Survey of Trucking Operations 1982/83: Methodology and Results

Occasional Paper

Early in 1984 the Bureau of Transport Economics carried out a survey of trucking operations, primarily to assist the National Road Freight Industry Inquiry in its data collection activity. This Paper describes the survey and sets out its major findings. Both road transport (for hire and reward) and ancillary operators were covered, with particular attention being given to the owner-drivers. The main aim of the survey was to collect information on the structure of commercial truck activity in Australia including administrative, operational and equipment details. Certain limited road freight task related information and income data were also collected. In terms of business activity, the survey covered the 1982-83 financial year.

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FOREWORD

In September 1983 the federal Minister for Transport announced the establishment of a committee to undertake a national inquiry into the road freight industry. Early in 1984 the Bureau of Transport Economics, in conjunction with the Inquiry, carried out a survey of trucking operations primarily to assist the Inquiry in its data collection activities. The Committee of Inquiry presented its report in September 1984.

This Paper sets out the major findings of the survey and provides a broad overview of commercial trucking operations in Australia.

The work was carried out in the Systems and Information Branch. Many officers contributed; in particular Mr D. Hamer, Mr I. Hart, Mr L. Kempen, Mr T. Mikosza, Dr G. Miller, Ms A. Paal and Mr C. Sayers. Mr Kempen has been largely responsible for the preparation of this Paper.

The provision of motor vehicle registration data by State and Territory governments, the co-operation of those who responded to the survey and the assistance provided by the industry associations in publicising the survey is gratefully acknowledged.

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Bureau of Transport Economics
Canberra
January 1986

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SUMMARY

Early in 1984 the Bureau of Transport Economics carried out a survey of trucking operations, primarily to assist the National Road Freight Industry Inquiry in its data collection activity. This Paper describes the survey and sets out its major findings.

The survey covered administratively self-contained business units operating at least one truck of tare weight 2 tonnes or more for carrying goods or equipment for commercial purposes. Both road transport (for hire and reward) and ancillary operators were covered, with particular attention being given to the owner-drivers. The main aim of the survey was to collect information on the structure of commercial truck activity in Australia including administrative, operational and equipment details. Certain limited road freight task related information and income data were also collected. In terms of business activity, the survey covered the 1982-83 financial year.

There were an estimated 164 500 business units in Australia that operated trucks with tare weight of 2 tonnes and over for the carriage of freight during 1982-83. These business units operated an estimated 279 880 trucks at 30 June 1983 and employed an estimated 389 610 persons in jobs associated with their trucking operations. Some 259 750 of these employees were full time.

Ancillary operators outnumbered road transport (for hire and reward) operators by four to one. The majority of ancillary operators were in the agriculture and forestry industry which accounted for one-half of all operators. There were 16 110 owner-drivers comprising almost one-half of hire and reward operators.

A prominent feature was the high proportion of small fleet business units. Some 72 per cent of business units operated only one truck, 17 per cent operated two trucks and only 11 per cent operated more than two trucks. Fleets of 10 or more trucks were rare, comprising only 1 per cent of all fleets and 5 per cent of the non-owner-driver component of the hire and reward sector.

Rigid trucks outnumbered articulated trucks by approximately four to one. Some four out of five rigid trucks but less than half of the articulated trucks were engaged in ancillary operations. Thirty-five per cent of owner-drivers had articulated trucks.

Trucks of tare weight 2 tonnes and over operated by business units in the scope of the survey performed an estimated 9 563 200 thousand vehicle kilometres in 1982-83. Of this, 4 695 100 thousand vehicle kilometres were performed by hire and reward operators including 853 600 thousand vehicle kilometres by owner-drivers. Overall, 61 per cent of vehicle kilometres were performed over short distance (less than 100 kilometres) routes, 22 per cent on long distance, intrastate routes and 17 per cent on long distance, interstate routes. Hire and reward operators were concentrated on the long distance routes and performed 75 per cent of long distance travel (in terms of vehicle kilometres) and only 33 per cent of short distance travel.

The most significant freight category in terms of total vehicle kilometres was non-bulk non-containerised goods which accounted for 30 per cent of all vehicle kilometres in 1982-83. This category of freight represented the dominant activity for hire and reward operators and accounted for 36 per cent of their total vehicle kilometres. Some 24 per cent of distance travelled by hire and reward operators was serving the manufacturing industry and a further 20 per cent was serving wholesale and retail trade.

As expected, hire and reward operators averaged higher annual kilometres per truck than ancillary operators. Trucks operated by ancillary operators averaged 22 500 kilometres in 1982-83. Overall, owner-drivers averaged 53 000 kilometres in 1982-83 and owner-drivers operating over long distances (at least 100 kilometres) averaged 112 300 kilometres. Trucks operated by non-owner-driver hire and reward operators averaged slightly more kilometres; 66 300 kilometres overall and 130 700 kilometres over long distance routes.

The financial data were limited by the low level of response to income questions and the absence of cost data. However, the data do suggest that the financial performance of hire and reward operators with two or three trucks may be worse than that of either single truck or large fleet operators.

CHAPTER 1 INTRODUCTION

BACKGROUND

This Paper sets out the major findings of the Bureau of Transport Economics' Survey of Trucking Operations, 1982-83, together with a description of the methodology adopted. The results presented here concentrate on the dimensions and characteristics of Australia's road freight transport industry, on several task-related measures and on some financial aspects of that sector of the industry classed as hire and reward operators. The work represents the Bureau's analysis of the results of the survey which in the first instance was undertaken in cooperation with the National Road Freight Industry Inquiry (NRFII) to assist with its data collection activities. To a large extent the Bureau's interest in trucking operations coincided with that of the Inquiry and the survey provided an appropriate extension to work which had already been in progress.

The Bureau had for some time been working towards surveying the trucking industry to gather basic data on the structure and nature of trucking operations. This work was being undertaken because the problems of the industry, particularly those of long distance owner-drivers, had been given considerable exposure over a long period of time. It was considered that some objective information on the industry would be required for any detailed investigation of these problems. As part of the planning process associated with such a survey the Bureau had commenced an analysis of truck fleets to determine fleet size characteristics and identify a sample frame of businesses using trucks in their operations.

The Inquiry's terms of reference[1] involved investigations which required a reliable base of information about employment, income and financial performance of road freight transport operators. This

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1. Included in the introductory letter sent with the survey questionnaire (see Appendix I).

situation was emphasised by the federal Minister for Transport in his announcement of the Inquiry:

> Freight transport is a multi-billion dollar industry that significantly affects every aspect of Australian primary industry, manufacturing and retailing....Yet there is a lack of facts on the most fundamental issues.

Given the recognised need for data and the mutual interest of the Bureau and NRFII, the two parties agreed early in 1984 to conduct a survey of trucking operations to cover the areas of interest. The survey was completed by the end of June 1984 and a preliminary analysis provided to the Inquiry. This Paper documents a comprehensive analysis of the survey results.

SURVEY AIMS AND SCOPE

Aims

The main aim of the survey was to collect information on the structure of commercial truck activity in Australia including administrative, operational and equipment details which would assist the NRFII in its deliberations.

A secondary aim was to take advantage of the opportunity to collect certain limited road freight task related items of information.

Scope

The terms of reference of the NRFII related to the commercial trucking activities of both hire and reward operators in the road freight transport industry and to ancillary operators in other industries. However, because the main issues pertain to the hire and reward operators and in particular to owner-drivers, the Bureau's efforts were concentrated on these areas.

Federal, State and local government instrumentalities that operate trucks were not included in the survey, since the emphasis was on commercial operations.

Individuals who responded to the survey by claiming that their truck or trucks were solely for private use were not included in the analysis. The potential number of such respondents was limited by the exclusion of trucks of tare weight less than 2 tonnes. This arbitrary cut-off was chosen so that the survey covered operators responsible for the majority of the freight task.

However, one consequence of this cut-off is that some classes of road transport which use smaller vehicles (for example, local delivery) were not covered by the survey.

The survey was conducted Australia wide, to reflect the national scope of the Inquiry and the interests of the Bureau.

STRUCTURE OF THIS PAPER

This chapter has outlined the origins of the Survey of Trucking Operations, 1982-83, its aims and scope. Chapter 2 follows with an overview of the survey design, operations and processing and includes definitions of the major terms used in the survey.

Chapters 3, 4 and 5 present the results of the survey. Chapter 3 addresses the size, structure and other characteristics of the Australian trucking industry and thereby aims to set out the fundamental dimensions of the industry. The task undertaken by the industry, while only partially described, is addressed in Chapter 4. Chapter 5 considers financial aspects of hire and reward operations. Concluding remarks are in Chapter 6.

Additional details relating to the survey are provided in a number of appendixes. These include the survey questionnaire (Appendix I), and sampling and operational aspects (Appendix II). The enumeration process by which population estimates were obtained took into account measurement errors and bias which were identified from the follow-up surveys described in Appendix III. The process itself is described in Appendix IV. Reliability of the estimates is discussed in Appendix V. The technical derivation of distance travelled is set out in Appendix VI.

CHAPTER 2 OVERVIEW OF SURVEY APPROACH AND ANALYSIS

Planning of the Survey of Trucking Operations was undertaken with less than six months available to the Bureau in which to report on specific results to the NRFII. This chapter outlines the course adopted by the Bureau with respect to survey design, the administrative and field plan and the processing of data to meet the constrained timescale. The chapter concludes with a summary of the enumeration procedure, including adjustment for bias, an appraisal of the reliability of the survey estimates, and definitions of the major terms used in the survey.

SURVEY DESIGN

Survey units and timeframe

The entities surveyed were a randomly selected sample of administratively self-contained business units owning trucks which were engaged in either the primary or an ancillary activity of a commercial operation. The survey units included business entities comprising several owners in partnership, together with administratively independent divisions within large road transport (for hire and reward) businesses, as well as self-employed individuals.

In terms of business activity, the timeframe covered in the survey was the 1982-83 financial year. This timeframe was determined by the most recent financial year data available to respondents at the time of the survey in early 1984.

Survey questionnaire

In recognition of the limited time available to design and conduct the survey, and to process the results, a self-administered mailed questionnaire was developed by the Bureau in consultation with the NRFII. Broadly, the survey questionnaire requested the following information on each survey unit:

- background information including the way the trucking operation was organised and how its trucks were distributed in Australia;
- operational details including the classification of the industry in which the trucking operation was engaged, type of freight carried and area of operation;
- employment details; and
- fleet details including vehicle types and ownership status.

Respondents classified as hire and reward operators were also asked about the basis of operation (for example, prime contractor, sub-contractor), type of contractual arrangement for freight loads, industry served and income. In addition, those operators who considered themselves owner-drivers were asked for details of their truck leasing and hire purchase arrangements.

To minimise the non-response normally associated with self-administered questionnaires, only questions considered capable of being answered without detailed reference to records were included.

The survey questionnaire was not formally pilot tested because of the severe time constraints. However, trials were carried out with a draft questionnaire in Melbourne and certain Victorian country areas.

Further details and a copy of the questionnaire are in Appendix I.

Sample frame

The sample frame consisted of vehicles classified as trucks with a tare weight of 2 tonnes or more on State and Territory motor registration records as at 31 August 1982.[1] Public sector trucks were eliminated from the registration records since these vehicles were outside the scope of the survey. It was expected that a small proportion of the trucks which were not used as part of commercial or business activity remained in the chosen sample; these were identified from the survey responses and excluded from subsequent analysis.

Sampling

Using the registration records, vehicles were randomly sampled without replacement and arranged to provide a random sample of business units

1. The most recent comprehensive data on motor vehicle registrations available to the Bureau at the time.

(including self-employed individuals) without duplication.[2] The primary objective of the sample selection process was to obtain an unbiased sample of administratively self-contained trucking operations. Because the sample frame comprised trucks, businesses with larger truck fleets were over-represented in the selected sample of business units; the probability of selection being proportional to the fleet size. This was taken into account in the enumeration process.

The sample was stratified by State and Territory to:

- minimise consistency errors arising from definitional differences in the various State motor registration records;
- facilitate adjustment for response rate variations between States; and to
- provide some control on the number of business units selected in each State and Territory.

The same sampling fraction was used for each State and Territory registration file. This was done to minimise the complexity of the enumeration process, bearing in mind the fact that a significant number of business units would be represented on more than one file. As a consequence, while the sample is optimal for estimates at the Australia level, the sampling errors for some estimates for the smaller States and, in particular the Territories, are high.

The names and addresses of the registered vehicle owners, taken directly from the registration records, were used as the mailing addresses for the questionnaires.

Sample size

The sample size was determined with the aim of providing estimates of satisfactory accuracy after allowance for inaccurate or incomplete returns and non-response. A further consideration was the limited resources available to administer the survey and analyse the results.

After giving appropriate consideration to these matters,a 7.5 per cent sample was taken from the population of 301 565 non-government trucks of tare weight 2 tonnes or more. Allowing for duplicate selections of

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2. That is, where two or more of the sampled trucks were registered to the same owner, this owner was included as a single survey unit in the sample.

business units, this sample of 22 591 trucks resulted in a survey sample of 20 354 business units.[3] While the initial sampling rate was 7.5 per cent, the probability of selection increased with the size of the fleet and the business units sampled are estimated to have operated 30 to 35 per cent of the truck population.

SURVEY OPERATIONS

Detailed comments on the data collection and processing phases of the survey are provided at Appendix II.

Mailing of questionnaires

The questionnaire and introductory letter were mailed to the 20 354 sample business units in early 1984, followed by up to two mail reminders to non-respondents.

Processing and control

Returned questionnaires were manually checked for inconsistencies, prior to recording the information on magnetic tape. The raw data were processed through edit check programs involving scope, encoding errors and logical consistency of answers, prior to analysis for the NRFII. The processing of questionnaire responses for the Inquiry was completed by end of June 1984. Subsequently, additional editing was carried out for the analysis presented in this Paper.

Control of the survey was carried out by coding against each survey unit the type of response which applied (for example, whether a respondent was in-scope and whether the questionnaire was partially or fully answered, to facilitate the administration of the survey.

SURVEY RESPONSE

The overall response to the survey exceeded initial expectation with 67 per cent of the surveyed business units responding by returning a questionnaire which was completed in some way. The survey analysis actually used the responses from 38 per cent of the business units surveyed because of out-of-scope returns (for example, stated used of trucks for private purposes only) and incomplete responses.

The high overall response rate was helped by both the Inquiry's

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3. The process of sample selection is described further in Appendix II.

objectives, which were widely publicised, and by the support received from a number of industry associations. These associations which represent diverse interests in the road freight industry were approached by the Bureau to publicise the survey and to encourage members to co-operate.

Response rates as measured by usable questionnaires varied from State to State. This was taken into account by post-stratifying by State in the enumeration process.

The non-response comprised 27 per cent of business units which were contacted but had not responded in any way, and 7 per cent of business units which were not contactable (questionnaires returned as undeliverable) or which received more than one questionnaire.

A significant proportion of respondents (39 per cent of all returned questionnaires) claimed that they did not use their truck(s) as part of a business activity, and this accounted for most of the responses which were not analysed.

The follow-up surveys (described in the next section) subsequently revealed that only 16 per cent of respondents who claimed that they used trucks for private purposes were in fact genuinely out of scope. That is, the majority of respondents who claimed to use their trucks for private purposes only misunderstood the relevant survey question and were actually engaged in operations considered commercial for the purposes of the survey. This was taken into account in the enumeration process.

AUXILIARY AND FOLLOW-UP SURVEYS

Auxiliary survey

In the case of large multi-divisional businesses it was particularly important that double counting was not introduced by a division reporting on behalf of another, because the validity of the survey results was sensitive to correct response by these businesses.[4]

The potential for double counting was greatest in the case of business units with trucks situated in more than one State. As sample selection was carried out on a State basis, the possibility existed that a State branch of a business organisation responded on behalf of

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4. The chosen sampling rate ensured that almost all fleets with more than 25 trucks would be selected.

its own operation but the data were already subsumed in a return from the main office of the business unit. Consequently, an auxiliary survey of large multi-divisional businesses was conducted to ensure that this group of the road transport industry responded only in respect of the sample survey units, that is, each self-contained trucking operation within the organisation which was selected in the sample.

Businesses which potentially could have led to some duplication of information were identified with the help of the NRFII and from business registers, assisted by survey responses which reported large truck fleets. The auxiliary survey involved approaches being made to these businesses:

- to co-ordinate responses of their divisions to the main survey; and
- to provide additional information on their corporate structure.

The businesses concerned were requested to provide truck and employee numbers, and some other information for each administratively self-contained entity, to enable the Bureau to verify the correctness of the responses from these entities received in the main survey.

