TYPE AND TARE WEIGHT, 1975-76 AND 1978-79[a]

Vehicle type	*1975-76*		*1978-79*	
	('000)	*Per cent*	*('000)*	*Per cent*
Rigid trucks, tare weight				
under 3 tonnes	206.1	49	158.8	40
3-4 tonnes	75.9	18	71.2	18
4 tonnes and over	101.2	24	120.6	31
Total rigid	382.2	91	350.6	89
Articulated trucks, tare weight				
under 9 tonnes	13.6	3	14.4	4
9-11 tonnes	10.2	2	7.8	2
11 tonnes and over	15.9	4	21.8	6
Total articulated	39.7	9	43.9	11
Total	419.9	100	394.5	100

a. Number of rigid and articulated trucks as estimated in each of the Surveys of Motor Vehicle Usage. Differences between these and the previous estimates of fleet size (as in Table 3.3) are due to differences in the scope of each collection (for example, vehicles which recorded zero usage are excluded from survey estimates) and sampling error.

NOTE: Figures may not add to totals due to rounding.

Sources: ABS (1978a), ABS (1981b)

Between the two survey years, articulated vehicles slightly increased their share of the total truck fleet. In each of the rigid and articulated fleets, the number of heavy trucks (with tare weight of 4 tonnes or over in the case of rigid and 11 tonnes or over in the case of articulated) has increased (at average rates of 6.0 and 11.1 per

1. The ABS collection of new motor vehicle registrations indicates little growth in the annual numbers of new commercial vehicles registered between 1977 and 1981. However, in the 12 months to 30 June 1982, the number of new light commercial vehicle registrations was 23 per cent higher than the annual 1977-81 average (and an increase of 18 per cent on new vehicle registrations in the previous year ended 30 June 1981). Similarly, the number of new rigid trucks registered in 1981-82 was 15 per cent higher than the previous 5 year average (and an increase of 10 per cent on 1980-81). However, registrations of new articulated trucks in 1981-82 fell 16 per cent below the previous 5 year average (and 14 per cent below the number of new vehicles registered in 1980-81).

2. Unfortunately statistics classifying the total truck fleet by truck size are not published annually although such information is recorded on nearly all vehicle registration documents. Furthermore, the classification of trucks used in the 1971 SMVU was based on carrying capacity which is not comparable with that used in later surveys (based on tare weight). Therefore, only data pertaining to truck size from the 1976 and 1979 SMVUs are given. Data relating to truck size are not yet available from the 1982 SMVU.

cent per annum respectively) while, with the exception of light articulated trucks (with tare weight less than 9 tonnes), the number of vehicles in the lighter categories has declined. Consequently, between 1976 and 1979 the proportion of heavy trucks increased from 26 to 34 per cent in the rigid fleet and from 40 to 50 per cent in the articulated fleet.

Truck fleet size

Some indication of the number and size of truck fleets has been obtained from data recently provided to the BTE by the motor vehicle registration authorities. Included among the items recorded on each truck's registration documents are a description of the vehicle type and the registered owner's name and address. Therefore, it has been possible to group into fleets those trucks having the same registered owner (whether that be an individual or a public or private enterprise).

Preliminary estimates of the size and composition (numbers of rigid and/or articulated trucks) of truck fleets registered in Queensland, South Australia, Western Australia, Tasmania, the Northern Territory and the Australian Capital Territory at 30 September 1982 are given in Tables 3.5 to 3.10[1].

In each State (or Territory), rigid trucks with a tare weight of more than 2 tonnes and all articulated trucks are included in the analysis[2]. Truck fleets are classified by size and for each size category, both the number of fleets and the number of rigid and articulated trucks operating in those fleets are given.

Before proceeding to a discussion of the above tables, it is emphasised that due to time limitations, the estimates are preliminary and subject to change once the vehicle registration data are analysed in more detail. In particular, it is likely that further editing and error correction may be warranted. For example, although the most commonly occurring discrepancies in the computer coding of the names of registered owners have been eliminated, it is known that some minor differences still exist. Therefore, since fleets are defined by the registered owner's name, some of the larger fleets may have been mistakenly identified as two or more smaller fleets during compilation of the above tables (and those in Appendix II referred to below). Consequently, estimates pertaining to the smaller fleet sizes are suspected of being overstated while estimates pertaining to the larger fleet sizes may be understated, although to what extent is not known.

A striking feature of Tables 3.5 to 3.10 is the relative uniformity between the six regions (States and Territories) in the distribution of fleets and trucks by fleet size. In each case, approximately 85 per cent of all truck fleets consist of only one truck. Furthermore, these one-truck fleets account for approximately 60 per cent of all rigid trucks and 40-50 per cent of all articulated trucks on register. As might have been anticipated, rigid trucks are more concentrated in the smaller fleet sizes and a greater proportion of the total number of articulated trucks falls into the larger fleet size categories.

Turning to the significance of the larger fleets, it is noted that fleets of over 50 trucks, for example, numbered 32 in Queensland and accounted for 4.1 per cent of the truck population. In South Australia, there were 13 fleets of this size with 5.9 per cent of the trucks; in Western Australia 18 fleets with 7.5 per cent of the trucks; and in Tasmania four fleets with 7.1 per cent of the trucks.

It seems reasonable to conclude that the owners of these larger fleets which account for only small shares of the market would not be in a position of price leadership

1. The Victorian data are currently being processed by the BTE while data describing vehicle registrations in New South Wales have not yet been made available by the New South Wales Department of Motor Transport.

2. Only trucks used mostly for the carriage of freight were considered. While rigid trucks with a tare weight of 2 tonnes or less carry some freight, the proportion of the road freight task performed by such vehicles is very small (less than 4 per cent; see Table 3.16).

or any other form of dominance in the general road freight market. The large number of operators should ensure extensive competition in all but the very remote or specialised sections of the industry.

With the exception of the Northern Territory, approximately 85 per cent of all trucks included in the analysis are rigid. In the Northern Territory, articulated trucks represent a significantly greater proportion (about 30 per cent) of the total truck fleet.

The BTE also examined the truck type composition of individual fleets (see Tables II.5-II.10 and Tables II.11-II.16 in Appendix II) and found a high degree of specialisation in either rigid or articulated trucks. Fleets of only rigid trucks or only articulated trucks accounted for about 96 per cent of all truck fleets and included some 80 per cent of all trucks. The remaining mixed fleets (of at least one rigid truck and one articulated truck) represented only 4 per cent of all truck fleets and about 20 per cent of all trucks.

Following on from these preliminary results, the BTE intends to undertake a more detailed analysis of the truck registration data. The analysis will be conducted at the State and Territory level and at the national level should the New South Wales data be made available. Besides the vehicle's type and tare weight, several other items describing the characteristics of the vehicle are recorded on the registration documents. These include the number of axles, fuel type, engine capacity, and number of cylinders. With the resultant variety of cross tabulations available, a detailed analysis of truck ownership in Australia will be possible.

TABLE 3.5—NUMBER OF FLEETS AND TRUCKS BY FLEET SIZE; QUEENSLAND, 1982[ap]

Trucks per fleet	*Fleets*		*Trucks*					
	Number	*Per cent*	*Rigid[b]*	*Per cent*	*Articulated*	*Per cent*	*Total*	*Per cent*
1	37 822	86.7	33 616	63.8	4 206	48.4	37 822	61.6
2	3 608	8.3	6 010	11.4	1 206	13.9	7 216	11.8
3	878	2.0	2 058	3.9	576	6.6	2 634	4.3
4	390	0.9	1 199	2.3	361	4.2	1 560	2.5
5	187	0.4	710	1.3	225	2.6	935	1.5
6-10	407	0.9	2 411	4.6	649	7.5	3 060	5.0
11-15	131	0.3	1 294	2.5	347	4.0	1 641	2.7
16-20	74	0.2	1 060	2.0	267	3.1	1 327	2.2
21-25	41	0.1	767	1.5	166	1.9	933	1.5
26-30	16	-	375	0.7	67	0.8	442	0.7
31-40	21	-	620	1.2	114	1.3	734	1.2
41-50	11	-	464	0.9	36	0.4	500	0.8
51-60	12	-	508	1.0	163	1.9	671	1.1
61-80	8	-	420	0.8	133	1.5	553	0.9
81-100	4	-	338	0.6	44	0.5	382	0.6
101-120	5	-	510	1.0	41	0.5	551	0.9
121-140	2	-	241	0.5	6	0.1	247	0.4
141+	1	-	54	0.1	90	1.0	144	0.2
Total	43 618	100.0	52 655	100.0	8 697	100.0	61 352	100.0

a. Trucks registered in the State at 30 September 1982.
b. Excludes rigid trucks with a tare weight of 2 tonnes or less.
p preliminary
- nil or rounded to zero

NOTE: Percentages may not add to totals due to rounding.

Source: Queensland Department of Main Roads (unpublished data).

Vehicle usage

Estimates of the average number of kilometres travelled by all vehicles in each of the vehicle type categories previously considered, in each of the years ending 30 September 1971, 1976, 1979 and 1982, are given in Table 3.11.

Over the 11 year period (1971-82) the average annual distance travelled by passenger and light commercial vehicles has remained relatively stable while a slight increase in the average utilisation of rigid trucks and a steady increase in the utilisation of articulated trucks are apparent. In 1982, the average articulated truck travelled almost four times the distance of any other vehicle while the average distances travelled by light commercial vehicles and rigid trucks were only slightly greater than that of passenger vehicles. However, in the same year, cars and station wagons are estimated to have accounted for almost 80 per cent of total vehicle kilometres travelled (VKT) while, at the other extreme, articulated trucks accounted for little more than 2 per cent of total VKT.

Averaged over the study period, all vehicle types recorded positive annual rates of growth in total VKT, although the total distance travelled by rigid trucks remained relatively constant over the first three surveys[1]. Of all vehicle types considered, light

TABLE 3.6—NUMBER OF FLEETS AND TRUCKS BY FLEET SIZE; SOUTH AUSTRALIA, 1982[ap]

Trucks per fleet	*Fleets*		*Trucks*					
	Number	*Per cent*	*Rigid[b]*	*Per cent*	*Articulated*	*Per cent*	*Total*	*Per cent*
1	18 019	84.2	16 385	60.4	1 634	36.5	18 019	57.0
2	2 129	9.9	3 614	13.3	644	14.4	4 258	13.5
3	537	2.5	1 255	4.6	356	7.9	1 611	5.1
4	209	1.0	639	2.4	197	4.4	836	2.6
5	115	0.5	450	1.7	125	2.8	575	1.8
6-10	234	1.1	1 228	4.5	501	11.2	1 729	5.5
11-15	70	0.3	635	2.3	257	5.7	892	2.8
16-20	36	0.2	470	1.7	169	3.8	639	2.0
21-25	16	0.1	249	0.9	118	2.6	367	1.2
26-30	5	–	52	0.2	85	1.9	137	0.4
31-40	14	0.1	417	1.5	68	1.5	485	1.5
41-50	5	–	147	0.5	79	1.8	226	0.7
51-60	2	–	110	0.4	3	–	113	0.4
61-80	5	–	172	0.6	161	3.6	333	1.1
81+	6	–	1 293	4.8	82	1.8	1 375	4.4
Total	21 402	100.0	27 116	100.0	4 479	100.0	31 595	100.0

a. Trucks registered in the State at 30 September 1982.
b. Excludes rigid trucks with a tare weight of 2 tonnes or less.
p preliminary
– nil or rounded to zero

NOTE: Percentages may not add to totals due to rounding.

Source: South Australian Department of Transport (unpublished data).

1. Caution needs to be exercised when comparing estimates from surveys conducted in different years. As well as the change in vehicle classification procedures referred to earlier, other small changes in the vehicle classifications have been implemented with each survey. Both sources of variation detract from the validity of comparing estimates of average and total VKT (and other survey estimates sensitive to vehicle type changes) from different surveys.

commercial vehicles and articulated trucks averaged the highest annual rate of growth in total VKT of approximately six per cent per annum. This compares with the average rate of growth in the number of light commercial vehicles and articulated trucks on register, of approximately five per cent per annum, noted earlier.

Vehicle loading

While the above sheds some light on total vehicle usage, a more relevant question to consider might be the following:

'What is the distance travelled by freight carrying vehicles and how does the rate of utilisation or load factor of such vehicles vary in response to changes in factors such as type of operation (for example urban or long distance), commodities carried, type of vehicle and size of fleet?'.

Unfortunately the information needed to fully answer such a question is not available. Some insight into some of the factors mentioned is gained from the ABS Surveys of Motor Vehicle Usage, but such inferences are based on only a limited sample survey of vehicles on register. The sampling and non-sampling type errors associated with SMVU estimates increase as the more detailed characteristics are examined so that a complete and accurate answer to a question such as the above is not available from this source.

One aspect that can be considered, to a limited extent, is the utilisation of vehicles across vehicle types and size (measured by tare weight). In each of the SMVUs

TABLE 3.7—NUMBER OF FLEETS AND TRUCKS BY FLEET SIZE; WESTERN AUSTRALIA, 1982[ap]

Trucks per fleet	*Fleets*		*Trucks*					
	Number	*Per cent*	*Rigid*[b]	*Per cent*	*Articulated*	*Per cent*	*Total*	*Per cent*
1	21 384	85.3	19 609	60.6	1 775	42.9	21 384	58.6
2	2 355	9.4	4 112	12.7	598	14.5	4 710	12.9
3	579	2.3	1 460	4.5	277	6.7	1 737	4.8
4	237	0.9	763	2.4	185	4.5	948	2.6
5	132	0.5	560	1.7	100	2.4	660	1.8
6-10	207	0.8	1 284	4.0	262	6.3	1 546	4.2
11-15	64	0.3	667	2.1	140	3.4	807	2.2
16-20	29	0.1	420	1.3	111	2.7	531	1.5
21-25	17	0.1	325	1.0	61	1.5	386	1.1
26-30	10	-	225	0.7	45	1.1	270	0.7
31-40	12	-	317	1.0	107	2.6	424	1.2
41-50	7	-	237	0.7	80	1.9	317	0.9
51-60	4	-	212	0.7	16	0.4	228	0.6
61-80	6	-	382	1.2	49	1.2	431	1.2
81-100	2	-	149	0.5	34	0.8	183	0.5
101-120	3	-	273	0.8	61	1.5	334	0.9
121-140	3	-	295	0.9	97	2.3	392	1.1
141+	5	-	1 046	3.2	136	3.3	1 182	3.2
Total	25 056	100.0	32 336	100.0	4 134	100.0	36 470	100.0

a. Trucks registered in the State at 30 September 1982.
b. Excludes rigid trucks with a tare weight of 2 tonnes or less.
p preliminary
- nil or rounded to zero

NOTE: Percentages may not add to totals due to rounding.

Source: Western Australia Traffic Licensing and Services Centre (unpublished data).

the total distance travelled by vehicles, in each of the commercial vehicle categories, is disaggregated by trip purpose. The classifications used are:

- business travel (vehicle distances travelled for hire and reward, or charged to a business expense or for which an allowance was received, except for travel to and from work);

TABLE 3.8—NUMBER OF FLEETS AND TRUCKS BY FLEET SIZE; TASMANIA, 1982[ap]

Trucks per fleet	Fleets		Trucks					
	Number	Per cent	Rigid[b]	Per cent	Articulated	Per cent	Total	Per cent
1	4 576	82.7	4 037	54.6	539	39.2	4 576	52.2
2	554	10.0	911	12.3	197	14.3	1 108	12.6
3	154	2.8	357	4.8	105	7.6	462	5.3
4	80	1.4	246	3.3	74	5.4	320	3.6
5	42	0.8	179	2.4	31	2.3	210	2.4
6-10	69	1.2	364	4.9	134	9.7	498	5.7
11-15	24	0.4	238	3.2	53	3.9	291	3.3
16-20	17	0.3	267	3.6	40	2.9	307	3.5
21-25	6	0.1	87	1.2	53	3.9	140	1.6
26-30	4	0.1	92	1.2	16	1.2	108	1.2
31-50	3	0.1	79	1.1	49	3.6	128	1.5
51+	4	0.1	535	7.2	85	6.2	620	7.1
Total	5 533	100.0	7 392	100.0	1 376	100.0	8 768	100.0

a. Trucks registered in the State at 30 September 1982.
b. Excludes rigid trucks with a tare weight of 2 tonnes or less.
p preliminary

NOTE: Percentages may not add to totals due to rounding.

Source: Tasmanian Department of Transport (unpublished data).

TABLE 3.9—NUMBER OF FLEETS AND TRUCKS BY FLEET SIZE; NORTHERN TERRITORY, 1982[ap]

Trucks per fleet	Fleets		Trucks					
	Number	Per cent	Rigid[b]	Per cent	Articulated	Per cent	Total	Per cent
1	536	85.2	406	63.1	130	51.2	536	59.8
2	43	6.8	59	9.2	27	10.6	86	9.6
3	23	3.7	46	7.2	23	9.1	69	7.7
4	7	1.1	16	2.5	12	4.7	28	3.1
5	7	1.1	21	3.3	14	5.5	35	3.9
6	5	0.8	21	3.3	9	3.5	30	3.3
7	1	0.2	7	1.1	-	-	7	0.8
8-10	2	0.3	8	1.2	12	4.7	20	2.2
11-15	3	0.5	19	3.0	17	6.7	36	4.0
16+	2	0.3	40	6.2	10	3.9	50	5.6
Total	629	100.0	643	100.0	254	100.0	897	100.0

a. Trucks registered in the Territory at 30 September 1982
b. Excludes rigid trucks with a tare weight of 2 tonnes or less.
p preliminary
- nil or rounded to zero

NOTE: Percentages may not add to totals due to rounding.

Source: Northern Territory Department of Transport and Works (unpublished data).

- travel to and from work (paid and unpaid); and
- private travel.

Business travel is further divided between 'laden' and 'unladen' and in the 1976, 1979 and 1982 SMVUs, laden travel is divided between 'fully laden' and 'less than fully laden'.

Table 3.12 indicates for each of the four survey years and for each of the three types of commercial vehicles previously considered, the total number of kilometres travelled in each category of business travel by vehicles used mostly for business purposes (with two exceptions—see footnote (b) to the Table). Where estimates are available, each of the truck types has been further disaggregated by tare weight to give an indication of the variation, if any, in load factors across vehicle size.

A feature of Table 3.12 is the stability over time in the distribution of business kilometres travelled between the three load related categories. Furthermore, the split between laden/unladen travel by light commercial vehicles, total rigid trucks and total articulated trucks was approximately 70:30 in each category[1]. Laden travel by rigid trucks is almost evenly divided between 'less than fully laden' and 'fully laden' while nearly all of the laden travel by articulated trucks is fully laden.

The utilisation of vehicles was generally higher for the larger sized vehicles. For rigid and articulated trucks, the ratio of fully laden travel to total business travel was significantly higher for the larger vehicles. With respect to less than fully laden travel, conflicting trends are apparent and a clear picture of the relationship to size of vehicle did not emerge.

TABLE 3.10—NUMBER OF FLEETS AND TRUCKS BY FLEET SIZE; AUSTRALIAN CAPITAL TERRITORY, 1982[ap]

Trucks per fleet	*Fleets*		*Trucks*					
	Number	*Per cent*	*Rigid*[b]	*Per cent*	*Articulated*	*Per cent*	*Total*	*Per cent*
1	809	82.6	709	62.7	100	42.9	809	59.4
2	95	9.7	151	13.4	39	16.7	190	13.9
3	33	3.4	80	7.1	19	8.2	99	7.3
4	15	1.5	52	4.6	8	3.4	60	4.4
5	10	1.0	34	3.2	16	6.9	50	3.7
6	2	0.2	10	0.9	2	0.9	12	0.9
7	5	0.5	30	2.7	5	2.1	35	2.6
8	3	0.3	15	1.3	9	3.9	24	1.8
9	2	0.2	10	0.9	8	3.4	18	1.3
10	2	0.2	16	1.4	4	1.7	20	1.5
11+	3	0.3	23	2.0	23	9.9	46	3.4
Total	979	100.0	1 130	100.0	233	100.0	1 363	100.0

a. Trucks registered in the Territory at 30 September 1982
b. Excludes rigid trucks with a tare weight of 2 tonnes or less.
p preliminary

NOTE: Percentages may not add to totals due to rounding.

Source: Department of Territories and Local Government, Canberra (unpublished data).

1. Departure from this ratio of unladen travel is most evident in the 1971 estimates. However, because of the use of different vehicle classifications and definitions of business travel, errors associated with the 1971 estimates are expected to be more significant than in later surveys.

TABLE 3.11—TOTAL AND AVERAGE ANNUAL KILOMETRES TRAVELLED BY VEHICLE TYPE, 1970-71, 1975-76, 1978-79 AND 1981-82

	Year ending 30 September								Average annual growth	
	1971		1976		1979		1982		1971-82	
Vehicle type	*Average (thousand km)*	*Total (million km)*	*Average (thousand km)*	*Total (million km)*	*Average (thousand km)*	*Total (million km)*	*Average[a] (thousand km)*	*Total[b] (million km)*	*Average (per cent)*	*Total (per cent)*
Cars and station wagons	15.9	63 802	15.4	78 531	15.0	84 871	15.6	97 571	–	3.9
Light commercial	16.3	8 567	17.0	12 290	17.0	15 928	16.9	16 934	–	6.4
Rigid trucks	16.0	6 001	15.7	6 032	16.7	5 837	19.0	8 393	1.6	3.1
Articulated trucks	48.3	1 572	50.5	2 005	59.3	2 607	65.4	3 045	2.8	6.2
Total light commercial and trucks	17.3	16 141	17.7	20 327	18.3	24 373	19.0	28 372	0.9	5.3
Total vehicles	16.2	79 943	15.8	98 858	15.7	109 244	16.3	125 943	–	4.2

a. ABS preliminary estimate.
b. BTE preliminary estimate.
– nil or rounded to zero

Sources: ABS (1973), ABS (1978a), ABS (1981b), ABS (1983c).

TABLE 3.12—TOTAL ANNUAL BUSINESS KILOMETRES TRAVELLED BY VEHICLE TYPE, TARE WEIGHT AND LOAD, 1970-71, 1975-76, 1978-79 and 1981-82[a]

Type of vehicle	Year ending 30 September	Unladen		Less than fully laden		Fully laden		Laden[b]		Total business[c]	
		million km	Per cent	million km	Per cent	million km	Per cent	million km	Per cent	million km	Per cent
Light commercial	1971	2 419	42	na	na	na	na	3 313	58	5 732	100
	1976	1 920	32	3 145	52	953	16	4 098	68	6 018	100
	1979	2 232	30	3 995	53	1 320	17	5 315	70	7 547	100
	1982	2 906	31	na	na	na	na	6 513	69	9 419	100
Rigid trucks, tare weight[d]											
Under 3 tonnes	1976	792	30	1 233	46	650	24	1 883	70	2 675	100
	1979	580	26	1 073	49	550	25	1 623	74	2 203	100
3-4 tonnes	1976	271	30	317	35	319	35	636	70	908	100
	1979	247	29	314	37	290	34	604	71	851	100
4 tonnes and over	1976	669	35	435	23	813	42	1 248	65	1 918	100
	1979	831	34	579	24	996	41	1 575	66	2 406	100
Total rigid trucks	1971	1 906	35	na	na	na	na	3 605	65	5 511	100
	1976	1 732	31	1 986	36	1 783	32	3 769	69	5 501	100
	1979	1 658	30	1 966	36	1 836	34	3 802	70	5 460	100
	1982	2 385	31	na	na	na	na	5 301	69	7 686	100

TABLE 3.12 (Cont)—TOTAL ANNUAL BUSINESS KILOMETRES TRAVELLED BY VEHICLE TYPE, TARE WEIGHT AND LOAD, 1970-71, 1975-76, 1978-79 and 1981-82[a]

Type of vehicle	Year ending 30 September	Unladen		Less than fully laden		Fully laden		Laden		Total business[c]	
		million km	Per cent	million km	Per cent	million km	Per cent	million km	Per cent	million km	Per cent
Articulated trucks, tare weight[d]											
Under 9 tonnes	1976	130	35	49	13	189	51	238	65	368	100
	1979	173	36	62	13	248	51	310	64	483	100
9-11 tonnes	1976	143	29	63	13	287	58	349	71	493	100
	1979	112	33	42	13	182	54	224	67	336	100
11 tonnes and over	1976	304	27	118	11	691	62	809	73	1 112	100
	1979	489	28	197	11	1 075	61	1 272	72	1 761	100
Total articulated trucks	1971	510	33	na	na	na	na	1 047	67	1 557	100
	1976	578	29	229	12	1 166	59	1 396	71	1 973	100
	1979	774	30	301	12	1 505	58	1 806	70	2 580	100
	1982	838	28	na	na	na	na	2 174	72	3 012	100

a. 1981-82 figures are BTE estimates based on preliminary results from the Survey of Motor Vehicle Usage, Australia, 1982.
b. The sum of 'fully laden' and 'less than fully laden' business travel.
c. In 1976 and 1979, 'total business' is all distance travelled for business purposes by vehicles predominantly used for business purposes. That is, business travel by vehicles used mostly for private purposes is excluded from the 1976 and 1979 estimates. Similarly the 1971 and 1982 estimates of business travel by rigid and articulated trucks also exclude a negligible amount of business travel by trucks used mostly for private purposes. However, the 1971 and 1982 estimates of business travel by light commercial vehicles are the total distance travelled for business purposes of all vehicles, including those used mostly for private purposes.
d. Estimates of business travel during 1970-71 by each of the sub-categories of rigid and articulated trucks are not available since the September 1971 survey classified trucks by carrying capacity rather than tare weight. 1981-82 estimates for each of the tare weight categories are not yet available.

na not available.

NOTE: Figures may not add to totals due to rounding.

Sources: ABS, unpublished data on microfiche, relating to Survey of Motor Vehicle Usage, Twelve Months ended 30 September 1971, 30 September 1976, 30 September 1979, ABS (1983c).

Table 3.12 suggests that even for the largest rigid and articulated trucks there may be considerable room for improvement in the ratios of fully laden to total business travel, and some reduction in the approximately 30 per cent of travel which is unladen. Some unladen travel is clearly unavoidable due to imbalances in the freight task on particular routes and the repositioning of vehicles between jobs. However, little is known about the composition of unladen business travel and how much of it could be avoided through better utilisation of the truck fleet.

Characteristics of the freight task

Urban and long distance road transport

An important aspect of the road freight task is the interaction between length of journey or area of operation and load carried. Intuitively, the operations of freight forwarding over long distances could be expected to differ markedly from those in urban areas with respect to characteristics such as the mix of commodities moved, size and type of vehicle used, costs of vehicle operation and other economic factors related to either the supply of or demand for commercial vehicle services. For example, the nature of the freight task in urban areas varies from long distance road haulage in obvious ways such as the type of vehicle used, average load carried and average journey length. Clearly though, there exist many more differences (related to cost or operational characteristics for example) which although significant, are far less easy to identify and analyse. Little is known about these latter characteristics of the freight task and, as before, reliance must be placed upon the Surveys of Motor Vehicle Usage (despite their limitations) to give some insight into the former.

In the SMVUs, the distribution of travel was recorded among the following areas of operation for all vehicles on a State of registration basis:

- capital city and environs
- provincial urban
- rest of State
- interstate.

Survey respondents were asked to estimate, for each vehicle, the average load carried per journey and the total kilometres travelled in each area during the survey year. Hence, for a truck registered in Sydney which travelled only to and from Melbourne, the Sydney-Albury stage of each journey was recorded as 'rest of State', while the Albury-Melbourne stage was recorded as 'interstate'. Estimates of tonne-kilometres performed in a given area of operation were then calculated as the sum over all vehicles of the product of the vehicle's average load carried and total distance travelled in that area.

Table 3.13 details for each of the State's fleets of light commercial vehicles, rigid trucks and articulated trucks, estimates of total tonne-kilometres performed in capital city or provincial urban areas, the rest of the State and in other States during each of the years ending 30 September 1971, 1976 and 1979. Preliminary estimates classified by State of registration and vehicle type for the year ending 30 September 1982 are also included although the area of operation breakdown is not yet available.

In 1981-82, articulated trucks accounted for almost 70 per cent of all tonne-kilometres performed in Australia (compared with 56 per cent in 1970-71). Over the period 1970-71 to 1981-82, tonne-kilometres performed by rigid and articulated trucks increased at average rates of 3.9 and 9.3 per cent per annum respectively, while the growth in tonne-kilometres performed by all vehicle types averaged 7.4 per cent per annum.

As the area of operation moves from urban (capital city and provincial urban) to other intrastate and to interstate, the proportion of the road freight task (measured in tonne-kilometres) performed by articulated trucks increases. In 1978-79, articulated

trucks accounted for approximately half of all tonne-kilometres performed in urban areas, 70 per cent of other intrastate travel and 95 per cent of interstate travel. In each case, rigid trucks accounted for most of the remainder with light commercial vehicles playing a relatively minor role.

In urban areas tonne-kilometres performed by rigid trucks were approximately equal to those performed by articulated trucks. However, during the period 1970-71 to 1978-79, the average rate of growth in the urban articulated truck freight task has been almost four times that for rigid trucks (12.5 per cent per annum compared with 3.3 per cent per annum). Comparisons between the average annual rates of growth in tonne-kilometres performed by rigid and articulated trucks in other areas of operation yield similar results[1].

The noticeable differences between States mainly reflect varied geographical and population density factors. For example, Western Australia has relatively less urban and interstate travel and more intrastate (excluding urban) travel than other States. The marked changes, between the three survey years, in interstate trucking activity by vehicles registered in South Australia is due at least in part to the incentive to register in that State provided by easier avoidance of road maintenance charges. This incentive subsequently disappeared with the abandonment of road maintenance charges in July 1979.

In 1972 the ABS introduced a collection of statistics describing freight carried by freight forwarders and/or road transport operators engaged in the interstate movement of freight for hire and reward[2]. Coverage was limited to those operators who, in 1970-71, moved a total of 10 000 tonnes or more per annum. While initially this collection may have given a reasonable indication of trends in the long distance freight task, the accuracy of the estimates became increasingly questionable during the late 1970s (prior to termination of the collection in 1981). This was partially due to problems encountered in maintaining an up-to-date sample framework. Consequently the collection's coverage of the interstate road freight industry declined although how quickly and to what extent is not known. The data are not considered to be sufficiently reliable to warrant further discussion although a summary of the seemingly more reliable parts of it is included in Appendix II.

A census of all freight moved interstate by all modes within Australia for the year ended 30 June 1981 was recently conducted by the ABS. Following on from the census, a quarterly survey of interstate road freight movements was introduced in September 1982. The survey collects details about the operations of all enterprises involved in freight forwarding and road transport which had moved 20 000 tonnes or more of freight interstate during the census year for hire or reward under prime contract arrangements or on own account. At the time of the 1980-81 census. the combined activities of these 100 or so enterprises constituted approximately 70 per cent of total interstate road freight movements. Although only a relatively new collection, the Interstate Road Freight Movement Survey promises to yield some useful information in the years to come. A summary of the results of the three surveys published to date (ABS 1982a and ABS 1983b) are given in Appendix II.

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1. Over the period 1970-71 to 1978-79, tonne-kilometres performed by rigid and articulated trucks in the remainder of the State increased by average annual rates of 2.9 and 7.9 per cent respectively. Comparable figures for interstate travel are 1.9 and 10.5 per cent per annum.

2. ABS, Interstate freight moved by major freight forwarders and road transport operators between specified Australian centres, 1971-72 to 1973-74, unpublished developmental collection.
ABS, Freight and furniture moved interstate by major freight forwarders and road transport operators between specified Australian centres, 1974-75 to 1980-81, unpublished developmental collection.

TABLE 3.13—TOTAL ANNUAL TONNE-KILOMETRES PERFORMED BY STATE OF REGISTRATION, VEHICLE TYPE AND AREA OF OPERATION, 1970-71, 1975-76, 1978-79 AND 1981-82[a]

(Million tonne-kilometres)

State and type of vehicle	*Capital city and provincial urban*[b]			*Rest of State*[c]			*Interstate*			*Australia*			
	1970-71	*1975-76*	*1978-79*	*1970-71*	*1975-76*	*1978-79*	*1970-71*	*1975-76*	*1978-79*	*1970-71*	*1975-76*	*1978-79*	*1981-82*[p]
New South Wales[d]													
Light commercial	235	366	502	142	150	126	7	19	12	385	535	640	867
Rigid trucks	2 288	2 265	2 582	1 483	1 576	1 878	99	194	188	3 870	4 036	4 648	6 261
Articulated trucks	1 442	2 686	3 718	2 601	3 429	5 331	1 355	1 797	2 459	5 397	7 912	11 508	13 775
Total	3 510	5 317	6 802	4 226	5 156	7 336	1 460	2 011	2 658	9 652	12 484	16 796	20 903
Victoria													
Light commercial	195	322	297	89	132	133	2	6	9	286	460	439	419
Rigid trucks	1 392	1 704	1 996	942	896	1 393	100	116	112	2 434	2 716	3 501	3 678
Articulated trucks	859	1 275	1 733	1 932	1 962	3 036	1 356	1 737	2 773	4 147	4 974	7 542	9 977
Total	2 447	3 301	4 026	2 962	2 989	4 563	1 459	1 859	2 893	6 867	8 149	11 482	14 074
Queensland													
Light commercial	50	92	393	61	99	254	1	8	1	113	200	648	590
Rigid trucks	588	822	828	711	817	1 022	51	44	109	1 350	1 683	1 959	2 648
Articulated trucks	281	643	883	793	859	2 209	424	478	892	1 499	1 980	3 983	5 561
Total	920	1 557	2 104	1 565	1 775	3 484	476	531	1 002	2 961	3 863	6 590	8 799
South Australia[e]													
Light commercial	56	91	84	41	67	95	2	6	2	98	163	180	171
Rigid trucks	515	701	581	969	654	828	169	120	77	1 652	1 475	1 485	1 533
Articulated trucks	199	606	508	1 210	1 599	2 486	808	3 557	2 540	2 217	5 762	5 534	6 514
Total	769	1 398	1 173	2 219	2 320	3 408	979	3 683	2 619	3 967	7 400	7 200	8 219
Western Australia													
Light commercial	70	91	125	63	96	136	–	1	1	132	180	261	299
Rigid trucks	551	681	815	822	1 104	1 143	5	2	7	1 377	1 787	1 966	2 185
Articulated trucks	230	305	454	1 441	1 362	1 788	32	68	183	1 702	1 735	2 425	3 934
Total	850	1 077	1 393	2 325	2 563	3 068	37	71	190	3 211	3 711	4 652	6 417

TABLE 3.13 (Cont)—TOTAL ANNUAL TONNE-KILOMETRES PERFORMED BY STATE OF REGISTRATION, VEHICLE TYPE AND AREA OF OPERATION, 1970-71, 1975-76, 1978-79 AND 1981-82[a]

(Million tonne-kilometres)

State and type of vehicle	*Capital city and provincial urban*[b]			*Rest of State*[c]			*Interstate*			*Australia*			
	1970-71	*1975-76*	*1978-79*	*1970-71*	*1975-76*	*1978-79*	*1970-71*	*1975-76*	*1978-79*	*1970-71*	*1975-76*	*1978-79*	*1981-82*[p]
Tasmania													
Light commercial	10	14	23	14	16	36	–	–	–	24	30	59	69
Rigid trucks	109	156	166	242	233	285	2	–	2	354	389	452	512
Articulated trucks	59	134	186	245	534	708	5	9	2	308	677	896	969
Total	178	303	374	502	782	1 029	7	9	4	687	1 095	1 407	1 550
Australia													
Light commercial	615	981	1 428	409	554	776	14	41	24	1 038	1 577	2 227	2 415
Rigid trucks	5 444	6 383	7 032	5 168	5 224	6 485	425	477	494	11 037	12 085	14 012	16 817
Articulated trucks	3 069	5 738	7 895	8 222	9 656	15 144	3 980	7 646	8 849	15 270	23 041	31 888	40 730
Total	9 127	13 103	16 355	13 799	15 434	22 405	4 419	8 164	9 366	27 344	36 702	48 127	59 962

a. Twelve months ending 30 September. While detailed estimates of tonne-kilometres performed in 1981-82 are not yet available, preliminary estimates of total tonne-kilometres by State of registration and vehicle type have been published and are included in this table's final column.

b. Capital city and provincial urban classifications are defined in each of the Surveys of Motor Vehicle Usage. Included are the capital city urban areas of each of the seven States (including Northern Territory), the whole of the Australian Capital Territory and the following provincial centres in:
New South Wales — Newcastle, Wollongong and Port Kembla;
Victoria — Geelong, Ballarat and Bendigo;
Queensland — Gold Coast, Toowoomba, Rockhampton and Townsville; and
Tasmania — Launceston.

c. Rest of State includes the Stuart and Barkly highways for vehicles registered in the Northern Territory.

d. New South Wales includes Australian Capital Territory.

e. South Australia includes Northern Territory.

p preliminary figures

— nil or rounded to zero

NOTE: Figures may not add to totals due to rounding.

Source: ABS, unpublished data on microfiche, relating to Survey of Motor Vehicle Usage, Twelve Months ended 30 September 1971, 30 September 1976, 30 September 1979, ABS (1983c).

Commodity composition

The road freight task is briefly considered from the perspective of the commodities carried and type and size of vehicle used[1]. Tables 3.14 and 3.15 give the number of tonnes carried and tonne-kilometres performed respectively, for each commercial vehicle type and for each commodity group carried, during the year ended 30 September 1979[2].

Table 3.14 indicates that in 1978-79, rigid trucks carried almost twice as much freight as articulated trucks and together accounted for more than 90 per cent of the total road freight tonnes carried. However, Table 3.15 indicates that significant variation between truck types in average journey length is apparent with articulated performing approximately 66 per cent of all tonne-kilometres and rigid approximately 30 per cent. That is, the ratio of 2 to 1 in tonnes carried in favour of rigid trucks is reversed in favour of articulated trucks when journey length and tonnes carried are both considered.

These tables identify the major commodities transported by each of the three vehicle types. For example, 'sand, gravel, stone and earth' account for a significant proportion of tonnes carried by rigid and articulated trucks (approximately 40 per cent and 20 per cent respectively of total tonnes carried by each vehicle type). The importance of this commodity group is evident to a lesser extent in tonne-kilometres performed (accounting for approximately 20 per cent of all tonne-kilometres performed by rigid trucks and six per cent of all tonne-kilometres performed by articulated trucks). The difference in relative importance indicates that the average distance travelled by a consignment of 'sand, gravel, stone or earth' is relatively short. Further, comparisons of the tables indicate this distance to be exceeded by the average journey length of a number of other commodities including 'livestock', 'fresh fruit and vegetables', 'other agricultural products', 'processed food', 'iron and steel and other metal products' and 'other manufactured goods'.

Large quantities of 'processed foods' and 'other manufactured goods' are also transported by rigid and articulated trucks. In addition, 'cement, concrete and concrete products' form a significant portion of the freight task performed by rigid trucks while 'petroleum and petroleum products' and 'iron, steel and other metal products' are other major commodities carried by articulated trucks.

Tables 3.14 and 3.15 also indicate the relative 'importance' of each vehicle type in the movement of each commodity (where 'importance' is measured in terms of tonnes carried or tonne-kilometres performed). For example, of all 'sand, gravel, stone and earth' transported by road, almost 80 per cent was carried by rigid trucks. However the higher proportion of tonne-kilometres performed by articulated trucks in the movement of this commodity indicates a higher average journey length for this truck type.

The analysis of commodity flows by vehicle type can be extended to vehicle sizes as shown in Table 3.16. Tonne-kilometres performed during the year ending 30 September 1979 are classified by commodity and truck type (as before) and truck size (based on the vehicle's tare weight).

Table 3.16 reveals the dominance of the heavy types of rigid and articulated trucks in the road freight task. Together, heavy rigid trucks (with tare weight 4 tonnes or over) and heavy articulated trucks (with tare weight 11 tonnes or over) account for more than 70 per cent of the total road freight task (tonne-kilometres performed by light commercial vehicles and all trucks).

1. Alternatively, the analysis of vehicle usage could be based on a classification of industry served. However, the service the road transport industry provides to itself needs to be clearly defined and detailed information obtained from those operators serving a number of other industries. The failure of the SMVUs in this respect imposes a major limitation on the industry estimates published.
2. As noted earlier, detailed commodity data are not yet available from the 1982 SMVU.

As noted earlier, of all commodities the 'sand, gravel, stone and earth' group accounts for the largest share of tonne-kilometres performed by rigid trucks. As expected, more than 90 per cent of the transport of this commodity group by rigid trucks is performed by the heavier vehicles. 'Processed food' and 'iron, steel and other metal products' are two of the more significant commodity groups carried by light rigid trucks (with tare weight under 3 tonnes) while the transport of 'processed food', 'livestock' and 'wheat' together account for about a quarter of the tonne-kilometres performed by trucks in the 3 to 4 tonnes tare weight category.

Although the transport of most 'processed food', 'livestock' and 'other manufactured goods' by articulated trucks is performed by the heavier vehicles, these commodities also account for significant proportions of the tonne-kilometres performed by vehicles in the two lighter categories of articulated trucks (with tare weights of 9 to 11 tonnes or under 9 tonnes).

ROAD FUNDING

Institutional framework

Each of the three levels of government in Australia (Commonwealth, State and local) has a significant share in road financing. The role of the Commonwealth is, however, restricted to the collection of revenue and provision of grants for roads to the other two levels of government except for road expenditure in the Australian Capital Territory. Both State and local government raise revenue and undertake expenditure on road works. By and large local government authorities are responsible for the unclassified road system in each State, chiefly local roads, although they have varying minor responsibilities for other roads (mainly a share of the maintenance of major roads passing through the municipality/shire). In addition, in some States, local government authorities undertake road works on behalf of the State road authority, for which they are reimbursed from either State or Commonwealth funds held by the State road authority.

Source of funds

Specific Commonwealth grants to the States for roads are currently provided under the *Roads Grants Act* (RGA) and the Australian Bicentennial Road Development (ABRD) Program. Funds provided under the RGA come from the Consolidated Revenue Fund and the Loan Fund. Funds are provided under the ABRD Program through a Trust Fund into which is paid the receipts from a 2 cents per litre excise duty on motor spirit and automotive distillate. Other Commonwealth fuel taxes (excise and crude oil production levies) are credited to consolidated revenue and are not earmarked for roads expenditure. The Commonwealth Government has also provided funds for unemployment relief under the Jobs for Local Roads (JOLOR) Program for 1983-84.

Apart from specific road grants from the Commonwealth, State governments also raise their own revenue for road purposes from a variety of taxes, chiefly motor vehicle registration charges, drivers' licence fees, and in all States except Queensland a State fuel tax (business (fuel) franchise duty). This revenue is largely earmarked for roads expenditure and State road expenditure from own resources is predominantly funded by this revenue. In New South Wales a considerable share of road expenditure is funded from State Treasury loans but a similar amount from the business (fuel) franchise levy is paid into consolidated revenue. In the Northern Territory road related taxes provide only a small share of road expenditure, the greater part being funded from consolidated revenue.

Local government authorities also raise their own revenue for road works but it is not specifically earmarked. The chief sources of revenue are rates and loans. They also receive reimbursements for road works from State road authorities and private developers or individual land holders. The BTE has found no evidence that local

TABLE 3.14—TOTAL ANNUAL TONNES CARRIED BY VEHICLE TYPE AND COMMODITY, 1978-79[a]

Commodity	Light commercial		Rigid trucks		Articulated trucks		Total	
	Tonnes (millions)	Per cent	Tonnes (millions)	Per cent	Tonnes (millions)	Per cent	Tonnes (millions)	Per cent
Livestock	0.9	1.4	14.1	2.6	13.8	4.7	28.8	3.2
Fresh fruit and vegetables	1.2	1.8	10.8	2.0	3.6	1.2	15.6	1.7
Other agricultural products								
Wheat	0.1	0.2	16.3	3.0	5.3	1.8	21.8	2.4
Other grains	0.3	0.5	8.7	1.6	7.5	2.5	16.5	1.8
Other products	3.5	5.3	18.7	3.4	16.6	5.6	38.9	4.3
Minerals								
Coal	–	–	8.8	1.6	30.0	10.1	38.8	4.3
Iron ore	–	–	0.4	–	0.3	–	0.7	–
Other minerals	0.2	2.7	11.9	2.2	10.3	3.5	22.4	2.4
Sand, gravel, stone and earth	0.8	1.2	212.6	38.6	57.2	19.3	29.6	
Processed food	3.8	5.7	25.0	4.5	19.2	6.5	48.0	5.3
Timber	1.8	2.7	11.3	2.1	21.4	7.2	34.5	3.8
Fertilizers	1.9	2.9	8.3	1.5	4.4	1.5	14.6	1.6
Petroleum and petroleum products	2.1	3.1	23.7	4.3	25.1	8.5	50.8	5.6
Cement, concrete and concrete products	0.8	1.2	49.8	9.0	11.2	3.8	61.8	6.8

TABLE 3.14 (Cont)—TOTAL ANNUAL TONNES CARRIED BY VEHICLE TYPE AND COMMODITY, 1978-79[a]

Commodity	Light commercial		Rigid trucks		Articulated trucks		Total	
	Tonnes (millions)	Per cent	Tonnes (millions)	Per cent	Tonnes (millions)	Per cent	Tonnes (millions)	Per cent
Iron and steel and metal manufactures								
Motor vehicles	–	–	2.3	0.4	2.1	0.7	4.4	0.5
Iron and steel, other metal products	6.7	10.0	20.6	3.7	19.4	6.6	46.7	5.1
Other manufactured goods								
Chemical products	3.1	4.7	5.0	0.9	4.1	1.4	12.1	1.3
Other manufactured goods	16.9	25.4	44.1	8.0	22.6	7.6	83.6	9.2
Other and not stated	22.4	33.6	58.2	10.6	22.1	7.5	102.7	11.2
Total	66.5	100.0	550.3	100.0	296.1	100.0	912.9	100.0
Per cent	7.3		60.3		32.4		100.0	

a. 12 months ending 30 September 1979.

– nil or rounded to zero

NOTE: Figures may not add to totals due to rounding.

Source: ABS, unpublished data on microfiche, relating to Survey of Motor Vehicle Usage, Twelve months ended 30 September 1979.

TABLE 3.15—TOTAL ANNUAL TONNE-KILOMETRES PERFORMED BY VEHICLE TYPE AND COMMODITY, 1978-79[a]

Commodity	Light commercial		Rigid trucks		Articulated trucks		Total	
	Tonne-kilometres (millions)	Per cent	Tonne-kilometres (millions)	Per cent	Tonne-kilometres (millions)	Per cent	Tonne-kilometres (millions)	Per cent
Livestock	33	1.5	802	5.7	2 703	8.3	3 538	7.4
Fresh fruit and vegetables	45	2.0	506	3.6	1 348	4.2	1 899	3.9
Other agricultural products								
Wheat	4	0.2	498	3.6	624	2.0	1 126	2.3
Other grains	17	0.8	321	2.3	1 351	4.2	1 689	3.5
Other products	140	6.3	674	4.8	1 489	4.7	2 302	4.8
Minerals								
Coal	1	–	59	–	846	2.7	906	1.9
Iron ore	–	–	4	–	9	–	13	–
Other minerals	3	0.1	128	0.9	439	1.4	570	1.2
Sand, gravel, stone and earth	30	1.3	3 050	21.7	1 901	6.0	4 981	10.4
Processed food	233	10.4	1 171	8.4	3 464	10.9	4 868	10.1
Timber	56	2.5	393	2.8	2 067	6.6	2 517	5.2
Fertilizers	22	1.0	330	2.4	799	2.5	1 151	2.4
Petroleum and petroleum products	45	2.0	771	5.5	2 138	6.7	2 948	6.1
Cement, concrete and concrete products	26	1.2	852	6.1	1 022	3.2	1 900	3.9

TABLE 3.15 (Cont)—TOTAL ANNUAL TONNE-KILOMETRES PERFORMED BY VEHICLE TYPE AND COMMODITY, 1978-79[a]

Commodity	Light commercial		Rigid trucks		Articulated trucks		Total	
	Tonne-kilometres (millions)	Per cent	Tonne-kilometres (millions)	Per cent	Tonne-kilometres (millions)	Per cent	Tonne-kilometres (millions)	Per cent
Iron and steel and metal manufactures								
Motor vehicles	–	–	142	1.0	377	1.2	520	1.1
Iron and steel, other metal products	319	14.3	781	5.6	2 483	7.8	3 583	7.4
Other manufactured goods								
Chemical products	36	1.6	181	1.3	653	2.0	871	1.8
Other manufactured goods	497	22.3	1 773	12.7	5 455	17.1	7 725	16.1
Other and not stated	725	32.5	1 570	11.2	2 723	8.5	5 018	10.4
Total	2 232	100.0	14 004	100.0	31 888	100.0	48 124	100.0
Per cent	4.6		29.1		66.3		100.0	

a. 12 months ending 30 September 1979.

– nil or rounded to zero

NOTE: Figures may not add to totals due to rounding.

Source: ABS, unpublished data on microfiche, relating to Survey of Motor Vehicle Usage, Twelve months ended 30 September 1979.

TABLE 3.16—TOTAL ANNUAL TONNE-KILOMETRES PERFORMED BY TARE WEIGHT AND COMMODITY FOR RIGID AND ARTICULATED TRUCKS, 1978-79[a]

(Million tonne-kilometres)

Commodity	Rigid trucks				Articulated trucks				
	Under 3 tonnes	*3 and under 4 tonnes*	*4 tonnes and over*	*Total rigid*	*Under 9 tonnes*	*9 and under 11 tonnes*	*11 tonnes and over*	*Total articulated*	*Total trucks*
Livestock	100	150	552	802	589	328	1 786	2 703	3 505
Fresh fruit and vegetables	104	93	310	506	120	116	1 112	1 348	1 854
Other agricultural products									
Wheat	23	120	354	498	85	83	456	624	1 122
Other grains	22	59	240	321	153	118	1 086	1 351	1 672
Other products	121	102	451	674	298	246	945	1 489	2 163
Minerals									
Coal	4	3	53	59	235	57	554	846	905
Iron ore	—	—	4	4	2	1	6	9	13
Other minerals	2	8	117	128	51	21	366	439	567
Sand, gravel, stone and earth	98	122	2 830	3 050	351	318	1 232	1 901	4 951
Processed food	173	159	838	1 171	512	254	2 698	3 464	4 635
Timber	80	75	238	393	324	315	1 429	2 067	2 460
Fertilizers	31	48	250	330	71	65	663	799	1 128
Petroleum and petroleum products	35	82	654	771	222	138	1 772	2 132	2 903
Cement, concrete and concrete products	48	72	731	852	145	87	791	1 022	1 874

TABLE 3.16 (Cont)—TOTAL ANNUAL TONNE-KILOMETRES PERFORMED BY TARE WEIGHT AND COMMODITY FOR RIGID AND ARTICULATED TRUCKS, 1978-79[a]

(Million tonne-kilometres)

Commodity	Rigid trucks				Articulated trucks				
	Under 3 tonnes	*3 and under 4 tonnes*	*4 tonnes and over*	*Total rigid*	*Under 9 tonnes*	*9 and under 11 tonnes*	*11 tonnes and over*	*Total articulated*	*Total trucks*
Iron and steel and metal manufactures									
Motor vehicles	1	11	130	142	70	79	228	377	520
Iron and steel, other metal products	156	98	526	781	333	303	1 846	2 483	3 264
Other manufactured goods									
Chemical products	25	21	136	181	67	49	538	653	835
Other manufactured goods	401	325	1 046	1 773	455	488	4 513	5 455	7 228
Other and not stated	408	233	929	1 570	434	226	2 063	2 723	4 293
Total	1 834	1 781	10 389	14 004	4 517	3 287	24 084	31 888	45 892

a. 12 months ending 30 September 1979.

— nil or rounded to zero

NOTE: Figures may not add to totals due to rounding.

Sources: ABS, unpublished data on microfiche, relating to Survey of Motor Vehicle Usage, Twelve months ended 30 September 1979.

government authorities have spent any significant amounts of Commonwealth personal income tax sharing grants on roads although it is usually not possible to distinguish such grants from rate revenue or loans in the publicly available data on local government budgets.

Finally, road works in the Australian Capital Territory are funded by the Commonwealth Government. Road user charges are levied in the Territory but they are credited to the Consolidated Revenue Fund and not earmarked to road works.

The BTE publishes data showing road expenditure by level of government by State, by year, by road category for both construction and maintenance (BTE 1982a).

The latest available data cover the years 1971-72 to 1980-81, and are summarised in Tables 3.17 and 3.18 below. The tables highlight the following key features:

- The decline in total road expenditure in real terms since 1977-78:
  - — the greater decline in Commonwealth funding from 1972-73 (this decline was, however, more than arrested with the ABRD Program in 1982-83);
  - — fluctuations in State road expenditure, but some increase in real expenditure over the nine years to 1980-81; and
  - — similar fluctuations in local government road expenditure with the 1980-81 level only slightly above the 1971-72 level.
- The introduction of the national highway system in 1974:
  - — and consequent decline in funding for the rural arterial roads system of which the national highways were a part prior to 1974-75.
- The steep decline in funds for urban arterial roads.
- The decline in the share of funds devoted to road construction (73 per cent in 1971-72 to 66 per cent in 1980-81) and the increased funding of maintenance activity:
  - — these later figures need to be treated cautiously however, due to the definitional problems with local government road expenditure data prior to 1979-80.

Comparisons with overseas countries

BTE (1982b) provides a comparison of road financing in Australia with that in five overseas countries—USA, Canada, Federal Republic of Germany, Great Britain, and New Zealand. Table 3.19 shows some of the more interesting comparisons. Road expenditure per vehicle, per capita or as a proportion of gross domestic product, is relatively high in Australia. However, because of the low population density in Australia and the consequent greater length of roads per capita, road expenditure per kilometre of road is low compared with other countries except New Zealand. In all six countries road expenditure declined as a percentage of GDP during the 1970s and per motor vehicle.

In Australia real expenditure per motor vehicle rose after World War II to reach a peak in the early 1970s but has since declined rapidly (Table 3.20).

INVESTMENT IN ROAD TRANSPORT

The capital infrastructure for road transport differs from that for rail in that the ownership of roads capital is divided into two quite separate components—the roads system is owned and maintained almost entirely by governments, whilst the operating vehicles and servicing functions are owned predominantly by private enterprise together with government business undertakings.

The large national investment in roads has been documented in the last section as over $2 billion per annum. The corresponding investment in vehicles and in the road freight industry is not known. Inquiries to the ABS, the Department of Industry and Commerce, and the Federal Chamber of Automotive Industries as to the *value* of sales of commercial vehicles and the value of the stock of such vehicles indicated this information was not readily available.

TABLE 3.17—TOTAL ROAD EXPENDITURE IN AUSTRALIA, BY STATE, YEAR AND LEVEL OF GOVERNMENT, 1971-82 to 1980-81[n]

($ million)

Year	*New South Wales*	*Victoria*	*Queensland*	*South Australia*	*Western Australia*	*Tasmania*	*Northern Territory*	*Australian Capital Territory*	*Total Australia*
1971-72									
Commonwealth	242.7	161.5	173.7	84.2	129.3	35.1	53.4	22.5	902.5
State	289.5	223.9	128.4	75.3	77.2	30.1	0.0	0.0	824.3
Local	340.4	120.8	92.9	53.4	15.5	22.5	1.5	0.0	647.0
Total	872.6	506.2	394.9	212.9	222.0	87.6	55.0	22.5	2 373.8
1972-73									
Commonwealth	260.2	173.5	174.7	87.9	135.9	36.8	49.4	47.6	966.0
State	318.0	210.2	130.0	66.4	75.8	29.3	0.0	0.0	829.6
Local	294.8	126.6	135.5	49.7	18.4	25.8	3.1	0.0	653.9
Total	873.0	510.3	440.2	203.9	230.1	92.0	52.5	47.6	2 449.6
1973-74									
Commonwealth	265.6	175.7	172.3	85.4	131.8	37.3	40.9	50.4	959.4
State	312.8	226.7	114.7	58.9	73.7	24.7	0.0	0.0	811.5
Local	297.1	137.8	126.4	49.8	44.4	22.8	3.0	0.0	681.4
Total	875.4	540.2	413.3	194.2	250.0	84.8	43.9	50.4	2 452.3
1974-75									
Commonwealth	248.2	182.9	179.8	66.8	108.3	42.1	35.1	48.7	911.8
State	296.9	228.2	116.8	61.2	57.9	20.2	0.0	0.0	781.1
Local	311.2	156.4	140.3	52.9	46.8	25.6	2.3	0.0	735.4
Total	856.3	567.4	436.9	180.9	213.0	87.9	37.4	48.7	2 428.4

TABLE 3.17 (Cont)—TOTAL ROAD EXPENDITURE IN AUSTRALIA, BY STATE, YEAR AND LEVEL OF GOVERNMENT, 1971-82 to 1980-81[a]

($ million)

Year	*New South Wales*	*Victoria*	*Queensland*	*South Australia*	*Western Australia*	*Tasmania*	*Northern Territory*	*Australian Capital Territory*	*Total Australia*
1975-76									
Commonwealth	260.5	176.1	170.0	74.6	112.2	58.6	39.6	50.8	942.3
State	295.6	214.5	112.0	54.6	62.1	22.1	0.0	0.0	760.9
Local	392.1	142.9	136.5	46.8	50.9	25.7	3.1	0.0	798.0
Total	948.2	533.5	418.6	176.0	225.2	106.3	42.6	50.8	2 501.2
1976-77									
Commonwealth	230.7	148.0	155.2	63.0	93.2	57.6	37.4	47.7	832.8
State	288.4	218.6	143.5	70.3	79.1	39.1	0.0	0.0	839.0
Local	326.8	153.2	117.0	49.5	52.5	24.6	4.0	0.0	727.4
Total	845.9	519.8	415.7	182.8	224.7	121.2	41.4	47.7	2 399.1
1977-78									
Commonwealth	236.4	146.6	150.1	59.5	91.9	41.4	37.0	58.7	821.6
State	342.2	233.9	138.9	62.0	77.8	39.9	0.0	0.0	894.8
Local	345.1	146.4	113.9	55.7	53.4	25.8	3.9	0.0	744.2
Total	923.7	526.9	403.0	177.2	223.1	107.1	41.0	58.7	2 460.6
1978-79									
Commonwealth	224.8	143.9	147.9	58.5	87.7	31.4	0.0	54.9	749.1
State	324.8	213.7	139.1	66.2	90.2	41.7	48.6	0.0	924.2
Local	350.7	150.4	111.2	55.0	59.5	26.6	0.8	0.0	754.2
Total	900.3	508.0	398.2	179.6	237.4	99.7	49.4	54.9	2 427.5

TABLE 3.17 (Cont)—TOTAL ROAD EXPENDITURE IN AUSTRALIA, BY STATE, YEAR AND LEVEL OF GOVERNMENT, 1971-82 to 1980-81[a]

($ million)

Year	*New South Wales*	*Victoria*	*Queensland*	*South Australia*	*Western Australia*	*Tasmania*	*Northern Territory*	*Australian Capital Territory*	*Total Australia*
1979-80									
Commonwealth	207.8	133.4	136.4	54.4	82.4	29.8	21.9	36.3	702.4
State	334.5	191.4	134.6	56.1	95.6	37.9	36.5	0.0	886.5
Local	210.6	155.5	125.7	50.0	47.6	21.8	2.3	0.0	613.5
Total	752.9	480.3	396.7	160.4	225.6	89.5	60.7	36.3	2.204.4
1980-81									
Commonwealth	199.5	129.4	133.2	52.2	79.0	36.6	21.1	19.2	670.2
State	335.0	176.5	132.2	55.3	87.7	34.7	33.9	0.0	855.3
Local	283.3	169.0	122.8	50.1	44.9	19.1	0.7	0.0	689.9
Total	817.8	474.9	388.2	157.6	211.6	90.3	55.8	19.2	2 215.4

a. Constant 1980-81 prices.