Follow-up surveys

Follow-up surveys were undertaken to check on non-response bias and to provide statistical information that would allow appropriate adjustment of the survey results. Reark Research Pty Ltd was engaged to carry out this work which involved telephone and personal interviews of a sample of both respondents and non-respondents. Details of the follow-up surveys are in Appendix III.

ENUMERATION AND ADJUSTMENT FOR BIAS

The mathematical procedures involved in this aspect of the survey analysis are described in Appendix IV. The aim of these operations was to obtain, from the survey, reliable estimates of the characteristics of the total population of administratively self-contained business units that operate trucks for commercial purposes.

RELIABILITY OF ESTIMATES

Since the estimates are based on a sample, they may differ from the figures which would have been obtained from a complete census using the same questionnaire and procedures. One measure of the likely

difference is the standard error. There are about two chances in three that a sample estimate will differ by less than one standard error from the figure that would have been obtained from a comparable complete enumeration, and about 19 chances in 20 that the difference will be less than two standard errors.

For a number of key estimates in this Paper, relative standard errors (standard errors as a percentage of the associated estimate) have been estimated and are shown in Appendix V. Some estimates (particularly small estimates in the bodies of tables) are subject to relatively high standard errors and should be used with caution.

A more complete discussion of standard errors is contained in Appendix V. This appendix also contains a table which can be used to derive approximate standard errors for estimates of the number of business units in any classification.

The imprecision due to sampling variability, which is measured by the standard error, should not be confused with other inaccuracies such as those which may occur because of errors in reporting by respondents. Where there is evidence of such non-sampling errors, special comment is made in the analysis.

DEFINITIONS

The major terms used in the survey are defined as follows.

Business unit

The survey covered administratively self-contained commercial trucking operations. Business units were considered to be in the scope of the survey:

- if they were the registered owner of at least one truck of tare weight 2 tonnes or more at 31 August 1982; and
- if at any time during the 12 months to June 1983, they used a truck of tare weight 2 tonnes or more for carrying goods or equipment for commercial purposes.

Industry

In their responses business units placed themselves in an industry classification based on the Australian Standard Industry Classification.

One of the industry categories is road transport (for hire and reward)

which includes owner-drivers. The business units in the other industries are collectively described as ancillary operators and typically they operate trucks to carry their own freight.

Industry served

Business units in the road transport (for hire and reward) industry were asked to provide a breakdown of the industries they served based on a percentage of total distance travelled by their trucks. Industry served relates to the industry classification of the business from which the freight was consigned.

Owner-driver

There are several definitions of owner-driver within the road transport industry. The survey questionnaire allowed respondents in the road transport (for hire and reward) industry to indicate whether they considered themselves to be owner-drivers. However, some quite large fleet operators appeared to misinterpret the questionnaire and provided answers to questions intended for 'self-defined' owner-drivers only.

According to the NRFII, an owner-driver is a road transport operator who owns (that is, leases, owns, or is buying) a single truck which is driven (principally or solely) by the owner, except for periods of illness or holiday (NRFII 1984, p. 476). The analysis in this Paper adopts basically that definition. That is, an owner-driver is a business unit in the road transport (for hire and reward) industry, which operates a single truck and has only one driver who is the proprietor.

CHAPTER 3 SIZE, STRUCTURE AND OTHER CHARACTERISTICS OF ROAD FREIGHT TRANSPORT OPERATIONS

This chapter provides a profile of the trucking industry in Australia. Distributions of truck fleets are shown on a State-by-State basis and according to the industry of the business unit. Various characteristics of business units are considered, including details of employment in trucking operations, types of legal organisation and contractual arrangements used in the carriage of freight.

The estimates that follow identify the ancillary operators and operators in the hire and reward road transport industry as two distinct groups.

OVERVIEW OF ROAD FREIGHT TRANSPORT OPERATORS

There were an estimated 164 500 business units in Australia that operated trucks with tare weights of 2 tonnes and over for the carriage of freight during 1982-83. These business units operated an estimated 279 880 trucks at 30 June 1983 and employed an estimated 389 610 persons in jobs associated with their trucking operations. Some 259 750 of these employees were full time. These estimates are subject to certain qualifications outlined in the following sections.

The distribution of business units by fleet size and State is shown in Table 3.1.

One prominent feature of the Australian road freight transport industry is the high proportion of small fleet business units. At 30 June 1983 some 72 per cent of business units operated only one truck, 17 per cent operated two trucks and only 11 per cent operated more than two trucks. There is a tendency towards larger fleets in the road transport (for hire and reward) industry; some 68 per cent of these business units operated one truck, 16 per cent operated two trucks and 16 per cent operated more than two.[1]

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1. These percentages (based on Tables 3.1 and 3.4) make allowance for the likely fleet size of business units with fleet size not stated (described further under 'Trucks').

No comparative figures from overseas for the timeframe in question were found. The only available source (Round Table on Transport Economics 1973) provides some out of date figures; for example in Sweden in 1972, 71.2 per cent of road haulage firms had one vehicle, compared with 88.5 per cent in Norway (1967), 50 per cent in United Kingdom (1963) and 50.7 per cent in New Zealand (1969).

CHARACTERISTICS BY INDUSTRY

Business units (or fleets)

Table 3.2 shows the distribution of business units by industry and State. Numerically, ancillary operators outnumber road transport (for hire and reward) operators by four to one.

Nearly half of the truck fleets operated by business units in Australia were engaged in agriculture and forestry. The highest proportions of fleets in that industry were in Western Australia (63 per cent) and South Australia (53 per cent), while predictably the lowest proportions were in the Australian Capital Territory (9 per cent) and Northern Territory (24 per cent).

The proportion of fleets in the road transport (for hire and reward) industry was slightly higher in Victoria (22 per cent) and Queensland (21 per cent) than the national average of 20 per cent. In Western Australia only 12 per cent of fleets were in the hire and reward industry.

The estimates for the Territories are based on relatively small samples and are less reliable. Nevertheless, the Australian Capital Territory and the Northern Territory showed proportionately much higher truck fleet operation in building and construction (40 per cent and 30 per cent respectively) than the national average of 10 per cent. A similar picture emerged for the Territories with respect to wholesale and retail trade. An estimated 23 per cent of truck fleets were engaged in that industry in the Australian Capital Territory and 16 per cent of fleets in the Northern Territory, compared with the national average of only 9 per cent.

Trucks

The distribution, by industry and State, of trucks with tare weight of 2 tonnes and over (see Table 3.3) differs somewhat from the corresponding distribution of business units described above.

While approximately half of truck fleets were engaged in agriculture and forestry, these fleets represented only some 37 per cent of total truck numbers. By contrast, the road transport (for hire and reward) industry operated some 26 per cent of total truck numbers but represented only some 20 per cent of truck fleets. Similarly, larger than average truck fleets operated in the wholesale and retail trade (some 12 per cent of total trucks, but 9 per cent of fleets) and in manufacturing (some 7 per cent of trucks and 4 per cent of fleets).

Nevertheless, truck fleets engaged in the manufacturing industry are quite small, with an average size of three trucks. Truck fleets in the wholesale and retail trade and in the hire and reward industry comprise on average slightly more than two trucks. The latter average is influenced by the fact that almost half the business units in the road transport (for hire and reward) industry are owner-drivers. Non-owner-drivers in this industry had fleets averaging almost three and one-half trucks.

It should be noted that the estimates of truck numbers at 30 June 1983 may be slightly understated. Table 3.1 indicates that 5.3 per cent of business units did not provide information on their fleet size at 30 June 1983. A small number of these would be business units with nil trucks operating at that date. Business units with fleet size not stated are predominantly in the agriculture and forestry industry; an industry with small fleets. Overall, the non-respense on fleet size may have understated the estimate of total trucks at 30 June 1983 by some 2 or 3 per cent.

Fleet size by industry

The numbers of business units (or fleets) and trucks were compared in the previous section to illustrate the differences in average fleet size by industry. Table 3.4 shows the actual distribution of business units by industry and fleet size.

Apart from owner-drivers, single truck fleets dominate, particularly in the agriculture and forestry and business and construction industries. Large fleets (of 10 or more trucks) are rare, comprising only 1 per cent of all fleets. The highest proportion of fleets of 10 or more trucks were in the non-owner-driver component of the road transport (for hire and reward) industry and manufacturing. In each of these categories approximately 5 per cent of fleets were of 10 or more trucks.

TRUCK TYPES

Details of the types of trucks (rigid or articulated and tare weight) operated by business units at 30 June 1983 were also collected. Tables 3.5 and 3.6 show the estimates of the total numbers of trucks operated by business units in Australia, classified by truck type and industry. The estimate of 56 320 articulated trucks is high compared to Australian Bureau of Statistics' estimates of 46 575 articulated trucks recording usage for the twelve months ended 30 September 1982 (ABS 1983a) and 47 179 articulated trucks on register at 30 September 1982 (ABS 1983b). There is evidence that some respondents may have misinterpreted the questionaire and reported heavy rigid trucks as articulated trucks, which would lead to an overstatement of articulated trucks. Consequently, the dominance of rigid trucks over articulated trucks may be somewhat higher than indicated.

Rigid trucks of 2 or more tonnes tare weight outnumbered articulated trucks by approximately four to one. Some four out of five rigid trucks but less than half the articulated trucks were engaged in ancillary operations. Over 40 per cent of all rigid trucks were engaged in agriculture and forestry, an industry in which rigid trucks of 4 to 8 tonnes tare weight dominate (almost 45 per cent of all trucks in agriculture and forestry were in this category).

The dominance of rigid trucks is most significant in agriculture and forestry (89 per cent of all trucks in that industry), building and construction (88 per cent), the public utilities (92 per cent) and wholesale and retail trade (89 per cent). Conversely, the mining and quarrying industry and road transport (for hire and reward) show the highest proportions of articulated trucks (30 per cent and 41 per cent respectively). Thirty-five per cent of owner-drivers had articulated trucks. The most significant truck type used by hire and reward operators was articulated 11 tonnes and over (31 per cent).

EMPLOYMENT IN TRUCKING OPERATIONS

Details of direct employment in trucking operations of business units at 30 June 1983 were obtained. Direct employment includes full time and part time truck drivers and other employees such as mechanics, dispatchers and fork lift operators. The estimates include working proprietors and working partners.

In addition to direct employment in trucking operations, details of employment in 'other activities' were sought but the answers were found to be inconsistent and estimates have not been presented.

Table 3.7 presents Australian total estimates of employment directly associated with trucking operations according to industry. Response rates to the employment question varied widely depending on the industry of the business unit. Non-response on employment was particularly high in the agricultural industry and may be attributed to some confusion among these respondents as to how they should have classified their employees. In addition, the number of part time employees could be overstated to the extent that double counting an employee as both 'part time truck driver' and 'part time other function' occurred.

For ancillary operators, average direct employment in trucking operations at 30 June 1983 ranged from 1.5 persons per business unit in the agricultural industry to 5.7 persons per business unit in manufacturing. The road transport (for hire and reward) industry averaged 3.3 persons per business unit compared with 2.1 persons per business unit in ancillary operations as a whole. Owner-drivers averaged 1.2 persons per business unit while other hire and reward operators averaged 5.3 persons per business unit.

Tables 3.8 to 3.13 provide similar estimates for each of the States. Because of the small sample size, detailed estimates for the Territories are subject to high sampling error and have not been shown.

Estimates of total full time employees associated with trucking operations were also produced by assuming that business units with employment not stated had the same average full time employment characteristics as business units in the same industry and State which responded to this question. Table 3.14 shows estimates of full time employees associated with trucking operations by industry and State.

LEGAL ORGANISATION

Business units were asked in the survey to describe the legal entity representing their business organisation by classifying it to one of the following types:

- sole proprietorship;
- partnership;
- division of business unit incorporated as a separate company but part of a larger organisation;
- division of business unit not incorporated as a separate company but part of a larger organisation;

- incorporated company;
- trust; or
- other organisation to be specified, including co-operative, welfare or charitable organisation.

Incorporation of business units or divisions means that they are registered as 'Pty Ltd' or 'Ltd' companies. Sole proprietorships (businesses owned by one person) and partnerships (owned by more than one person, for example, husband and wife) are registered in a business name, not as 'Pty Ltd' companies.

The distribution of business units by type of legal organisation and industry is presented in Table 3.15.

Over half of all business units engaged in trucking operations were partnerships and another quarter were sole proprietorships. Partnerships were particularly prevalent in agriculture and forestry and in the road transport (for hire and reward) industry (63 per cent and 53 per cent of business units in each industry respectively). The manufacturing industry had the highest proportions of business units which were incorporated companies (31 per cent of business units in the industry), divisions of business units incorporated as separate companies (16 per cent) and unincorporated divisions (8 per cent).

Sole proprietor business units were most significant in the road transport (for hire and reward) industry, particularly among owner-drivers (34 per cent).

HIRE AND REWARD OPERATIONS

Two additional characteristics of the operations of business units in the road transport (for hire and reward) industry were investigated. First, respondents were asked to state the main basis on which the business unit operated at 30 June 1983, that is, whether they were freight forwarders, prime contractors, sub-contractors or freelance operators. Second, respondents were asked to indicate the freight contract arrangement most often used by their business unit during the 12 months ended 30 June 1983. Each of these characteristics is discussed below.

Main basis of operation

Business units in the road transport (for hire and reward) industry can operate as freight forwarders, contractors or freelance operators.

A freight forwarder consolidates freight from a number of sources and arranges its dispatch.

A prime contractor enters into a contract to carry freight directly with the consignor of that freight (the shipper). A sub-contractor enters into a contract to carry freight for a freight forwarder or a prime contractor. Contractors may be tied (or 'painted'). Such contractors carry freight for one customer only.

A freelance operator has no fixed pattern of employment.

In practice the distinction between some of these categories, particularly sub-contractors and freelance operators, is not always clear. The follow-up surveys disclosed some differences in interpretation or confusion in respect of these two categories and the estimates are subject to this qualification.

The distribution of road transport (for hire and reward) business units by main basis of operation and State is shown in Table 3.16.

Over 30 per cent of business units considered themselves to be freelance operators. Sub-contractors totalled some 42 per cent and prime contractors some 19 per cent. Some 59 per cent of contractors were tied or painted.

Freight contracting arrangements

Business units in the road transport (for hire and reward) industry were also asked to specify the freight contract arrangement most often used during 1982-83. The distribution of business units by main basis of operation and freight contract arrangement most often used is shown in Table 3.17.

The dominant arrangement was a verbal contract which, in 1982-83, was the arrangement most often used by approximately 54 per cent of business units overall, and 70 per cent of prime contractors who were not tied. Written contract was the second most significant arrangement (17 per cent of all business units), and was the arrangement most often used by 33 per cent of tied prime contractors and 32 per cent of tied sub-contractors.

The distribution of owner-drivers by main basis of operation and freight contract arrangement most often used (Table 3.18) is similar to the road transport (for hire and reward) industry as a whole.

TABLE 3.1 BUSINESS UNITS BY FLEET SIZE AND STATE: 30 JUNE 1983

Fleet size[a] *(trucks)*	*New South Wales*	*Victoria*	*Queensland*	*South Australia*	*Western Australia*	*Tasmania*	*Northern Territory*	*Australian Capital Territory*	*Australia* (number)	*Australia* (per cent)
1	35 120	29 680	20 000	11 580	12 540	2 230	260	380	111 780	68.0
2	7 170	6 630	5 230	2 790	3 500	780	20	160	26 280	16.0
3	2 590	1 900	1 730	630	840	260	20	40	8 000	4.9
4	1 180	750	740	330	370	100	20	50	3 520	2.1
5-9	1 320	1 120	780	410	410	170	20	30	4 240	2.6
10-19	390	280	270	170	120	40	10	10	1 280	0.8
20-49	150	140	100	50	60	20	-	-	520	0.3
50-99	30	50	30	10	20	-	-	-	140	0.1
100 and over	30	20	10						60	0.0
Not stated[b]	2 420	2 570	1 520	920	1 080	140	-	40	8 690	5.3
Total	50 390	43 120	30 380	16 880	18 930	3 740	350	700	164 500	100.0
Per cent	(30.6)	(26.2)	(18.5)	(10.3)	(11.5)	(2.3)	(0.2)	(0.4)	(100.0)	

a. Fleet may include trucks operated by branches of the business unit in other States or Territories.
b. Includes a small number of business units with nil trucks operating at 30 June 1983.

\- nil

Note Figures may not add to totals due to rounding.