NOTES: See source for interpretation and qualifications of the figures in the table. The BTE Road Construction Index (BTE 1981a) was used to convert current prices to constant prices.
Figures may not add to totals due to rounding.

Source: BTE (1982a).

TABLE 3.18—TOTAL ROAD EXPENDITURE, AUSTRALIA, 1971-72 TO 1980-81[a]

($ million)

Categories	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	Total
Construction											
National roads	0.0	0.0	0.0	233.6	284.2	276.7	292.5	282.3	265.3	264.6	899.8
Rural arterial roads	416.4	444.3	416.7	301.3	301.5	291.1	282.0	282.8	297.1	261.7	3 294.9
Rural local roads	444.4	430.3	425.1	373.5	353.3	345.9	344.9	338.6	306.3	321.7	3 684.0
Urban arterial roads	623.7	674.6	673.6	510.9	455.0	412.3	435.1	419.7	385.1	354.1	4 944.2
Urban local roads	232.2	247.9	257.7	230.3	290.3	316.1	312.0	303.0	227.7	242.6	2 659.8
Total	1 716.3	1 797.0	1 773.4	1 649.6	1 684.3	1 641.8	1 666.3	1 626.3	1 481.6	1 444.9	16 481.5
Maintenance											
National roads	0.0	0.0	0.0	51.1	46.0	45.3	50.9	54.3	50.5	52.6	350.7
Rural arterial roads	201.6	201.2	214.8	208.8	193.8	190.6	188.8	181.0	182.1	171.0	1 933.7
Rural local roads	200.8	202.2	210.1	262.6	270.1	228.6	238.1	236.8	227.1	254.3	2 333.5
Urban arterial roads	58.3	60.8	63.0	79.1	77.2	81.4	87.6	95.2	78.8	76.7	758.1
Urban local roads	179.3	171.7	174.5	157.6	203.5	191.3	204.7	212.4	163.1	196.7	1 854.8
Total	639.8	635.7	662.0	759.1	790.5	735.6	770.6	780.0	701.2	751.6	7 226.1
Total construction and maintenance	2 356.8	2 432.8	2 435.5	2 408.3	2 474.9	2 376.6	2 436.9	2 406.2	2 182.7	2 196.6	23 707.3
Planning and research	16.9	16.9	16.9	20.1	26.2	22.5	23.9	21.3	19.8	19.0	203.5
Total road expenditure	2 373.8	2.449.6	2.452.3	2.428.4	2 501.2	2 399.1	2 460.6	2 427.5	2 202.4	2 215.4	23 910.3

a. Constant 1980-81 prices.

NOTES: See source for interpretation and qualification of the figures in the table. The BTE Road Construction Price Index (BTE 1981a) was used to convert figures from current prices to constant prices.
Figures may not add to totals due to rounding.

Source: BTE (1982a).

Purchases of *new* commercial vehicles (utilities, panel vans and rigid and articulated trucks) in Australia numbered 143 771 in 1981-82 and the *stock* of commercial vehicles registered at 30 June 1982 was 1 571 400. Excluding light commercial, purchases of new rigid and articulated trucks was 43 727 and the stock of these vehicles was 542 700.

The ABS is planning a Transport Industry Survey with respect to transport operations in 1983-84, with the results becoming available in 1985. This will be the first such survey and should provide comprehensive data on the number of operators, employment, capital investment in vehicles and other assets, the value of services provided, and other aspects of transport business. However, the fact that a significant share of transport activity is undertaken as ancillary to other economic activities will mean that even with a comprehensive survey of transport industries, there will still be a significant gap in available statistics about total transport activity.

TABLE 3.19—COMPARISON OF ROAD EXPENDITURE INDICATORS IN SIX SELECTED COUNTRIES, 1977-78

Country	*$ per vehicle*	*$ per capita*	*As per cent of GDP*	*$ per km*
Australia	288	139	2.35	2 403
Canada	310	170	2.00	4 500
Germany	280	100	1.50	13 000
Great Britain	144	47	1.20	7 529
New Zealand	92	62	1.06	2 079
USA	195	133	1 52	4 369

Source: BTE (1982b) and BTE estimates.

TABLE 3.20—ESTIMATED TOTAL AUSTRALIAN ROAD EXPENDITURE PER MOTOR VEHICLE: SELECTED YEARS, 1940-41 TO 1980-81[a]

Year	*Road expenditure ($ million)*	*Number of motor vehicles ('000)*	*Road expenditure per motor vehicle ($)*
1940-41	730	750	973
1945-46	375	1 300	288
1950-51	500	1 580	316
1955-56	900	2 246	401
1960-61	1 270	2 963	428
1965-66	1 800	3 878	464
1970-71	2 360	5 039	468
1975-76	2 501	6 581	380
1980-81	2 215	7 918	280

a. Constant 1980-81 prices.

Source: BTE (1979a), BTE (1982a), ABS (1978b).

CHAPTER 4—PARTICIPANTS IN THE ROAD FREIGHT TRANSPORT INDUSTRY

This chapter provides an overview of the road freight transport industry in terms of its organisational structure, the major participants in the industry and their representational arrangements. Other topics covered relate to transport user issues such as quality of service and pricing, and the impact of the industry on non-users of road transport services with respect to safety and environmental effects.

OPERATORS IN THE ROAD TRANSPORT INDUSTRY

Figure 4.1 outlines the organisational structure of operators in the road transport industry. The first distinction to be made is between the freight forwarder and the independent owner-driver or fleet owner. A major role of the freight forwarder is that of consolidation of freight. Once orders have been received, the forwarder can consolidate consignments of various densities in order to seek the optimum load in terms of both the maximum legal weight and the available capacity.

Freight forwarders may either provide a transport service nationally or concentrate on moving goods on specific routes. Furthermore, most forwarders are not restricted to the use of one transport mode and operate on a multi-modal basis. The freight forwarder may operate his own road fleet and employ his own drivers, but more commonly he engages hire and reward sub-contractors to provide the service for the customer on his behalf.

The second distinction to be made is between hire and reward and ancillary road haulage operations. Hire and reward operations involve the carriage of freight for another firm on a contractural basis. Ancillary operations involve the carriage of freight by vehicles owned by the firm and operated by employees of the firm. The freight operations are subsidiary to the main function of the firm.

The third distinction in the organisational structure of the road haulage industry is the dichotomy of the independent category into owner-driver and fleet owner operations. Apart from the individual who owns and is the sole operator of the vehicle, the definition of an owner-driver is somewhat clouded. A number of operators own more than one vehicle and employ drivers but still operate one of the vehicles themselves. In contrast, the fleet owner employs labour to drive the vehicles while undertaking the managerial functions of the firm. While there is an obvious overlap in the definitions of owner-drivers and fleet owners, the significance of the distinction is that current economic circumstances have tended to hit the smaller operators harder than the larger ones.

Hire and reward operators secure consignments on a contractual basis either directly from a customer or from a freight forwarder. The hire and reward operator who is contracted by a freight forwarder to complete the line haul is classified under one of the following categories:

- a tow operator who supplies a prime mover and is sub-contracted to tow a trailer from terminal to terminal;
- a 'painted' sub-contractor whose equipment bears the name of the forwarder and who is employed on a semi-permanent basis;
- an independent sub-contractor employed on an itinerant basis; and

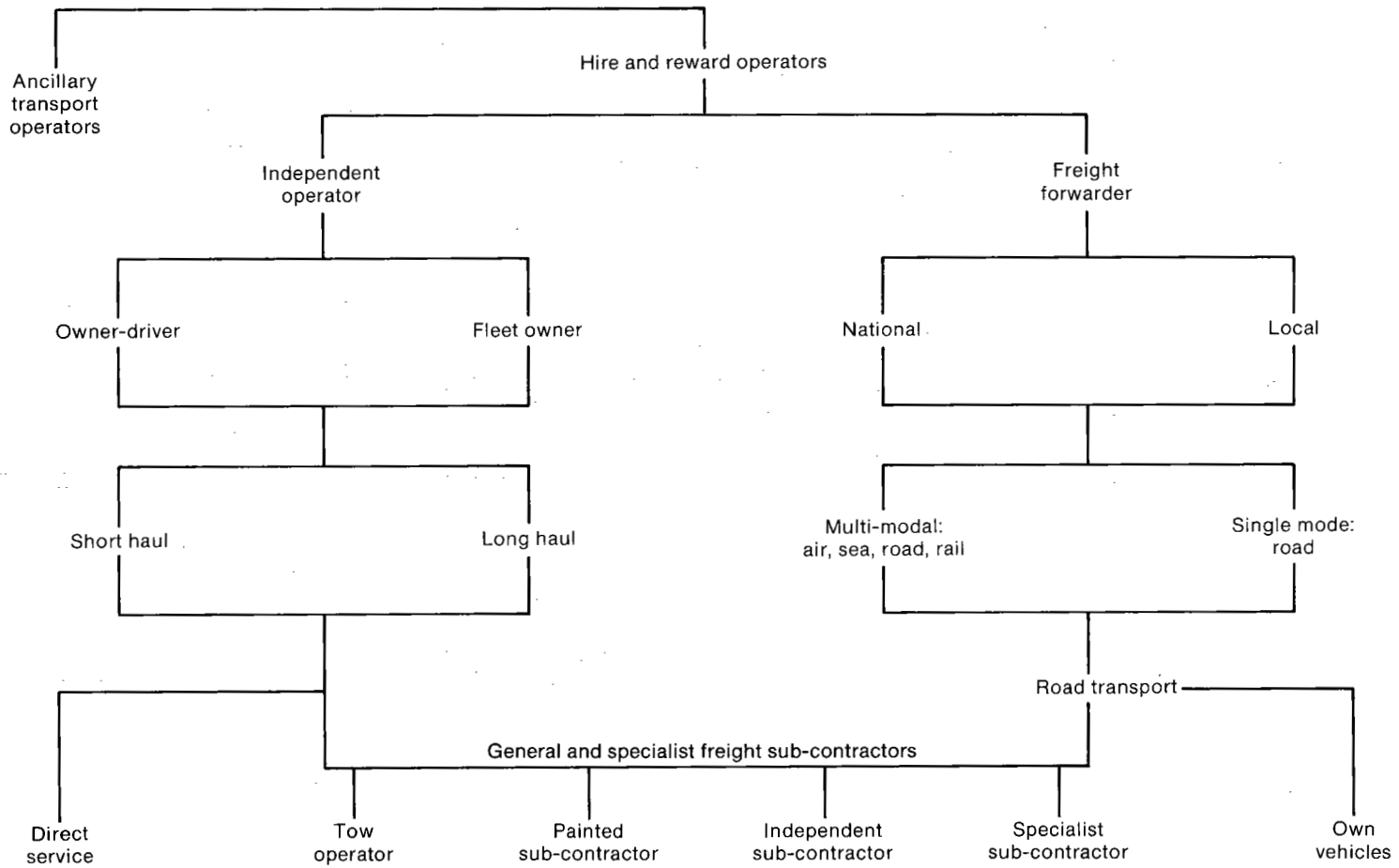

Figure 4.1—Operators in the road haulage industry

- a specialist sub-contractor who supplies specialised equipment for the carriage of particular commodities such as cement, sand or beer.

The number of operators in each of the major sectors of the road haulage industry is not known, and frequently a number of apparently conflicting estimates are available. This partly reflects problems of definition, and also changes over time with movements in and out of the industry, and internal changes. It also reflects the poor statistical coverage of the industry, and the poor representational arrangements referred to in the next section.

Three large Australian owned trans-national companies—TNT, Mayne Nickless and Brambles—dominate the freight forwarding business, and particularly the interstate activity. There is an unknown number of medium and small freight forwarders, with a tendency to greater area or product specialisation in the smaller firms. The National Freight Forwarders Association (NFFA) comprises only seven members:

- TNT Transport System;
- TNT Australia (also representing Ansett Freight Express);
- United Transport Holdings;
- Mayne Nickless;
- Tradex Transport Pty Ltd;
- Brambles; and
- IPEC.

There is no restriction on other freight forwarders joining the Association.

In 1982, the ABS Labour Force survey estimated the total number employed and self-employed in the road transport industry to be approximately 164 000. This figure includes categories like taxi-drivers and bus employees, but excludes the significant employment in ancillary transport activities.

The ABS 1981 Population Census classified 41 192 persons as self-employed drivers in the road transport industry.

The number of owner-drivers is not known. It is believed that most short-haul owner-drivers are members of the Transport Workers Union (TWU) and this number approximated 17 000 (this would include many carrier and delivery services in light commercial vehicles as well as trucks). The number of long distance owner-drivers was estimated by Hay at about 10 000 (Hay 1980). It is apparent that the definition of an owner-driver must be clearly established before these estimates can have much meaning.

ROAD FREIGHT INDUSTRY REPRESENTATIONAL ARRANGEMENTS

The representational arrangements which exist within the road freight industry have a significant bearing on the overall stability of the industry and on its economic performance. In this section, consideration is given to two matters:

- the representational structure which exists within the industry; and
- the industrial relations environment.

Representational structure

The representational structure of the road freight industry is fragmented to a significant extent which is to be expected given the diverse composition of the industry. The industry is comprised of three major groupings namely, employees, employers (prime contractors), and owner-drivers. Employees within the road freight industry are primarily represented by the Transport Workers Union. Employer interests are represented by numerous prime contractors associations of which the most prominent at the national level is the Australian Road Transport Federation (ARTF).

Owner-drivers, to the extent they join any organisation, are represented by the TWU and a myriad of associations at a regional and State level.

Unions

The main union representing employees in the road freight industry is the TWU except in northern Queensland where for historical reasons the Australian Workers Union (AWU) covers a significant number of industry personnel. Other unions which have a significant impact on the functioning of the industry are the Storemen and Packers Union (SPU) and to a lesser extent the Federated Clerks Union. Primary attention will be given to the TWU because of its dominant position in the industry.

The Federal TWU was established in 1912 and currently has a membership in the vicinity of 100 000 making it the largest union in the transport industry. Membership of the TWU comprises employees and owner-drivers. It is estimated that about 18 000 owner-drivers are members of the TWU of which approximately 17 000 are short haul owner-drivers and 1000 long distance owner-drivers.

The TWU is typical of a craft union with its members doing similar types of work spread across various industries (for example, airport tanker refuellers, interstate truck drivers). Coverage is given to all forms of transport by the TWU except for workers in the shipping industry. The TWU and the SPU had earlier proposed to amalgamate to form the largest tertiary sector union (membership 180 000) in Australia. However, the 1981 TWU Federal Conference rejected the amalgamation proposal.

The structure of the TWU is constituted around a federal organisation with State and territory branches. The Federal TWU is registered under the *Commonwealth Conciliation and Arbitration Act* as a trade union. The State branches are also registered in terms of relevant State industrial legislation as trade unions.

The TWU at the Federal and State levels is party to a multiplicity of awards, agreements and determinations numbering in the vicinity of 90. Some awards, agreements and determinations also apply to a number of unions jointly, such as the *Aircraft Industry Award.* There are three major parent awards at the Commonwealth level applicable to the road freight industry.

- *Transport Workers Award* covers firms whose main source of income is the distribution of goods and applies in all States except New South Wales.
- *Transport Workers (General) Award* covers government and statutory authorities whose transport function is ancillary to their main operations, except for South Australia where the award does cover a number of private employers.
- *Transport Workers (Mixed Industries) Award* covers smaller businesses whose transport function is ancillary to their main function.

Other awards which are applicable to the road freight industry include the *Transport (Interstate Drivers) Award* and the *Transport Workers (Interstate Long-Distance Haulage) Award* which applies to work in one or more States where the journey is more than 160 kilometres long.

The TWU also represents owner-drivers. In late 1980 the Federal TWU entered into an agreement with the ARTF on minimum sub-contract rates for long distance owner-drivers. The agreement is of a commercial nature with Commonwealth involvement being limited to trade practices implications. The Trade Practices Commission granted interim authorisation to the agreement on 7 September 1980 with full authorisation being granted on 4 March 1982. A similar agreement exists between the Long Distance Road Transport Association (LDRTA) and TWU New South Wales Branch. The LDRTA/TWU New South Wales Branch Agreement forms the basis of a contract determination made by the New South Wales Industrial Commission, while the ARTF/Federal TWU Agreement refers to *recommended* rates only.

Employer associations

A diverse range of associations exists within the road freight industry to represent prime contractors. Associations usually represent members on the basis of type of operation (for example, furniture removalist, taxi truck operators) and/or by geographical areas.

State level

The major associations which represent prime contractors at the State level are the State Road Transport Associations. These Associations undertake a wide range of functions from concerns with industrial relation matters to providing representatives for government and industry technical advisory committees. All of the State Road Transport Associations are members of the ARTF.

An illustration of how the State Road Transport Associations are organised is provided by the Victorian Road Transport Association which comprises various divisions and sections which are listed below.

- Freight Forwarders Division.
- Furniture Removers Division.
- General Goods Cartage Division:
  - —Armoured Car Section;
  - —Tip Truck Section;
  - —Bonded and Free Storekeepers Section;
  - —Waste Disposal Section;
  - —Country Operators Section;
  - —Refrigerated Transport Section;
  - —Parcel Messenger and Taxi-Truck Section; and
  - —Associate Section.

National level

The industry is represented at the national level primarily by the ARTF. The ARTF was formed in the late 1940s with the 'aim of providing a national forum for policy-making within the industry and to co-operate with government at all levels in all matters of legislation affecting the industry and road users generally' (Hay 1980, p11). The ARTF is a federation of nine associations, namely:

- New South Wales Road Transport Association;
- Victorian Road Transport Association;
- Queensland Road Transport Association;
- South Australian Road Transport Association;
- Western Australian Road Transport Association;
- Tasmanian Road Transport Association;
- National Freight Forwarders Association;
- National Furniture Removalists Association; and
- Australian Taxi Industry Association.

The ARTF's primary functions relate to negotiating with unions, notably the TWU, on logs of claims affecting parent industry awards and in making representations to government on industry problems (for instance, fuel excise, uniform carrier liability). Currently the ARTF has an application before the Commonwealth Industrial Registrar for registration of the Australian Road Transport Industrial Organisation (ARTIO) as a registered organisation pursuant to the *Commonwealth Conciliation and*

Arbitration Act.
The withdrawal from the ARTF in 1981-82 of the LDRTA, whose membership was primarily owner-drivers, has resulted in the ARTF representing mostly prime contractor associations (except for the Australian Taxi Industry Association). The implication this will have for the longer term functioning of the ARTF/TWU Agreement is not known at this stage. The recommended sub-contract freight rates have been effectively frozen since the February 1982 review. As a result of recessionary conditions affecting the economy, significant undercutting of the recommended ARTF/TWU Agreement rates is reported.

Owner-driver associations
While employers and prime contractors have a significant degree of cohesiveness and unity in their organisation, this is not apparent in respect to owner-driver associations particularly in regard to LDODs. The fragmentation of LDOD representation arrangements has been reported on at length in the Hay Report (Hay 1980). The Report recommended that an Australian Council of LDOD Associations be established with Commonwealth assistance for the first year for the purpose of:

- resolving industry conflicts;
- negotiating with prime contractors on freight rates; and
- articulating the industry's views to Government.

A number of attempts were made following the Hay Report's release in March 1980 for LDOD associations to establish a national organisation to represent their interests. The initial proposal by the industry to establish the Council of Australian Transport Operators (CATO) did not succeed. In April-May 1981 six long distance owner-driver organisations comprising the Professional Transport Drivers Association (New South Wales, Victoria and South Australian Branches), Australian Association of Transport Operators, Hunter-Valley Owner-Driver Association and the Australian Transport Association (Victoria) merged with the LDRTA to form a national association under the umbrella of the LDRTA organisation.

An attempt was made in late 1981 to gain an industry consensus when it was proposed that the LDRTA, Independent Truckers Association (ITA) and the Australian Council of Taxi Truck Operators (ACTTO) establish a national council to represent owner-driver interests. Dissension amongst the parties saw this initiative fail. In 1982 differences emerged within the LDRTA which gave rise to protracted legal proceedings over whether the 1981 amalgamation was valid in terms of the *New South Wales Trade Union Act* and the LDRTA's own rules. Justice Cahill ruled on 8 July 1983 that the amalgamation had indeed been invalid on both counts. At this stage it is not possible to determine what will be the consequences for the associations which were a party to the 1981 LDRTA merger. What the Hay Report found in 1980, namely that representation arrangements for LDODs were fragmented and inadequate, still appears to be the case three years later.

Industrial relations

Under this heading two matters are addressed:

- statistics on the extent and causes of industrial disputation within the industry; and
- specific industrial relations issues relating to the industry.

Industrial disputation statistics
Serious deficiencies exist in the statistical information on the road freight industry as to both the quality and quantity of information available. The utilisation by the Australian Bureau of Statistics of the Australian Standard Industrial Classification (ASIC) system which defines each range of economic activity only by primary classes, results in the majority of road transport activity which is performed as an ancillary function to industry being aggregated into other industry classes rather than being

included in the road transport industry collection. In the absence of a modal activity approach to compiling transport statistics only a partial picture of activity within the industry is revealed.

The statistics which are available are broken down only to the extent of the broad classification of the road transport industry, which includes both road freight and road passenger transport. A further problem with the official statistics is that they relate mainly to the operations of prime contractors.

Strikes

Details of strike activity in all surface transport modes are provided in Table 4.1. Average days lost per worker involved for each surface mode for the ten year period 1972-1982 were:

- road transport, 2.54 days lost;
- rail transport, 2.49 days lost; and
- water transport, 2.34 days lost.

However, these statistics are likely to understate the overall effects of strike action on each mode for a number of reasons, including:

- rail and sea disputes often involve relatively small numbers of workers but disrupt the whole system; and
- the reluctance of management to stand down road and sea employees who are not directly taking part in a dispute.

TABLE 4.1—INDUSTRIAL DISPUTES; SURFACE TRANSPORT INDUSTRIES; AUSTRALIA, 1972-1982

Year	Number of disputes	Total number of workers involved[a]	Working days lost		Estimated loss in wages ($'000)
			Total	Average	
		Road transport			
1972[b]	87	16 240	46 771	2.88	777.3
1973	74	14 740	27 143	1.84	410.1
1974	100	92 946	435 360	4.68	8 827.2
1975	53	35 850	45 271	1.26	1 143.1
1976	70	138 131	202 449	1.47	6 024.9
1977	62	44 507	48 788	1.10	1 627.4
1978	59	30 460	56 884	1.82	1 802.3
1979	41	8 700	13 681	1.57	480.8
1980	21	24 841	27 478	1.10	1 105.9
1981	42	29 898	152 888	5.11	7 183.0
1982	19	17 961	32 949	1.83	1 806.7
		Rail transport			
1972	53	89 801	125 809	1.40	1 815.9
1973[c]	83	28 099	39 453	1.40	791.5
1974[c]	64	23 484	65 800	2.80	1 137.8
1975[c]	56	79 542	83 553	1.05	2 050.4
1976[c]	67	131 699	147 142	1.12	4 255.2
1977[c]	85	53 272	110 931	2.08	4 248.0
1978	47	33 507	45 799	1.37	1 577.6
1979	31	63 973	146 248	2.29	5 175.5
1980	64	58 235	84 464	1.50	3 429.2
1981	69	23 667	38 089	1.61	1 761.1
1982	49	34 408	218 493	6.35	11 355.0

TABLE 4.1 (Cont)—INDUSTRIAL DISPUTES; SURFACE TRANSPORT INDUSTRIES; AUSTRALIA, 1972-1982

Year	Number of disputes	Total number of workers involved[a]	Working days lost		Estimated loss in wages ($'000)
			Total	Average	
		Water transport[d]			
1972	50	3 626	13 451	3.71	208.6
1973	52	10 843	26 603	2.45	452.9
1974	63	7 575	15 021	1.98	336.1
1975	74	10 138	17 872	1.76	542.5
1976	42	24 824	38 395	1.55	1 292.7
1977	56	7 326	12 858	1.76	511.2
1978	27	6 927	8 347	1.20	309.7
1979	31	6 095	8 984	1.47	336.8
1980	51	5 967	11 735	2.00	572.6
1981	77	5 751	31 599	5.49	1 797.2
1982	41	5 887	10 924	1.86	724.5

a. Includes workers directly and indirectly involved.
b. Includes air transport.
c. Includes air transport.
d. Excludes stevedoring.

Source: ABS (personal communication).

The sharp increase in strike activity in the road transport industry in 1981 (5.11 days lost per worker) resulted from a wage claim campaign. The TWU gained ARTF agreement for a $20 over award payment. However, the Commonwealth Conciliation and Arbitration Commission rejected the application as being outside the wage indexation guidelines. The resulting national road transport industry strike was protracted (except in New South Wales where the State Industrial Commission agreed to the $20 wage rise) and contributed to the Commission's decision to abandon the centralised wage fixing approach; the TWU subsequently gained the wage increase.

Causes of strikes

The causes of strikes in the road transport industry are primarily a result of claims for higher wages, which is evident from Table 4.2. The road transport industry has been relatively free from protracted strikes resulting from demarcation disputes which have characterised other surface transport modes.

Table 4.2 indicates that except for wages and hours of work disputes, the road transport industry has been relatively less affected by stoppages resulting from:

- managerial policy disputes;
- working condition disputes; and
- other, which includes leave and demarcation disputes.

It is these latter causes of disputes which often see the most protracted and most difficult strikes to resolve. The road transport industry does not suffer these types of disputes to the same extent as other sections of the transport industry, which may account in a large part for its better public image in respect to industrial disputes. Nevertheless, such a conclusion can be only tentative pending a detailed study of causes and effects of disputes in all transport modes.

Issues

A number of specific industrial relations matters which pose problems for

TABLE 4.2—WORKING DAYS LOST THROUGH INDUSTRIAL DISPUTES IN ROAD TRANSPORT AND IN ALL TRANSPORT BY CAUSE,[a] 1979-81

	Days lost					
	1979		1980		1981	
Cause	Road transport	All transport	Road transport	All transport	Road transport	All transport
Wages	57 810	309 766	1 308	43 412	16 187	255 112
Hours of work	5 393	6 681	919	4 485	1 137	14 869
Managerial policy	3 176	11 963	1 158	47 329	9 099	124 577
Working conditions	1 204	17 893	122	9 765	250	3 625
Other[b]	0	88 831	4 330	37 616	133	6 446
Total	67 583	435 134	7 837	142 607	26 806	404 629

a. Excludes stevedoring.
b. Includes leave, pensions and compensation provisions, trade unionism and other causes not specified.

Source: ABS (personal communication).

organisations and the industry overall are:

- dual Commonwealth and State registration of unions; and
- matters relating to owner-drivers (intra-union disputes, legislative provisions and arbitration processes).

Dual registration

The process of dual Commonwealth and State registration of unions has posed considerable problems for the TWU as evidenced by the outcome of the *Moore vs Doyle (1969) 15 FLR 59* case. The Court held in that case that the TWU New South Wales Branch was not a branch of the Federal TWU but a separate legal entity. The outcome was that the New South Wales TWU Branch split from the Federal TWU. This split between the organisations remained until early 1980 when the TWU New South Wales Branch rejoined the Federal TWU.

In response to the problems raised by the *Moore vs Doyle* case, the Commonwealth appointed Justice Sweeney to conduct an enquiry into the co-ordination of industrial organisations. Justice Sweeney's 1974 Report (Sweeney 1974) recommended that reciprocal legislation should be introduced by the Commonwealth and States which would enable State registered trade unions to become branches of Federal organisations. Legislation to give effect to this was passed by the Commonwealth but to date not all States have introduced corresponding legislation.

Intra-union disputes

A number of the most disputative industrial actions in the road transport industry have centred on intra-union disputes concerning TWU owner-driver members entering into the designated work areas of other TWU members involving the delivery of petroleum products in metropolitan areas. Major disputes occurred in 1978 involving Mr Leo Gorman and in 1980 involving Mr Leon Laidley, who were both petrol distributors and members of the TWU. In both cases Section 45D of the *Trade Practices Act* became the focus of the disputes.

Legislative provisions

The *Commonwealth Conciliation and Arbitration Act* coverage is limited to employees, with independent contractors (for example, owner-drivers) excluded from its coverage, except to the extent provided by Section 132 of the Act. Under this Section they may be covered by Industrial Arbitration in the States of New South Wales, Queensland, South Australia and Western Australia. The capacity of the TWU to enrol owner-drivers was considered in the Federal Court case of *Lineham v Transport*

Workers Union of Australia (1981). Justice Northrop's judgement in that case was as follows:

> 'That the rules of the Transport Workers' Union of Australia, an organisation of employees under the *Conciliation and Arbitration Act* 1904, contravene sub-section (1) of section 140 of that Act in a specified respect, namely that they allow persons not being employees as defined in sub-section (4) of section 132 of that Act to be eligible to become and to remain members of the union.'

The issue of coverage of independent contractors by the Commonwealth *Conciliation and Arbitration Act* is likely to be considered by the Committee of Review into Australian Industrial Relations Law and Systems which is to report to the Commonwealth Government by 31 March 1985. The terms of reference of the Committee are to examine, report and make recommendations on:

> '(a) all aspects of Commonwealth law relating to the prevention and settlement of industrial disputes;
>
> (b) all aspects of Commonwealth law relating to the recognition and operation of associations of employers and workers;
>
> (c) the extent to which and the manner in which the Federal and State industrial relations institutional and legislative arrangements might better inter-relate.
>
> Without restricting the scope of the Review, the Committee is also to inquire into and report as a matter of priority on such matters within its terms of reference as the Minister for Employment and Industrial Relations may request from time to time following consultation by him with the National Labour Consultative Council'.

Arbitration processes

The New South Wales *Industrial Arbitration Amendment Act* (1979) provides industrial coverage for certain contractors in the New South Wales road transport industry. The Act was introduced to implement the recommendations of the Industrial Committee 1970 inquiry into contract arrangements in the road transport industry (Industrial Commission of NSW 1970). The principal recommendation of the inquiry report (commonly known as the Beattie Report) was to give access to the Industrial Arbitration and Conciliation system by independent road transport contractors through the establishment of special tribunals. As previously noted, the agreement between the LDRTA and TWU uses this mechanism to cover the setting of minimum sub-contract cartage rates for owner-drivers in New South Wales.

The Federal TWU has made a number of requests for the Commonwealth Government to amend the *Commonwealth Conciliation and Arbitration Act* to bring about a situation which is similar to that prevailing in New South Wales. As consideration of the *Commonwealth Conciliation and Arbitration Act* is involved this would appear to fall within the ambit of the Committee of Review into Australian Industrial Relations Law and Systems.

TRANSPORT USER ISSUES

Level of service

The main qualitative aspects of a freight service are transit time, reliability of meeting expected times, the likelihood of loss, damage and theft, availability of capacity, convenience of departure times and frequency of service. Their relative importance will vary from shipper to shipper depending on the type of commodity being shipped, its manner of shipment (for example, in refrigerated cargo space, in bulk, in container loads, less than container loads, or in small packages), and the frequency of shipment. Users of freight services frequently regard combinations of these qualitative aspects as strongly influencing their choice of mode, besides the freight rate charged. A higher level of service will generally command a premium freight rate.

The Australian Railway Research and Development Organisation (ARRDO) published

several reports in 1980-81 based on its work program on mode choice . Among these were an analysis of modal competition on the Sydney-Brisbane and Adelaide-Perth corridors (ARRDO 1981c) and a survey of shippers and forwarders (ARRDO 1981b). The survey was conducted by questionnaire and interview and included both shippers (in this category were representatives of industries which appeared to be 'captive' to either road or rail as well as 'non-captive' firms) and freight forwarders. The survey included representatives of apparently 'captive' business if the potential for mode switching appeared to exist even if the present market appeared to be dominated by one mode.

Both shipper and freight forwarder respondents were asked to assess the following attributes:

- door-to-door transit time (using road or rail for the line-haul);
- reliability of meeting arrival time at destination;
- availability of capacity when required;
- frequency of service;
- freight rates (prices);
- avoidance of damage or deterioration;
- avoidance of loss or theft;
- convenience of time of departure; and
- communication with respect to problems.

These had been selected as a result of *a priori* reasoning, a literature search, discussions with rail marketing personnel and the results of a pilot study. In addition to an assessment of these qualitative aspects, an overall assessment of road and rail was requested from the respondents together with their expectations of the future for road and rail modes.

For shippers of manufactured goods, freight rates and the reliability of meeting arrival times at destination were the most significant attributes. Avoidance of damage or deterioration, communication with respect to problems and frequency of service were also important, but to a lesser extent than the freight rate and reliability aspects. This category of shippers felt that an improvement in the perception of the reliability of railway transport to meet arrival times would be the most effective way of increasing the share of traffic carried by rail.

For the non-manufactured goods category of shippers the freight rate was again the most important attribute followed by the availability of capacity when required, avoidance of loss or theft, reliability of meeting arrival times and communication with respect to problems. Improvements in freight rates and the capacity available were seen as most likely to increase rail's share of traffic.

For freight forwarders avoidance of loss or theft was ranked first, followed by the freight rate, and availability of capacity when required. However, in the case of freight forwarders, the results may have been affected by the relatively small sample size.

ARRDO researchers concluded that overall, while the relationship between road and rail freight rates was important and dominant for some commodities or shippers, service factors might outweigh price factors for other shippers. With better quality of rail service it was felt higher freight rates may be accepted by rail customers. The reliability attribute was found to be important to many customers. It reflected increased user costs caused by things such as delays to pickup vehicles, extra warehousing for buffer stocks, time spent by managers in tracing late consignments and perhaps sales foregone as a result of unreliability in the transport process.

A further Transport User Survey was conducted by the Commonwealth Department

of Transport in 1982. It covered 156 companies representing the major traffics carried both interstate and intrastate by road and rail[1].

These results provide useful insight into the relative weightings of modal attributes which determine the choice of mode and hence the tendency for mode shares to change. Over a period of time, however, these relative weightings may themselves change under the influence of changes in commodity flows, industry location and transport technology. There appears to be considerable scope for further work to be done in Australia on mode choice.

Road is clearly favoured over rail in terms of level of service factors by a wide range of shippers. This is reflected in evidence of road charging more than rail for a comparable journey, and road holding a dominant share of a commodity market where if offers no advantage in terms of freight rates[2]. What is not well known is the sensitivity of road/rail shares in the various markets and sub-markets to changes in the level of service provided by either mode, and hence the uncertainty as to the likely returns from upgrading the level of service.

One aspect of quality of service is the avoidance of loss or theft and here the current Inquiry by a Joint (Commonwealth and New South Wales Governments) Task Force on Security of Wharves and Containers is relevant. The Task Force will report on access to and the security of wharves and other places in New South Wales where containers used in the shipment of goods are held, and the adequacy of legislative and administrative arrangements and the practices of relevant private and public bodies. The investigation is seen as a pilot project and its findings may be used as a model for other States.

Pricing

The price paid by the user for door-to-door freight services comprises the freight rate on the line-haul segment, plus transhipping, pickup and delivery costs, and terminal charges.

The McDonell Report (McDonell 1980) drew attention to the comparative importance in the cost of railway services of terminal operations and handling and delivery charges, especially for small consignments of less than 25 kilograms. For this kind of traffic road haulage has a cost and flexibility advantage over rail. In contrast, rail transport has a competitive advantage for consignments over 10 tonnes.

The McDonell Report also recorded the concern expressed to the New South Wales Enquiry about the effect of congestion and delays at wharves and warehouses and in city traffic on handling and distribution costs associated with short haul urban road transport. It was pointed out that the alleviation of such delays could considerably reduce the total handling and distribution costs in which the line-haul element was a comparatively minor component. The assessment of the effect on costs of these delays would help public authorities to evaluate options on the placing and improvement of traffic flow facilities and the location of freight terminals.

On long distance freight haulage the results of the work undertaken by ARRDO on the Sydney-Brisbane and Adelaide-Perth corridors in 1981 provide a useful insight into the relative importance of freight rates (ARRDO 1981c). The conclusion of the ARRDO study was that greater use of the rail mode would only occur if the level of service was improved, and that if the latter was achieved, shippers would be likely to accept higher freight rates.

Transport operators will seek to pass on increases in their costs in higher prices,

1. This survey was conducted for the Rail Group of ATAC as part of the Action Plan for National Railway Development, May 1983. The results are available on request from the Rail Branch of the Department of Transport.

2. For an example of the latter case, see the evidence on modal shares and freight rates for slaughter cattle in BTE (1982c).

but for those freight corridors and particular commodities where haulage by an alternative mode or operator is possible, competition provides a check on increasing freight rates for whatever reason. The McDonell Report found that increasing downward pressure was being put on road haulage rates by the freedom of access and existence of many small operators in the industry, the existence of over-capacity and the wide range of bulk purchasing possibilities which in turn produced a range of costs for service provision. It is equally important to note that any subsequent changes to the road haulage industry which modified the degree of excess capacity will tend to also reduce the downward competitive pressure on road haulage rates. The impact on the modal split of any changes in road freight prices will depend on the competition from rail and the importance of quality of service factors for the type of commodity and the freight corridor concerned.

Two related issues are the provision of ancillary services and the pricing of back-haul runs. The first of these issues concerns the all-up price to a firm of providing its own distribution transport service. This may be done by operating a fleet of vehicles or employing tow-operators to haul company-owned trailers. Unless the size of the operation is very large and well-organised, capacity may not be used efficiently. Also if the operation is only associated with the primary function, say, of retailing, the degree of specialist managerial control may be less than if the transportation aspect was the major activity of the firm. To provide this ancillary transport function in-house may prove to be an expensive luxury unless the benefits in terms of access, reliability and security are substantial. A real alternative may be a firm operating as a contractor to provide the specialist distribution function. There is already a move in this direction with the operations of Linfox for large retailing chains being an example.

The issue of pricing back-hauls concerns the user and the provider of the service. It appears that road hauliers associations may sometimes encourage their members to regard all hauls as 'outward' when quoting rates, regardless of direction. This does not recognise the value to the haulier of getting back-haul loadings which will cover the extra costs of taking on the load (essentially loading and unloading costs and slightly higher operating costs), and in addition provide some contribution to the overhead costs of the round trip. The per kilometre rate involved can be less than the average cost per kilometre for the round trip and still contribute to the haulier's net revenue for the trip. At the same time the freight rate may induce freight which might not have otherwise done so to move on road. In fact it appears that it is very often the ability of road hauliers to appropriately choose and price their multiple trips and trip patterns, that enables them to effectively compete with the railways[1].

The available data on road freight rates applying in Australia are far from adequate. The BTE's quarterly *Transport Indicators* includes two series: the scheduled rates set by several freight forwarders, and estimates of the maximum and minimum rates received by sub-contractors. Actual rates paid to freight forwarders are known to be below the scheduled rates in most instances (BTE 1983b).

Freight forwarders' rates in real terms increased sharply from mid-1979 to the third quarter of 1982, while sub-contractors' rates have remained relatively constant in real terms since 1977. Freight rates for both groups have declined over the past year (BTE 1983b).

Inventories

Level of service factors affect the level of inventory costs with respect to holdings of both inputs and outputs and these factors may affect mode choice. The reliability of arrival times at the destination together with transit time are probably the most

1. For a discussion of road haulage freight rates strategies and some examples of common multiple trip patterns in NSW, see BTE (1976).

important level of service factors to affect inventory cost. To a lesser extent the probability of damage or loss during transit may be important for some commodities so that the necessary buffer stock level would again need to be higher.

Given an acceptable level of these service factors the shipper will adjust his demand for the transport service to take into account the cost of inventory holding (including warehousing, interest on value of stocks and depreciation or obsolescence), and the freight rate as it varies with the mode, number and size of shipments, so as to minimise the total stock delivery cost.

Technology

Improvements in technology in the haulage industry can benefit the operator, and ultimately the user of the service, by raising the quality of level of service in general, lowering the costs of providing the service and/or improving the type of service which can be offered to the shipper.

The reliability of meeting arrival times at destination is a service attribute rated highly by shippers. Hence improvements in technology which speed up the line-haul segment, or improve the efficiency of handling and pick-up and delivery services, will potentially improve the reliability factor.

The McDonell Report drew attention to the comparatively high terminal costs associated with rail transport and the need to streamline this aspect of rail freight services (McDonell 1980).

The ARRDO survey (ARRDO 1981b) recorded the concern of shippers interviewed in the survey with the 'communication with respect to problems' attribute. These concerns included the ability to supply requested information, for example about the expected time or date of arrival of a shipment and ability to locate shipments in transit. Apart from the managerial factors involved in such matters, the extension of computerised documentation and consignment monitoring systems could assist in overcoming these complaints and improve the perceived quality of service offered by the rail mode. While users of the road haulage mode would logically have similar requirements in these respects to rail users it is not known whether they constitute a significant source of complaint.

Improvements in technology which affect vehicle performance and capital costs, and specifications of prime mover/trailer combinations all influence costs per tonne-kilometre and therefore are ultimately of interest to users of the service. Of current interest is the imminent release of new low cost trucks, the capital cost of which is expected to be considerably lower than equivalent currently available models. If these vehicles perform satisfactorily under Australian conditions and are widely adopted, they will provide a potential avenue for operators to either offer lower rates or offset increases from other causes against lower capital costs. This will place further pressure on hauliers operating with high cost vehicles, particularly if they do not have access to economies of bulk purchasing. After a period of adjustment this may affect not only freight rates, but also the level of vehicle capacity in the road haulage industry.

NON-USER ISSUES

Safety

While classified here as a non-user issue, truck safety is clearly of great importance to truck drivers and owners, to owners of the freight, to other motorists, to roadside property owners, and to the community as a whole. The involvement of road haulage vehicles in crashes, and technical aspects of commercial vehicle safety, operation and maintenance were examined in some detail in the McDonell Report.

A research paper published in association with the McDonell Report (Pearson-Kirk 1980a) provides useful insights into safety aspects of road haulage vehicles which

tend to justify community concern for suitable standards. The paper points out that the accident *rates* may be quoted in a number of different ways and that care is required in interpreting such figures. It notes that in several countries the number of persons killed, injured or involved in crashes is considered more important than the accident *rates*, where the number of accidents by certain vehicle types are related to their relative exposure. This distinction seems useful when considering the different views on the subject.

The paper found that in 1977 trucks contributed to the number of fatal accidents disproportionately more than the numbers on the New South Wales register would suggest. This was particularly the case for articulated trucks. The latter conclusion held even when fatal crashes involving articulated trucks were related to an exposure variable such as average annual distance travelled. Accidents involving trucks in New South Wales were more severe on average in rural than in urban areas and articulated trucks were more often involved than rigid vehicles. It was also found that trucks were more frequently involved in accidents with other moving vehicles than cars. Trucks were involved in fewer single vehicle fatal crashes than other vehicles. Articulated trucks were involved in more vehicle-to-vehicle fatal crashes than rigid trucks, particularly in head-on crashes. Thus not only was danger involved for heavy freight vehicle drivers but also for other road users.

Contributing causes of truck accidents were found to be strongly related to the number of hours spent at the wheel per week by the driver and other factors also related to fatigue. Driver attitudes to regulations such as those relating to speed and overtaking were also found to be significant.

The Department of Motor Transport (DMT) in New South Wales set up a specialised group of motor vehicle inspectors to check the condition of heavy trucks using New South Wales roads. This followed a number of serious and fatal crashes in 1979 and the realisation that many heavy trucks operating in the State were poorly maintained. The current report of Heavy Vehicle Inspections for the year ended 30 June 1982 (DMT 1983) shows that a significant proportion of heavy haulage vehicles were defective at inspection, particularly prime movers. The most common faults, regardless of severity, were in vehicle lighting systems. The most common major and extremely dangerous defects were in braking systems, tyres and steering systems. These results support the comments made in the McDonell Report on technical safety matters.

The vehicle inspection report noted that since the commencement of the Mobile Inspection Division's activities in 1979, there is evidence of a reduction in the defective vehicle rate, but there is scope for further improvement with more than one-in-twelve heavy vehicles still having major defects. It is proposed to expand the program for improving heavy vehicle safety to provide for annual inspections of these vehicles by New South Wales Government officers.

Two other factors which could be expected to influence the safety record are the road condition, and the extent to which overloading and poor loading occurs. The major investments incurred and planned for road upgrading, including the extensions of divided highways on the major intercapital city routes, should contribute to greater safety. The problem of overloading appears to be serious and this aspect is referred to again in Chapter 5.

Environmental issues

These effects can be broadly grouped under the headings of emissions, noise, intrusion of privacy and loss of amenity. Emissions cover lead compounds, oxides of nitrogen, carbon monoxide, hydrocarbons, smoke and odours. Petrol driven vehicles contribute the greatest proportion of all of these emissions except smoke and odour emissions which are caused predominantly by diesel-driven vehicles as well as by causes not originating in vehicles. Exhaust smoke, particularly that from

diesel vehicles, contains carcinogenic compounds (State Pollution Control Commission 1980). Smoke and particulate emissions for diesel driven trucks may be 10 times those for a passenger car and possibly more if operating with heavy loads or if the engine is poorly maintained.

In New South Wales the *Clean Air Act* provides for the control of emissions from all motor vehicles. This Act empowers the Minister for Planning and Environment to prohibit the use of motor vehicles in any area and at any time considered necessary. Regulations under the Act may cover the operation, inspection and testing of motor vehicles and the fuels used in their operation. Enforcement of the regulations limiting visible smoke from motor vehicles exhausts and the monitoring of pollutants in the atmosphere are carried out in New South Wales by the State Pollution Control Commission.

For new petrol-driven vehicles the Australian Design Rule No 36 for Exhaust Emission Control for Heavy Duty Vehicles (1976) and Australian Design Rule No 27A for Vehicle Emission Control (1978) apply in order to limit fuel evaporative and exhaust emissions from passenger cars and their derivatives. In the case of diesel-fuelled vehicles, Australian Design Rule No 30 for Diesel Engine Exhaust Smoke Emissions applies.

Considerable research on vehicle emissions in general and with particular emphasis on lead emissions has been undertaken by the Commonwealth Committee on Motor Vehicle Emissions; a major report was made to ATAC in 1981 (COMVE 1982).

Noise pollution has been addressed in some detail in two supplementary papers published with the McDonell Report (Pearson-Kirk 1980b, Lawrence and Burgess 1980). This work found noise pollution from traffic to be significant in the Sydney Metropolitan Area and trucks, notably those with diesel engines, were the principal contributors. It was considered necessary that noise levels be reduced at their source and new Australian Design Rules and in-service truck noise limits be implemented. The State Pollution Control Commission has compiled draft regulations on noise limits for trucks. The New South Wales Government has also considered introducing road traffic noise charges.

Intrusion of privacy and loss of amenity are affected by noise vibration levels and visual nuisance associated with heavy traffic, particularly road haulage vehicles. It is believed that studies on these considerations in Australia have been predominantly carried out by or for municipal authorities and civic protest groups or as part of environmental impact statements.

CHAPTER 5—ROAD TRANSPORT ISSUES

This chapter examines seven broad topics which are considered to be particularly important aspects of the economic issues facing this Inquiry.

These are:

- the impact on the road freight industry of the general state of the economy;
- the economic position of road haulage operators with respect to incomes, debt levels, bankruptcies and truck finance;
- the constitutional and legal framework for transport policies in Australia;
- the regulation of road/rail competition, and also regulation of entry and operational standards in road transport;
- road taxation, cost recovery and pricing;
- the further involvement of governments through the provision of road and rail infrastructure; and
- developments in technology, resource costs, productivity, management and communications affecting road transport.

These seven topics are not independent and their treatment sequentially may tend to obscure some of the complex interrelationships operating in the industry. The aim is to present the main facts and theoretical guidelines in some detail in this chapter, and then in Chapter 6 to attempt to pull the threads together and indicate the broad characteristics and pressures for change which appear likely to dominate future developments in the industry.

GENERAL STATE OF THE ECONOMY

It is widely acknowledged in the press and elsewhere that recently the road freight industry in Australia has been subjected to particularly 'hard times'. A key issue which the National Road Freight Industry Inquiry must address is the extent to which the industry's current problems reflect the depressed conditions in the economy as a whole. With a return to a long-run trend rate of growth in the economy, will most of the current problems of the industry disappear? Expressed in a different manner, are the current problems mainly cyclical in nature, or do they reflect fundamental structural problems with respect to, for example, the ownership structure of the industry, the number and type of vehicles and their utilisation, or the regulation and pricing of freight services?

There are no black and white answers to these complex questions, but it seems certain that the industry's current problems do reflect some mix of cyclical and structural conditions. This section examines the available data on movements in road freight and total freight activity, and compares these with movements in total economic activity (as measured by Gross Domestic Product at constant prices).

Unfortunately these comparisons are far from satisfactory. The infrequent observations of freight activity provide a rough guide to general trends, but do not allow us to compare major turning points in freight activity with those in general economic activity.

Table 5.1 shows growth rates in real Gross Domestic Product (GDP), total freight,

and road freight for six periods between 1949-50 and 1981-82. The periods selected are governed entirely by the few years for which road freight data are available. Also as noted in Chapter 3, the road freight data are from ABS surveys and hence are subject to sampling error.

Despite the limitations of the statistics, several major developments in the road freight industry are apparent from Table 5.1:

- the road freight task, as measured by total tonne-kilometres performed, has grown consistently faster than total economic activity over the past 30 years;
- in the period 1970-71 to 1981-82, economic growth has been considerably slower than in the preceding two decades, while the growth in the road freight task appears to have accelerated to more than double the growth rate in real GDP; and
- between 1975-76 and 1981-82, the road freight task has grown significantly faster than the total freight task.

These figures should be interpreted with regard to the relationship between economic activity and transport activity. The demand for road freight transport services is derived from the demand for intermediate and final goods which require transport services in their production or distribution. Aggregating this derived demand for transport over all goods will provide a relationship between the level of freight transport activity and the level of overall economic activity. However this relationship may vary significantly over time due to changes in the composition of national output (and the differing transport requirements of different sectors of the economy) and the location of production and consumption centres.

In Australia there have been significant changes in the composition and location of economic activity, particularly those associated with developments in mineral production and processing. As mineral production generally has a high transport component associated with it, it is hypothesised that these developments will have had a major impact on the freight task which is not directly related to the growth in real GDP. Also, on a year to year basis, fluctuations in rural output, particularly grains, have had a significant impact on the Australian freight task.

This variability in the freight task through time, and the lack of stability in the relationship between the total freight task and real GDP, is supported by the limited evidence available in Table 5.1.

TABLE 5.1—MOVEMENTS IN DOMESTIC TOTAL FREIGHT TASK AND ROAD FREIGHT TASK AND REAL GROSS DOMESTIC PRODUCT, 1949-50 TO 1981-82

(per cent)

Period	*Average annual change in*				
	Real GDP	*Total freight*		*Road freight*	
		Tonnage	*Tonne-kilometres*	*Tonnage*	*Tonne-kilometres*
1949-50 to 1959-60	4.3	na	4.8	na	5.0
1959-60 to 1964-65	5.0	na	6.3	na	5.5
1964-65 to 1969-70	5.4	na	9.6	na	7.4
1970-71 to 1975-76	3.5	2.2	7.5	1.0	6.1
1975-76 to 1978-79	2.8	5.0	2.0	6.5	9.4
1978-79 to 1981-82	2.3	na	1.9	na	7.7

na not available

Sources: ABS (1983a), Commonwealth Bureau of Roads (1973) p81, Table 3.1 of this Submission.

Looking to the more recent period, economic activity in Australia has declined (negative growth) over the past 18 months. In the June quarter 1983, real GDP (seasonally adjusted) was 4.6 per cent below the peak level reached in the September quarter 1981.

No satisfactory indicators are available of the impact of this slump in economic activity on road freight activity. Press reports have suggested a serious downturn in activity and competitive price cutting in road freight. It is also claimed that freight forwarders and other users of road and rail transport have cut back more severely on road freight in the downturn because they have contractual arrangements to carry certain quantities by rail.

Two partial indicators of road freight activity, namely automotive distillate sales for road use, and truck movements through checking stations, diverged through 1982. Automotive distillate sales for road use rose sharply up until August 1982 (Department of Transport and Construction 1983), but this indicator was no longer available after this date, with cessation of the Diesel Fuel Certificate Scheme. The second measure comprises a truck count index compiled for a small number of truck checking stations in New South Wales and Queensland. This index peaked in the September quarter 1981 and subsequently fell sharply by 19 per cent to the March quarter 1983 (BTE 1983b). However the partial nature of this indicator of road freight activity must be stressed; it relates to a few locations in two States, and to the number of trucks taking no account of load factors.

One negative conclusion is that the currently available direct and indirect measures of road freight activity in Australia are inadequate for normal business planning, and the economic analysis of developments in the road freight industry. Some current initiatives to improve the information base are referred to later in this chapter. However the evidence does point to one important positive conclusion—that road freight activity has been responsive to changes in real GDP and appears to have risen (and fallen) more than proportionately to rises (and falls) in real GDP. In the 1970s, road freight activity grew at more than double real GDP, although this probably reflects in part other factors such as the stimulus from deregulation of road freight. Correspondingly the limited evidence suggests road freight activity may have declined more than general economic activity in the recent slump. This relationship suggests that the currently forecast recovery in economic activity should be accompanied by a strong recovery in the road freight sector.

ECONOMIC PROBLEMS OF ROAD HAULAGE OPERATORS

Very little is known about the economic and financial status of truck operators. Moreover the fact that truck operators are not a fixed population but may easily move in and out of other occupations makes it particularly difficult to make generalised statements about their economic status.

This section reports on the findings of two small surveys of long distance owner-drivers (LDODs), the taxation statistics for transport companies, the incidence of bankruptcies, and the provision of truck finance. All the information presented is incomplete in one way or another, often out-of-date, and is generally inconclusive as to whether the economic problems facing the road haulage industry are more or less severe than those facing other business activities.

A recent development is the change in the income tax collection arrangements for contract work and services in a number of specified industries including road transport. From 1 September 1983, persons making prescribed payments are required to deduct tax from these payments (known as withholding tax). There have been administrative difficulties in establishing the system, along with confusion in the road freight industry about its application beyond sub-contractors to prime contractors. The imposition of these arrangements may add to the cash flow difficulties of some owner-drivers, although it is too early to evaluate the likely overall impact.

Department of Transport surveys

The Commonwealth Department of Transport commissioned the Department of Science and Technology to undertake two interfirm comparison studies of LDODs. The first study, covering the 1979-80 financial year, was confined to a survey of 113 LDODs in the eastern States and South Australia. The second study covered the 1980-81 financial year and the survey coverage of 161 LDODs was extended to include Western Australia.

The objectives of these studies were firstly, to obtain a financial and operational profile of LDODs and secondly, to provide participants in the surveys with a basis upon which to assess their own financial performance compared with that of others in the industry. Because of the small size and non-random nature of the survey samples, the results need to be interpreted with caution.

The major findings from both surveys were that LDOD operations were characterised by:

- long working hours of up to 80 hours per week per LDOD;
- a significant level of indebtedness in the range of $32 000 to $35 000 per truck; and
- low profitability.