TABLE 3.2 BUSINESS UNITS BY INDUSTRY AND STATE: 30 JUNE 1983

Industry	*New South Wales*	*Victoria*	*Queensland*	*South Australia*	*Western Australia*	*Tasmania*	*Northern Territory*	*Australian Capital Territory*	*Australia* (number)	*Australia* (per cent)
Ancillary										
Agriculture, forestry, fishing and hunting	23 500	20 340	15 210	8 930	11 960	1 820	90	60	81 910	49.8
Building and construction	5 770	4 100	3 130	1 520	1 470	490	100	280	16 880	10.3
Electricity, gas and water[a]	290	220	180	50	120	20	-	-	880	0.5
Manufacturing	2 020	2 310	890	550	470	70	30	10	6 350	3.9
Mining, quarrying	850	570	490	240	350	110	20	-	2 620	1.6
Wholesale and retail trade	4 780	4 090	2 670	1 440	1 470	300	60	160	14 950	9.1
Other	3 010	1 800	1 510	810	740	270	-	90	8 240	5.0
Total (ancillary)	40 230	33 440	24 070	13 540	16 570	3 080	290	600	131 820	80.1

TABLE 3.2 (Cont.) BUSINESS UNITS BY INDUSTRY AND STATE: 30 JUNE 1983

Industry	*New South Wales*	*Victoria*	*Queensland*	*South Australia*	*Western Australia*	*Tasmania*	*Northern Territory*	*Australian Capital Territory*	*Australia (number)*	*Australia (per cent)*
Road transport (for hire and reward)										
Owner-drivers	5 160	4 990	3 100	1 530	1 040	220	-	60	16 110	9.8
Other	5 010	4 700	3 220	1 810	1 320	440	60	30	16 570	10.1
Total (road transport)	10 170	9 690	6 320	3 340	2 360	660	60	100	32 680	19.9
Total (all industries)	50 390	43 120	30 380	16 880	18 930	3 740	350	700	164 500	100.0
Per cent	(30.6)	(26.2)	(18.5)	(10.3)	(11.5)	(2.3)	(0.2)	(0.4)	(100.0)	

a. Business units classified to these public utilities were commercial operations engaged in work such as carriage of LP gas cyliners, soil from pipeline construction, electrical equipment and so on.

\- *nil or rounded to zero*

Note Figures may not add to totals due to rounding.

TABLE 3.3 TRUCKS BY INDUSTRY AND STATE[a]: 30 JUNE 1983

Industry in which business unit engaged	*New South Wales*	*Victoria*	*Queensland*	*South Australia*	*Western Australia*	*Tasmania*	*Northern Territory*	*Australian Capital Territory*	*Australia* (number)	*Australia* (per cent)
Ancillary										
Agriculture, forestry, fishing and hunting	29 120	24 550	19 800	10 160	15 670	2 670	90	160	102 210	36.5
Building and construction	8 880	6 180	5 490	2 740	2 430	890	180	420	27 200	9.7
Electricity, gas and water	580	520	420	90	240	70	-	-	1 920	0.7
Manufacturing	5 670	7 520	2 380	1 560	1 290	350	30	60	18 860	6.7
Mining, quarrying	2 330	1 140	1 010	570	1 030	260	130	-	6 480	2.3
Wholesale and retail trade	10 710	9 370	6 360	3 260	3 000	780	110	310	33 890	12.1
Other	5 240	3 830	3 270	1 410	1 750	480	70	130	16 180	5.8
Total (ancillary)	62 530	53 120	38 730	19 780	25 400	5 490	610	1 080	206 730	73.9

TABLE 3.3 (Cont.) TRUCKS BY INDUSTRY AND STATE[a]: 30 JUNE 1983

Industry in which business unit engaged	*New South Wales*	*Victoria*	*Queensland*	*South Australia*	*Western Australia*	*Tasmania*	*Northern Territory*	*Australian Capital Territory*	*Australia* (number)	*Australia* (per cent)
Road transport (for hire and reward)										
Owner-drivers	5 160	4 990	3 100	1 530	1 040	220	-	60	16 110	5.8
Other	18 890	14 460	11 050	6 070	4 750	1 440	250	140	57 040	20.4
Total (road transport)	24 050	19 450	14 150	7 600	5 790	1 660	250	200	73 150	26.1
Total (all industries)	86 570	72 570	52 880	27 380	31 180	7 150	860	1 280	279 880	100.0
Per cent	(30.9)	(25.9)	(18.9)	(9.8)	(11.1)	(2.6)	(0.3)	(0.5)	(100.0)	

a. According to State or Territory of business unit, not truck registration.

\- nil or rounded to zero

Note Figures may not add to totals due to rounding.

TABLE 3.4 BUSINESS UNITS BY INDUSTRY AND FLEET SIZE: AUSTRALIA, 30 JUNE 1983

Industry	Fleet size (trucks)										Industry total (Australia)
	1	2	3	4	5 to 9	10 to 19	20 to 49	50 to 99	100 and over	Not stated[a]	
Ancillary											
Agriculture, forestry, fishing and hunting	59 020	12 750	3 070	940	540	80	10	10	-	5 500	81 910
Building and construction	11 560	2 550	730	410	430	150	40	10	-	980	16 880
Electricity, gas and water	570	140	60	10	90	-	10	-	-	-	880
Manufacturing	3 430	1 250	410	260	420	180	80	30	10	280	6 350
Mining, quarrying	1 310	610	200	70	160	50	20	10	-	190	2 620
Wholesale and retail trade	8 370	2 960	1 120	530	860	210	110	30	10	750	14 950
Other	5 640	1 210	430	240	270	100	30	10	10	300	8 240
Total (ancillary)	89 900	21 460	6 020	2 460	2 780	770	310	90	20	8 000	131 820

TABLE 3.4 (Cont.) BUSINESS UNITS BY INDUSTRY AND FLEET SIZE: AUSTRALIA, 30 JUNE 1983

	Fleet size (trucks)										
Industry	*1*	*2*	*3*	*4*	*5 to 9*	*10 to 19*	*20 to 49*	*50 to 99*	*100 and over*	*Not stated*[a]	*Industry total (Australia)*
Road transport (for hire and reward)											
Owner-drivers	16 110	..	..	..	..	..	..	..	..	..	16 110
Other	5 770	4 810	1 980	1 060	1 460	510	210	40	30	690	16 570
Total (road transport)	21 880	4 810	1 980	1 060	1 460	510	210	40	30	690	32 680
Total (all industries)	111 780	26 280	8 000	3 520	4 240	1 280	520	140	60	8 690	164 500
Per cent	(68.0)	(16.0)	(4.9)	(2.1)	(2.6)	(0.8)	(0.3)	(0.1)	(0.0)	(5.3)	(100.0)

a. Includes a small number of business units with nil trucks operating at 30 June 1983.

.. not applicable
- nil or rounded to zero

Note Figures may not add to totals due to rounding.

TABLE 3.5 TRUCKS BY TRUCK TYPE AND INDUSTRY: ANCILLARY OPERATORS, AUSTRALIA, 30 JUNE 1983

Truck type (tonnes tare weight)	*Agriculture, forestry, etc*	*Building and construction*	*Electricity, gas and water*	*Manufacturing*	*Mining, quarrying*	*Wholesale and retail trade*	*Other*	*Total (ancillary) (number)*	*Total (ancillary) (per cent)*
Rigid									
2 but less than 3	12 300	6 670	630	4 580	320	9 500	3 030	37 030	17.9
3 but less than 4	17 590	3 600	130	3 190	310	6 520	2 430	33 780	16.3
4 but less than 8	45 790	6 530	600	5 510	1 650	8 680	4 800	73 550	35.6
8 and over	14 840	6 810	290	2 140	2 110	5 130	3 020	34 340	16.6
Not stated (rigid)	480	410	110	100	150	180	180	1 600	0.8
Total (rigid)	91 000	24 020	1 760	15 520	4 540	30 010	13 460	180 300	87.2
Per cent	(50.5)	(13.3)	(1.0)	(8.6)	(2.5)	(16.6)	(7.5)	(100.0)	
Articulated									
Less than 9	2 250	370	10	360	190	300	380	3 860	1.9
9 but less than 11	1 980	650	-	500	210	390	370	4 100	2.0
11 and over	5 460	1 740	110	2 240	1 470	2 960	1 570	15 530	7.5
Not stated (articulated)	1 320	410	40	240	70	200	320	2 600	1.3
Total (articulated)	11 010	3 170	160	3 340	1 930	3 840	2 640	26 090	12.6
Per cent	(42.2)	(12.1)	(0.6)	(12.8)	(7.4)	(14.7)	(10.1)	(100.0)	
Not stated (other)	200	20	-	-	10	40	80	350	0.2
Total (trucks)	102 210	27 200	1 920	18 860	6 480	33 890	16 180	206 730	100.0
Per cent	(49.4)	(13.2)	(0.9)	(9.1)	(3.1)	(16.4)	(7.8)	(100.0)	

\- nil or rounded to zero

Note Figures may not add to totals due to rounding.

TABLE 3.6 TRUCKS BY TRUCK TYPE; OWNER-DRIVERS: OTHER ROAD TRANSPORT (FOR HIRE AND REWARD) OPERATORS AND TOTAL ALL INDUSTRIES, AUSTRALIA, 30 JUNE 1983

Truck type (tonnes tare weight)	*Road transport (for hire and reward)*						*All industries*	
	Owner-drivers		*Other*		*Total*			
	(trucks)	*(per cent)*	*(trucks)*	*(per cent)*	*(trucks)*	*(per cent)*	*(trucks)*	*(per cent)*
Rigid								
2 but less than 3	1 260	7.8	3 790	6.7	5 060	6.9	42 090	15.0
3 but less than 4	1 480	9.2	3 950	6.9	5 420	7.4	39 200	14.0
4 but less than 8	3 920	24.4	11 670	20.5	15 600	21.3	89 150	31.9
8 and over	3 740	23.2	12 490	21.9	16 220	22.2	50 560	18.1
Not stated (rigid)	50	0.3	280	0.5	330	0.5	1 930	0.7
Total (rigid)	10 450	64.9	32 180	56.4	42 630	58.3	222 930	79.7
Per cent	(4.7)		(14.4)		(19.1)		(100.0)	
Articulated								
Less than 9	490	3.0	1 320	2.3	1 810	2.5	5 670	2.0
9 but less than 11	510	3.2	2 730	4.8	3 240	4.4	7 340	2.6
11 and over	4 280	26.5	18 250	32.0	22 530	30.8	38 060	13.6
Not stated (articulated)	360	2.3	2 290	4.0	2 650	3.6	5 250	1.9
Total (articulated)	5 640	35.0	24 590	43.1	30 230	41.3	56 320	20.1
Per cent	(10.0)		(43.7)		(53.7)		(100.0)	
Not stated (other)	20	0.1	270	0.5	290	0.4	640	0.2
Total (trucks)	16 110	100.0	57 040	100.0	73 150	100.0	279 880	100.0
Per cent	(5.8)		(20.4)		(26.1)		(100.0)	

Note Figures may not add to totals due to rounding.

TABLE 3.7 EMPLOYMENT DETAILS OF BUSINESS UNITS BY INDUSTRY: AUSTRALIA, 30 JUNE 1983

Industry	Employees associated with trucking operations						
	Full time		Part time				
	Truck driver	Other function	Truck driver	Other function	Not stated[a]	Total (Australia)	Average employment
Ancillary							
Agriculture, forestry fishing and hunting	15 580	15 700	49 810	13 250	25 990	120 320	1.5
Building and construction	15 590	9 530	5 760	2 530	4 830	38 240	2.3
Electricity, gas and water	920	160	580	190	150	2 000	2.3
Manufacturing	13 510	16 340	3 280	1 570	1 630	36 340	5.7
Mining, quarrying	4 250	1 610	910	490	1 320	8 570	3.3
Wholesale and retail trade	24 530	16 110	5 900	3 250	4 070	53 860	3.6
Other	9 280	5 000	3 460	1 730	3 250	22 730	2.8
Total (ancillary)	83 650	64 460	69 710	23 000	41 240	282 060	2.1
Road transport (for hire and reward)							
Owner-drivers	15 140	2 610	970	1 030	b	19 750	1.2
Other	45 520	12 420	7 180	4 020	18 660	87 800	5.3
Total (road transport)	60 660	15 030	8 150	5 050	18 660	107 550	3.3
Total (all industries)	144 310	79 500	77 860	28 050	59 900	389 610	2.4
Per cent	(37.0)	(20.4)	(20.0)	(7.2)	(15.4)	(100.0)	

a. Estimate based on the assumption that business units with employment not stated have same average employment as those in the same industry and State with employment stated.
b. Nil. Employment details were required to classify business unit as an owner-driver.

Note Figures may not add to totals due to rounding.

TABLE 3.8 EMPLOYMENT DETAILS OF BUSINESS UNITS BY INDUSTRY: NEW SOUTH WALES, 30 JUNE 1983

	Employees associated with trucking operations						
	Full time		*Part time*			*Total*	
Industry	*Truck driver*	*Other function*	*Truck driver*	*Other function*	*Not stated*[a]	*(New South Wales)*	*Average employment*
Ancillary							
Agriculture, forestry, fishing and hunting	5 120	3 190	15 930	3 130	6 080	33 450	1.4
Building and construction	5 100	2 660	1 790	1 180	1 300	12 020	2.1
Electricity, gas and water	310	110	160	70	-	640	2.2
Manufacturing	3 620	2 380	900	600	270	7 780	3.9
Mining, quarrying	1 730	610	260	40	230	2 880	3.4
Wholesale and retail trade	7 340	5 510	1 920	660	1 190	16 630	3.5
Other	3 110	1 870	820	520	990	7 320	2.4
Total (ancillary)	26 340	16 350	21 770	6 210	10 060	80 720	2.0
Road transport (for hire and reward)							
Owner-drivers	4 940	1 050	230	310	b	6 530	1.3
Other	15 480	3 940	2 220	870	5 110	27 610	5.5
Total (road transport)	20 420	4 990	2 440	1 190	5 110	34 140	3.4
Total (all industries)	46 760	21 330	24 210	7 390	15 170	114 860	2.3
Per cent	(40.7)	(18.6)	(24.5)	(6.4)	(13.2)	(100.0)	

a. Estimate based on the assumption that business units with employment not stated have same average employment as those in the same industry with employment stated.
b. Nil. Employment details were required to classify business unit as an owner-driver.

\- nil or rounded to zero

Note Figures may not add to totals due to rounding.

TABLE 3.9 EMPLOYMENT DETAILS OF BUSINESS UNITS BY INDUSTRY: VICTORIA, 30 JUNE 1983

Industry	Employees associated with trucking operations						
	Full time		Part time				
	Truck driver	Other function	Truck driver	Other function	Not stated[a]	Total (Victoria)	Average employment
Ancillary							
Agriculture, forestry, fishing and hunting	3 500	2 730	10 940	3 450	7 190	27 820	1.4
Building and construction	3 570	2 490	1 290	350	1 530	9 220	2.2
Electricity, gas and water	170	-	120	-	-	290	1.3
Manufacturing	6 200	10 050	1 020	380	840	18 480	8.0
Mining, quarrying	660	440	110	20	420	1 650	2.9
Wholesale and retail trade	7 420	3 040	1 310	690	1 620	14 080	3.4
Other	2 520	1 750	890	310	1 100	6 570	3.7
Total (ancillary)	24 040	20 500	15 690	5 200	12 700	78 120	2.3
Road transport (for hire and reward)							
Owner-drivers	4 700	630	270	240	b	5 830	1.2
Other	10 950	3 050	1 950	1 280	6 790	24 030	5.1
Total (road transport)	15 650	3 680	2 220	1 520	6 790	29 860	3.1
Total (all industries)	39 690	24 180	17 910	6 720	19 490	107 990	2.5
Per cent	(36.8)	(22.4)	(16.6)	(6.2)	(18.1)	(100.0)	

a. Estimate based on the assumption that business units with employment not stated have same average employment as those in the same industry with employment stated.
b. Nil. Employment details were required to classify business unit as an owner-driver.

\- nil or rounded to zero

Note Figures may not add to totals due to rounding.