From the 1980-81 survey, the average operating surplus was $41 400 which, after deducting imputed wages of $23 500 (based on 79 hours work per week at the award wage), left a residual operating surplus of $17 900. This figure, however, conceals marked variations according to size and type of operations. For example, the average operating surplus per operator (after deducting imputed wages) was $8 000 for single truck operators and $53 400 for multiple truck operators. Also, the average operating surplus (after deducting imputed wages) for carriers of general freight was $12 900, while the corresponding average for carriers of specialist freight was $30 700.

Taxation statistics

Information is available from taxation statistics on the financial position of private and public companies in the road transport industry, but the financial position of sole traders and partnerships in the industry is not separately identified in published statistics.

Summary statistics for the 10 years to 1979-80 (the last year for which data are available) are shown in Table 5.2.

The number of public companies in the road transport industry declined from 259 in 1971-72 to 113 in 1979-80, and there was a sharp increase in average taxable income per company. This indicates a substantial trend to amalgamation and rationalisation of ownership amongst the larger enterprises, and is consistent with the frequent reports of takeover activity by the major freight forwarders.

The number of private companies in the industry has remained relatively constant at between 3600 and 4000. A feature is the high and increasing proportion of non-taxable private companies in the road transport industry, but it is noted that a similar trend is apparent for all private companies. A comparison of average taxable incomes of private road transport companies with those of all private companies indicates roughly comparable trends in the taxable incomes of the two groups.

Bankruptcies

Concern has been expressed about the high level of bankruptcies in the road haulage industry. Earlier work has suggested that the bankruptcy rate of owner-drivers was not exceptionally high when compared with that of the self-employed in other industries (Rosengren and Webb 1980). It concluded that the main factors responsible for

TABLE 5.2—COMPARISON OF ROAD TRANSPORT COMPANIES WITH TOTAL COMPANIES, 1969–70 TO 1979–80

Type of company	*1969-70*	*1970-71*	*1971-72*	*1972-73*	*1973-74*	*1974-75*	*1975-76*	*1976-77*	*1977-78*	*1978-79*	*1979-80*
Road transport companies											
Taxable											
Private (number)	2 227	2 187	2 154	2 182	1 983	1 876	1 621	1 305	1 086	1 047	1 063
Public (number)	214	199	196	163	147	138	127	92	79	68	72
Taxable and non-taxable											
Private (number)	na	na	3 683	3 856	3 761	3 654	3 812	3 887	3 854	na	3 962
Public (number)	na	na	259	234	226	198	181	154	130	na	113
Total companies											
Taxable											
Private (number)	78 710	83 116	87 151	89 982	88 652	83 495	80 739	72 725	66 214	63 720	60 920
Public (number)	10 757	10 857	10 491	10 661	10 688	10 269	10 113	9 628	9 359	9 060	9 048
Taxable and non-taxable											
Private (number)	na	na	171 240	182 778	186 924	184 808	194 233	196 116	195 998	na	194 085
Public (number)	na	na	16 789	17 038	16 617	16 351	16 225	15 876	15 660	na	14 329
Average taxable income											
Road transport companies											
Private ($'000)	12	12	12	14	16	19	17	18	20	22	27
Public ($'000)	112	129	113	151	230	325	210	230	336	613	924
Total companies											
Private ($'000)	14	14	14	17	19	21	24	26	26	28	33
Public ($'000)	255	262	297	346	460	505	582	672	715	831	1 147

na not available

Source: Australian Taxation Office (1982).

bankruptcy were liquidity problems, lack of business acumen, economic conditions and industrial disputes (Webb 1980).

Table 5.3 shows bankruptcies for the owner-driver sector of the road haulage industry, and for comparison, total bankruptcies in Australia for the business sector of the economy, over the 10 year period to 1981-82. Unfortunately later data are not available to indicate the impact of the recent economic recession. Also, the allocation of bankruptcies to occupational groups is subject to some degree of uncertainty and error.

The annual number of bankruptcies in the road haulage sector has been about 300 in recent years, which represents about one per cent of the estimated total owner-driver population.

While no clear trend in bankruptcies is apparent in the owner-driver sector relative to total business bankruptcies, there was a marked increase, in absolute terms, in both the road transport sector and total bankruptcies over the latter half of the decade. Hence while there is clear evidence of an increase in the incidence of bankruptcies in the road transport industry in the late 1970s, it appears this trend was common to unincorporated businesses as a whole.

Truck finance

The BTE has no objective information on which to base any evaluation of the claim that 'easy finance' has been a significant factor in encouraging over-supply in the industry and entry by persons with inadequate business skills.

Informal contact with finance industry officials has indicated that in the long distance sector, currently at least one in three trucks on the road is subject to some type of financial arrangement, being either leased or acquired by hire purchase. The break-up between leasing and hire purchase is approximately 60:40. While details of the financial arrangements are not available, the BTE has been advised that over the past few years the amount of a loan or lease has increased in line with the increase in the price of new vehicles. Consequently, those entering into either type of financial arrangement are required to pay higher monthly repayments than a few years ago.

Subject to meeting certain provisions, tax concessions are available for owner-drivers

TABLE 5.3—BANKRUPTCIES, DEEDS OF ASSIGNMENT, DEEDS OF ARRANGEMENT OR COMPOSITIONS; AUSTRALIA, 1972-73 TO 1981-82[a]

Year	*Total for all occupational groups (number)*	*Drivers in road transport*	
		(number)	*(per cent of total)*
1972-73	1 685	210	12.5
1973-74	1 260	143	11.3
1974-75	1 506	153	10.2
1975-76	1 490	152	10.2
1976-77	1 502	127	8.5
1977-78	2 046	196	9.6
1978-79	2 440	339	13.9
1979-80	3 158	339	10.7
1980-81	2 729	328	12.0
1981-82	2 857	272	9.5

a. Business category only.

Source: Attorney-General (1983)

when purchasing new vehicles[1]. An investment allowance of 20 per cent for vehicles ordered after 1 July 1978 is applicable up to 30 June 1985. In common with other small businesses, road hauliers are also entitled to deduct interest charges and a depreciation allowance (either 20 per cent per annum simple or 30 per cent per annum reducible) from their taxable income. Leasing charges are also tax deductible although no depreciation allowance is granted as this has already been included in the leasing charge.

Finance companies have indicated that currently it is considerably more difficult to obtain finance than when the trucking industry was reasonably buoyant. Tighter credit controls are now acting as a barrier to potential entrants into the industry. In this way the credit market is supportive of the normal market signals in working to reduce the rate of entry into the industry in a period when returns are low.

CONSTITUTIONAL ISSUES

Some understanding of the constitutional and legal framework with respect to transport in Australia is necessary to appreciate the present issues facing the road transport industry, particularly those concerning the regulation and cost recovery from interstate transport.

The constitutional and legal position of transport in Australia is well documented in three articles by Kolsen and Docwra of Queensland University (Docwra and Kolsen 1982, Kolsen and Docwra 1982, Docwra and Kolsen 1983). The relevant sections of the Constitution:

- state that 'trade, commerce and intercourse' (which includes transport) should be free between the States (Section 92);
- give control of interstate transport to the Commonwealth (Section 51(i));
- appear to give some control of intrastate transport (railways, navigation and shipping) to the Commonwealth in certain circumstances (Section 98); and
- provide for an Inter-State Commission with powers over interstate transport and discriminatory pricing of railways on intrastate services (Sections 101-104).

The legal interpertation given to the above provisions of the Constitution with respect to transport is of particular importance. There is the apparent conflict between the power over interstate trade given to the Commonwealth under Section 51(i) and the free interstate trade provision of Section 92. The usual interpretation given to these Sections has been that laws (Federal or State) which prohibit interstate trade, or are directed against it (for example through restriction of entry) are invalid, but laws which regulate conduct in trade (for example quality regulation for safety reasons) but do not prohibit or restrain it, may be valid. More recently, several High Court judgments have led to suggestions that Commonwealth powers in this area may be considerably greater than previously thought.

The Commonwealth has not used its powers under Section 51(i) in relation to interstate road transport. It appears however that the Commonwealth could act as a registration authority and could enforce quality registration with respect to interstate vehicles. The Commonwealth influence over interstate transport will be strengthened by the re-establishment of the Inter-State Commission, although the Commission's charter will be confined to an investigatory and advisory role.
The legal position with respect to State powers was clarified by the Hughes and Vale

1. Persons leasing a truck are also entitled to receive the investment allowance provided the finance company elects to pass it on to the lessee.

case in 1954 which ruled invalid the then current State levies on interstate road transport. The current legal position:

- prohibits the States from charging registration fees, except for the cost of issuing plates, to interstate vehicles[1];
- allows the States to make charges on interstate vehicles which are related to the road maintenance costs caused by vehicles (this was the basis of the Road Maintenance Charge); and
- allows the States to enforce quality regulation on interstate vehicles (although there is some doubt about this proposition).

It is noted that in making decisions on charges on interstate vehicles, the High Court has only considered charges which act as a restraint of trade. It has ignored all other policies of the States with respect to interstate transport, for example, the operation of State railways and their infrastructure in a way which achieves particular State objectives with respect to the carriage of goods.

REGULATION

The distinction is frequently made between 'economic' or 'quantity' regulation on the one hand and 'non-economic' or 'quality' regulation on the other hand. The former category normally includes direct controls over entry to the industry, area and scope of operation and prices charged. The latter category refers generally to standards of entry and performance and is aimed at road safety, traffic management, avoidance of road damage and environmental objectives.

While this distinction is useful, it is most important to recognise that in practice there will usually be interactions between economic and non-economic regulations. For example, standards based on non-economic criteria could be imposed on the quality of new entrants to the industry but these could be set at levels which effectively prohibited entry, thus reducing competition in the industry and allowing existing entrants to raise their financial returns. Equally, regulations aimed primarily at economic objectives could significantly influence the achievement of safety objectives.

Economic regulation

Economic theory suggests two main grounds upon which regulation may be justified to improve the operation of the market. The first is the control of externalities, the effects of which are not reflected in market prices. For road transport, three significant externalities are safety, pollution and congestion, and it is widely accepted that regulations are needed in these areas. The second justification is the regulation of the adverse effects of monopolies. In road transport, the problem is sometimes viewed as one of too many operators, but certainly not as a problem of too few operators exerting monopoly power, except possibly in some very remote or specialised area of operation.

The main justification for past economic regulation of road transport has been to protect the State railways from competition. Historically this regulation may have been justified as State governments attempted to rationalise their investment in road and rail infrastructure by regulating long distance freight towards their sunk investment in rail.

This framework of State economic regulations aimed mainly at protecting the railways has now almost all been dismantled. The deregulation of interstate traffic stemmed largely from the Hughes and Vale case in 1954. At the intrastate level, annual registration taxes still exist, but all States except Tasmania have deregulated or are

1. All States except Queensland have adopted this practice and impose higher registration fees for intrastate plates than for interstate plates. Queensland does not provide a separate registration category for interstate vehicles.

in the process of deregulating road freight transport. Associated with this has been the release of all but two State rail systems from their common carrier obligations. Overall, this has resulted in the railways' freight activities being rationalised with carriage of more bulk commodities and the diverting of LCL and general merchandise freight to road transport. The result has been a significant improvement in the overall efficiency of freight transport operations.

At present there is no regulation of freight rates, apart from the ARTF-Federal TWU and the LDRTA-New South Wales TWU minimum rates agreements described in Chapter 4. There appears to have been significant undercutting of the minimum rates set in these agreements which suggests that market forces have been too strong for the set rates given the oversupply of capacity in the economic downturn.

Regulation of minimum freight rates may be viewed as a way to counter the cost-price squeeze and the financial difficulties currently being faced by many operators. One aspect of such regulation is the problem of enforcement. Probably of greater importance in the long term, however, is that pricing flexibility is a great asset of the road transport industry, and rate regulation would almost certainly involve the loss of some flexibility. Prices should reflect not only cost and supply conditions in the industry, but also the complex and continually changing set of demand conditions reflecting freight imbalances between inward, outward and third legs, and also imbalances between freight of different densities. It is impossible to set regulated rates which adequately reflect these complex and changing conditions on different routes. The importance of the ability of road hauliers to appropriately choose and price their multiple trips in their competition with rail was noted in Chapter 4.

Entry standards

At present the only requirements for entry to the road freight industry are the obtaining of a driver's licence and procuring a truck. The tests involved in obtaining a licence are not very demanding although there is some variation across the States (House of Representatives Standing Committee on Road Safety 1982, Appendix 3). Obtaining finance to buy a truck also appears to have posed few problems through most of the 1970s, although as noted earlier in this chapter, recent changes in the credit market may have generated some constraint on vehicle purchases.

Many people in the industry and outside have suggested that entry has been too easy and that this has encouraged marginal entrants who are more susceptible to pressures to cut corners through overloading, speeding, undermaintenance, drug dependence and financial mismanagement. Many have advocated quality licensing as a way to improve the standard of entrants.

The McDonell report suggested that requirements for driver registration should cover the following (McDonell 1980, 2nd Report, Vol 4, pxvi):

- standards of professional competence and experience for all drivers in commercial haulage operations to be determined by a hauliers' regulation tribunal;
- knowledge and observance of minimum standards of vehicle maintenance and effective procedures for ensuring compliance with environmental and industrial laws;
- demonstration that the applicant is a fit and proper person to carry on business as a haulier having regard to his record of certain specified offences relating to traffic and driving behaviour; and
- demonstration of sufficient financial means to carry on business as a haulier with sufficient protection against the necessity for recourse to unsafe measures during an initial establishment period.

There might be constitutional difficulty with the testing in basic business principles (unless it could be related to safety standards). This difficulty might be overcome

by the introduction of a two strand heavy vehicle licence test—one compulsory strand relating to safety and operations, and the other optional strand relating to commercial practice. It could be accepted as the industry standard if industry, insurers, freight forwarders and government gave preference to those with the dual licence.

Operational standards

The traffic code in each State is a fairly standard form of operational regulation. All road users are required to obey road rules, although certain qualifications exist for trucks (for example, in several States appropriately identified long vehicles may turn left or right from either lane at intersections which is illegal for cars, but in all States articulated trucks are subject to lower speed limits than cars). This form of regulation promotes safety of truck drivers, other road users and non-users, and the smooth movement of traffic. Nonetheless any change, for example alteration of speed limits, obviously affects the road freight industry.

Truck operations are also affected by the Australian Design Rules for Motor Vehicle Safety. ATAC has endorsed some 36 of these, several of which are specific to heavy duty vehicles.

Load limits for trucks also have safety implications as well as a crucial effect on road construction standards and maintenance costs. Other regulations include those concerning transport of dangerous goods and food, and environmental regulations (for example, restriction on heavy vehicle passage through urban areas, emission controls).

Many operational regulations involve problems of enforcement. This is evident in the New South Wales Department of Motor Transport findings concerning dangerous defects in trucks (DMT 1983) and the anecdotal evidence suggesting that loading of vehicles above legal limits is common. An often-heard claim is that reduced essential maintenance, travel at excessive speed, overloading and excessive driving hours are forced on operators by tighter commercial conditions. Strong competitive pressure may account for some abuse, but an operator will always be inclined to cut corners if the perceived risks are slight; these perceived risks relate not only to breaches of law but also other risks inherent in cutting corners like loss of reputation and higher insurance premiums.

On the issue of overloading, one report for New South Wales based on Department of Main Roads prosecutions in 1981-82 showed that 10.7 per cent of all heavy vehicles checked were found to be loaded in excess and the average truck overload was of the order of 21 per cent (Truck and Bus Transportation 1983, p32).

In reporting this, the editor of *Truck and Bus Transportation* made the following comment:

> 'While this magazine. . . deplores that some operators may be forced, for one reason or another, to overload their vehicles in order to make a living, may we ask whether there is a strong case for an upgrading of the maximum Standard Axle limitations on State Highways, Freeways, and major adjoining roads?. . .
>
> 'Is it really a case of overloaded trucks—or hopelessly unsuitable pavement standards?'

The response to this comment must surely be that the truck industry's arguments for better roads and higher weight limits should be considered on their merits, but overloading must be contrary to the interests of the industry as a whole. Widespread overloading would be expected to generate significant road maintenance costs and tend to limit the funds available for the permanent upgrading of pavement standards.

As well as reducing safety and increasing road costs, ineffective enforcement of vehicle load limits (and other operational regulations), has resulted in distortion of market forces. One possible way to improve enforcement might be to widen responsibility to owners and perhaps even consignors as well as drivers.

The Australian Transport Advisory Council has played a major role in achieving

the uniformity which now exists in varous aspects of operational regulations. Examples are the national code for transport of dangerous goods, and the moves toward a National Road Traffic Code. Early in September the Vehicle Standards Advisory Committee was formed to continue the work of the previous Advisory Committee on Safety in Vehicle Design and the Advisory Committee on Vehicle Performance.

Other regulations

Financial regulations which affect the road transport industry include road user taxes (see next section), and the regulation of insurance arrangements and credit availability. The variable costs of operating vehicles are also influenced by taxation policies—including Commonwealth taxes on fuel, oil and spare parts, and State fuel levies.

Finally, governments can influence or regulate the road freight industry through the provision of transport infrastructure (this aspect is also covered in a subsequent section).

Future regulation

The relevant studies of the industry reviewed in Chapter 2 were unanimous in recommending against the general use of economic regulation in the Australian road transport industry. Allowing for the current economic downturn, there do not appear to be any permanent changes in the industry environment which would justify a return to widespread economic regulation.

There are however two areas of regulation which deserve the highest priority in the deliberations of this Inquiry. These are, firstly, the determination and means of enforcement of appropriate vehicle operational regulations, and secondly, whether quality licencing or similar regulation aimed at establishing quality standards for drivers and owner-drivers can be introduced without imposing significant economic costs.

ROAD TAXATION, COST RECOVERY AND PRICING

Background

Subject to some assumptions regarding attribution of taxes and charges to road users, the level of cost recovery is usually regarded as the relationship between such charges and the costs occasioned by road users. The services provided by the Australian public road system, with the exception of a few toll roads, are not priced directly, but the taxes and charges paid by road users correspond to an implicit set of prices paid for the use of the roads.

As explained below, a policy aimed at an optimum pricing policy may not yield the level of cost recovery sought by government. However given the level of cost recovery required by government, a pricing policy can be formulated that will minimise the loss of economic efficiency.

Road taxation, cost recovery and pricing issues in Australia have been well documented. A major contribution was the BTE cost recovery report which provided estimates of financial cost recovery in all modes of Australian transport for the year 1974-75 (BTE 1977). This provided a basis for two subsequent seminars, sponsored by ATAC, to discuss cost recovery objectives for the transport sector and how they might be progressed (proceedings of the two seminars are reported in Department of Transport 1980 and Starkie, Grenning and Starrs 1982). The subject was reviewed at the 1981 Transport Outlook Conference (BTE 1981c), and the BTE subsequently produced two papers (unpublished) on specific aspects of road cost recovery in response to requests from ATAC Road Group (Lawlor 1982 and Cronin and Luck 1983). Several other relevant reports concerned specifically with road pricing are Kolsen, Ferguson and Docwra 1975, Affleck 1976 and Transport Economics Centre 1981.

Road taxes

Road user taxes and charges in Australia are dominated by Commonwealth and State fuel taxes, with fixed charges in the form of State registration and licence fees making a much smaller contribution. The concentration on fuel taxes has increased since the abolition of road maintenance charges in 1979 and their replacement in all States except Queensland with fuel franchise charges on petrol and automotive distillate.

The above Commonwealth and State taxes and charges are normally included in estimates of cost recovery from Australian roads. Other taxes such as sales taxes on vehicles and parts, import duties and the crude oil levy are treated as general purpose taxes which are not specifically aimed at the road user, and these are not usually included in cost recovery estimates.

Cost recovery and pricing objectives

The pricing objective consistent with maximising economic efficiency is to have prices which reflect the underlying social costs. It is also noted that in looking at pricing effects, it is necessary to include all taxes and charges on road users, including general purpose taxes, as changes in any of these charges will act as a rationing device on the level of activity by road users.

The objectives set for the level of cost recovery, and the taxes and charges attributed to a given activity such as road use, are arbitrary decisions which need to be taken by government. A common objective aimed at applying the 'user pays' principle is to seek full financial cost recovery through those taxes and charges which can be directly attributed to road users.

The cost recovery target set may well conflict with achievement of maximum economic efficiency. One reason for this is because in an increasing returns industry such as roads, marginal costs are below average costs, and pricing according to marginal cost will result in financial under-recovery. A public subsidy may be considered justified to meet this under-recovery. If not, rules have been devised to meet, or at least partially meet, this under-recovery and at the same time minimise the loss of economic efficiency (see next section).

Governments may also wish to pursue income distributional objectives through road pricing policies. Distributional considerations appear to have played a significant role in decisions on both road and rail facilities for remote areas, and on the policy of subsidising petroleum products in country areas under the Petroleum Products Freight Subsidy Scheme.

Tradeoffs are required to resolve the conflicts between the objectives of full financial cost recovery, optimal economic efficiency and specific distributional goals. Many commentators have urged governments to clearly define distributional objectives, and preferably to meet them through direct assistance rather than through cost recovery and pricing policies. For the tradeoff between economic efficiency and full cost recovery, the following set of principles has been developed.

Pricing and cost recovery principles

The 1979 Seminar (Department of Transport 1980) identified the following three pricing and cost recovery principles which it believed could be used in the Australian context to reduce under-recoveries in the context of a more efficient allocation of resources:

(1) Prices should not fall below marginal cost levels, and should equal these cost levels unless the second or third principles (below) indicate otherwise.

(2) When there is a shortage of capacity (for example, at times of peak demand) prices should be raised to higher levels to clear markets.

(3) To the extent that prices determined by the first two principles do not generate

enough revenue to meet the cost recovery target, discriminatory pricing should be employed—with higher charges for those users who are least deterred by higher prices.

The possible need for governments to take account of externalities such as accidents, congestion and pollution in pricing and cost recovery policies was also noted.

The 1981 Seminar (Starkie, Grenning and Starrs 1982) endorsed the above three principles, but noted that the third principle relating to differential pricing may have to be tempered by equity considerations where free entry to the market is limited by regulations. Attention was also focused on the relationship between investment and cost recovery policies, noting that full cost recovery of 'bad' investments may not be desirable. The seminar agreed on the importance of disinvestment and cost shedding as well as increased revenues for improving cost recovery levels, and recognised a need for more careful scrutiny of new investment proposals and their cost recovery implications.

The United States in its Federal highways cost recovery program has followed a different set of principles from that outlined above, based on the objectives of full financial cost recovery and the achievement of horizontal equity in the allocation of charges between road users. This approach places far less weight on the economic efficiency objective, and excludes the use of discriminatory pricing to recover common costs (see Cronin and Luck 1983).

Another important principle concerns road/rail competition. It has been suggested that if prices cannot be set equal to marginal costs, for example due to a subsidy paid to rail freight, then a corresponding subsidy should be paid to road freight so that the price/marginal cost ratios in the competing transport services are equal. While this solution would avoid any price distortion and misallocation of resources between road and rail, it is important to remember that it may involve a misallocation of resources between land transport and the rest of the economy and hence may not be in the nation's best interest.

Recovery of aggregate road costs

It is useful to distinguish three different concepts of road costs: annual roads expenditure, financial costs, and social costs.

Annual roads expenditure indicates road costs from a government financing perspective, but does not reflect the economic (or resource) costs involved. BTE estimates (unpublished) for all Australian roads indicate that the ratio of annual revenue[1] to annual expenditure by all levels of government declined from over 100 per cent in 1973-74 to 85 per cent in 1980-81.

In estimating financial cost recovery ratios, capital costs are included as depreciation (reflecting the service provided by the capital stock) and not as a current expenditure item. This raises the issue of how to value the capital stock. The BTE 1977 study (BTE 1977) valued it first as historical cost, but indicated that the preferred approach was to value it at indexed historical cost (in the prices prevailing in the year of evaluation) to indicate its approximate current opportunity cost. This study, using the indexed historical cost approach, found that in 1974-75 the financial cost recovery level from road transport was about 89 per cent and from rail transport 59 per cent. For the freight segment, the ratios were 79-80 per cent for road and 67 per cent for rail.

Estimates of social cost recovery levels are not available. This would require adjusting financial flows firstly for externalities such as accidents, congestion and pollution, and secondly for any differences between resource costs and financial costs due, for example, to the inclusion of taxes or subsidies in financial costs. With respect

1. Revenue comprises fuel taxes, heavy vehicle charges, fees for vehicle registration and drivers' licences.

to externalities, it is noted that congestion and pollution costs occur mainly in urban areas and could justify a level of social cost recovery significantly above the financial recovery level. On the other hand, accident costs (as indicated by fatalities per vehicle kilometre) are higher in rural than urban areas.

Allocation of road costs to vehicles classes

The BTE recently reviewed for ATAC five Australian studies and six overseas studies on the allocation of road costs among vehicle classes, and in particular trucks (Lawlor 1982). This review revealed significant differences in the approaches taken, concerning such items as the treatment of administrative costs, whether all costs or only avoidable costs were allocated, the time period of costs considered, and the method of cost allocation to different vehicle types. However, in the key cost allocation process, all studies recognised that a significant part of road damage costs are related to vehicle axle loadings, and that data on distance travelled by vehicles with different axle loadings are essential for cost allocation among vehicle categories.

Two conclusions from this review are of particular note.

> '. . . it is not feasible at present to carry out a proper technical cost allocation exercise in Australia. This is because the available information base is outdated and insufficient. Further fundamental technical investigation of the interaction between vehicles, the road, the costs of vehicle operations and road maintenance and reconstruction is needed' (Lawlor 1982, p2).
>
> '. . . a large proportion of road system expenditure cannot be causally allocated among vehicle classes—except by somewhat arbitrary procedures' (Lawlor 1982, p48).

At first sight these conclusions could lead the reader to feel that nothing can be done to improve the cost allocation process without further major technical studies on the allocation of avoidable costs in Australia. Moreover, even with this information, cost allocation among vehicle classes will have a significant arbitrary element due to the importance of common costs.

There is ample evidence, however, that heavy trucks are not paying for the damage they impose on Australian roads[1], and also that their relative contribution has been reduced by the abolition of road maintenance taxes. Conversely the evidence points to over-recovery from cars and light commercial vehicles. It can be argued that car travel is largely a form of consumption and the excess recoveries can be viewed as consumption taxes similar to sales taxes and excises on other consumer goods. The same argument does not apply to light commercial vehicles (Taplin 1982, pp23-24). In fact the avoidable road pavement costs caused by cars and light commercial vehicles are so small that they have never been satisfactorily identified.

Heavy vehicles impose costs on the road system that are more than proportional to either their weight or their fuel consumption. Hence the current cost recovery regime which is dominated by fuel taxes is not appropriately related to the road damage and road costs imposed by particular vehicle classes.

If heavy vehicles are to cover the avoidable pavement cost attributable to them, let alone make any contribution to common costs, then it is necessary to supplement the various fuel taxes with large fixed charges and/or some charge proportional to tonne-kilometres.

All States currently impose significant fixed charges on vehicles used for intrastate operations. These charges vary between States but a typical charge (excluding stamp duty and third party insurance) is about $800 for a three-axle rigid truck and $1 200 for a five-axle articulated truck. These fixed charges amount to an estimated 43

1. See for example McDonell (1980), SWATS (1977), Transport Economics Centre (1981) and NAASRA (1976) reported in Chapter 2.

and 29 per cent respectively of total fixed and variable charges[1] for these two truck types. The available evidence suggests that fixed charges on *very heavy vehicles* engaged in intrastate operations would need to be much greater than at present to cover the avoidable pavement costs attributable to such vehicles[2].

For vehicles engaged exclusively in interstate operations, fixed charges are very low and the constitutional validity of imposing higher fixed charges is uncertain. Consequently cost recovery from interstate operations is generally lower than from intrastate operations and there is a strong case for seeking a more effective taxing of interstate operations.

Commonwealth and State powers with respect to interstate trade are restricted by Section 92, but constitutional rulings have indicated that the States may impose charges on interstate vehicles where the charges are directly related to the road maintenance costs caused by those vehicles. Previous State road maintenance charges encountered significant problems with high administration costs and widespread evasion. Two suggestions have been put forward in various ATAC forums to counter these problems. One is for the States to impose a *prior* charge on vehicles based on their expected road use in terms of average tonne-kilometres of laden travel, and make a subsequent adjustment according to actual travel. An alternative is for the Commonwealth to administer the system and to establish a Commonwealth register of interstate vehicles. The constitutional power for the Commonwealth to do this appears strong. A convenient way to *administer* such charges and related regulations would be for the States to act as agents for the Commonwealth. The use of hubodometers in New Zealand and similar devices in Europe appears worthy of investigation as a counter to possible administration problems of the kind encountered in Australia with earlier road maintenance taxes.