TABLE 3.10 EMPLOYMENT DETAILS OF BUSINESS UNITS BY INDUSTRY: QUEENSLAND, 30 JUNE 1983

Industry	Employees associated with trucking operations: Full time — Truck driver	Full time — Other function	Part time — Truck driver	Part time — Other function	Not stated[a]	Total (Queensland)	Average employment
Ancillary							
Agriculture, forestry, fishing and hunting	2 370	3 990	8 110	2 300	5 130	21 880	1.4
Building and construction	3 560	1 820	1 120	660	540	7 690	2.5
Electricity, gas and water	250	-	80	120	20	460	2.5
Manufacturing	1 570	2 060	520	320	180	4 660	5.3
Mining, quarrying	880	190	50	210	310	1 640	3.4
Wholesale and retail trade	4 540	3 790	1 200	670	770	10 980	4.1
Other	1 780	540	810	630	340	4 110	2.7
Total (ancillary)	14 950	12 380	11 890	4 920	7 270	51 410	2.1
Road transport (for hire and reward)							
Owner-drivers	2 980	500	120	240	b	3 840	1.2
Other	9 370	1 980	1 150	930	3 530	16 950	5.3
Total (road transport)	12 340	2 480	1 270	1 170	3 530	20 790	3.3
Total (all industries)	27 290	14 860	13 160	6 090	10 800	72 200	2.4
Per cent	(37.8)	(20.6)	(18.2)	(8.4)	(15.0)	(100.0)	

a. Estimate based on the assumption that business units with employment not stated have same average employment as those in the same industry with employment stated.
b. Nil. Employment details were required to classify business unit as an owner-driver.

\- nil or rounded to zero

Note Figures may not add to totals due to rounding.

TABLE 3.11 EMPLOYMENT DETAILS OF BUSINESS UNITS BY INDUSTRY: SOUTH AUSTRALIA, 30 JUNE 1983

Industry	Employees associated with trucking operations: Full time — Truck driver	Full time — Other function	Part time — Truck driver	Part time — Other function	Not stated[a]	Total (South Australia)	Average employment
Ancillary							
Agriculture, forestry, fishing and hunting	1 680	850	5 700	1 170	3 150	12 540	1.4
Building and construction	1 400	1 110	590	70	960	4 130	2.7
Electricity, gas and water	60	10	30	-	-	100	2.2
Manufacturing	1 020	810	400	140	280	2 650	4.8
Mining, quarrying	230	80	110	30	90	540	2.2
Wholesale and retail trade	2 350	1 640	550	410	180	5 130	3.6
Other	790	510	250	70	450	2 060	2.5
Total (ancillary)	7 510	5 000	7 640	1 910	5 090	27 150	2.0
Road transport (for hire and reward)							
Owner-drivers	1 340	230	190	130	b	1 900	1.2
Other	4 610	1 770	970	370	1 400	9 120	5.0
Total (road transport)	5 960	2 000	1 150	500	1 400	11 010	3.3
Total (all industries)	13 470	7 010	8 790	2 410	6 490	38 170	2.3
Per cent	(35.3)	(18.4)	(23.0)	(6.3)	(17.0)	(100.0)	

a. Estimate based on the assumption that business units with employment not stated have same average employment as those in the same industry with employment stated.
b. Nil. Employment details were required to classify business unit as an owner-driver.

\- nil or rounded to zero

Note Figures may not add to totals due to rounding.

TABLE 3.12 EMPLOYMENT DETAILS OF BUSINESS UNITS BY INDUSTRY: WESTERN AUSTRALIA, 30 JUNE 1983

	Employees associated with trucking operations						
	Full time		*Part time*				
Industry	*Truck driver*	*Other function*	*Truck driver*	*Other function*	*Not stated*[a]	*Total (Western Australia)*	*Average employment*
Ancillary							
Agriculture, forestry, fishing and hunting	2 110	3 490	7 700	2 740	3 780	19 820	1.7
Building and construction	1 380	820	510	210	420	3 340	2.3
Electricity, gas and water	80	50	180	-	130	440	3.7
Manufacturing	780	1 000	370	110	60	2 320	4.9
Mining, quarrying	430	210	320	180	200	1 340	3.9
Wholesale and retail trade	1 990	850	660	750	210	4 470	3.1
Other	740	140	480	180	160	1 710	2.3
Total (ancillary)	7 520	6 560	10 220	4 170	4 980	33 450	2.0
Road transport (for hire and reward)							
Owner-drivers	960	200	100	100	b	1 370	1.3
Other	3 900	1 080	590	380	1 210	7 160	5.4
Total (road transport)	4 860	1 280	690	490	1 210	8 530	3.6
Total (all industries)	12 390	7 840	10 910	4 660	6 190	41 980	2.2
Per cent	(29.5)	(18.7)	(26.0)	(11.1)	(14.7)	(100.0)	

a. Estimate based on the assumption that business units with employment not stated have same average employment as those in the same industry with employment stated.
b. Nil. Employment details were required to classify business unit as an owner-driver.

\- nil or rounded to zero

Note Figures may not add to totals due to rounding.

TABLE 3.13 EMPLOYMENT DETAILS OF BUSINESS UNITS BY INDUSTRY: TASMANIA, 30 JUNE 1983

Industry	Employees associated with trucking operations						
	Full time		Part time				
	Truck driver	Other function	Truck driver	Other function	Not stated[a]	Total (Tasmania)	Average employment
Ancillary							
Agriculture, forestry, fishing and hunting	690	1 320	1 390	450	660	4 510	2.5
Building and construction	350	120	280	10	100	860	1.7
Electricity, gas and water	50	-	20	-	-	70	3.2
Manufacturing	250	30	80	10	-	370	5.6
Mining, quarrying	220	50	20	-	80	370	3.6
Wholesale and retail trade	640	410	100	20	100	1 260	4.2
Other	200	60	50	-	100	420	1.5
Total (ancillary)	2 410	1 980	1 960	500	1 040	7 860	2.6
Road transport (for hire and reward)							
Owner-drivers	160	-	70	-	b	220	1.0
Other	950	500	260	140	330	2 190	5.0
Total (road transport)	1 100	500	330	140	330	2 410	3.7
Total (all industries)	3 510	2 490	2 290	640	1 370	10 270	2.8
Per cent	(34.2)	(24.2)	(22.3)	(6.2)	(13.4)	(100.0)	

a. Estimate based on the assumption that business units with employment not stated have same average employment as those in the same industry with employment stated.
b. Nil. Employment details were required to classify business unit as an owner-driver.

\- nil or rounded to zero

Note Figures may not add to totals due to rounding.

TABLE 3.14 FULL TIME EMPLOYEES ASSOCIATED WITH TRUCKING OPERATIONS BY INDUSTRY AND STATE: 30 JUNE 1983

Industry	*New South Wales*	*Victoria*	*Queensland*	*South Australia*	*Western Australia*	*Tasmania*	*Australia*[a] *(number)*	*Australia*[a] *(per cent)*
Ancillary								
Agriculture, forestry, fishing and hunting	10 160	8 410	8 300	3 370	6 920	2 350	39 750	15.3
Building and construction	8 700	7 260	5 780	3 260	2 520	530	28 790	11.1
Electricity, gas and water	420	170	260	70	180	50	1 040	0.4
Manufacturing	6 230	17 020	3 780	2 040	1 820	280	31 260	12.0
Mining, quarrying	2 550	1 470	1 320	370	750	350	6 930	2.7
Wholesale and retail trade	13 850	11 820	8 960	4 130	2 990	1 130	43 990	16.9
Other	5 770	5 130	2 530	1 660	980	350	16 720	6.4
Total (ancillary)	47 670	51 280	30 910	14 890	16 170	5 040	168 480	64.9
Road transport (for hire and reward)								
Owner-drivers	5 990	5 330	3 480	1 580	1 170	160	17 750	6.8
Other	23 820	19 520	14 330	7 540	5 990	1 710	73 520	28.3
Total (road transport)	29 810	24 850	17 800	9 110	7 160	1 870	91 270	35.1
Total (all industries)	77 480	76 130	48 720	24 000	23 330	6 910	259 750	100.0
Per cent	(29.8)	(29.3)	(18.8)	(9.2)	(9.0)	(2.7)	(100.0)	

a. Includes the Northern Territory and the Australian Capital Territory.

Note Figures may not add to totals due to rounding.

TABLE 3.15 BUSINESS UNITS BY INDUSTRY AND LEGAL ORGANISATION: AUSTRALIA, 30 JUNE 1983

Industry	*Legal organisation*							*Industry total (Australia)*
	Sole proprietorship	*Partnership*	*Incorporated division*	*Unincorporated division*	*Incorporated company*	*Trust*	*Other*	
Ancillary								
Agriculture, forestry, fishing and hunting	22 890	51 870	590	440	3 320	2 410	400	81 910
	(27.9)	(63.3)	(0.7)	(0.5)	(4.1)	(2.9)	(0.5)	(100.0)
Building and construction	3 680	6 900	510	290	4 000	1 380	120	16 880
	(21.8)	(40.9)	(3.0)	(1.7)	(23.7)	(8.2)	(0.7)	(100.0)
Electricity, gas and water	260	330	20	50	190	40	-	880
	(28.9)	(37.3)	(2.3)	(5.4)	(21.6)	(4.1)	-	(100.0)
Manufacturing	830	1 410	1 020	540	2 000	450	100	6 350
	(13.1)	(22.3)	(16.1)	(8.4)	(31.5)	(7.1)	(1.5)	(100.0)
Mining, quarrying	540	1 130	200	90	450	200	-	2 620
	(20.6)	(43.2)	(7.7)	(3.4)	(17.1)	(7.7)	-	(100.0)
Wholesale and retail trade	2 520	5 760	990	650	3 460	1 480	80	14 950
	(16.9)	(38.6)	(6.6)	(4.3)	(23.2)	(9.9)	(0.6)	(100.0)
Other	2 180	3 320	300	250	1 420	430	330	8 240
	(26.5)	(40.3)	(3.7)	(3.0)	(17.3)	(5.2)	(4.0)	(100.0)
Total (ancillary)	32 900	70 730	3 630	2 300	14 840	6 390	1 040	131 820
	(25.0)	(53.7)	(2.8)	(1.7)	(11.3)	(4.8)	(0.8)	(100.0)

TABLE 3.15 (Cont.) BUSINESS UNITS BY INDUSTRY AND LEGAL ORGANISATION: AUSTRALIA, 30 JUNE 1983

	Legal organisation							
Industry	*Sole proprietorship*	*Partnership*	*Incorporated division*	*Unincorporated division*	*Incorporated company*	*Trust*	*Other*	*Industry total (Australia)*
Road transport (for hire and reward)								
Owner-drivers	5 450	8 840	-	-	850	910	60	16 110
	(33.8)	(54.9)	-	-	(5.3)	(5.6)	(0.3)	(100.0)
Other	4 120	8 410	270	280	2 400	1 100	10	16 570
	(24.9)	(50.7)	(1.6)	(1.7)	(14.5)	(6.6)	(0.0)	(100.0)
Total (road transport)	9 570	17 250	270	280	3 250	2 000	60	32 680
	(29.3)	(52.8)	(0.8)	(0.8)	(10.0)	(6.1)	(0.2)	(100.0)
Total (all industries)	42 470	87 980	3 900	2 570	18 090	8 390	1 100	164 500
Per cent	(25.8)	(53.5)	(2.4)	(1.6)	(11.0)	(5.1)	(0.7)	(100.0)

- nil or rounded to zero

Notes 1. Figures may not add to totals due to rounding.
2. Figures in parentheses are percentages.

TABLE 3.16 BUSINESS UNITS BY MAIN BASIS OF OPERATION AND STATE: ROAD TRANSPORT (FOR HIRE AND REWARD) OPERATORS, 30 JUNE 1983

Main basis of operation	*New South Wales*	*Victoria*	*Queensland*	*South Australia*	*Western Australia*	*Tasmania*	*Northern Territory*	*Australian Capital Territory*	*Australia* (number)	*Australia* (per cent)
Freight forwarder	160	60	20	50	10	30	-	10	330	1.0
Prime contractor										
Tied or painted	1 000	1 000	610	210	120	70	10	-	3 030	9.3
Not tied or painted	1 100	850	680	280	190	20	10	20	3 140	9.6
Sub-contractor										
Tied or painted	2 510	2 930	1 550	960	750	70	-	20	8 790	26.9
Not tied or painted	1 810	1 370	850	530	330	30	-	-	4 920	15.0
Freelance operator	2 700	2 770	2 140	1 120	730	410	50	40	9 950	30.4
Other/not stated	890	710	470	200	230	40	-	-	2 530	7.7
Total	10 170	9 690	6 320	3 340	2 360	660	60	100	32 680	100.0
Per cent	(31.1)	(29.6)	(19.3)	(10.2)	(7.2)	(2.0)	(0.2)	(0.3)	(100.0)	

- nil or rounded to zero

Note Figures may not add to totals due to rounding.

TABLE 3.17 BUSINESS UNITS BY MAIN BASIS OF OPERATION AND FREIGHT CONTRACT ARRANGEMENT MOST OFTEN USED: ROAD TRANSPORT (FOR HIRE AND REWARD) OPERATORS, AUSTRALIA, 1982-83

Main basis of operation	*Arrangement most often used*							*Total*	
	Written contract	*Verbal contract*	*Letter of intent*	*Preferential loading*	*No fixed loading*	*Other (specified)*	*Not stated*	*(number)*	*(per cent)*
Freight forwarder	90	150	10	10	60	-	10	330	1.0
Prime contractor									
Tied or painted	990	1 640	150	150	50	-	60	3 030	9.3
Not tied or painted	520	2 210	60	230	70	30	20	3 140	9.6
Sub-contractor									
Tied or painted	2 800	4 460	100	810	480	140	-	8 790	26.9
Not tied or painted	500	2 670	50	670	880	30	120	4 920	15.0
Freelance operator	370	5 710	50	370	3 030	240	180	9 950	30.4
Other/not stated	370	740	10	110	360	260	670	2 530	7.7
Total	5 630	17 570	440	2 340	4 920	710	1 060	32 680	100.0
Per cent	(17.2)	(53.8)	(1.4)	(7.2)	(15.1)	(2.2)	(3.2)	(100.0)	

- nil or rounded to zero

Note Figures may not add to totals due to rounding.

TABLE 3.18 BUSINESS UNITS BY MAIN BASIS OF OPERATION AND FREIGHT CONTRACT ARRANGEMENT MOST OFTEN USED: OWNER-DRIVERS, AUSTRALIA, 1982-83

Main basis of operation	*Arrangement most often used*							*Total*	
	Written contract	*Verbal contract*	*Letter of intent*	*Preferential loading*	*No fixed loading*	*Other (specified)*	*Not stated*	*(number)*	*(per cent)*
Prime contractor									
Tied or painted	320	570	50	100	20	-	60	1 120	7.0
Not tied or painted	210	580	-	80	-	-	-	860	5.4
Sub-contractor									
Tied or painted	1 960	2 850	100	670	360	110	-	6 050	37.5
Not tied or painted	220	1 690	20	260	470	30	50	2 740	17.0
Freelance operator	80	2 590	-	120	1 420	90	-	4 300	26.7
Other/not stated	150	240	-	50	170	130	290	1 040	6.4
Total	2 950	8 510	180	1 280	2 440	350	390	16 110	100.0
Per cent	(18.3)	(52.8)	(1.1)	(7.9)	(15.2)	(2.2)	(2.4)	(100.0)	

- nil or rounded to zero

Note Figures may not add to totals due to rounding.

CHAPTER 4 TASK PERFORMED BY ROAD FREIGHT TRANSPORT OPERATIONS

A major consideration in the design of the survey questionnaire was the minimisation of respondent burden in order to achieve a good response rate. Only questions which could be answered without detailed reference to records were included. In particular, information on tonnes consigned or tonne-kilometres carried was not collected since it was known that such information was not readily available from truck operators.

However, information was obtained on the proportion of distance travelled by type of route and average distance travelled in 1982-83 for trucks operating respectively over long distances and over short distances (routes less than 100 kilometres). Provided these questions were answered it was possible to estimate total distance travelled for each survey respondent. The method is described in Appendix VI. A number of respondents did not answer all the questions required for this calculation. This was accounted for by adjusting estimates at the industry by State level, assuming that business units not supplying the necessary details had the same average kilometres per truck as those that did.

Using these estimates of distance travelled together with information on the type of freight carried and industries served by hire and reward operators, it is possible to paint a broad picture of the nature and distribution of the road freight task.

TASK DISTRIBUTION

The estimates of distance travelled are intended as a broad indication only. As shown in Appendix V the estimated relative standard errors for total distance travelled at the State level range from 13 to 27 per cent. Separate estimates of distance travelled have not been shown for the Northern Territory or the Australian Capital Territory because of high relative standard errors. In addition, the estimates were derived indirectly from a number of questions. Somewhat different estimates might have been obtained if the survey

questionnaire had directly sought information on total distance travelled.

By type of route

Table 4.1 shows estimates of distance travelled in 1982-83 by trucks of all business units in the scope of the survey classified by State of business address and type of route. The significant features include a relatively high level of interstate travel for South Australia and a relatively low level of interstate travel for Western Australia. However, as would be expected, Western Australia has a relatively high level of long distance intrastate travel.

Similar details are shown for road transport (for hire and reward) operators (Table 4.2) and owner-drivers (Table 4.3). Compared with all business units, these operators concentrate more on long distance activity and particularly on interstate travel.

The estimates of distance travelled can be compared with estimates obtained in the Survey of Motor Vehicle Usage (SMVU) 1982 (ABS 1983a). However, the two surveys are not exactly comparable. The SMVU referred to the 12 months ended 30 September 1982, compared to the financial year 1982-83 for this study. The SMVU also included State and local government trucks and trucks of tare weight less than 2 tonnes, all of which were excluded from this study. In addition, this study excluded fleets which only used trucks for private purposes. Notwithstanding these differences, the total of 9 563 200 thousand vehicle kilometres shown in Table 4.1 compares with SMVU estimates of 11 653 800 thousand vehicle kilometres for all trucks, and 6 914 400 thousand vehicle kilometres for all trucks excluding rigid trucks of less than 3 tonnes tare weight.

By comparing Tables 4.1 and 4.2 it can be seen that road transport (for hire and reward) operators perform some 75 per cent of long distance travel and only 33 per cent of short distance travel. Because these operators tend to use heavier trucks than ancillary operators, the importance of long distance activity in the overall road freight task is much higher than the 39 per cent of total vehicle kilometres indicated in Table 4.1.

By type of freight

Estimates of distance travelled by type of freight carried and State, are shown in Tables 4.4, 4.5 and 4.6 for all business units, road transport (for hire and reward) operators and owner-drivers respectively.

The most significant freight category in terms of total vehicle kilometres was non-bulk non-containerised which accounted for 30 per cent of all vehicle kilometres in 1982-83. The dominance of this freight category was accentuated for hire and reward operators and comprised 36 per cent of their total vehicle kilometres.

Significant features on a State basis are the relative importance of livestock and bulk solid freight for Western Australia and non-bulk non-containerised freight for South Australia.

Overall, approximately one-fifth of total travel distance was estimated to be without payload. This is likely to be an underestimate, because a significant number of survey responses reported no travel without payload.

INDUSTRY CHARACTERISTICS

Type of freight by industry

A detailed breakdown of total distance travelled in Australia by type of freight carried and industry is shown in Tables 4.7 and 4.8. As might be expected, the results show the relative importance of:

- non-bulk non-containerised freight in manufacturing and the wholesale and retail trade;
- refrigerated freight in wholesale and retail trade;
- livestock in agriculture;
- bulk solids in building and construction and mining and quarrying; and
- bulk liquids in manufacturing and the wholesale and retail trade.

The significance of hire and reward operators in the movement of non-bulk non-containerised freight which was mentioned in the previous section is also apparent.

Vehicle kilometres generated by industry groups

Road transport (for hire and reward) operators were asked to specify the industries they served as a percentage of total distance travelled. Industry served relates to the industry from which the freight was consigned. This made it possible to allocate the road freight task on the basis of which industry generated the travel.

Table 4.9 shows estimates of distance travelled by industry and State

with separate estimates for ancillary operators and road transport (for hire and reward) operators. The estimates for road transport (for hire and reward) operators were disaggregated by industry served and are shown in Table 4.10. Overall, some 24 per cent of distance travelled by hire and reward operators in 1982-83 was serving the manufacturing industry, and a further 20 per cent was serving the wholesale and retail trade.

The estimates in Table 4.10 were then added to those for ancillary operators in Table 4.9 to produce the estimates of distance travelled by industry generating travel shown in Table 4.11. On a State basis, higher than average proportions of vehicle kilometres were generated by mining and quarrying in New South Wales and Western Australia, by manufacturing in Victoria and South Australia, by building and construction in Queensland, and by agriculture and forestry in Western Australia and Tasmania.

Long and short distance operations

The method used to indirectly estimate distance travelled from a number of other measures was briefly described at the start of this chapter. In particular, the calculation hinged on estimates obtained for average distance travelled in 1982-83 for trucks operating over long and short distances respectively. A short distance was defined in the questionnaire as a route less than 100 kilometres. The calculation also required estimated proportions of total distance over long distance and short distance routes and the total number of trucks involved for each business unit. The estimated proportions of total distance by type of route were obtained in the questionnaire.

The analysis of trucks in Chapter 3 was based on responses to the question on numbers of trucks operated at 30 June 1983. Because of non-response to that question it was argued that the estimate of total trucks operated at 30 June 1983 may be understated by some 2 or 3 per cent. Ideally, a measure of truck equivalents (full year equivalent number of trucks available for operation) is needed to calculate total distance from average distance per truck for each survey respondent, but it was not appropriate to obtain such a measure in the survey.

Details of the numbers of trucks registered at 31 August 1982 were also obtained for each respondent, primarily to calculate the sample weights (see Appendix IV). In the event, the number of truck equivalents for each business unit was taken to be the number of

trucks reported as operating at 30 June 1983 if greater than zero; otherwise, the number of trucks registered at 31 August 1982. The estimated truck equivalents classified by industry and long or short distance operation at the total Australia level are shown in Table 4.12.

Estimates of average kilometres per truck per year were derived by dividing distance travelled by truck equivalents. Table 4.13 shows estimates of average kilometres per truck per year classified by industry and State. Tables 4.14 and 4.15 provide similar estimates for trucks operating over long distances and short distances respectively.

As expected, average kilometres per truck are generally higher for hire and reward operators than for ancillary operators. Overall, owner-drivers averaged 53 000 kilometres in 1982-83 and owner-drivers operating over long distances (greater than or equal to 100 kilometres) averaged 112 300 kilometres. Trucks operated by non owner-driver hire and reward operators averaged slightly more kilometres; 66 300 kilometres overall and 130 700 kilometres over long distance routes.

The very low average kilometres for trucks operating over long distances in mining and quarrying for Queensland and Tasmania suggests that there is very little travel over long distances in these categories.

FLEET CHARACTERISTICS

The inter-relationship between fleet size and average annual kilometres per truck is illustrated in Table 4.16 which shows the number of business units classified by fleet size and categories of average kilometres per truck for 1982-83. Table 4.17 provides similar details for hire and reward operators only and an additional breakdown for owner-drivers.

In general, larger fleets average more kilometres per truck annually and, regardless of fleet size, hire and regard operators average more kilometres per truck than do ancillary operators. Some 20 per cent of hire and reward operators with fleets of 20 or more trucks averaged at least 100 000 kilometres per truck in 1982-83. An estimated 2 270 owner-drivers (14 per cent) averaged at least 100 000 kilometres in 1982-83.

HIRE AND REWARD OPERATIONS

Previously in this chapter, estimates of distance travelled by hire and reward operators serving various industries were presented (Table 4.10). Another aspect of hire and reward operations is provided by Table 4.18 which shows distance travelled by industry served and main basis of operation. Table 4.19 provides similar estimates for owner-drivers.

Hire and reward operators classified as mainly operating as freight forwarders concentrated their services in the manufacturing industry. A relatively high proportion of distance travelled by tied prime contractors was serving the wholesale and retail trade industry. Freelance operators were concentrated in serving the agriculture and forestry industry.

Among owner-drivers the concentration of freelance operators serving the agriculture and forestry industry is even more marked (18 per cent of kilometres travelled by freelance operators is serving that industry, compared to 8 per cent for all owner-drivers). Another feature of Table 4.19 is the concentration of tied prime contractor owner-drivers serving the mining and quarrying industry.

TABLE 4.1 DISTANCE TRAVELLED BY STATE AND TYPE OF ROUTE: 1982-83

(thousand vehicle km)

State[a]	Long distance		Short distance[b]			Total	
	Inter-state	*Within State*	*Urban*	*Non-urban*	*Mixed urban and non-urban*	*(distance)*	*(per cent)*
New South Wales	427 700	669 900	741 100	494 700	818 800	3 152 200	33.0
	(13.6)	(21.3)	(23.5)	(15.7)	(26.0)	(100.0)	
Victoria	573 200	426 000	662 600	451 700	506 500	2 620 000	27.4
	(21.9)	(17.6)	(25.3)	(17.2)	(19.3)	(100.0)	
Queensland	227 300	412 800	376 600	250 000	424 800	1 691 500	17.7
	(13.4)	(24.4)	(22.3)	(14.8)	(25.1)	(100.0)	
South Australia	308 500	162 300	190 600	120 300	149 600	931 300	9.7
	(33.1)	(17.4)	(20.5)	(12.9)	(16.1)	(100.0)	
Western Australia	38 500	306 800	192 500	171 700	141 800	851 400	8.9
	(4.5)	(36.0)	(22.6)	(20.2)	(16.7)	(100.0)	
Tasmania	5 600[c]	69 300	42 700	42 200	62 600	222 400	2.3
	(2.5)	(31.2)	(19.2)	(19.0)	(28.2)	(100.0)	
Australia[d]	1 596 600	2 085 600	2 225 900	1 538 500	2 116 600	9 563 200	100.0
Per cent	(16.7)	(21.8)	(23.3)	(16.1)	(22.1)	(100.0)	

a. State of business unit, not State in which travel occurs.
b. Routes less than 100 km.
c. Movement of goods to or from Tasmanian ports may be considered as interstate if the goods originate from or are destined for the mainland.
d. Includes Northern Territory and the Australian Capital Territory.

Notes 1. Figures may not add to totals due to rounding.
2. Figures in parentheses are percentages.

TABLE 4.2 DISTANCE TRAVELLED BY STATE AND TYPE OF ROUTE: ROAD TRANSPORT (FOR HIRE AND REWARD) OPERATORS, 1982-83

(thousand vehicle km)

	Long distance		*Short distance*[b]			*Total*	
State[a]	*Inter-state*	*Within State*	*Urban*	*Non-urban*	*Mixed urban and non-urban*	*(distance)*	*(per cent)*
New South Wales	349 200	400 100	327 900	158 600	237 100	1 472 900	31.4
	(23.7)	(27.2)	(22.3)	(10.8)	(16.1)	(100.0)	
Victoria	518 000	247 400	247 600	97 100	155 500	1 265 600	27.0
	(40.9)	(19.5)	(19.6)	(7.7)	(12.3)	(100.0)	
Queensland	193 900	333 200	137 800	84 200	175 500	924 500	19.7
	(21.0)	(36.0)	(14.9)	(9.1)	(19.0)	(100.0)	
South Australia	282 300	90 800	53 200	31 800	60 900	519 000	11.1
	(54.4)	(17.5)	(10.3)	(6.1)	(11.7)	(100.0)	
Western Australia	33 500	216 100	67 800	25 300	40 500	383 200	8.2
	(8.7)	(56.4)	(17.7)	(6.6)	(10.6)	(100.0)	
Tasmania	-	42 900	15 100	6 100	17 700	81 800	1.7
	-	(52.4)	(18.4)	(7.4)	(21.7)	(100.0)	
Australia[c]	1 390 400	1 359 900	852 300	404 200	688 300	4 695 100	100.0
Per cent	(29.6)	(29.0)	(18.2)	(8.6)	(14.7)	(100.0)	

a. State of business unit, not State in which travel occurs.
b. Routes less than 100 km.
c. Includes Northern Territory and the Australian Capital Territory.

\- nil

Notes 1. Figures may not add to totals due to rounding.
2. Figures in parentheses are percentages.

TABLE 4.3 DISTANCE TRAVELLED BY STATE AND TYPE OF ROUTE: OWNER DRIVERS, 1982-83

(thousand vehicle km)

State[a]	Long distance		Short distance[b]			Total	
	Inter-state	*Within State*	*Urban*	*Non-urban*	*Mixed urban and non-urban*	*(distance)*	*(per cent)*
New South Wales	73 800	45 000	59 500	28 500	49 600	256 300	30.0
	(28.8)	(17.5)	(23.2)	(11.1)	(19.3)	(100.0)	
Victoria	113 700	23 700	62 400	16 700	51 100	267 600	31.4
	(42.5)	(8.9)	(23.3)	(6.2)	(19.1)	(100.0)	
Queensland	22 100	41 500	40 500	12 400	38 600	155 000	18.2
	(14.2)	(26.7)	(26.1)	(8.0)	(24.9)	(100.0)	
South Australia	73 900	7 700	8 800	1 400	12 700	104 600	12.3
	(70.7)	(7.4)	(8.4)	(1.4)	(12.2)	(100.0)	
Western Australia	400	36 600	17 500	400	5 800	60 700	7.1
	(0.6)	(60.3)	(28.8)	(0.7)	(9.6)	(100.0)	
Tasmania	-	900	300	2 500	600	4 200	0.5
	-	(20.3)	(7.8)	(58.9)	(13.0)	(100.0)	
Australia[c]	283 900	160 400	189 000	61 900	158 400	853 600	100.0
Per cent	(33.3)	(18.8)	(22.1)	(7.3)	(18.6)	(100.0)	

a. State of business unit, not State in which travel occurs.
b. Routes less than 100 km.
c. Includes Northern Territory and the Australian Capital Territory.

\- nil

Notes 1. Figures may not add to totals due to rounding.
2. Figures in parentheses are percentages.

TABLE 4.4 DISTANCE TRAVELLED BY FREIGHT CARRIED AND STATE[a]: 1982-83

(thousand vehicle km)

Freight	*New South Wales*	*Victoria*	*Queensland*	*South Australia*	*Western Australia*	*Tasmania*	*Australia*[b] *(distance)*	*Australia*[b] *(per cent)*
Empty (no payload)	728 100 (23.1)	513 200 (19.6)	350 900 (20.7)	173 100 (18.6)	181 000 (21.3)	45 900 (20.6)	2 014 000	21.1
Non-bulk containerised	89 700 (2.8)	119 500 (4.6)	53 200 (3.1)	20 900 (2.2)	30 000 (3.5)	20 900 (9.4)	335 700	3.5
Non-bulk, non-containerised (break bulk)	909 100 (28.8)	736 000 (28.1)	565 900 (33.5)	355 600 (38.2)	236 800 (27.8)	53 600 (24.1)	2 894 900	30.3
Refrigerated containerised (reefer container)	17 300 (0.6)	21 900 (0.8)	17 100 (1.0)	2 900 (0.3)	4 300 (0.5)	4 500 (2.0)	707 000	0.7
Refrigerated non-containerised (refrigerated vans)	140 900 (4.5)	141 700 (5.4)	69 600 (4.1)	45 700 (4.9)	33 900 (4.0)	900 (0.4)	439 000	4.6
Livestock	137 500 (4.4)	112 200 (4.3)	80 400 (4.8)	23 600 (2.5)	56 000 (6.6)	6 200 (2.8)	416 900	4.4

TABLE 4.4 (Cont.) DISTANCE TRAVELLED BY FREIGHT CARRIED AND STATE[a]: 1982-83

(thousand vehicle km)

Freight	*New South Wales*	*Victoria*	*Queensland*	*South Australia*	*Western Australia*	*Tasmania*	*Australia*[b] *(distance)*	*Australia*[b] *(per cent)*
Bulk solid (tipper)	426 600	255 800	183 600	96 900	150 900	30 400	1 149 800	12.0
	(13.5)	(9.8)	(10.9)	(10.4)	(17.7)	(13.7)		
Bulk liquid (tanker, concrete agitator)	249 700	308 800	147 600	83 200	74 200	37 500	911 100	9.5
	(7.9)	(11.8)	(8.7)	(8.9)	(8.7)	(16.9)		
Other (specified)	410 300	384 500	209 800	117 700	70 800	21 100	1 222 000	12.8
	(13.0)	(14.7)	(12.4)	(12.6)	(8.3)	(9.5)		
Not stated	43 000	26 400	13 400	11 500	13 400	1 300	109 100	1.1
	(1.4)	(1.0)	(0.8)	(1.2)	(1.6)	(0.6)		
Total	3 152 200	2 620 000	1 691 500	931 300	851 400	222 400	9 563 200	100.0
	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)		
Per cent	(33.0)	(27.4)	(17.7)	(9.7)	(8.9)	(2.3)	(100.0)	

a. State of business unit, not State in which travel occurs.
b. Includes Northern Territory and the Australian Capital Territory.

Notes 1. Figures may not add to totals due to rounding.
2. Figures in parentheses are percentages.