Any proposals to increase the level of cost recovery on heavy vehicles appears likely to meet objections on the following grounds:

Is it unfair, and possibly uneconomic, to raise cost recovery levels for heavy road vehicles without raising cost recovery levels in the competing rail freight task to the same level?

This is a pertinent comment. A move to improve the road cost allocation between road vehicle classes could worsen the allocative distortions between road and rail which stem from differing degrees of under-recovery of costs. However it is important to keep in mind that the share of road freight which is subject to competition from rail is a relatively small part of the total task and hence this potential distortion applies to only one part of the road freight industry.

To avoid this problem, it is desirable to seek the achievement of consistent cost recovery targets for both road and rail at the same time. One approach would be to seek the parallel regulation of road taxes and charges on the one hand and rail pricing on the other, and it has been suggested (Taplin 1982) that there may be a role for the Inter-State Commission in the achievement of a balanced cost recovery between road and rail. This, however, would be a very complex exercise involving detailed coordination (and associated loss of freedom) of the policies of the relevant State governments and authorities. An alternative approach would be to pursue separate policies for road and rail, which are both aimed at consistent cost recovery

1. Variable charges per typical vehicle are based on the relevant Commonwealth and State diesel taxes, which were converted to a per vehicle kilometre basis using estimates of diesel consumption per kilometre and typical kilometres travelled per year.

2. It is noted that Commonwealth and State Transport Ministers at ATAC are currently considering a proposal for a Commonwealth fuel levy to replace State and Territory annual fixed motoring charges such as registration and third-party insurance. If this proposal is adopted and State and Territory fixed charges are abolished, it will strengthen the case for a system of charges (like the Road Maintenance Charges) which are related to the road damage inflicted by different vehicle types.

targets. As under-recovery from rail primarily reflects the deficit financing of rail operations, the broad cost recovery target should be to break-even on rail freight operations[1]. While the former approach conceptually has the potential to more finely balance road and rail pricing, the latter approach appears to have distinct advantages in terms of political and administrative feasibility.

Would not the higher cost recovery charges add to the current financial problems of road transport operators?

This argument is questionable. In the highly competitive road freight industry it must be expected that higher costs will be largely passed on to consumers. The extent to which the resulting higher prices will affect demand will vary between routes and commodities carried, but in general the demand for freight services appears to be fairly unresponsive to price changes. If parallel moves to full cost recovery in road and rail freight could be achieved, the resulting loss of market would be expected to be minimal.

Would not higher taxes on heavy trucks penalise the more efficient units?

This argument is not valid from a national viewpoint. The relative economic efficiency of large and small trucks can only be assessed when the appropriate costs incurred by the vehicle owner and the costs imposed on the road system are considered together.

GOVERNMENT INVOLVEMENT IN ROAD AND RAIL INFRASTRUCTURE

This chapter has already discussed two major aspects of government involvement in road/rail competition, namely the regulation (or deregulation) of road freight in competition with rail, and the level of cost recovery in the two modes. This section deals with the provision of infrastructure which clearly has a strong influence on operating costs and the quality of service with respect to speed, frequency and reliability provided by the respective modes.

These categories of infrastructure have certain characteristics which probably largely explain why they have been predominantly provided by governments. They generally have long lives and are specific both as to location and as to function which tends to make transport infrastructure a riskier investment than the operation of transport vehicles. Also, the lumpiness and indivisibility of transport infrastructure investment requires access to large sums of capital and also generates problems in fully utilising the asset through time and pricing it accordingly (for example, congestion pricing).

Government investment in road and rail

Expenditure on Australian roads by the three levels of government has been given in Chapter 3. The capital investment component of road expenditure is compared with that for rail, and total capital expenditure in Australia in Table 5.4.

The significance of government investment in the road and rail transport industries is self-evident. In 1981-82, public investment in roads amounted to $2.1 billion and in rail to about $0.4 billion. Road and rail combined accounted for approximately one quarter of total investment expenditure by all levels of government.[2]

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1. The extent of deficit financing of rail freight operations is not known, and any estimate would require the arbitrary allocation of common costs between passenger and freight activities. In 1979-80, the combined deficit of the government owned railways was $772 million, and systems covered about 65 per cent of their working expenses and capital charges (ARRDO 1981a). This relates to both passenger and freight operations.

2. Note that in Table 5.4 the figures for Commonwealth, and for State and local government refer to actual expenditure incurred by each level of government, and not to the funding of that expenditure.

TABLE 5.4—GROSS FIXED CAPITAL EXPENDITURE BY PUBLIC AUTHORITIES ON ROAD AND RAIL TRANSPORT; AUSTRALIA, 1972-73 TO 1981-82

	1972-73	*1973-74*	*1974-75*	*1975-76*	*1976-77*	*1977-78*	*1978-79*	*1979-80*	*1980-81*	*1981-82*
					PART A Expenditure ($million)					
Road systems and regulations										
Commonwealth	24	26	29	34	32	56	32	26	16	14
State and local	742	832	1 074	1 289	1 379	1 481	1 621	1 735	1 903	2 116
Total road	766	858	1 103	1 324	1 411	1 537	1 653	1 761	1 919	2 131
Rail transport										
Commonwealth	11	7	14	46	36	40	46	50	40	65
State and local	139	139	218	277	312	386	440	456	510	322
Total rail	150	147	231	323	348	426	486	506	550	387
Total GFCE[a] by public authorities	3 484	3 980	5 653	6 699	7 136	7 948	8 158	8 851	10 074	10 433

TABLE 5.4 (Cont)—GROSS FIXED CAPITAL EXPENDITURE BY PUBLIC AUTHORITIES ON ROAD AND RAIL TRANSPORT; AUSTRALIA, 1972-73 TO 1981-82

	1972-73	*1973-74*	*1974-75*	*1975-76*	*1976-77*	*1977-78*	*1978-79*	*1979-80*	*1980-81*	*1981-82*
	PART B Expenditure on road and rail transport as a proportion of total GFCE[a] by public authorities (per cent)									
Road systems and regulations										
Commonwealth	0.7	0.7	0.5	0.5	0.4	0.7	0.4	0.3	0.2	0.1
State and local	21.3	20.9	19.0	19.2	19.3	18.6	19.9	19.6	18.9	20.3
Total road	22.0	21.6	19.5	19.7	19.8	19.3	20.3	19.9	19.0	20.4
Rail transport										
Commonwealth	0.3	0.2	0.2	0.7	0.5	0.5	0.6	0.5	0.4	0.6
State and local	4.0	3.5	3.9	4.1	4.4	4.9	5.4	5.2	5.1	3.1
	4.3	3.7	4.1	4.8	4.9	5.4	6.0	5.7	5.5	3.7

a. Gross Fixed Capital Expenditure.

NOTE: Figures may not add to totals due to rounding.

Source: ABS (1983a).

Optimum investment for economic efficiency

The question of when and how much to invest in road and rail infrastructure can be tackled from an economic efficiency viewpoint within the framework of benefit-cost analysis. While the empirical task involved is complex and difficult, the principle is relatively simple; investment in new infrastructure is justified where the discounted benefits flowing from the additional traffic accommodated and the reduced operating costs and other benefits to existing users, exceeds the discounted costs of providing and operating the infrastructure.

This type of analysis has been undertaken on Australian roads by the Commonwealth Bureau of Roads and more recently by the BTE and on the Australian mainline rail system by the BTE and more recently the Australian Railway Research and Development Organisation (ARRDO).

These studies have identified many areas of road and rail infrastructure where significant additional investment would be justified on economic criteria (that is, the evaluations undertaken have indicated benefit/cost ratios greater than one). For roads, the areas where additional expenditure appeared most justified were urban arterials, followed by rural arterials and national highways, while it appeared least justified for urban and rural local roads[1]. For rail, expenditure on mainline upgrading has been shown to be economically justified, in particular for the provision or extension of crossing loops to increase line capacity and allow for larger trains, and the introduction of CTC (centralised traffic control).

While these benefit-cost studies are an important analytical tool, it is important to recognise their limitations. Firstly, it is very hard to measure all the benefits which will flow from improving the road and rail infrastructure. Secondly, work in the BTE on roads expenditure suggests that governments have placed considerable weight on factors not reflected in the traditional benefit-cost analysis in determining the distribution of road expenditure monies. Accordingly, in the BTE's current Roads Study which will be completed in 1984, particular focus is being placed on identifying the costs and final outputs of alternative road expenditure strategies (that is, on the cost effectiveness of alternative strategies), rather than on formulating a single economically warranted road expenditure program.

The BTE is also currently examining evaluation procedures for transport issues in its Social Audit Study. The Commonwealth Minister for Transport has advocated the use of the social audit as an extension of social benefit-cost analysis so that all relevant financial, social, environmental and defence factors can be thoroughly taken into account in evaluating transport issues.

Road funding options

Road funding by the three levels of government is detailed in Chapter 3. The division of responsibility between the Commonwealth and the States is not clear, and there has been considerable discussion in recent years on both the level and nature of Commonwealth assistance to roads. In particular there has been the issue of possible absorption of Commonwealth specific purpose (Section 96) grants for roads into the income tax sharing grants provided by the Commonwealth to the States and local government.

In considering the scope for absorption, it is necessary to identify three categories of Commonwealth road funding. The first is the funding of national roads which appears likely to continue as a Commonwealth responsibility subject to tight Commonwealth controls. The second category are grants under the Roads Grants Act. There are now few controls over these grants to the States for arterial roads, or over grants to local governments for local roads. Thus for this category of road funding it would not appear

1. Informative discussions on the benefits of increased national expenditure on Australia's roads are provided in Taplin (1980) and Gannon (1982).

a large change to absorb Commonwealth specific road grants into the general income tax sharing grants. However, it would then be the responsibility of the relevant road authorities to fight for the absorbed funds, which would be allocated according to State and local government budget priorities, and this could affect the final levels of road expenditure. By contrast, the third category of funding, the Australian Bicentennial Road Development Program, involves tied project-related funding, but this is programmed to run only to 1988 and then expire.

Rail funding options

Present funding is predominantly through State Government Loan Council Programs, and borrowings by State Rail Authorities and Australian National (which are also subject to Loan Council approval). Supplementary sources have included Commonwealth Specific Purpose Grants for gauge standardisation and mainline upgrading, advances from rail users (particularly mining companies), internal funds and leverage leasing.

The extent of Commonwealth participation in railway investment funding has varied considerably over time, being highest in real terms in the 1960s. ARRDO recommended the Commonwealth Government increase its assistance for mainline upgrading from $70 million over the five year period, 1978-79 to 1982-83 to $415 million (in 1979-80 dollars) for the five year period to 1986-87 (ARRDO 1981a).

CHANGES IN TECHNOLOGY, RESOURCE COSTS, PRODUCTIVITY, MANAGEMENT AND COMMUNICATIONS

The future competitiveness and financial viability of the road freight industry, and its safety record, will be influenced by adoption of technological improvements and developments in management capabilities and communication practices. The BTE has done little work concerning these operational aspects of the road transport industry, however their importance is recognised, and brief reference is made to a number of known developments in this area.

Important potential sources of future productivity gains appear to be in improvements in the technical performance of vehicles, and in the better utilisation of vehicles by matching the capability and availablity of vehicles with the demand.

Improvements in the technical performance of the vehicle fleet are expected to flow from the continuation of the trend away from petrol engines and towards diesel engines, and also from anticipated further advances in the diesel engine with respect to its power rating, durability and fuel consumption. A wide range of other technical advances[1] are continually being made, and these together with improvements in overall system design, are likely to lead to further reductions in operating costs.

With respect to capacity utilisation the survey data presented in Chapter 3 indicated that there are a significant proportion of empty and partly-empty trucks on the road. There may be significant scope for increasing capacity utilisation and reducing empty running time by the strengthening of vertical and horizontal linkages in the industry, by greater use of computerised freight management systems, by management training for owner-drivers, and by the provision of better information.

It is also important to view the utilisation and productivity of the trucking industry in a much wider context than the physical utilisation of the vehicle fleet. From a national viewpoint, the resources in the trucking industry are best utilised when the industry is able to specialise in those areas of operation where it has a comparative advantage relative to competing modes.

The advantages of road freight from the transport users' view have been considered in Chapter 4. Considered in terms of resource usage, two particular beneficial characteristics

1. Details of recent technical advances are given, for example, in a paper presented to the SAE (Australasia) seminar on Transportation-New Technologies, (Close, Tinney and Pollard 1983).

of the road freight industry stand out.

Firstly, there is the flexibility of the industry to satisfy the complex and changing pattern of demand, and adjust to freight imbalances between legs and different freight densities; this flexibility reflects the physical characteristics of the industry, but also the adaptability of the major owner-driver segment of the industry in a largely unregulated environment.

Secondly, road freight has an advantage with respect to end costs (terminal operations, accounting and distribution costs) relative to line haul costs, and hence has a comparative advantage where end costs are high relative to line haul costs.

A number of initiatives have been taken to improve performance in the industry in the areas of driver training, driver licensing and upgrading the commercial skills of owner-operators.

Regarding driver training, the House of Representatives Standing Committee on Road Safety (1982) noted that extended driver training appears to have a place for professional drivers, and that many companies are convinced of the cost-effectiveness of training programs. The Committee recommended the Commonwealth Government initiate action to implement apprenticeship programs for heavy vehicle operators. The National Training Council has established a Road Transport Industry Training network comprising a National Committee and five State Committees, to assess training needs in the industry. The National Road Transport Industry Training Committee supports the introduction of apprenticeship programs for heavy vehicle operators.

Current driver licensing systems vary between States, and ATAC is working towards a uniform licence classification system throughout Australia. The House of Representatives Standing Committee on Road Safety (1982) suggested consideration be given to the inclusion of an additional licence class for extra large or long heavy vehicles (say over 30 tonnes, or in excess of 15 metres in length).

Initiatives taken to upgrade small road operators' commercial knowledge include a transport business management training package compiled by the Commonwealth Department of Industry and Commerce, and the business management advisory services provided by State small business agencies. Short 'truckstop' seminars on business management have been presented in roadside cafes and truck shows by the New South Wales Road Transport Industry Training Committee. The provision of operational information such as 'The Truck Loading Guide' published by the ATAC Advisory Committee on Vehicle Performance in 1981 can also play a useful role.

Business planning would be assisted by the availability of more comprehensive and up-to-date statistics on road freight activity. The BTE, with the assistance of a Project Committee established by the Transport Industries Advisory Committee, is seeking better indicators of road freight activity as part of its current review of Transport Indicators. The BTE is also planning a survey of manufacturers in Australia to allow estimation of interregional freight flows, especially of non-bulk road freight.

CHAPTER 6—AN OVERVIEW

This Chapter provides an overview of the economic issues facing the road freight industry, with particular emphasis on the complex and interactive nature of relationships in the industry and the broad themes which influence the course of its development.

ROAD FREIGHT: IS IT A PROBLEM INDUSTRY?

This overview of the road freight industry commences by looking at how it compares with other industries and asking whether this industry has certain characteristics which tend to make it somewhat of a problem industry. The fact that a major public inquiry into the industry has been established by the Commonwealth Government with the support of all State governments and apparently by most sectors of the industry is sufficient evidence to conclude that the present problems of the industry are widely seen as being significant and of justifying a national review.

On the other hand, the road transport industry does not have the characteristics of a lot of other problem industries. In fact, it has enjoyed a high rate of growth with the growth in tonne-kilometres performed through the 1970s being more than double the growth in real GDP. Also the industry does not appear to suffer from outdated technology, poor management, a declining competitive position in the market or any other similar features commonly associated with poor performance industries.

Another feature of the road transport industry is that most of its problems, and a recognition of those problems, are certainly not new. The 12 studies summarised in Chapter 2 clearly show that a wide range of issues facing this industry have been thoroughly canvassed in the past. One frequent comment is that inquiries are needed because so little is known about the industry—because the statistics are so poor. While this is true, this information gap is seen to be only one factor and not the major stumbling block to finding solutions to the problems of this industry.

Nevertheless the road freight industry does possess a set of characteristics which in many ways make it unique, and certainly generate considerable national interest in the operation of the industry. Three broad features are discussed below which are seen as particularly characterising this industry.

These are:

- the importance of competition, entrepreneurship and flexibility to its efficient operation;
- the level of government involvement in the industry due to its national and defence significance, and the government ownership of road and rail infrastructure; and
- the presence of externalities in the form of accidents, pollution and traffic congestion which means that the market mechanism cannot be relied on to provide the appropriate market signals—policy directives are required.

One aspect which stands out is the importance of the interface between private enterprise interests and public (or social) interests. In fact the whole industry is characterised by the complexity and interactive nature of its internal relationships, as well as its external relationships with the rest of the economy. These relationships relate to technical, institutional, political and organisational aspects of the industry.

An appreciation of the interactive nature of the major influences on the road freight industry is considered essential to an understanding of the industry's problems and to the successful search for lasting solutions to these problems.

THE OWNER-DRIVERS' POSITION

The road freight industry in Australia is essentially a private enterprise activity. The vehicles, servicing and handling equipment and the entrepreneurial input come predominantly from private enterprises ranging from the single vehicle owner-driver to some of the largest commercial conglomerates in the economy, including several Australian owned trans-national transport companies. Much of the industry's competitive strength stems from this ownership structure. But at the same time this structure tends to produce a group of only marginally viable owner-operators who are particularly susceptible to economic downturns.

Transport is a derived demand and hence transport activity is sensitive to fluctuations in general economic activity. It has been suggested that road transport is even more sensitive because term contracts are more common for competing rail transport; owner-operator activity is likely to be more sensitive again as shippers and freight forwarders give preference to utilising their own vehicles before hiring the services of owner-operators. Hence it comes as no surprise that many owner-operators are currently facing severe financial hardship. However the converse should apply as the economic upturn progresses; as shippers and freight forwarders utilise their own transport capacity, they will tend to direct their additional traffic to the owner-operators.

There may be some danger in generalising about the economic plight of owner-drivers. The small surveys of owner-drivers reported in Chapter 5 suggested a wide range of financial results with multiple-vehicle owners and carriers of specialist freight getting far better financial returns. At the other end of the range was the owner-driver with one vehicle chasing the highly competitive general freight market. Particularly susceptible to economic pressures is the new entrant with high interest commitments and poor reserves. It is not difficult to understand how the marginal operator, particularly in a recession, can easily fall into a vicious circle as pressures mount to drive longer hours, stay awake with pills, overload the vehicle and minimise maintenance expenditures.

The long-term solution to these problems may lie in part in greater vertical and horizontal integration in the industry. A larger share of owner-operators may form ties with shippers or freight forwarders to provide greater certainty and some protection from the vagaries of the market place. Also enterprises with several trucks and hired drivers may increase at the expense of single vehicle owner-operators.

In addition, governments need to give careful consideration as to how they can help through education (for example, driver training and small business management), enforcement of safety regulations and possibly quality licensing of owner-operators. The apparent inadequacy of present representational arrangements for owner-drivers provides a barrier to finding solutions within the industry and to communications with governments.

COMPETITION, FLEXIBILITY AND EFFICIENCY

The road freight industry faces competition from rail in certain traffics but generally each mode has specialised in those traffics where it has an advantage, and the areas of competition are believed to be a minor part of the total traffic. Hence the major competitive element in the industry comes not from rail, but from competition within the industry from the large number of independent operators and the absence of restrictions on entry to and exit from the industry.

There are positive benefits from this highly competitive industry structure, particularly

in regard to the high degree of flexibility in the road freight industry. Unlike rail with its fixed track, State rivalries and bureaucratic rigidities, the road freight industry has enormous flexibility as to the size, distribution and utilisation of its vehicle fleet, and also its pricing and customer service policies. This flexibility contributes to the economic efficiency of the industry. The benefits of this flexibility should be carefully assessed in the evaluation of any proposals which might affect the competitive structure of the industry. For example, in evaluating proposals to increase industry stability or to protect owner-operators, the resulting benefits need to be carefully weighed against the costs associated with the reduction in competition and flexibility.

GOVERNMENT INTERVENTION

Road freight is of particular national significance. Everyone in the community, directly or indirectly, stands to benefit from a fast, efficient, flexible road freight system, as it contributes to the costs of all goods and services. In addition, an efficient road transport system will provide direct national benefits in terms of defence and national disaster requirements and any other call for the large scale mobilisation of resources. On the other hand, everyone in the community stands to lose if commercial vehicles add significantly to the road congestion and accident risks facing private vehicle users, and adversely affect non-road users through noise and air pollution, reduced safety, and visual intrusion.

Externalities such as congestion, accidents, and pollution are not adequately dealt with by the market mechanism and governments have a role to play in determining socially acceptable standards and seeking to apply the 'user pays' principle. The use of quality regulations in this area is a major issue affecting the road freight industry. Two major aspects are the enforcement of appropriate vehicle operational regulations, and the question of whether quality licencing or similar regulation aimed at establishing quality standards for drivers and owner-drivers can be introduced without imposing significant economic costs. Regulatory action in this area is largely undertaken by State governments. This raises the issues of achieving uniformity between State regulations, and the legality of quality regulation of interstate traffic.

A major issue facing this Inquiry is that of the recovery of road costs through setting taxes and charges on various classes of road users to reflect the road use (and damage occasioned) by them. The following points are pertinent:

- the setting of cost recovery levels, and the attribution of taxes and charges to road use, are arbitrary decisions which need to be taken by government;
- there may be conflicts between the cost recovery targets set and other objectives such as optimum pricing for economic efficiency, and the achievement of certain income distribution goals—problems associated with these conflicts can be minimised by clearly identifying income distribution goals, and by following a set of pricing guidelines which have been formulated to minimise the loss of economic efficiency involved with any particular cost recovery target;
- while there is considerable uncertainty as to the allocation of road costs between different classes of users, there is ample evidence that heavy vehicles are currently not paying for the damage they impose on Australian roads; and
- it is desirable that moves to full recovery of road freight costs be accompanied by parallel moves to full recovery of rail freight costs.

Finally governments have a major involvement in the road freight industry as owners and managers of the road system. This responsibility is shared between three levels of government in Australia according to a complex and changing set of arrangements. The web of government influence is extended by government ownership of rail, the main competitor, but this influence has been greatly diminished with the dismantling of most road freight regulations aimed at protecting the State railways.

Nevertheless there remains a most extensive set of Commonwealth and State government interventions covering the funding of the road system, the taxing and regulating of its users, and protecting the public from its dangers. The complexity and linkages between these interventions clearly contribute to the difficulties in finding solutions to road freight industry problems.

APPENDIX I—SUMMARY OF PREVIOUS STUDIES

INTRODUCTION

Chapter 2 gave a brief review of previous studies into important broad aspects of the Australian road transport industry. This Appendix considers each of these studies in more detail by summarising:

- the nature of each study and its terms of reference;
- the empirical work undertaken; and
- major conclusions and recommendations relevant to the BTE submission.

The structure of Appendix I follows that of Chapter 2 with studies being summarised in the following order.

State Studies

- Board of Inquiry into the Victorian Land Transport System (Bland 1972)
- Victorian Transport Study (Lonie 1980)
- Southern Western Australia Transport Study (SWATS 1977)
- Commission of Enquiry into the NSW Road Freight Industry (McDonell 1980)
- Pricing Tasmania's Roads (Transport Economics Centre 1981).

Australia-Wide Studies

- A Study of the Economics of Road Vehicle Limits (NAASRA 1976)
- Road User Charges in Australia: An Assessment of the Existing System and Guidance for Future Policy (Affleck 1976)
- The Independent Inquiry into Representation for Long Distance Owner-Drivers (Hay 1980)
- Cost Recovery in Australian Transport 1974-75 (BTE 1977)
- The Long Distance Road Haulage Industry (BTE 1979c)
- The Road Transport Business: A Guide to Some Financial Aspects (BTE 1980b)
- Some Characteristics of Truck Ownership in Australia (BTE 1981b)

STATE STUDIES

Board of Inquiry into the Victorian Land Transport System (Bland 1972)

Form of inquiry and terms of reference
Sir Henry Bland was appointed by the Victorian Government in November 1970 to conduct an inquiry into the existing system of land transport in Victoria (excepting passenger transport in Melbourne, Ballarat, Bendigo and Geelong).
The Report of the Board of Inquiry into the Victorian Land Transport System which was released in January 1972 concentrated upon goods transport.

The terms of reference commissioned the Board to examine, in particular:

(1) whether the existing land transport system is satisfactory to meet the needs of agriculture, commerce and industry, and the public;

(2) whether the present division of freight traffic as to area and type of goods between road and rail is desirable;

(3) whether there is duplication of existing transport services which is wasteful and, if so, how such duplication could be avoided;

(4) whether the existing system of transport regulation allows a flexible transport system which can adapt reasonably to changing conditions;

(5) what changes, if any, should be brought about in the system of transport regulation and the provision of rail services to give the most efficient transport service practicable in the public interest; and

(6) what effect any changes proposed would be likely to have on the transport industry and Government finances generally.

Empirical work

The road freight task for the years since 1933 was reviewed. Costs and charges in the transport industry were examined with a working party established to investigate road construction and maintenance costs. A detailed examination of road maintenance charges was being made along with a separate study of railway costs.

An overall assessment of the freight task was undertaken, followed by an assessment of particular industries' (including timber, oil and wool) transport needs.

Major conclusions and recommendations relevant to the BTE submission

- The Victorian transport system which was devised for an earlier period when technological developments placed the Railways in the exclusive position to undertake the major transport task, was regulated heavily in favour of rail in the early 1970s. Nonetheless, this regulation was failing to protect the Railways' financial position.

- The objective of protecting the Railways' comprehensive system should be replaced by that of facilitating their restructuring and reorganisation, and at the same time allowing some extension of road freedom. The Railways should function primarily as a commercial undertaking.

- In the long term, the scope for free competition between rail and road modes should be progressively extended.

- The Railways should perform that part of the total transport task for which they have inherent advantages over road transport. They should be freed of tasks whose continued performance could mean continued growth in their annual deficits and which can be better performed by the road mode. The division of traffic between rail and road modes should not be predetermined, but rather should be the outcome of the choices of transport users made in an environment where each mode is highly efficient and neither mode enjoys an advantage over the other in the form of hidden community subsidies.

- With minor qualifications in relation to specialised vehicle licences, surveillance of entry to the road transport industry should be directed to qualitative aspects.

- The costs of road construction and maintenance were allocated to the various classes of users on the basis of their relative responsibilities, with the conclusion that road hauliers do not meet their full attributable costs.

- Both modes should bear their real costs, or, after taking account of community subsidies, be equally placed cost-wise. Road transport operators should meet the costs, attributable to their vehicles, of road construction and maintenance. The Railways should be required to operate in such a way that their total revenues cover their total costs, including capital charges and proper provision for depreciation.

Victorian Transport Study (Lonie 1980)

Nature of study and terms of reference

Mr W.M. Lonie was appointed to carry out a study which examined all freight and passenger transport within, and to and from Victoria. No formal terms of reference were announced for the study which resulted from the following motion carried by the Legislative Assembly of the Parliament of Victoria on 13 June 1979:

> 'that in the opinion of this House the Government should:
>
> (a) Institute a study into all freight and passenger transport within Victoria, and to and from Victoria, in order to produce a co-ordinated transport system capable of meeting the needs of all residents of Victoria, having particular regard to the effect of transport on the balanced development of the State; and
>
> (b) Retain all country rail lines, including the Balmoral line pending the results of the above Study.'

Empirical work

A series of 27 reports relating to various aspects of the transport system was succeeded by the Final Report released in September 1980. The study considered various background information including the nature, extent and use of the present land transport system, current transport administration and finance, recent events and some policy matters. It examined relevant specific aspects including road freight transport, interstate rail freight services, country rail systems and country roads.

Of particular interest was the revision for Victoria of the Country Road Board's 1977 assessment of avoidable costs of truck operation. The procedure involved calculating the reduction in pavement costs resulting from the exclusion of each of seven particular vehicle types from the road system.

Major conclusions and recommendations relevant to the BTE submission

The study presented various recommendations which were seen to lead to securing maximum economic benefit to the people of Victoria.

- The principal issue is whether in view of the dominance of transport by largely road based privately owned and operated transport systems there is a continuing place in transport for the publicly owned and operated fixed rail systems which were the backbone of transport in Victoria for nearly 100 years.
- The inflexibility of the fixed rail systems operating in much the same way as they did in the 19th Century renders them obsolete because of their replacement by other transport systems. Even with the legislative, regulatory and financial support of the railways, people have turned to the highly sophisticated road systems which satisfied their want for flexible transport.
- Control over the road based systems by regulation, by limitation of alternative transport capabilities, by financial support of public transport authorities, and by maintenance of reduced freight rate levels, has not prevented the evolution of the road transport system, and is now ineffective.
- The existing system of road freight transport regulation should be terminated as soon as possible and the following changes be made:
  - —repealing of relevant provisions of the Commercial Road Vehicles Act which protect rail services and some licensed road services;
  - —enactment of legislation to enable the Governor in Council on the recommendation of the Minister of Transport to apply or lift restrictions or prohibitions of carriage of prescribed goods by road transport;
  - —abolition of the existing licensing system and introduction of a system of operator competency regulation; and
  - —intensified enforcement of legislation dealing with overloading, dimensions,

speed, driving hours, rest periods and safe loading, and an increase in the level of random inspection of heavy commercial vehicles.