TABLE 4.5 DISTANCE TRAVELLED BY FREIGHT CARRIED AND STATE[a]: ROAD TRANSPORT (FOR HIRE AND REWARD) OPERATORS, 1982-83

(thousand vehicle km)

Freight	*New South Wales*	*Victoria*	*Queensland*	*South Australia*	*Western Australia*	*Tasmania*	*Australia*[b] *(distance)*	*Australia*[b] *(per cent)*
Empty (no payload)	302 200	213 800	185 100	70 800	72 000	11 600	866 000	18.4
	(20.5)	(16.9)	(20.0)	(13.6)	(18.8)	(14.1)		
Non-bulk containerised	64 700	96 300	37 100	11 500	23 100	9 500	243 500	5.2
	(4.4)	(7.6)	(4.0)	(2.2)	(6.0)	(11.6)		
Non-bulk, non-containerised (break bulk)	480 500	433 900	356 300	252 500	116 300	22 800	1 684 900	35.9
	(32.6)	(34.3)	(38.5)	(48.7)	(30.4)	(27.9)		
Refrigerated containerised (reefer container)	15 900	17 900	15 400	2 400	4 300	1 000	59 500	1.3
	(1.1)	(1.4)	(1.7)	(0.5)	(1.1)	(1.2)		
Refrigerated non-containerised (refrigerated vans)	41 800	61 400	46 000	19 000	21 200	600	194 900	4.2
	(2.8)	(4.9)	(5.0)	(3.7)	(5.5)	(0.8)		
Livestock	56 500	53 500	51 500	10 000	36 200	1 700	210 000	4.5
	(3.8)	(4.2)	(5.6)	(1.9)	(9.5)	(2.1)		

TABLE 4.5 (Cont.) DISTANCE TRAVELLED BY FREIGHT CARRIED AND STATE[a]: ROAD TRANSPORT (FOR HIRE AND REWARD) OPERATORS, 1982-83

(thousand vehicle km)

Freight	*New South Wales*	*Victoria*	*Queensland*	*South Australia*	*Western Australia*	*Tasmania*	*Australia*[b] *(distance)*	*Australia*[b] *(per cent)*
Bulk solid (tipper)	244 400	89 700	77 700	42 600	61 800	12 100	528 400	11.3
	(16.6)	(7.1)	(8.4)	(8.2)	(16.1)	(14.8)		
Bulk liquid (tanker, concrete agitator)	60 100	76 500	57 600	31 800	20 200	18 400	269 300	5.7
	(4.1)	(6.0)	(6.2)	(6.1)	(5.3)	(22.5)		
Other (specified)	177 400	217 100	95 800	69 200	24 300	4 000	588 500	12.5
	(12.0)	(17.2)	(10.4)	(13.3)	(6.3)	(4.9)		
Not stated	29 400	5 500	1 900	9 300	3 700	100	49 900	1.1
	(2.0)	(0.4)	(0.2)	(1.8)	(1.0)	(0.2)		
Total	1 472 900	1 265 600	924 500	519 000	383 200	81 800	4 695 100	100.0
	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	
Per cent	(31.4)	(27.0)	(19.7)	(11.1)	(8.2)	(1.7)	(100.0)	

a. State of business unit, not State in which travel occurs.
b. Includes Northern Territory and the Australian Capital Territory.

Notes 1. Figures may not add to totals due to rounding.
2. Figures in parentheses are percentages.

TABLE 4.6 DISTANCE TRAVELLED BY FREIGHT CARRIED AND STATE[a]: OWNER-DRIVERS, 1982-83

(thousand vehicle km)

Freight	*New South Wales*	*Victoria*	*Queensland*	*South Australia*	*Western Australia*	*Tasmania*	*Australia*[b] *(distance)*	*Australia*[b] *(per cent)*
Empty (no payload)	54 600	45 400	32 600	5 500	9 500	1 100	151 200	17.7
	(21.3)	(17.0)	(21.0)	(5.2)	(15.6)	(24.8)		
Non-bulk containerised	9 200	17 600	1 600	1 800	700	-	30 800	3.6
	(3.6)	(6.6)	(1.0)	(1.7)	(1.1)	-		
Non-bulk, non-containerised (break bulk)	82 700	89 500	48 600	52 800	27 000	2 000	302 400	35.4
	(32.3)	(33.4)	(31.3)	(50.4)	(44.5)	(45.9)		
Refrigerated containerised (reefer container)	300	2 800	3 500	-	-	-	6 600	0.8
	(0.1)	(1.0)	(2.3)	-	-	-		
Refrigerated non-containerised (refrigerated vans)	8 600	4 700	8 600	2 700	6 200	-	33 200	3.9
	(3.3)	(1.7)	(5.5)	(2.6)	(10.2)	-		
Livestock	5 000	11 600	1 700	100	3 500	200	22 000	2.6
	(1.9)	(4.3)	(1.1)	(0.1)	(5.7)	(4.6)		

TABLE 4.6 (Cont.) DISTANCE TRAVELLED BY FREIGHT CARRIED AND STATE[a]: OWNER-DRIVERS, 1982-1983

(thousand vehicle km)

Freight	*New South Wales*	*Victoria*	*Queensland*	*South Australia*	*Western Australia*	*Tasmania*	*Australia[b]* *(distance)*	*Australia[b]* *(per cent)*
Bulk solid (tipper)	45 500 (17.8)	17 100 (6.4)	18 000 (11.6)	6 400 (6.1)	7 600 (12.4)	1 000 (24.7)	95 600	11.2
Bulk liquid (tanker, concrete agitator)	7 600 (3.0)	11 500 (4.3)	12 300 (7.9)	2 000 (1.9)	1 600 (2.7)	- -	35 100	4.1
Other (specified)	41 500 (16.2)	65 800 (24.6)	28 300 (18.2)	27 400 (26.2)	4 700 (7.8)	- -	167 600	19.6
Not stated	1 300 (0.5)	1 600 (0.6)	- -	6 100 (5.8)	- -	- -	9 000	1.1
Total	256 300 (100.0)	267 600 (100.0)	155 000 (100.0)	104 600 (100.0)	60 700 (100.0)	4 200 (100.0)	853 600 (100.0)	100.0
Per cent	(30.0)	(31.4)	(18.2)	(12.3)	(7.1)	(0.5)	(100.0)	

a. State of business unit, not State in which travel occurs.
b. Includes Northern Territory and the Australian Capital Territory.

\- nil or rounded to zero

Notes 1. Figures may not add to totals due to rounding.
2. Figures in parentheses are percentages.

TABLE 4.7 DISTANCE TRAVELLED BY FREIGHT CARRIED AND INDUSTRY: ANCILLARY OPERATORS, AUSTRALIA, 1982-83

(thousand vehicle km)

Freight	*Agriculture, forestry, etc*	*Building and construction*	*Electricity, gas and water*	*Manufacturing*	*Mining quarrying*	*Wholesale and retail trade*	*Other*	*Total ancillary (distance)*	*Total ancillary (per cent)*
Empty (no payload)	347 900	173 500	11 500	136 800	94 300	273 300	110 800	1 148 000	23.6
Non-bulk containerised	21 900	4 400	-	24 900	200	34 000	6 800	92 100	1.9
Non-bulk non-containerised (break bulk)	256 300	150 500	5 700	279 000	11 800	382 200	124 500	1 210 000	24.9
Refrigerated containerised (reefer container)	4 200	-	-	800	-	5 700	500	11 200	0.2
Refrigerated non-containerised (refrigerated vans)	22 800	-	-	33 500	-	149 000	38 600	244 100	5.0

TABLE 4.7 (Cont.) DISTANCE TRAVELLED BY FREIGHT CARRIED AND INDUSTRY: ANCILLARY OPERATORS, AUSTRALIA, 1982-83
(thousand vehicle km)

Freight	*Agriculture, forestry, etc*	*Building and construction*	*Electricity, gas and water*	*Manufacturing*	*Mining quarrying*	*Wholesale and retail trade*	*Other*	*Total ancillary (distance)*	*Total ancillary (per cent)*
Livestock	182 800	4 100	300	2 500	-	6 900	10 300	206 900	4.2
Bulk solid (tipper)	174 100	193 600	2 900	52 100	136 300	25 300	37 000	621 500	12.8
Bulk liquid (tanker, contcrete agitator)	64 800	89 400	12 600	118 900	17 200	267 000	72 000	641 800	13.2
Other (specified)	129 400	108 600	9 000	55 900	16 000	104 600	210 100	633 500	13.0
Not stated	13 400	7 900	-	10 300	-	15 800	11 700	59 200	1.2
Total	1 217 600	731 900	41 800	714 700	275 900	1 263 800	622 300	4 868 100	100.0
Per cent	(25.0)	(15.0)	(0.9)	(14.7)	(5.7)	(26.0)	(12.8)	(100.0)	

- nil or rounded to zero

Note Figures may not add to totals due to rounding.

TABLE 4.8 DISTANCE TRAVELLED BY FREIGHT CARRIED: OWNER-DRIVERS, OTHER ROAD TRANSPORT (FOR HIRE AND REWARD) OPERATORS AND TOTAL ALL INDUSTRIES, AUSTRALIA, 1982-83

(thousand vehicle km)

	Road transport (for hire and reward)						*Total (all industries)*	
	Owner-drivers		*Other*		*Total*			
Freight	*(distance)*	*(per cent)*	*(distance)*	*(per cent)*	*(distance)*	*(per cent)*	*(distance)*	*(per cent)*
Empty (no payload)	151 200	17.7	714 800	18.6	866 000	18.4	2 014 000	21.1
Non-bulk containerised	30 800	3.6	212 800	5.5	243 500	5.2	335 700	3.5
Non-bulk non-containerised (break bulk)	302 400	35.4	1 382 500	36.0	1 684 900	35.9	2 894 900	30.3
Refrigerated containerised) (reefer container)	6 600	0.8	53 000	1.4	59 500	1.3	70 700	0.7
Refrigerated non-containerised (refrigerated vans)	33 200	3.9	161 700	4.2	194 900	4.2	439 000	4.6

TABLE 4.8 (Cont) DISTANCE TRAVELLED BY FREIGHT CARRIED: OWNER-DRIVERS, OTHER ROAD TRANSPORT (FOR HIRE AND REWARD) OPERATORS AND TOTAL ALL INDUSTRIES, AUSTRALIA, 1982-83

(thousand vehicle km)

	Road transport (for hire and reward)						*Total (all industries)*	
Freight	*(distance)*	*(per cent)*	*(distance)*	*(per cent)*	*(distance)*	*(per cent)*	*(distance)*	*(per cent)*
Livestock	22 000	2.6	188 000	4.9	210 000	4.5	416 900	4.4
Bulk solid (tipper)	95 600	11.2	432 700	11.3	528 400	11.3	1 149 800	12.0
Bulk liquid (tanker, concrete agitator)	35 100	4.1	234 300	6.1	269 300	5.7	911 100	9.5
Other (specified)	167 600	19.6	420 800	11.0	588 500	12.5	1 222 000	12.8
Not stated	9 000	1.1	40 900	1.1	49 900	1.1	109 100	1.1
Total	853 600	100.0	3 841 500	100.0	4 695 100	100.0	9 563 200	100.0
Per cent	(8.9)		(40.2)		(49.1)		(100.0)	

Note Figures may not add to totals due to rounding.

TABLE 4.9 DISTANCE TRAVELLED BY INDUSTRY AND STATE[a]: 1982-83

(thousand vehicle km)

Industry	*New South Wales*	*Victoria*	*Queensland*	*South Australia*	*Western Australia*	*Tasmania*	*Australia[b]* *(distance)*	*Australia[b]* *(per cent)*
Ancillary								
Agriculture, forestry, fishing and hunting	429 000 (13.6)	301 100 (11.5)	177 700 (10.5)	83 300 (8.9)	164 300 (19.3)	53 800 (24.2)	1 217 600	12.7
Building and construction	238 100 (7.6)	172 100 (6.6)	155 600 (9.2)	60 900 (6.5)	68 800 (8.1)	21 900 (9.9)	731 900	7.7
Electricity, gas and water	12 200 (0.4)	9 300 (0.4)	9 800 (0.6)	1 600 (0.2)	7 200 (0.8)	1 600 (0.7)	41 800	0.4
Manufacturing	197 800 (6.3)	330 100 (12.6)	88 900 (5.3)	43 600 (4.7)	34 800 (4.1)	17 100 (7.7)	714 700	7.5
Mining, quarrying	137 200 (4.4)	53 700 (2.1)	33 400 (2.0)	14 900 (1.6)	26 300 (3.1)	6 700 (3.0)	275 900	2.9
Wholesale and retail trade	440 800 (14.0)	317 700 (12.1)	206 600 (12.2)	136 100 (14.6)	120 300 (14.1)	30 500 (13.7)	1 263 800	13.2
Other	224 100 (7.1)	170 400 (6.5)	95 100 (5.6)	71 800 (7.7)	46 400 (5.4)	9 100 (4.1)	622 300	6.5
Total (ancillary)	1 679 300 (53.3)	1 354 400 (51.7)	767 000 (45.3)	412 300 (44.3)	468 200 (55.0)	140 700 (63.2)	4 868 100	50.9

TABLE 4.9 (Cont.) DISTANCE TRAVELLED BY INDUSTRY AND STATE[a]: 1982-83

(thousand vehicle km)

Industry	*New South Wales*	*Victoria*	*Queensland*	*South Australia*	*Western Australia*	*Tasmania*	*Australia[b]* *(distance)*	*Australia[b]* *(per cent)*
Road transport (for hire and reward)								
Owner-drivers	256 300	267 600	155 000	104 600	60 700	4 200	853 600	8.9
	(8.1)	(10.2)	(9.2)	(11.2)	(7.1)	(1.9)		
Other	1 216 600	998 000	769 400	414 400	322 500	77 500	3 841 500	40.2
	(38.6)	(38.1)	(45.5)	(44.5)	(37.9)	(34.9)		
Total (road transport)	1 472 900	1 265 600	924 500	519 000	383 200	81 800	4 695 100	49.1
	(46.7)	(48.3)	(54.7)	(55.7)	(45.0)	(36.8)		
Total (all industries)	3 152 200	2 620 000	1 691 500	931 300	851 400	222 400	9 563 200	100.0
	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)		
Per cent	(33.0)	(27.4)	(17.7)	(9.7)	(8.9)	(2.3)	(100.0)	

a. State of business unit, not State in which travel occurs.
b. Includes Northern Territory and the Australian Capital Territory.

Notes 1. Figures may not add to totals due to rounding.
2. Figures in parentheses are percentages.

TABLE 4.10 DISTANCE TRAVELLED BY INDUSTRY SERVED AND STATE[a]: ROAD TRANSPORT (FOR HIRE AND REWARD) OPERATORS, 1982-83

(thousand vehicle km)

Industry served	*New South Wales*	*Victoria*	*Queensland*	*South Australia*	*Western Australia*	*Tasmania*	*Australia[b]*	
							(distance)	*(per cent)*
Agriculture, forestry, fishing and hunting	210 900 (14.3)	148 100 (11.7)	177 900 (19.2)	75 800 (14.6)	81 300 (21.2)	19 800 (24.2)	717 400	15.3
Building and construction	207 700 (14.1)	149 200 (11.8)	142 800 (15.4)	51 600 (9.9)	56 100 (14.6)	10 300 (12.6)	628 100	13.4
Electricity, gas and water	10 200 (0.7)	13 800 (1.1)	12 700 (1.4)	6 300 (1.2)	10 200 (2.7)	600 (0.7)	53 800	1.1
Manufacturing	344 600 (23.4)	369 400 (29.2)	166 500 (18.0)	163 600 (31.5)	63 000 (16.4)	19 300 (23.6)	1 139 700	24.3
Mining, quarrying	159 400 (10.8)	92 900 (7.3)	65 300 (7.1)	23 100 (4.5)	46 400 (12.1)	8 300 (10.2)	399 500	8.5
Wholesale and retail trade	275 700 (18.7)	246 600 (19.5)	218 600 (23.6)	102 300 (19.7)	67 500 (17.6)	17 700 (21.6)	937 400	20.0

TABLE 4.10 (Cont.) DISTANCE TRAVELLED BY INDUSTRY SERVED AND STATE[a]: ROAD TRANSPORT (FOR HIRE AND REWARD) OPERATORS, 1982-83

(thousand vehicle km)

Industry served	*New South Wales*	*Victoria*	*Queensland*	*South Australia*	*Western Australia*	*Tasmania*	*Australia[b]* (distance)	*Australia[b]* (per cent)
Other (specified)	192 300	142 800	106 700	62 400	31 800	4 500	543 300	11.6
	(13.1)	(11.3)	(11.5)	(12.0)	(8.3)	(5.6)		
Unknown	22 600	41 400	18 500	15 000	10 900	1 000	112 200	2.4
	(1.5)	(3.3)	(2.0)	(2.9)	(2.8)	(1.2)		
Not stated	49 300	61 500	15 500	19 000	16 000	300	163 700	3.5
	(3.4)	(4.9)	(1.7)	(3.7)	(4.2)	(0.3)		
Total	1 472 900	1 265 600	924 500	519 000	383 200	81 800	4 695 100	100.0
	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)		
Per cent	(31.4)	(27.0)	(19.7)	(11.1)	(8.2)	(1.7)	(100.0)	

a. State of business unit, not State in which travel occurs.
b. Includes Northern Territory and the Australian Capital Territory.

Notes 1. Figures may not add to totals due to rounding.
2. Figures in parentheses are percentages.

TABLE 4.11 DISTANCE TRAVELLED BY INDUSTRY GENERATING TRAVEL AND STATE[a]: 1982-83

(thousand vehicle km)

Industry generating travel	*New South Wales*	*Victoria*	*Queensland*	*South Australia*	*Western Australia*	*Tasmania*	*Australia[b]* *(distance)*	*Australia[b]* *(per cent)*
Agriculture, forestry, fishing and hunting	640 000 (20.3)	449 200 (17.1)	355 500 (21.0)	159 100 (17.1)	245 600 (28.8)	73 600 (33.1)	1 935 100	20.2
Building and construction	445 800 (14.1)	321 200 (12.3)	298 400 (17.6)	112 400 (12.1)	124 900 (14.7)	32 200 (14.5)	1 360 100	14.2
Electricity, gas and water	22 500 (0.7)	23 100 (0.9)	22 500 (1.3)	7 900 (0.9)	17 400 (2.0)	2 200 (1.0)	95 600	1.0
Manufacturing	542 500 (17.2)	699 500 (26.7)	255 400 (15.1)	207 200 (22.2)	97 800 (11.5)	36 400 (16.4)	1 854 400	19.4
Mining, quarrying	296 600 (9.4)	146 600 (5.6)	98 700 (5.8)	38 100 (4.1)	72 800 (8.5)	15 000 (6.7)	675 400	7.1
Wholesale and retail trade	716 500 (22.7)	564 300 (21.5)	425 200 (25.1)	238 400 (25.6)	187 800 (22.1)	48 100 (21.6)	2 201 300	23.0

TABLE 4.11 (Cont.) DISTANCE TRAVELLED BY INDUSTRY GENERATING TRAVEL AND STATE[a]: 1982-83

(thousand vehicle km)

Industry generating travel	*New South Wales*	*Victoria*	*Queensland*	*South Australia*	*Western Australia*	*Tasmania*	*Australia[b]* *(distance)*	*Australia[b]* *(per cent)*
Other	416 500	313 200	201 800	134 200	78 200	13 600	1 165 500	12.2
	(13.2)	(12.0)	(11.9)	(14.4)	(9.2)	(6.1)		
Not stated/unknown	71 900	102 900	34 000	34 000	26 900	1 300	275 800	2.9
	(2.3)	(3.9)	(2.0)	(3.6)	(3.2)	(0.6)		
Total	3 152 200	2 620 000	1 691 500	931 300	851 400	222 400	9 563 200	100.0
	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)		
Per cent	(33.0)	(27.4)	(17.7)	(9.7)	(8.9)	(2.3)	(100.0)	

a. State of business unit, not State in which travel occurs.
b. Includes Northern Territory and the Australian Capital Territory.

Notes 1. Figures may not add to totals due to rounding.
2. Figures in parentheses are percentages.

TABLE 4.12 ESTIMATED TRUCK EQUIVALENTS[a] BY INDUSTRY AND LONG OR SHORT DISTANCE OPERATION: AUSTRALIA, 1982-83

Industry	*Long distance*	*Short distance*[b]	*Total*
Ancillary			
Agriculture, forestry, fishing and hunting	9 840	98 660	108 500
Building and construction	1 600	26 700	28 300
Electricity, gas and water	270	1 650	1 920
Manufacturing	1 980	17 220	19 190
Mining, quarrying	710	6 030	6 740
Wholesale and retail trade	3 930	31 020	34 950
Other	2 090	14 550	16 640
Total (ancillary)	20 410	195 820	216 230
Road transport (for hire and reward)			
Owner-drivers	3 940	12 170	16 110
Other	17 010	40 980	57 990
Total (road transport)	20 950	53 150	74 090
Total (all industries)	41 360	248 970	290 320

a. Full year equivalent number of trucks available for operation. In the absence of a more suitable measure this was defined for each survey respondent as the number of trucks reported as operating at 30 June 1983 if greater than zero; otherwise, the number of trucks registered at 31 August 1982.
b. Routes less than 100 km.

Note Figures may not add to totals due to rounding.

TABLE 4.13 AVERAGE KILOMETRES PER TRUCK PER YEAR BY INDUSTRY AND STATE[a]: 1982-83

(km/truck/year)

Industry	*New South Wales*	*Victoria*	*Queensland*	*South Australia*	*Western Australia*	*Tasmania*	*Australia*[b]
Ancillary							
Agriculture, forestry, fishing and hunting	14 000	11 400	8 500	7 700	9 900	18 900	11 200
Building and construction	25 600	26 500	27 400	21 600	27 400	24 700	25 900
Electricity, gas and water	21 200	17 900	23 400	17 700	30 100	23 700	21 800
Manufacturing	34 400	43 300	36 300	27 500	26 400	45 800	37 200
Mining, quarrying	56 900	44 200	30 700	26 200	25 000	25 200	41 000
Wholesale and retail trade	40 000	32 800	31 800	39 900	38 700	37 800	36 200
Other	41 100	43 700	28 700	49 000	25 700	18 900	37 400
Total (ancillary)	25 800	24 300	19 000	19 800	18 300	24 600	22 500
Road transport (for hire and reward)							
Owner-drivers	49 700	53 600	50 000	68 200	58 400	19 100	53 000
Other	63 600	67 300	68 500	67 900	67 200	51 800	66 300
Total (road transport)	60 600	63 800	64 500	68 000	65 600	47 600	63 400
Total (all industries)	35 200	34 700	30 900	32 700	26 300	29 900	32 900

a. State of business unit, not State in which travel occurs.
b. Includes Northern Territory and the Australian Capital Territory.

TABLE 4.14 AVERAGE KILOMETRES PER TRUCK PER YEAR BY INDUSTRY AND STATE[a]: TRUCKS OPERATING OVER LONG DISTANCES[b], 1982-83

(km/truck/year)

Industry	*New South Wales*	*Victoria*	*Queensland*	*South Australia*	*Western Australia*	*Tasmania*	*Australia*[c]
Ancillary							
Agriculture, forestry, fishing and hunting	36 400	31 600	30 400	17 300	16 400	31 500	27 900
Building and construction	45 700	28 700	43 600	63 000	48 200	17 800	46 200
Electricity, gas and water	83 200	d	33 000	7 400	42 100	11 500	41 000
Manufacturing	75 700	97 300	83 600	38 800	89 900	104 500	78 300
Mining, quarrying	52 000	109 700	1 300	29 200	40 100	1 300	42 600
Wholesale and retail trade	75 400	49 300	46 500	93 600	84 000	101 300	67 100
Other	102 400	135 400	84 300	120 700	68 900	19 500	100 600
Total (ancillary)	58 200	54 900	47 800	49 500	30 200	44 100	49 900
Road transport (for hire and reward)							
Owner-drivers	102 400	122 200	113 800	124 600	101 000	21 000	112 300
Other	120 100	137 900	139 100	122 400	135 400	113 400	130 700
Total (road transport)	116 800	134 600	135 300	122 900	128 700	103 700	127 200
Total (all industries)	87 200	97 300	98 400	92 200	65 400	64 000	89 000

a. State of business unit, not State in which travel occurs.
b. Routes greater than or equal to 100 km.
c. Includes Northern Territory and the Australian Capital Territory.
d. No long distance trips reported.

TABLE 4.15 AVERAGE KILOMETRES PER TRUCK PER YEAR BY INDUSTRY AND STATE[a]: TRUCKS OPERATING OVER SHORT DISTANCES[b], 1982-83

(km/truck/year)

Industry	*New South Wales*	*Victoria*	*Queensland*	*South Australia*	*Western Australia*	*Tasmania*	*Australia*[c]
Ancillary							
Agriculture, forestry, fishing and hunting	11 800	9 500	7 400	6 700	8 900	16 500	9 600
Building and construction	24 100	26 500	26 400	18 100	26 400	24 900	24 600
Electricity, gas and water	13 500	17 900	22 400	18 800	22 000	38 200	18 700
Manufacturing	27 500	38 400	32 200	26 400	110 800	33 500	32 900
Mining, quarrying	57 300	40 400	32 300	25 400	21 300	29 300	40 800
Wholesale and retail trade	35 700	30 800	30 000	97 700	33 400	27 300	32 200
Other	31 900	31 300	20 400	39 900	19 300	18 900	28 400
Total (ancillary)	22 300	21 400	16 900	16 400	16 500	21 500	19 700
Road transport (for hire and reward)							
Owner-drivers	34 600	33 700	36 200	26 200	35 200	18 700	33 800
Other	43 100	38 100	40 300	34 600	35 600	33 100	39 500
Total (road transport)	41 200	36 900	39 300	33 000	35 500	31 100	38 200
Total (all industries)	26 700	24 800	21 800	19 700	19 400	23 500	23 600

a. State of business unit, not State in which travel occurs.
b. Routes less than 100 km.
c. Includes Northern Territory and the Australian Capital Territory.

TABLE 4.16 BUSINESS UNITS BY FLEET SIZE AND AVERAGE KILOMETRES PER TRUCK PER YEAR: AUSTRALIA, 1982-83

Fleet size (trucks)	Average km/truck/year: Less than 10 000	10 000 to 19 999	20 000 to 29 999	30 000 to 39 999	40 000 to 49 999	50 000 to 59 999	60 000 to 69 999	70 000 to 79 999	80 000 to 99 999	100 000 and over	Not stated	Total (number)	Total (per cent)
1	46 740	15 860	9 210	6 320	3 100	2 730	1 810	1 080	1 380	3 770	19 780	111 780	68.0
	(41.8)	(14.2)	(8.2)	(5.7)	(2.8)	(2.4)	(1.6)	(1.0)	(1.2)	(3.4)	(17.7)	(100.0)	
2	9 140	4 000	2 470	1 600	1 210	760	490	420	410	1 170	4 610	26 280	16.0
	(34.8)	(15.2)	(9.4)	(6.1)	(4.6)	(2.9)	(1.9)	(1.6)	(1.6)	(4.5)	(17.6)	(100.0)	
3	1 840	1 090	820	760	350	390	210	140	170	590	1 650	8 000	4.9
	(23.0)	(13.7)	(10.2)	(9.5)	(4.3)	(4.8)	(2.7)	(1.7)	(2.2)	(7.4)	(20.7)	(100.0)	
4	680	480	440	250	210	210	100	100	100	370	590	3 520	2.1
	(19.3)	(13.7)	(12.4)	(7.0)	(5.9)	(6.0)	(2.7)	(2.9)	(2.8)	(10.5)	(16.8)	(100.0)	
5-9	480	420	730	390	310	250	210	120	160	500	690	4 240	2.6
	(11.4)	(9.8)	(17.1)	(9.1)	(7.3)	(6.0)	(4.8)	(2.8)	(3.7)	(11.8)	(16.1)	(100.0)	
10-19	80	150	190	150	100	90	60	50	50	180	190	1 280	0.8
	(6.2)	(11.4)	(14.7)	(11.3)	(8.0)	(7.1)	(4.3)	(4.1)	(3.6)	(14.0)	(15.2)	(100.0)	

TABLE 4.16 (Cont.) BUSINESS UNITS BY FLEET SIZE AND AVERAGE KILOMETRES PER TRUCK PER YEAR: AUSTRALIA, 1982-83

	Average km/truck/year												
Fleet size (trucks)	*Less than 10 000*	*10 000 to 19 999*	*20 000 to 29 999*	*30 000 to 39 999*	*40 000 to 49 999*	*50 000 to 59 999*	*60 000 to 69 999*	*70 000 to 79 999*	*80 000 to 99 999*	*100 000 and over*	*Not stated*	*Total (number)*	*Total (per cent)*
20-49	20	60	80	60	40	30	40	30	20	80	60	520	0.3
	(4.0)	(12.3)	(15.3)	(11.2)	(7.3)	(6.2)	(8.4)	(5.3)	(3.1)	(15.1)	(11.8)	(100.0)	
50 and over	10	20	30	30	30	20	10	10	20	20	10	200	0.1
	(2.6)	(10.3)	(14.4)	(15.4)	(14.4)	(8.2)	(3.1)	(6.2)	(11.3)	(8.7)	(4.6)	(100.0)	
Not stated[a]	3 550	800	540	300	60	80	110	10	30	200	3 020	8 690	5.3
	(40.9)	(9.2)	(6.2)	(3.4)	(0.7)	(0.9)	(1.2)	(0.1)	(0.3)	(2.3)	(34.8)	(100.0)	
Total	62 540	22 880	14 490	9 840	5 400	4 560	3 020	1 950	2 330	6 880	30 610	164 500	100.0
Per cent	(38.0)	(13.9)	(8.8)	(6.0)	(3.3)	(2.8)	(1.8)	(1.2)	(1.4)	(4.2)	(18.6)	(100.0)	

a. Includes a small number of business units with nil trucks operating at 30 June 1983.

Notes 1. Figures may not add to totals due to rounding.
2. Figures in parentheses are percentages.

TABLE 4.17 BUSINESS UNITS BY FLEET SIZE AND AVERAGE KILOMETRES PER TRUCK PER YEAR: ROAD TRANSPORT (FOR HIRE AND REWARD) OPERATORS AND OWNER-DRIVERS, AUSTRALIA, 1982-83

	Average km/truck/year											*Total*	
Fleet size (trucks)	*Less than 10 000*	*10 000 to 19 999*	*20 000 to 29 999*	*30 000 to 39 999*	*40 000 to 49 999*	*50 000 to 59 999*	*60 000 to 69 999*	*70 000 to 79 999*	*80 000 to 99 999*	*100 000 and over*	*Not stated*	*(number)*	*(per cent)*
1	920	2 290	3 450	2 810	1 530	1 610	880	660	810	3 020	3 910	21 880	66.9
	(4.2)	(10.5)	(15.8)	(12.8)	(7.0)	(7.4)	(4.0)	(3.0)	(3.7)	(13.8)	(17.9)	(100.0)	
2	210	550	450	440	450	280	290	320	210	840	790	4 810	14.7
	(4.4)	(11.3)	(9.4)	(9.0)	(9.3)	(5.8)	(5.9)	(6.7)	(4.3)	(17.5)	(16.3)	(100.0)	
3	70	140	240	200	120	170	120	70	80	350	410	1 980	6.1
	(3.3)	(7.2)	(12.3)	(10.2)	(6.2)	(8.5)	(6.0)	(3.7)	(4.2)	(17.8)	(20.5)	(100.0)	
4	40	40	130	120	70	110	60	50	30	210	210	1 060	3.2
	(3.4)	(3.5)	(12.2)	(11.4)	(6.7)	(10.8)	(5.4)	(4.8)	(2.7)	(19.6)	(19.4)	(100.0)	
5-9	60	80	120	160	110	90	100	50	90	270	330	1 460	4.5
	(3.9)	(5.3)	(8.1)	(11.1)	(7.6)	(6.1)	(6.9)	(3.5)	(6.4)	(18.5)	(22.5)	(100.0)	
10-19	-	40	50	40	40	60	10	30	30	110	90	510	1.6
	-	(8.7)	(9.0)	(7.8)	(7.7)	(11.9)	(1.4)	(6.7)	(6.5)	(21.3)	(18.4)	(100.0)	

TABLE 4.17 (Cont.) BUSINESS UNITS BY FLEET SIZE AND AVERAGE KILOMETRES PER TRUCK PER YEAR: ROAD TRANSPORT (FOR HIRE AND REWARD) OPERATORS AND OWNER-DRIVERS, AUSTRALIA, 1982-83

	Average km/truck/year												
Fleet size (trucks)	*Less than 10 000*	*10 000 to 19 999*	*20 000 to 29 999*	*30 000 to 39 999*	*40 000 to 49 999*	*50 000 to 59 999*	*60 000 to 69 999*	*70 000 to 79 999*	*80 000 to 99 999*	*100 000 and over*	*Not stated*	*Total (number)*	*Total (per cent)*
20 and over	-	10	30	30	40	20	30	20	30	60	40	290	0.9
	-	(4.1)	(9.6)	(9.2)	(13.4)	(6.8)	(8.9)	(6.5)	(8.9)	(19.9)	(12.3)	(100.0)	
Not stated[a]	10	130	30	70	10	80	50	-	-	100	200	690	2.1
	(1.6)	(19.4)	(4.4)	(10.8)	(2.0)	(11.4)	(7.9)	-	-	(14.1)	(28.4)	(100.0)	
Total	1 300	3 290	4 500	3 870	2 380	2 420	1 530	1 210	1 280	4 950	5 960	32 680	100.0
Per cent	(4.0)	(10.1)	(13.8)	(11.9)	(7.3)	(7.4)	(4.7)	(3.7)	(3.9)	(15.2)	(18.2)	(100.0)	
Owner-drivers	640	1 790	2 580	2 240	1 150	970	680	460	610	2 270	2 740	16 110	
Per cent	(4.0)	(11.1)	(16.0)	(13.9)	(7.1)	(6.0)	(4.2)	(2.9)	(3.8)	(14.1)	(17.0)	(100.0)	

a. Includes a small number of business units with nil trucks operating at 30 June 1983.