- The redevelopment and upgrading of the two major interstate rail routes should be accelerated to improve the economics of freight transport between the capital cities, and the extension of standard gauge facilities for several port areas should be investigated. The Railways should confine its interstate freight activities to the handling and haulage of wagon and train lots only, to ensure revenue covers all costs, and should abandon handling any LCL freight. The common carrier obligation of the Victorian Railways Board should be abolished. The lines and services which as a result are no longer required should be closed.
- Restrictions on road transport of fertilizer, sawn timber and cement should be abolished, movement of petroleum investigated and carriage of grain amended.
- There should be a substantial increase in the funds made available for the maintenance and development of the State's road system.

Southern Western Australia Transport Study (SWATS 1977)

Form of inquiry and terms of reference
On 21 May 1975, the Western Australian Cabinet commissioned the Director-General of Transport and the Commissioner of Railways to jointly direct a study of transport policy in the southern half of the State (that is, south of latitude 26 degrees south). The study was completed in late 1977.

The terms of reference required that the study would result in recommendations for:

- updating of policies governing the use of all transport in that part of Western Australia to ensure that the resources allocated to transport are used in the most efficient manner;
- the measures needed to co-ordinate and develop the various transport modes should be established; and
- the sequence of measures needed to change from the current policy to recommended policy should be established, together with a time scale so that implementation would be as acceptable as possible.

Empirical work
Forecasts of traffic outside the metropolitan area of Perth up to the year 1991 were estimated (based on origin-destination flows of twelve SWATS cargo-forms resulting from a range of transport policy options with 1974-75 as the base year). Production, exports and imports forecasts were obtained from secondary sources, while consumption forecasts were related to changes in population.

A computer model was developed to evaluate the impact on the transport system (carriage of freight by road and rail) of five transport policy options.
These policies comprised:

(i) continuation of current policy, based on protection of WestRail and franchised road operators' roles as common carriers, and users generally being required to send goods by rail if a service exists;

(ii) Least resource cost policy where each traffic flow was allocated to the transport alternative with the lowest attributable long-run marginal cost (a benchmark for assessing other policies);

(iii) total reliance on the price mechanism (a completely deregulated road and rail freight policy allowing for inter-modal and within road competition);

(iv) partial decontrol of both road and rail through relaxing existing economic regulations (allowing greater freedom of choice and relating freight rates more

closely to costs but still maintaining some controls on inter-modal competition, since there is a need for some non-economic regulations in the interest of community values, safety and reasonable service standards); and

(v) deregulated road policy while maintaining rail pricing regulation and social constraints (road would be free to compete for all traffic and rail would be allowed to reduce freight rates below the maximum values specified by government to meet competition).

Estimated total annual resource costs (comprising vehicle operating and time costs, accident costs, and road construction and maintenance expenditure) varied by less than 5 per cent between the two extreme transport policies (iii) and (i)[1]. Cost differences between the base and project cases were classified into additional capital and maintenance expenditure. The former policy (deregulated freight transport industry) was regarded as the most efficient policy, while the latter (continuation of current policy) was considered as the least efficient policy.

Major recommendations relevant to the BTE submission

- The objective of a 'practical' transport policy should be the attainment of the highest practical level of economic efficiency through a mixture of regulation and competition. Consequently, some variant of policy (iv) was recommended.
- The proposed partial decontrol of both road and rail freight transport (policy (iv)) was to be achieved gradually over a period of more than ten years. There was to be a move from the present policy to a revised regulated environment where regulations are more closely related to the resource cost advantages. Then there was to be a further move towards a situation where the allocation of transport between the modes is performed substantially by the price mechanism (other than for safety and essential standards). In progressively implementing the new policy the Government should have special regard for the need to maintain balance in the transport systems.
- Subject to safety and other essential standards, regulation of road transport should be confined to an absolute minimum, and based on clear proof that is is needed in the public interest.
- The road maintenance contribution should be recognised as justifiable (large vehicles inflict more damage than they pay for). Similarly, all transport subsidies should be identified and monitored for their effectiveness.
- A restructuring of the Transport Commission and the establishment of a Transport Subsidies Board.
- The Government should foster WestRail's development as a corporate trading entity with freedom to determine its own price structure and how and where it will operate (that is, to become more commercially market-orientated in its operations through releasing it from its common-carrier obligations). Also, WestRail should consider the advantages of estabishing regional freight centres providing transfer facilities for commodities and from which farmers can directly take delivery of superphosphate.
- As a commercial entity, WestRail should be required to operate on a business accounting basis with revenues at least covering costs (this would require development of appropriate costing techniques and a more market oriented approach throughout the organisation).
- Handling of small freight consignments and parcels should be transferred to a new and separate division of WestRail (Westfreight) where the separate business philosophies required for the two kinds of business can be pursued without conflict.

1. In estimating these costs, use was made of the Study of the Economics of Road Vehicle Limits (explained below). Furthermore, attention was accorded to sensitivity of cost items to changes in the levels of SWATS traffic (transfer of traffic from rail to road).

Commission of Enquiry into the NSW Road Freight Industry (McDonell 1980)

Form of enquiry and terms of reference

The enquiry was constituted on 8 August 1978 by the New South Wales Minister for Transport (the Hon. Peter Cox). The enquiry was to be conducted by Mr Gavan McDonell and its reports were tabled in the New South Wales Parliament in April 1980.

Its purpose was to enquire into, report upon and make recommendations relating to the road transport industry (other than passenger transport), with particular reference to:

- the economy and efficiency of the industry generally and especially in the case of owner-drivers;
- the need or otherwise for rationalisation of freight traffic between rail and road transport and between various operators of road transport;
- whether a licensing system and/or other form of control over entry into the industry is desirable;
- safety standards and environmental factors associated with road operations;
- the effect truck operations have on road standards and requirements;
- whether the industry is making an equitable contribution towards the cost of road construction and maintenance;
- whether there is some practical and acceptable alternative to the present road maintenance charges which will ensure a fair contribution towards the upkeep of road by interstate operators;
- the effects of the recent decisions relating to the implementation of the NAASRA recommendations; and
- any other matters considered to be relevant to the enquiry or subsequently referred by the Minister.

Empirical work

- Long distance freight transport demand data was derived from studies commissioned several years previously by BTE.
- Forecasts for the New South Wales freight task to 1983-84 (based on changes in economic activity as measured by changes in GDP) and for the road/rail freight split were undertaken.
- Output and capacity utilisation in road and rail freight in the 1969-76 period was analysed.
- Surveys of vehicles with a mass greater than 4 tonnes were carried out with the assistance of the Department of Main Roads (DMR) to obtain information on trip type, vehicle ownership arrangements between contractors, and loading characteristics, including overloading.
- Surveys of matters including a classified traffic count, operating speeds, axle mass and vehicle flows into Darling Harbour Goods Yard, were carried out with the assistance of the DMR and the Public Transport Commission (PTC).
- Work done on the cost of accidents, pavement performance and the consequences of increasing mass limits, implications of increased commercial vehicle limits on road system costs, axle and gross mass characteristics of basic commercial vehicle configurations, safety and environmental problems associated with the operation of the road freight industry, and truck and traffic noise levels was reviewed.

Major recommendations relevant to the BTE submission

- Economic regulation of the road freight industry was not favoured. However, the use of 'quality' licensing, including the application of several financial and business

competency factors prior to registration was recommended to improve safety and quality of service aspects in trucking.

- The study recommended the establishment of:
  - —a Road Freight Transport Industry Council;
  - —a Road Haulage Administration within the DMR;
  - —a Road Haulage Industry Development Committee;
  - —a small group of skilled advisers to act as a 'think tank' associated with the Ministry of Transport; and
  - —a Hauliers' Registration Tribunal.
- Promotion of efficiency and rationalisation in long haul freight transport should be guided by:
  - —rates set according to what the market will bear (with the floor freight rate level set by separable costs) in both the road and rail modes;
  - —cost reduction, greater efficiency and productivity in both modes;
  - —the road freight industry meeting its costs including the cost of road damage apportioned between traffic on the basis of applied load and use; and
  - —financial viability being adopted by the PTC (now the State Rail Authority (SRA)) as the goal for its freight operations, taking one year with the next.
- Steps should be taken to improve and expand the information base relating to freight transport.
- The Prices Commission should investigate the conditions of competition and pricing among freight forwarders and their sub-contractors.
- The effects on intermodal pricing, competition and the allocation of resources, of the imposition of taxes, charges and other revenue measures, should be examined.
- Studies should be made of the sharing of costs and revenues between the Commonwealth and the States, of the incidence and importance of poor utilisation, congestion, safety, noise and other costs in short haul and urban freight transport, of driver education training courses, of intermodal freight substitution and of energy conservation objectives.

Pricing Tasmania's Roads (Transport Economics Centre 1981)

Nature of study

This study was funded jointly by the Tasmanian Government and the Commonwealth Government under the Transport Planning and Research Programme, and supervised by Professor J. Taplin of the University of Tasmania. The study report, released in June 1981, established what it costs the Tasmanian road system, on average, each time a medium to heavy truck uses a section of it.

The report dealt with the problem of cost attribution in two stages. Firstly, it established how much of the road system costs were made up of the true marginal costs of road use. Secondly, the inverse elasticity principle was used to attribute the balance of costs to be recovered to various vehicle types.

Empirical work

The study examined various relationships between heavy vehicle traffic and pavement width, between heavy (laden) trucks and pavement damage and between the traffic level and pavement thickness, to obtain attributable road costs. It also examined recovery of other costs of the road system. Data relating to number of vehicles by type for each road, levels of expenditure in the various categories and information on other factors were obtained (principally from the Tasmanian Department of Main Roads).

Regression analysis was used to estimate, for routine seal maintenance, pavement thickness and pavement width, the influence of heavy vehicles (those with a gross vehicle mass (GVM) in excess of 3 tonnes) on costs. In the short run, avoidable costs were regarded as the marginal costs of routine seal maintenance, and in the long run as the marginal costs of providing extra capacity, that is of extra pavement width and thickness. These three costs were partitioned to obtain marginal costs for various types of heavy vehicles.

The recovery of road costs apart from marginal costs was then examined by considering demand elasticities for transport, for goods and for travel, in order to apply the inverse elasticity principle.

Major conclusions relevant to the BTE submission

- The study used the inverse elasticity approach (allocating costs in proportion to the inverse of the estimated elasticity of demand for transport services) to allocate the high proportion of road costs which were common to all vehicle classes.
- Whereas cost recovery from 2-axle trucks over 7 tonnes GVM almost equals the indicated charge, recovery from rigid 3-axle trucks is a little less than half of the indicated charge. For larger trucks, the recovery falls to less than a quarter. In the case of trucks of only 4 to 7 tonnes GVM, the situation is reversed, the total of fuel and motor taxes being about three times the amount that is warranted as cost recovery. This is similar to vans and other light commercial vehicles for which over-recovery is even more pronounced.
- A State tax falling more heavily on diesel fuel than on petrol would achieve some shift towards rational recovery of the costs of the road system, but substantial increases in charges on very heavy vehicles are still required, as are reductions in the burden on lighter commercial vehicles.
- The whole point of recovering costs above marginal costs on the basis of the inverse elasticity rule is that recovery on this basis leads to the least possible disruption of activity. The resulting increase in charges would be passed on to transport users and, because the demand for truck transport is very inelastic in Tasmania, there would be little decrease in the amount of business. This depends on the assumption that there is no alternative mode of transport which would attract the truck business.
- Concerning administration charges, the greatest weakness of the present system is that motor tax per vehicle-kilometre tends to be less for larger trucks than for smaller. Motor tax has the drawback that it can only be set to the average performance of each type and carrying capacity of truck. Permit systems are administratively cumbersome. Far preferable would be some type of automatic and tamper-proof device for recording distance—as done successfully in New Zealand with the use of hubodometers.

AUSTRALIA-WIDE STUDIES

A Study of the Economics of Road Vehicle Limits (NAASRA 1976)

Nature of study and objectives

This study was undertaken by NAASRA to examine the performance and operational characteristics of commercial vehicles in the mainland States. The study team used available information from the ABS Surveys of Motor Vehicle Usage (SMVU) and the Australian Road Survey (1969-74), and also undertook special surveys of vehicle mass and dimensions to allow prediction of axle and axle group loads from gross vehicle weights.

The study report (published in March 1976) presented the methodology and models used to:

- identify the magnitude, and distribution between roads, of the road freight task;

- predict the effect of changes in vehicle mass and dimension limits on the characteristics of vehicles carrying out the road freight task (in order to estimate changes in vehicle operating costs and road pavement costs which depend on vehicle or axle loading); and
- estimate the relationship between the costs of road haulage and the mass characteristics of commercial vehicles.

Empirical work

Available information was summed over a number of road sections to provide estimates of total truck-kilometres performed by road functional class (urban and rural), by State regions (capital city, provincial urban and rural), and interstate travel.

An assumed gravity type model was used to distribute the 1971 SMVU's total interstate travel mileage among individual States.

Regression analyses were used extensively to estimate and forecast:

- the road transport task throughout a period of 25 years (between 1976 and 2000) using information provided by the three SMVUs of 1955, 1963 and 1971;
- the position of axle groups (steering, driving or trailing axle group) on the vehicle; and
- the effect of axle loading, traffic volume, number of lanes and age of seal on pavement cost.

Finally, a computer system was developed to evaluate the relationships between vehicle operating costs and the mass related characteristics of commercial vehicles.

Major conclusions relevant to the BTE submission

- Asssumed demand elasticities for (converted and generated) road freight measured in tonne-kilometres (for road freight facing and not facing competition from rail) were used to estimate annual increases (across all road functional classes) for New South Wales, Victoria, Queensland and Western Australia. No increase was projected in the road freight task in South Australia. Estimates of the impact on the rail system (excluding Commonwealth and privately-owned railways) of this potential conversion to road traffic were projected.
- For existing vehicle types, changes in vehicle load relationships could result in two things: normal tandems replacing spread tandems for vehicles operating at levels lower than the limits, and replacement of 5-axle articulated vehicles with spread tandems by vehicles with triple axles.
- For new vehicle types, changes in vehicle load relationships could result in a 5-axle articulated truck plus 4-axle dog-trailer replacing two 4-axle articulated trucks.
- Firm (fleet) size *per se* is not a significant variable in determining the cost of vehicle operation for a particular freight task.
- Some cost differences between urban and rural operations (particularly for diesel-engine vehicles) were identified on the grounds of interaction with other vehicles in the traffic stream, vehicle speed, road geometry and road conditions.
- Total operating cost per vehicle-kilometre (cents/km) were estimated for vehicles included in the mass and dimension survey. Results indicated that these costs decrease with increases in vehicle size. This decrease was, however, almost entirely due to reductions in driver's wage costs, achieved through the higher annual travel of these larger vehicles.
- The study team indicated the need for further research with respect to updating of costs, identifying the effects of variations in the road system characteristics (including grades, roughness, traffic conditions), and combination vehicles.

Road User Charges in Australia: An Assessment of the Existing System and Guidance for Future Policy (Affleck 1976)

Nature of study and terms of reference

This study was commissioned by a sub-committee of State and Commonwealth Government officers appointed by the Australian Transport Advisory Council to provide advice on the broad principles which should be followed in future consideration of road pricing in Australia.

The report prepared by F. Affleck and Associates was published in 1976. It complemented the work of two other similar and earlier committees appointed to consider the immediate problems of administration and enforcement associated with the road maintenance charges and the implications of recommended increases in road vehicle limits.

Empirical work

Empirical work dealt with four issues. Firstly, road costs and revenues were calculated for Australia in 1973-74. Costs taken into account were:

- construction and reconstruction costs—treated under alternative assumptions as current costs or long-lived assets;
- maintenance, lighting and cleaning costs;
- costs of general administration and regulation;
- costs of providing traffic police, judicial services in connection with road transport, and promotion of road safety; and
- accident costs borne by public authorities and not covered by insurance.

Secondly, the total avoidable costs and road user charges for 2-axle rigid, 4-axle articulated and 6-axle articulated vehicles were estimated. Data used related to rural arterial roads in South Australia. Accident costs, and noise and air pollution costs were not included. Track costs only were considered covering:

- routine maintenance of pavements;
- maintenance resealing;
- reconstruction of life-expired pavements; and
- costs of strengthening pavement at reconstruction to cope with the growth of heavy vehicle traffic.

Thirdly, possible changes in the system of road user charges in Australia were investigated.

Finally, there was an assessment of the Economics of Road Vehicle Limits Study (NAASRA 1976) data and procedures for estimation of avoidable costs attributable to commercial vehicles.

Major recommendations relevant to the BTE submission

Accepting the earlier finding that road users *as a whole* paid their 'fair' share of attributable road costs in 1973-74, and that economic efficiency appeared not to have been well served by the then existing road user charges, the following major recommendations were made.

- There should be legislative changes and the installation of metering devices to overcome the administrative difficulties associated with enforcing and collecting road maintenance charges.
- There should be a new basis for road user charges comprising:
  - —a variable charge related closely to avoidable road costs, designed to encourage optimum substitution among vehicle types and transport modes (this charge could consist of a reformed road maintenance charge and a fuel excise taken together);

—a fixed charge (for example a vehicle registration fee) closely related to elasticities of demand for road use, that is, assessed on a basis which will capture the varying consumer surpluses of different road user classes and permit optimum utilisation of the road system by all users: and

—a variety of other fixed charges (such as sales tax, customs duties and excise on motor vehicle and parts) intended for general revenue purposes and having a minimal impact on users' decisions about road use.

- Further research should be undertaken to:

  —estimate avoidable road costs attributable to all types of vehicles in all States;

  —estimate price elasticities of demand for road use (to confirm the validity of the suggested proximities for elasticities); and

  —investigate pricing policies of other modes which compete closely with road transport.

The Independent Inquiry into Representation for Long Distance Owner-Drivers (Hay 1980)

Form of inquiry and terms of reference

The inquiry was announced on 21 November 1979 by the Commonwealth Minister for Transport, the Hon P.J. Nixon. The inquiry was headed by Sir David Hay and completed by the end of February 1980.

The purpose of the inquiry was to investigate the need for changes in the current arrangements for representation for owner-drivers engaged in the long distance freight transport industry, with particular reference to:

- the aims and status of associations, including trade unions, representing owner-drivers;
- factors and arrangements, apart from controls on entry and freight rates, which could be considered by governments and by the industry to facilitate the establishment of an effective and comprehensive system of owner-driver representation; and
- legislation which may be required in connection with recommended arrangements.

Empirical work

To obtain an indication of the views of long distance owner-drivers (LDODs), a questionnaire was designed according to the recommendations of the Transport Industry Advisory Council and the Australian Road Transport Federation. A total of 620 completed questionnaire forms, representing about 6 per cent response rate from the 10 000 LDODs believed to be in the industry, was analysed by the study team.

Major conclusions and recommendations relevant to the BTE submission

- 'Long distance owner-driver' is defined as a person who owns, or has the use of (that is, borrows, bails, hires or leases), from one to five trucks, who is the driver of one of those trucks, and whose transport operations involve distances of greater than 160 kilometres which require him to be away from his base overnight. Similarly, definitions were given for 'independent' LDOD, 'permanent' operator and a 'tow' operator.
- The current arrangements for industry representation are inadequate. These arrangements rely on the well-established organisations (ARTF and TWU) and consequently do not provide a voice for the substantial number of LDODs relying on a number of newer organisations. The newer organisations, comprising the Australian Association of Transport Operators Ltd (AATO), Independent Truckers' Association (ITA) and Professional Transport Drivers' Association of Australia (PTDA) have been able to substantiate their claims for recognition.

- An Australian Council of Organisations representing LDODs should be established. The Long Distance Road Transport Association of Australia (LDRTA) and the TWU should not be excluded from any new representative body. Invitations to join the Council should be issued by the Minister to the AATO, ITA, LDRTA, PTDA and the TWU. Also, interested organisations such as the ARTF and National Freight Forwarders' Association (NFFA) should be invited to recognise the Council, and State governments and the Northern Territory Government should be invited to endorse its role.
- The purposes of the Council should be limited to:
  - —discussions and consultation on the state of the industry;
  - —approaches to the Commonwealth Government and its instrumentalities on matters of policy within the Commonwealth's jurisdiction;
  - —negotiations with prime contractors, or bodies representing prime contractors, on contract conditions, subject to the authorisation of the Trade Practices Commission; and
  - —approaches to relevant Commonwealth Arbitration Tribunals, if established, concerning contract conditions applying between prime contractors and LDOD sub-contractors.
- For an initial period of one year the Commonwealth should provide and pay for suitable office space and facilities for the Council in Canberra, together with an executive secretary/treasurer and appropriate supporting staff. The Council would operate under an initial constitution to be reviewed during the first year of operation.
- An independent registrar should be appointed by the Commonwealth Government to conduct an annual review of the eligibility of member organisations. In determining the aims, staffing and operation of the Council, there should be no duplication of activities that could be more effectively undertaken by the individual member organisations.

Cost Recovery in Australian Transport 1974-75 (BTE 1977)

Form of inquiry and terms of reference
The inquiry was announced on 9 February 1976 by the Commonwealth Minister for Transport, the Hon P.J. Nixon. He directed the BTE to investigate and report on the comparative levels of cost recovery in the various modes and operational areas of Australian transport. The study results, relating to cost recovery in the financial year 1974-75, were published in September 1977.

The specific objectives of the investigation were to:

- develop an economic basis for comparing the levels of cost recovery in the various modes and operational areas of the transport sector;
- determine historical levels of cost recovery in the various modes and operational areas;
- indicate impacts on transport costs, demand and modal split of differing rates of cost recovery between modes in the performance of specific tasks; and
- examine alternative charging methods for increasing cost recovery in the various modes and operational areas.

Empirical work
The study examined cost recovery from each transport 'task' by the following three sectors' funding and policy activities:

- Commonwealth Government including its activities in the Australian Capital Territory and Northern Territory while excluding the operations of Commonwealth transport instrumentalities such as Qantas, Trans Australian Airlines, Australian

National Line, Australian National Railways and Territorial bus services;

- State governments excluding State transport instrumentalities such as railways, ports, harbour authorities; and
- 'Other' sectors which variously included the infrastructure activities of local government, operations by commercial firms and activities of quasi-commercial Commonwealth and State transport instrumentalities.

To determine cost recovery levels (regarded as the extent to which users pay for transport services) by these three sectors. an analytical framework was developed on a task basis. Cost recovery levels for particular tasks were identified on the basis of mode, area of operation, class of operation and the sector undertaking recovery. In developing such a framework emphasis was given to actual financial transfers; that is, the fact that many transport services have both positive and negative spinoffs which cannot be accounted for in a direct financial sense (such as mobility, trade, employment, pollution and accidents) was ignored.

Major conclusions and recommendations relevant to the BTE submission
Data limitations, and the four main problems encountered in undertaking cost recovery analysis (attribution of costs and revenues to a particular activity, allocation of attributable costs to user groups, determination of capital values and assessment of intangibles), preclude the precise determination of the 'true' position. There were several main conclusions.

- The results were generally in line with commonly held views regarding cost recovery levels in particular modes and tasks. With the exception of certain classes of users of road systems, users generally do not pay the full financial costs of providing transport services (see Table I.1). This is an indication that society in general implicitly values transport services more highly than the valuation given by financial markets for such services.
- Many pricing practices adopted in transport have developed over time. For example, historic price structures have been subject to blanket adjustments over time and particular levies/subsidies introduced to overcome short term phenomenon have gained a permanent place as part of the price structure.
- Commonwealth and State Government cost recovery levels varied quite significantly, while cost recovery within the 'other' sector (which generally involves operational agencies) was far less variable.
- The generally low cost recovery estimates may indicate that insufficient attention has been given in the past to recouping capital costs in transport. If continued, this may well cause problems with maintaining investment in the future.

The Long Distance Road Haulage Industry (BTE 1979c)

Nature of study and terms of reference
In April 1979, the Commonwealth Minister for Transport, the Hon P.J. Nixon, requested the Bureau of Transport Economics to investigate and report (by 30 June 1979) on the structure, market conduct and performance of the domestic long distance freight industry. In this study, particular emphasis was to be placed on the long distance road transport sector and the inter-modal competition it faces.

The following are the terms of reference.

- On the basis of available information assess:
  - —the extent to which the market share of long distance road transport is affected by changes in freight rates (and particularly by increases in contract rates payable to road transport owner-drivers by freight forwarders); and
  - —the inter-relationship between the freight forwarding section of the industry and road transport owner-drivers and sub-contractors.

TABLE I.1—OVERALL COST RECOVERY LEVELS FOR ALL SECTORS BY MODE; AREA AND CLASS OF OPERATION, 1974-75

Mode	*Area of operation*	*Class of operation*	*Surplus (+) or deficit (-) ($million)*	*Cost recovery level (Per cent)*
Air transport	Domestic trunk and rural operations	Passenger and freight	-120.7	78
	Domestic general operations	Passenger and freight	-65.3	46
	All domestic operations	Passenger and freight	-186.0	72
Sea transport	Coastal operations	Passenger and freight	-259.9	56
Road transport	Urban	Passenger	351.4	144
	Urban	Freight	-353.2	79
	Rural	Passenger	-243.7	69
	Rural	Freight	-217.2	80
	Urban and rural	Passenger and freight	-462.7	89
Rail transport	Urban	Passenger	-179.6	40
	Non-urban	Passenger	-91.9	46
	Non-urban	Freight	-299.2	67
	Urban and non-urban	Passenger and freight	-570.7	59

Source: BTE (1977).

- Undertake explorative investigations that would enable identification of the extent and nature of research that could be required to provide an authoritative assessment of the structure, market conduct and economic performance of the domestic long distance freight transport market for road/rail/sea modes.

Empirical work

Empirical analyses undertaken covered four aspects of this work. First, using monthly data for the eight year period between 1970-71 and 1977-78, estimates were made of the risk free rates of return on capital to five companies (Ansett, Brambles, Mayne Nickless, TNT, and Fleetways). Secondly, short and long run price elasticities for inter-capital road freight were estimated over the period 1971-72 to 1976-77 using an index of road freight rates to rail freight rates, gross domestic product and dummy variables for seasonal variations. Thirdly, costs incurred by the railways in providing container services between Sydney and Melbourne were calculated. Finally, estimates were made of the increase in consumer prices resulting from increases in the costs of road and rail transport under varying assumptions about the level of wage indexation.

Major conclusions relevant to the BTE submission

- The major problem perceived within the industry is the financial plight of the owner-driver. The industry suffers from oversupply, and rates paid to owner-drivers have not kept pace with operating costs.
- All sectors of the industry appear to be highly competitive. Not only is there competition within the industry, but rail has the potential to capture significant amounts of the long distance freight market from road.
- There is no evidence to support the contention that freight forwarders make monopoly returns (returns of five main operators appear to not be excessive and to reflect the relative risk of investment).
- More research could be conducted on the rail, sea and air modes. A more detailed

study of the competing freight modes would be of value in considering the effect of intermodal competition. In particular, a study of rail pricing would assist in examining road-rail competition (unfortunately, lack of comprehensive actual freight rate and cost information for rail services precluded detailed examination of road/rail competition).

The Road Transport Business: A Guide to Some Financial Aspects (BTE 1980b)

Nature of study and objectives
This study was undertaken in response to requests from various sections of the long distance road haulage industry in late 1979. There was a general opinion within the trucking industry that there existed a serious lack of financial knowledge relating to entry requirements.

The study (published in 1980) was prepared as a guide for persons considering entering the road transport industry as owner-operators and for current operators. It outlined certain key factors in business success and introduced some simple techniques (through a case study of a prospective owner-driver considering the operation of a 22 tonne capacity 6-axle semi-trailer on the Sydney to Adelaide run) to assist in increasing trucking profitability.

Empirical work
A number of technical background issues were considered including:

- basic requirements to commence as an owner-driver including the necessary business records, alternative legal and operational structures (hire purchase or lease arrangements);
- assessing demand for the proposed services, and the costs incurred in running a trucking business (using a computer program); and
- operational strategy with a view to maximising the profitability of the business (highlighting the significance of backloading).

Major conclusions relevant to the BTE submission
- For many truck operators the attractive life style and the glamour of driving a 'big rig' seem to have relegated financial matters to a secondary position.
- Operations which require a late model prime-mover commonly involved an undertaking by the owner-driver to pay fixed sums monthly for some years into the future. Hence, difficulties can be created by the inability to:
  - —predict accurately the demand for road transport over the asset's working life;
  - —select the most suitable vehicle for the task and the operation structure; and
  - —anticipate price movements in some of the components of total operating costs (for example, fuel).

Some Characteristics of Truck Ownership in Australia (BTE 1981b)

Nature of study and objectives
The absence of adequate information on road transport operations has been a continuing problem in research. The Surveys of Motor Vehicle Usage conducted by the Australian Bureau of Statistics provide valuable information on the physical operations of vehicles. However, these surveys do not cover the ownership and organisational structure of the industry.

The objective of this study was to develop a statistical procedure for identifying road fleet structure and operators at a State level using information available from Motor Vehicle Registration Authorities. As a byproduct, a range of statistical information on the ownership and concentration of the Australian road transport fleet could be examined.

Empirical work

Although the study report was published in 1981, information provided by the State registries related to vehicles on register in mid-1976. The following three mechanical steps were followed to produce lists of fleet owners:

- identification of the key word in the name file;
- determination of the statistical division in which the registered owner lived; and
- a sorting process to group fleets together.

To evaluate the accuracy of the mechanical procedures used, registration records for Tasmania (containing a relatively small number of vehicles) were examined manually.

Major conclusions relevant to the BTE submission

- Despite some evident distortions in the results obtained, the study provided an inexpensive methodology which can be updated at relatively short notice for providing an approximate guide to the pattern of vehicle ownership and fleet sizes (see Chapter 3 of this submission).
- Distortions can be attributed to one or more of the following causes:
  - —the procedures and the method used as evidenced by the check undertaken on the Tasmanian results (for instance, problems with the identification of 'independent' operators, partnership operations, and the degree of control exercised by companies over branch office operations);
  - —on the Victorian register, a large number of vehicles appeared without name or address (a situation believed to have been remedied since the end of 1979); and
  - —results are influenced to a great extent by the choice of vehicles to be included in each fleet (excluding passenger cars, commercial vehicles of less than 1 tonne tare weight and special purpose non-freight carrying vehicles such as tow trucks).
- The industry is highly disaggregated, with the majority of fleets consisting of one or two vehicles often operating in conjunction with some other primary business activity. Between 48 per cent (New South Wales) and 57 per cent (Western Australia) of vehicles are operated as part of one or two truck fleets whereas between 15 per cent (South Australia) and 23 per cent (New South Wales) are operated as part of a ten or more truck fleet.
- The between-State differences may be due to differences in State transport regulations, industrial activity, population distribution and other factors.
- Fleets outside capital city areas tend to be smaller with much smaller numbers of large fleets (for example 69 per cent of vehicles registered outside capital cities are in fleet sizes of three or less compared with 56 per cent in these size categories in the capital cities).
- For Tasmania, of the trucks allocated to the different industries, over 39 per cent of the fleets and nearly 25 per cent of trucks served agriculture. This was followed by the transport and storage industry, and wholesale and retail trade.

APPENDIX II—SUPPLEMENTARY STATISTICAL TABLES

INTRODUCTION

Chapter 3 drew upon a number of data collections to examine the main trends in the Australian road freight task as it has developed since the early 1970s. Comparisons were made with the freight task performed by other transport modes and road freight activity was considered from a number of different perspectives. In some of these only a selection or summary of information available from current data collections was included. Therefore, Appendix II contains more detailed information relating to:

- the Australian domestic freight task;
- the rail freight task;
- interstate road freight movements; and
- the size and composition of truck fleets.

TABLE II.1—AUSTRALIAN DOMESTIC FREIGHT TASK BY MODE; TONNES CONSIGNED AND TONNE-KILOMETRES PERFORMED, 1970-71 TO 1981-82

Year	Road[a]	Rail		Sea[d]	Air[e]	All modes
		Government[b]	Non-government[c]			
			Tonnes consigned (million)			
1970-71	720.5	79.0	72.6	39.9	0.10	912.1
1971-72	na	81.6	78.7	45.1	0.10	na
1972-73	na	83.8	94.6	44.1	0.11	na
1973-74	na	87.3	115.1	47.4	0.13	na
1974-75	na	92.7	127.8	47.4	0.12	na
1975-76	756.4	96.0	116.7	48.1	0.12	1 017.3
1976-77	na	99.5	123.6	47.7	0.12	na
1977-78	na	98.6	121.2	48.5	0.14	na
1978-79	912.6	102.5	114.1	48.1	0.14	1 177.4
1979-80	na	117.1	123.2	48.8	0.15	na
1980-81	na	127.3	124.1	46.8	0.15	na
1981-82	na	129.1	121.4	43.5	0.15	na
			Tonne-kilometres ('000 million)			
1970-71	27.3	25.2	13.8	72.0	0.09	138.4
1971-72	na	25.4	16.6	83.4	0.09	na
1972-73	na	26.6	20.0	89.9	0.10	na
1973-74	na	28.3	26.5	96.6	0.12	na
1974-75	na	29.8	30.2	101.7	0.12	na
1975-76	36.7	30.8	26.3	104.9	0.11	198.8
1976-77	na	32.0	27.3	102.8	0.11	na
1977-78	na	31.8	28.4	105.5	0.12	na
1978-79	48.1	32.1	25.6	105.0	0.12	210.9
1979-80	na	36.4	27.8	105.5	0.13	na
1980-81	na	36.5	28.9	110.6	0.13	na
1981-82	60.1	37.4[p]	27.4	98.2	0.13	223.2

a. Year ending 30 September.
b. Tonnes consigned after 1979-80 are overstated because double counting occurs where freight is transferred between or within systems. This double counting was netted out in years up to and including 1979-80 in detailed work by the BTE (1983a).
c. Consignments transferred from or to non-government railways are excluded from tonnes consigned on non-government railways (and are only included in tonnes consigned on government railways).
d. Due to changes in the collection, the figure for 1970-71 is not directly comparable with figures for later years. After 1979-80 only mass tonnes consigned and mass tonne-kilometres performed are available. For some types of cargo mass tonnes are slightly less than cargo tonnes recorded in earlier years.
e. Scheduled carriers only. Includes all domestic airline operations to/from Papua New Guinea prior to 15 September 1975.
p preliminary figure
na not available

Sources: ABS (1973), ABS (1978a), ABS (1981b), ABS (1982c), ABS (1983c), BTE (1983a), Department of Transport (1983), Department of Aviation (1983a), Department of Aviation (1983b).

TABLE II.2—ESTIMATED RAIL FREIGHT TASK; AUSTRALIA, 1975-76, 1978-79 AND 1979-80

Commodity group	*Government*			*Non-government*		
	1975-76	*1978-79*	*1979-80*	*1975-76*	*1978-79*	*1979-80*
	Tonnes consigned (million)[a]					
Bulk liquids	3	3	3	–	–	–
Coal and coke	40	46	50	6	7	7
Iron ore	2	1	2	84	80	88
Other minerals	16	19	20	8	9	10
Grains	13	12	20	–	–	–
Other bulk solids	4	4	4	19	19	18
Non-bulk freight	19	18	18	–	–	–
Total	96	103	117	117	114	123
	Tonne-kilometres (million)[a]					
Bulk liquids	c	c	c	–	–	–
Coal and coke	2 053	2 358	2 823	67	110	87
Iron ore	1 127	573	806	25 748	24 930	27 128
Other minerals	1 701	1 964	1 983	229	227	258
Grains	3 083[d]	3 189[e]	5 215[e]	–	–	–
Other bulk solids	859	1 036	1 128	302	299	292
Non-bulk freight	21 986[f]	22 936[g]	24 411[g]	2	–	–
Total	30 809	32 056	36 366	26 348	25 566	27 765

a. Freight transferred between or within government railway systems is counted as a single consignment regardless of the number of stages travelled. Transfers between government and non-government railway systems are included in estimates of tonnes consigned on government railways (and excluded from estimates of tonnes consigned on non-government railways).
b. In Queensland all tonne-kilometres performed on government rail systems are included in the category 'non-bulk freight'.
c. Included in the category 'non-bulk freight'.
d. Includes wheat only. All grains other than wheat are included in the category 'non-bulk freight'.
e. Excludes New South Wales grains other than wheat. Other grains in New South Wales included in the category 'non-bulk freight'.
f. Includes all freight transported by Queensland railways, all bulk liquids and all grains other than wheat.
g. Includes all freight transported by Queensland railways, all bulk liquids and all New South Wales grains other than wheat.
– nil or rounded to zero

NOTE: Figures may not add to totals due to rounding.

Sources: BTE (1979b), BTE (1983a), ABS (1981a), ABS (1982c).

TABLE II.3—INDICATORS OF INTERSTATE ROAD FREIGHT MOVEMENTS BETWEEN MAINLAND CAPITAL CITIES[a], 1971-72 TO 1980-81

('000 tonnes)

Year	Sydney-Melbourne	9 city pairs	Total for 10 city pairs
1971-72	1 038	1 547	2 585
1972-73	1 195	1 683	2 879
1973-74	1 319	1 932	3 251
1974-75	1 368	1 825	3 193
1975-76	1 372	1 772	3 144
1976-77	1 448	1 946	3 394
1977-78	1 506	2 154	3 660
1978-79	1 459	2 167	3 626
1979-80	1 524	2 181	3 705
1980-81	1 302	2 044	3 346

a. Sydney, Melbourne, Brisbane, Adelaide and Perth.

NOTE: (i) Only freight carried by freight forwarders and/or road transport operators who engaged in the interstate movement of freight for hire and reward is included.

(ii) Coverage is limited to those operators who moved a total of 10 000 tonnes or more per annum.

(iii) The removal of household furniture and effects is excluded.

(iv) While giving a possible indication of the growth in interstate traffic, estimates are subject to significant levels of error (particularly in the later years prior to termination of the collection in 1981).

(v) Figures may not add to totals due to rounding.

Source: ABS, Interstate freight moved by major freight forwarders and road transport operators between specified Australian centres, 1971-72 to 1973-74, unpublished developmental collection.
ABS, Freight and furniture moved interstate by major freight forwarders and road transport operators between specified Australian centres, 1974-75 to 1980-81, unpublished developmental collection.

TABLE II.4—INTERSTATE ROAD FREIGHT MOVEMENTS; AUSTRALIA, 1980-81 AND 1982-83

('000 tonnes)

Time period	Sydney-Melbourne	9 city pairs[a]	Total for 10 city pairs	Other interstate	Total interstate
1980-81[b]	3 283.5	4 062.4	7 345.9	5 361.1	12 977.0
September 1982[c]	380.5	655.0	1 035.5	646.5	1 682.0
December 1982[c]	369.6	655.7	1 025.3	636.0	1 661.3
March 1983[c]	364.9	575.6	940.4	626.7	1 567.1

a. Routes linking Sydney, Melbourne, Brisbane, Adelaide and Perth but excluding Sydney-Melbourne.
b. Estimates of freight carried by all businesses in Australia that were engaged in the movement of freight interstate by road for hire and reward under prime contract arrangements or on own account.
c. Freight carried by enterprises involved in freight forwarding and road transport operations which had moved 20 000 tonnes or more of freight interstate in 1980-81, for hire or reward under prime contract arrangements or on own account.

Source: ABS (1982a), ABS (1983b).

TABLE II.5—NUMBER OF FLEETS BY TRUCKS WITHIN TRUCK TYPE; QUEENSLAND, 1982[ap]

Trucks per fleet		*Articulated*													*Total fleets*
		0	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11-15*	*16-20*	*21+*	
Rigid [b]	0		4 206	304	77	33	8	4	5	1		1	2		1	4 642
	1	33 616	598	85	25	15	3	4	2	3	1	1	1	2		34 356
	2	2 706	175	43	17	8	7	4	2	2	2		2	2		2 970
	3	541	68	22	9	10	4	3	1	3			2	1	1	665
	4	221	30	11	4	8	2	1	1	2	2					282
	5	95	24	4	3	2	1	2	2			1	3			137
	6	64	14	15	7	2	1		1			1	2			107
	7	51	13	4	1	2	1	1					1		1	75
	8	30	6	2	3	1	3			1			1	1		48
	9	32	10	5	4		1			1					1	54
	10	22	4	3	3					1	1		1			35
	11	14	2	1	2		1						1			21
	12	14	5	5		1	1		3					1		30
	13	11	1	1		3		1		1						18
	14	10	3				1			1	1		1		1	18
	15	6	3													9
	16-20	30	7	7	3	3		1	2		1					54
	21-30	23	6	5	1	3	1		1		1			1	3	45
	31-50	12	5	3		2	1	1		1				2	2	29
	51+	7	7	1			3					1			4	23
Total fleets		37 505	5 187	521	159	93	39	22	20	17	9	5	17	10	14	43 618

a. Trucks registered in the State at 30 September 1982.
b. Excludes rigid trucks with a tare weight of 2 tonnes or less.
p preliminary

Source: Queensland Department of Main Roads (unpublished data).

TABLE II.6—NUMBER OF FLEETS BY TRUCKS WITHIN TRUCK TYPE; SOUTH AUSTRALIA, 1982[ap]

Trucks per fleet		*Articulated*													*Total fleets*
		0	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11-15*	*16-20*	*21+*	
Rigid[b]	0		1 634	200	44	17	8	8	2	3	4	1	3	2	3	1 929
	1	16 385	244	62	22	3	3	2	2	3		1	2	1		16 730
	2	1 685	100	14	8	5	5	2	1	3		1	2			1 826
	3	331	35	14	4	1	4	2	2	1			2	1		397
	4	121	21	6	6	5	2		1	2	2				1	167
	5	61	12	7	3	1		1						2		87
	6	43	9	3	2	2		2	1						1	63
	7	24	6	2	1					1				1	2	37
	8	15	7	2	1		2		1				1	1		30
	9	9	2	2	1		1		1	1		1	1			19
	10	8	2	3	2			3								18
	11	9	1	2	1	1								1		15
	12	5	1	1	1											8
	13	2	1				1								1	5
	14	6	1			1		1								9
	15	3		1	1											5
	16-20	14	3	2	2		1							1		23
	21-30	5	2		1	2										10
	31-50	7	4				2								1	14
	51+		1	1	1	1	2			1			1		2	10
Total fleets		18 733	2 086	322	101	39	31	21	11	15	6	4	12	10	11	21 402

a. Trucks registered in the State at 30 September 1982.
b. Excludes rigid trucks with a tare weight of 2 tonnes or less.

p preliminary

Source: South Australian Department of Transport (unpublished data).

TABLE II.7—NUMBER OF FLEETS BY TRUCKS WITHIN TRUCK TYPE; WESTERN AUSTRALIA, 1982[ap]

Trucks per fleet		*Articulated*														*Total fleets*
		0	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11-15*	*16-20*	*21+*	
Rigid[b]	0		1 775	138	33	14	4	1	1	1				1		1 958
	1	19 609	322	40	14	3		2	1		2	1				19 994
	2	1 895	98	23	7	5	1									2 029
	3	408	41	11	3	4	3	2	1					1		474
	4	145	25	6	4	1	1			1			2		1	186
	5	82	17	1	5	1										106
	6	39	5	2	1	1	1	4	1	1			1			56
	7	27	10	4	3	2	1	2				1	1	1		52
	8	18	3		1				2							24
	9	11	3	1	1	2		1								19
	10	17	3	1		1										22
	11	9						1							1	11
	12	8	1	1	1								1			12
	13	7	2		1							1			1	12
	14	2				1									1	4
	15	6	1					1								8
	16-20	11	4	3	2	2	1		1				1		1	26
	21-30	11	2	1	2		1				1	1	1			20
	31-50	6	1	1	2	1									2	13
	51+		3	2	1	6		1		1	1			1	4	20
Total fleets		22 311	2 316	235	81	44	13	15	7	4	4	4	7	4	11	25 056

a. Trucks registered in the State at 30 September 1982.
b. Excludes rigid trucks with a tare weight of 2 tonnes or less.

p preliminary

Source: Western Australia Traffic Licensing and Services Centre (unpublished data).

TABLE II.8—NUMBER OF FLEETS BY TRUCKS WITHIN TRUCK TYPE; TASMANIA, 1982[ap]

Trucks per fleet		Articulated									Total fleets
		0	1	2	3	4	5	6-7	8-10	11+	
Rigid[b]	0		539	45	15	3	3	2			607
	1	4 037	107	16	11			3	1		4 175
	2	402	28	7	1	2	2	1	1		444
	3	95	15	3	1	1	1			1	117
	4	44	7	3	3		1				58
	5	28	6	2	1		1	1	1		40
	6	12	2	1	1		1	2			19
	7	7	3	2	1						13
	8	3	3			1				2	9
	9	2		1							3
	10	1						1			2
	11	7	1		1					1	10
	12	2									2
	13-15	3	1	3	1	2		1		2	13
	16-20	9	1	1							11
	21+	3	1		1			1		4	10
Total fleets		4 655	714	84	37	9	9	12	3	10	5 533

a. Trucks registered in the State at 30 September 1982.
b. Excludes rigid trucks with a tare weight of 2 tonnes or less.
p preliminary

Source: Tasmanian Department of Transport (unpublished data).

TABLE II.9—NUMBER OF FLEETS BY TRUCKS WITHIN TRUCK TYPE; NORTHERN TERRITORY, 1982[ap]

Trucks per fleet		Articulated							Total fleets
		0	1	2	3	4	5-6	7+	
Rigid[b]	0		130	9	2	1			142
	1	406	9	5	1	2	1		424
	2	25	7					1	34
	3	9	3	1					13
	4	1	4	1				1	7
	5		2						2
	6	1				1			2
	7	1				1			2
	8						1		1
	9+				1			1	2
Total fleets		443	155	17	4	5	2	3	629

a. Trucks registered in the Territory at 30 September 1982.
b. Excludes rigid trucks with a tare weight of 2 tonnes or less.
p preliminary

Source: Northern Territory Department of Transport and Works (unpublished data).

TABLE II.10—NUMBER OF FLEETS BY TRUCKS WITHIN TRUCK TYPE; AUSTRALIAN CAPITAL TERRITORY, 1982[ap]

Trucks per fleet		*Articulated*							*Total fleets*
		0	*1*	*2*	*3*	*4*	*5-6*	*7+*	
Rigid[b]	0		100	12	3				115
	1	709	15	4	1	2			731
	2	68	2	1	1		1	1	74
	3	24	3	1					28
	4	10	3	1					14
	5	3		2	1	2			8
	6	1	1						2
	7	2			1				3
	8	1					1		2
	9		1						1
	10	1							1
Total fleets		819	125	21	7	4	2	1	979

a. Trucks registered in the Territory at 30 September 1982.
b. Excludes rigid trucks with a tare weight of 2 tonnes or less.
p preliminary

Source: Department of Territories and Local Government, Canberra (unpublished data).

TABLE II.11—TOTAL NUMBER OF TRUCKS BY TRUCKS WITHIN TRUCK TYPE; QUEENSLAND, 1982[ap]

Trucks per fleet		*Articulated*														*Total trucks*		
		0	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11-15*	*16-20*	*21+*	*Total*	*Rigid*	*Articulated*
Rigid[b]	0		4 206	608	231	132	40	24	35	8		10	23		22	5 339	0	5 339
	1	33 616	1 196	255	100	75	18	28	16	27	10	11	14	35		35 401	34 356	1 045
	2	5 412	525	172	85	48	49	32	18	20	22		27	39		6 449	5 940	509
	3	1 623	272	110	54	70	32	27	10	33			29	23	58	2 341	1 995	346
	4	884	150	66	28	64	18	10	11	24	26					1 281	1 128	153
	5	475	144	28	24	18	10	22	24			15	56			816	685	131
	6	384	98	120	63	20	11		13			16	35			760	642	118
	7	357	104	36	10	22	12	13					18		36	608	525	83
	8	240	54	20	33	12	39			16			20	25		459	384	75
	9	288	100	55	48		14			17					39	561	486	75
	10	220	44	36	39					18	19		23			399	350	49
	11	154	24	13	28		16						25			260	231	29
	12	168	65	70		16	17		57					28		421	360	61
	13	143	14	15		51		19		21						263	234	29
	14	140	45				19			22	23		28		36	313	252	61
	15	90	48													138	135	3
	16-20	535	128	135	60	69		24	49		27					1 027	956	71
	21-30	546	146	130	31	87	28		35		31			42	181	1 257	1 086	171
	31-50	443	196	138		91	42	40		52				103	142	1 247	1 105	142
	51+	501	523	114			343					106			425	2 012	1 805	207
Total		46 219	8 082	2 121	834	775	708	239	268	258	158	158	298	295	939	61 352	..	..
Total trucks																		
Rigid		46 219	2 895	1 079	357	403	513	107	128	122	77	108	88	121	438	..	52 655	..
Articulated		0	5 187	1 042	477	372	195	132	140	136	81	50	210	174	501	..	..	8 697

a. Trucks registered in the State at 30 September 1982.
b. Excludes rigid trucks with a tare weight of 2 tonnes or less.
p preliminary
.. not applicable

Source: Queensland Department of Main Roads (unpublished data).

TABLE II:12—TOTAL NUMBER OF TRUCKS BY TRUCKS WITHIN TRUCK TYPE; SOUTH AUSTRALIA, 1982[ap]

Trucks per fleet		*Articulated*														*Total trucks*	
		0	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11-15*	*16-20*	*21+*	*Total*	*Rigid*	*Articulated*
Rigid [b]	0		1 634	400	132	68	40	48	14	24	36	10	40	33	85	2 564	0	2 564
	1	16 385	488	186	88	15	18	14	16	27		11	31	18		17 297	16 730	567
	2	3 370	300	56	40	30	35	16	9	30		12	30			3 928	3 652	276
	3	993	140	70	24	7	32	18	20	11			30	20		1 365	1 191	174
	4	484	105	36	42	40	18		11	24	26				48	834	668	166
	5	305	72	49	24	9		11						45		515	435	80
	6	258	63	24	18	20		24	13						68	488	378	110
	7	168	48	18	10					15				25	92	376	259	117
	8	120	63	20	11		26		15				23	28		306	240	66
	9	81	20	22	12		14		16	17		19	23			224	171	53
	10	80	22	36	26			48								212	180	32
	11	99	12	26	14	15								27		193	165	28
	12	60	13	14	15											102	96	6
	13	26	14				18								42	100	65	35
	14	84	15			18		20								137	126	11
	15	45		17	18											80	75	5
	16-20	248	58	39	41		21							35		442	407	35
	21-30	120	47		25	66										258	245	13
	31-50	252	152				81								65	550	506	44
	51+		57	56	93	66	452			70			110		720	1 624	1 527	97
Total		23 178	3 323	1 069	633	354	755	199	114	218	62	52	287	231	1 120	31 595	..	..
Total trucks																		
Rigid		23 178	1 237	425	330	198	600	73	37	98	8	12	127	58	735	..	27 116	..
Articulated		0	2 086	644	303	156	155	126	77	120	54	40	160	173	385	..	..	4 479

a. Trucks registered in the State at 30 September 1982.
b. Excludes rigid trucks with a tare weight of 2 tonnes or less.
p preliminary
.. not applicable

Source: South Australian Department of Transport (unpublished data).

TABLE II.13—TOTAL NUMBER OF TRUCKS BY TRUCKS WITHIN TRUCK TYPE; WESTERN AUSTRALIA, 1982[ap]

Trucks per fleet		*Articulated*														*Total trucks*	
		0	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11-15*	*16-20*	*21+*	*Total*	*Rigid*	*Articulated*
Rigid [b]	0		1 775	276	99	56	20	6	7	8				17		2 264	0	2 264
	1	19 609	644	120	56	15		14	8		20	11				20 497	19 994	503
	2	3 790	294	92	35	30	7									4 248	4 058	190
	3	1 224	164	55	18	28	24	18	10					20		1 561	1 422	139
	4	580	125	36	28	8	9			12			35		45	878	744	134
	5	410	102	7	40	9										568	530	38
	6	234	35	16	9	10	11	48	13	14			17			407	336	71
	7	189	80	36	30	22	12	26				17	21	26		459	364	95
	8	144	27		11				30							212	192	20
	9	99	30	11	12	26		15								193	171	22
	10	170	33	12		14										229	220	9
	11	99					17								34	150	121	29
	12	96	13	14	15								25			163	144	19
	13	91	28		16							23			47	205	156	49
	14	28			18										37	83	56	27
	15	90	16					21								127	120	7
	16-20	205	76	59	42	41	23		26				29		40	541	471	70
	21-30	272	48	23	54		31				31	35	34			528	483	45
	31-50	244	46	40	86	42									194	652	516	136
	51+		270	143	164	667		106		59	140			146	810	2 505	2 238	267
Total		27 574	3 796	940	715	986	137	271	94	93	191	86	140	209	1 207	36 470	..	..
Total trucks																		
Rigid		27 574	1 480	470	472	810	72	181	45	61	155	46	51	140	748	..	32 336	..
Articulated		0	2 316	470	243	176	65	90	49	32	36	40	89	69	459	..	..	4 134

a. *Trucks registered in the State at 30 September 1982.*
b. Excludes rigid trucks with a tare weight of 2 tonnes or less.
p preliminary
.. not applicable

Source: Western Australia Traffic Licensing and Services Centre (unpublished data).

TABLE II.14—TOTAL NUMBER OF TRUCKS BY TRUCKS WITHIN TRUCK TYPE; TASMANIA, 1982[ap]

Trucks per fleet		*Articulated*									*Total*		
		0	*1*	*2*	*3*	*4*	*5*	*6-7*	*8-10*	*11+*	*Total*	*Rigid*	*Articulated*
Rigid [b]	0		539	90	45	12	15	12			713	0	713
	1	4 037	214	48	44			23	9		4 375	4 175	200
	2	804	84	28	5	12	14	8	11		966	888	78
	3	285	60	15	6	7	8			19	400	351	49
	4	176	35	18	21		9				259	232	27
	5	140	36	14	8		10	11	13		232	200	32
	6	72	14	8	9		11	24			138	114	24
	7	49	24	18	10						101	91	10
	8	24	27			12				47	110	72	38
	9	18		11							29	27	2
	10	10						17			27	20	7
	11	77	12		14					25	128	110	18
	12	24									24	24	0
	13-15	42	14	48	18	36		22		72	252	183	69
	16-20	165	21	19							205	202	3
	21+	89	26		29			139		526	809	703	106
Total		6 012	1 106	317	209	79	67	256	33	689	8 768	..	..
Total trucks													
Rigid		6 012	392	149	98	43	22	180	8	488	..	7 392	..
Articulated		0	714	168	111	36	45	76	25	201	..	..	1 376

a. Trucks registered in the Territory at 30 September 1982.
b. Excludes rigid trucks with a tare weight of 2 tonnes or less.
p preliminary
.. not applicable

Source: Tasmanian Department of Transport (unpublished data).

TABLE II.15—TOTAL NUMBER OF TRUCKS BY TRUCKS WITHIN TRUCK TYPE; NORTHERN TERRITORY, 1982[ap]

Trucks per fleet		*Articulated*								*Total trucks*	
		0	*1*	*2*	*3*	*4*	*5-6*	*7+*	*Total*	*Rigid*	*Articulated*
Rigid [b]	0		130	18	6	4			158	0	158
	1	406	18	15	4	10	6		459	424	35
	2	50	21	4				10	85	68	17
	3	27	12	5					44	39	5
	4	4	20	6				11	41	28	13
	5		12						12	10	2
	6	6				10			16	12	4
	7	7				11			18	14	4
	8						14		14	8	6
	9+				23			27	50	40	10
Total		500	213	48	33	35	20	48	897	..	..
Total trucks											
Rigid		500	58	14	21	15	9	26	..	643	..
Articulated		0	155	34	12	20	11	22	..	..	254

a Trucks registered in the Territory at 30 September 1982.
b. Excludes rigid trucks with a tare weight of 2 tonnes or less.
p preliminary
.. not applicable

Source: Northern Territory Department of Transport and Works (unpublished data).

TABLE II.16—TOTAL NUMBER OF TRUCKS BY TRUCKS WITHIN TRUCK TYPE; AUSTRALIAN CAPITAL TERRITORY, 1982[ap]

Trucks per fleet		*Articulated*								*Total trucks*	
		0	*1*	*2*	*3*	*4*	*5-6*	*7+*	*Total*	*Rigid*	*Articulated*
Rigid [b]	0		100	24	9				133	0	133
	1	709	30	12	4	10			765	731	34
	2	136	6	4	5		8	20	179	148	31
	3	72	12	5					89	84	5
	4	40	15	6					61	56	5
	5	15		14	8	18			55	40	15
	6	6	7						13	12	1
	7	14			10				24	21	3
	8	8					13		21	16	5
	9		10						10	9	1
	10+	13							13	13	0
Total		1 013	180	65	36	28	21	20	1 363	..	..
Total trucks											
Rigid		1 013	55	23	15	12	10	2	..	1 130	..
Articulated		0	125	42	21	16	11	18	..	..	233

a. Trucks registered in the Territory at 30 September 1982.
b. Excludes rigid trucks with a tare weight of 2 tonnes or less.
p preliminary
.. not applicable

Source: Department of Territories and Local Government, Canberra (unpublished data).

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