\- nil or rounded to zero

Notes 1. Figures may not add to totals due to rounding.
2. Figures in parentheses are percentages.

TABLE 4.18 DISTANCE TRAVELLED BY INDUSTRY SERVED AND MAIN BASIS OF OPERATION: ROAD TRANSPORT (FOR HIRE AND REWARD) OPERATORS, AUSTRALIA, 1982-83

(thousand vehicle km)

Industry served	*Freight forwarder*	*Prime contractor*		*Sub-contractor*		*Freelance operator*	*Other/ not stated*	*Total*	
		Tied	*Not tied*	*Tied*	*Not tied*			*(number)*	*(per cent)*
Agriculture, forestry, fishing and hunting	17 400 (7.6)	89 100 (11.4)	201 000 (17.7)	67 900 (10.1)	63 300 (12.4)	252 200 (23.0)	26 400 (9.8)	717 400	15.3
Building and construction	30 200 (13.2)	85 900 (11.0)	147 400 (13.0)	91 900 (13.6)	55 300 (10.8)	180 000 (16.4)	37 500 (13.9)	628 100	13.4
Electricity, gas and water	4 900 (2.1)	3 100 (0.4)	23 800 (2.1)	1 900 (0.3)	7 900 (1.5)	9 100 (0.8)	3 200 (1.2)	53 800	1.1
Manufacturing	78 200 (34.2)	197 900 (25.4)	341 400 (30.0)	176 800 (26.2)	101 600 (19.9)	202 900 (18.5)	40 900 (15.1)	1 139 700	24.3
Mining, quarrying	32 700 (14.3)	75 400 (9.7)	94 600 (8.3)	46 800 (6.9)	60 300 (11.8)	66 800 (6.1)	22 900 (8.5)	399 500	8.5
Wholesale and retail trade	42 600 (18.6)	245 600 (31.5)	219 300 (19.3)	158 000 (23.4)	96 400 (18.9)	152 600 (13.9)	23 000 (8.5)	937 400	20.0

TABLE 4.18 (Cont.) DISTANCE TRAVELLED BY INDUSTRY SERVED AND MAIN BASIS OF OPERATION: ROAD TRANSPORT (FOR HIRE AND REWARD) OPERATORS, AUSTRALIA, 1982-83

(thousand vehicle km)

Industry served	*Freight forwarder*	*Prime contractor*		*Sub-contractor*		*Freelance operator*	*Other/ not stated*	*Total*	
		Tied	*Not tied*	*Tied*	*Not tied*			*(number)*	*(per cent)*
Other (specified)	17 800	58 900	96 000	98 400	85 900	137 100	49 100	543 300	11.6
	(7.8)	(7.6)	(8.4)	(14.6)	(16.8)	(12.5)	(18.1)		
Unknown	4 500	13 400	6 900	15 500	29 200	40 400	2 200	112 200	2.4
	(2.0)	(1.7)	(0.6)	(2.3)	(5.7)	(3.7)	(0.8)		
Not stated	-	9 800	6 000	17 600	11 300	53 600	67 400	163 700	3.5
	-	(1.3)	(0.5)	(2.6)	(2.2)	(4.9)	(24.9)		
Total	228 400	779 100	1 136 600	674 700	511 200	1 094 600	270 600	4 695 100	100.0
	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)		
Per cent	(4.9)	(16.6)	(24.2)	(14.4)	(10.9)	(23.3)	(5.8)	(100.0)	

- nil

Notes 1. Figures may not add to totals due to rounding.
2. Figures in parentheses are percentages.

TABLE 4.19 DISTANCE TRAVELLED BY INDUSTRY SERVED AND MAIN BASIS OF OPERATION: OWNER-DRIVERS, AUSTRALIA, 1982-83

(thousand vehicle km)

Industry served	*Prime contractor*		*Sub-contractor*		*Freelance operator*	*Other/ not stated*	*Total*	
	Tied	*Not tied*	*Tied*	*Not tied*			*(number)*	*(per cent)*
Agriculture, forestry, fishing and hunting	2 800	5 500	13 100	13 800	38 700	1 300	75 200	8.8
	(4.1)	(10.2)	(4.3)	(7.8)	(18.1)	(3.9)		
Building and construction	6 200	6 000	47 500	18 900	49 600	5 100	133 200	15.6
	(9.2)	(11.0)	(15.4)	(10.7)	(23.2)	(16.0)		
Electricity, gas and water	-	500	400	5 400	1 100	-	7 400	0.9
	-	(0.8)	(0.1)	(3.0)	(0.5)	-		
Manufacturing	15 800	24 500	86 200	36 700	45 300	3 600	212 000	24.8
	(23.4)	(45.2)	(28.0)	(20.6)	(21.2)	(11.1)		
Mining, quarrying	19 200	2 200	19 800	17 600	14 500	1 400	74 700	8.8
	(28.4)	(4.0)	(6.4)	(9.9)	(6.8)	(4.5)		
Wholesale and retail trade	14 400	13 200	83 000	45 000	39 500	5 600	200 600	23.5
	(21.3)	(24.3)	(26.9)	(25.3)	(18.5)	(17.6)		

TABLE 4.19 (Cont.) DISTANCE TRAVELLED BY INDUSTRY SERVED AND MAIN BASIS OF OPERATION: OWNER-DRIVERS, AUSTRALIA, 1982-83

(thousand vehicle km)

Industry served	*Prime contractor*		*Sub-contractor*		*Freelance operator*	*Other/ not stated*	*Total*	
	Tied	*Not tied*	*Tied*	*Not tied*			*(number)*	*(per cent)*
Other (specified)	7 500	2 300	45 800	28 600	18 300	2 300	104 700	12.3
	(11.0)	(4.2)	(14.8)	(16.1)	(8.6)	(7.0)		
Unknown	1 700	100	7 200	8 900	3 700	-	21 700	2.5
	(2.6)	(0.2)	(2.3)	(5.0)	(1.7)	-		
Not stated	-	-	5 300	2 700	3 200	12 800	24 000	2.8
	-	-	(1.7)	(1.5)	(1.5)	(39.8)		
Total	67 500	54 100	308 400	177 600	213 900	32 100	853 600	100.0
	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)		
Per cent	(7.9)	(6.3)	(36.1)	(20.8)	(25.1)	(3.8)	(100.0)	

- nil

Notes 1. Figures may not add to totals due to rounding.
2. Figures in parentheses are percentages.

CHAPTER 5 FINANCIAL CONSIDERATIONS OF HIRE AND REWARD OPERATIONS

Business units in the road transport (for hire and reward) industry were asked to provide some financial data. Gross income from the carriage of freight, income from other sources and total taxable income (profit or loss) were sought for 1982-1983. Owner-drivers were also asked to provide details of truck purchase and leasing arrangements.

The extent of financial data sought was deliberately limited to minimise respondent burden and ensure a good response to the survey. In particular, information on costs of operation was not sought as this would have required detailed reference to records.

The following sections analyse the income data and owner-drivers' truck financing arrangements.

INCOME

Notwithstanding the fact that only a limited amount of income data was sought, a significant proportion of respondents did not provide answers to these questions. Consequently, the estimates presented in this section are subject to qualification and are intended to provide only a broad indication of income characteristics of truck operators.

Profit and loss

Table 5.1 shows the distribution of hire and reward operators by total taxable income and fleet size. There was a wide variation in reported profit/loss figures. Non-response was high; operators providing details of total taxable income represented only 65 per cent of the population. Of those that did respond, 17 per cent reported a loss for 1982-83. Eighty-eight per cent of those reporting a profit had profits of less than $25 000.

Total taxable income was meant to represent the balance after all expenses, including wages, had been met. However, when both gross and taxable income responses were examined, some respondents, particularly

small operators such as husband and wife partnerships, appeared to have included their nominal wage component as part of their business profit. Depending on the actual structure of their business, it may not be possible for some operators to separate this component of their total income. Because of this the data presented in Table 5.1 may reflect an optimistic view of the profit/loss distribution in the hire and reward sector.

Gross income from carriage of freight

Table 5.2 shows the distribution of hire and reward operators by gross income from carriage of freight and main basis of operation. The response rate for the question on gross income from carriage of freight was higher than that for total taxable income. Operators providing details of gross income from carriage of freight represented 81 per cent of the population. Of those that did respond, 59 per cent earned less than $50 000 and 22 per cent reported earnings of between $50 000 and $100 000 for 1982-83.

A significant feature of Table 5.2 is the indication that tied contractors tend to earn less than those not tied. Of those that responded, 55 per cent of tied prime contractors earned less than $50 000, compared to 36 per cent of those not tied. The corresponding figures for sub-contractors were 73 per cent and 56 per cent respectively. This may reflect the fact that tied contractors tend to travel less distance.[1] (However, as noted later in this section (Table 5.6), tied contractors tend to earn more on a per kilometre basis.) Another possible explanation could be that some of the maintenance and operating costs of tied contractors are met by their employers, with this form of subsidisation being balanced by a lower direct income.

Income per truck

The distribution of hire and reward operators by fleet size and gross income per truck from carriage of freight is shown in Table 5.3. Details are also shown separately for owner-drivers who dominate the single truck fleet population, comprising 74 per cent of single truck fleets.

Of those who provided the gross income data, 17 per cent of single truck fleets earned less than $20 000 per truck. The figure for

1. This can be seen, for example, by calculating average vehicle kilometres per business unit from Tables 3.16 and 4.18.

owner-drivers is the same. For two and three truck fleets much higher proportions (36 per cent and 31 per cent respectively) earned less than $20 000 per truck. With increasing fleet size the proportion drops rapidly; 16 per cent for four truck fleets down to 2 per cent for fleets of 20 or more trucks. This suggests that single truck operators may be making more productive use of their vehicles than two or three truck operators.

The absence of operating cost data limits the analysis. However, the data presented in this section do support some overseas research into the relationship between fleet size and operating costs. Bayliss (1965) observed that

> The owner-driver does his own administration and most of the servicing of his vehicle, but if he expands this means employing administrative staff, a service engineer for the vehicles, and he will require also offices and proper garaging facilities.

This means that owner-drivers should have lower unit operating costs than some of the medium sized fleets. However, as fleet size increases further, businesses are in a position to cut costs through bulk discounts for fuel and vehicle spares, and are therefore better able to utilise their administrative and additional infrastructure. Thus total costs per vehicle tend to decrease when fleets reach a size capable of taking advantage of these economies of scale.

Table 5.4 provides another way of illustrating the relationship between gross income per truck and fleet size. It shows estimates of average gross income per truck from carriage of freight classified by fleet size and average annual distance categories. For each cell in the table the average is the estimated total gross income from carriage of freight for business units falling into that cell, divided by the estimated total number of trucks for those business units. The overall picture across the average distance categories is a drop in gross income per truck from single truck fleets to fleets of two or three trucks, followed by a steady rise in gross income per truck for the larger fleets.

Of course, gross income per truck could be influenced by other factors; in particular truck size (payload capacity). It was found that for fleets of less than 10 trucks the distribution of truck size was fairly constant for the various fleet sizes. However, larger fleets tended to have a higher proportion of heavy trucks and this may

be reflected in the higher gross income per truck figures for larger fleets in Table 5.4.

Income per kilometre

In addition to describing gross income from carriage of freight on a unit truck basis, the survey data allowed its derivation on a unit kilometre basis. This analysis is a little less clear because of the higher non-response; some of the respondents that provided gross income data did not provide the necessary information for the calculation of total vehicle kilometres.

Table 5.5 shows the distribution of hire and reward operators by fleet size and gross income per kilometre from carriage of freight. Details for owner-drivers are shown separately. As was the case with gross income per truck (Table 5.3), higher proportions of operators of two and three truck fleets are in the lowest income category.

Table 5.6 shows the distribution of hire and reward operators by gross income per kilometre and main basis of operation. As foreshadowed in the previous section, tied contractors are relatively less dominant in the lower unit income categories than those not tied.

The relationship between gross income per kilometre, distance travelled and fleet size is further illustrated in Table 5.7. The average gross income per kilometre for each cell in the table is calculated as the estimated total gross income from carriage of freight divided by total vehicle kilometres travelled for business units falling into that cell. There are two distinct trends. First, gross income per kilometre decreases steadily with increasing average annual distance. Second, gross income per kilometre drops from single truck fleets to two and three truck fleets and then increases markedly in the larger fleets, reflecting to some extent the higher proportion of larger (and hence higher payload) trucks in the larger fleets.

OWNER-DRIVERS' TRUCK FINANCING ARRANGEMENTS

A broad picture of the truck fleet operated by owner-drivers as at 30 June 1983 is provided by Tables 5.8, 5.9 and 5.10 showing year of purchase, new or secondhand when purchased, ownership in terms of owned, leased or on hire purchase, and purchase price (adjusted to 1983 prices). The types of trucks operated by owner-drivers were shown in Table 3.6.

Leaving out those who did not provide the required details, some 41 per cent of owner-drivers' trucks were purchased new; the rest were secondhand. Sixty-three per cent of trucks were owned, 17 per cent leased and 20 per cent on hire purchase. Of the trucks owned or on hire purchase 37 per cent had a purchase price of less than $20 000, 33 per cent between $20 000 and $50 000, 20 per cent between $50 000 and $100 000 and 10 per cent had a purchase price of $100 000 or more (1983 prices).

Deposit

The questionnaire sought information on the original loan and amount outstanding for trucks owned or on hire purchase, but the response rate to these questions was very low. Information on deposit paid was also sought and the response rate to this question was somewhat higher. Table 5.11 shows the distribution of trucks owned or on hire purchase by deposit as a percentage of purchase price and whether new or secondhand when purchased. In addition to the high not stated category, it should be noted that an estimated 2850 owner-drivers (18 per cent) have been excluded from the table because ownership status was not given. Many of these would have owned their truck or had it on hire purchase.

One issue that has received publicity is the 'jack-up' finance deal whereby an artificially inflated value is attributed to the trade-in and an equivalent amount added to the truck to be purchased. The truck could then be purchased on minimal or nil deposit (NRFII 1984, p. 199). The data in Table 5.11 do not support the view that such arrangements are widespread. However, the data are far from conclusive both because of the high non-response and because the data represent 'surviving' owner-drivers. That is, the survey did not cover owner-drivers who had gone out of business and it is argued that low deposits (and consequent high repayments) are related to business failure.

Lease payments

Information on lease payments was also sought. The distribution of truck lease payments is provided in Table 5.12. The average (median) lease payment was between $800 and $999 per month.

TABLE 5.1 BUSINESS UNITS BY TOTAL TAXABLE INCOME AND FLEET SIZE: ROAD TRANSPORT (FOR HIRE AND REWARD) OPERATORS, AUSTRALIA, 1982-83

Total taxable income ($)	*Fleet size (trucks)*								*Total*	
	1	*2*	*3*	*4*	*5-9*	*10-19*	*20 and over*	*Not stated*[a]	*(number)*	*(per cent)*
Loss 50 000 and over	-	30	10	10	30	60	40	-	170	0.5
Loss 25 000 -49 999	100	30	70	30	40	20	10	-	290	0.9
Loss 10 000 -24 999	460	180	80	50	60	50	20	10	910	2.8
Loss 5 000 -9 999	460	200	60	60	10	10	-	30	810	2.5
Loss under 5 000	980	200	120	70	70	10	10	60	1 510	4.6
Profit under 5 000	2 250	460	180	30	40	20	-	10	2 990	9.1
Profit 5 000 -9 999	3 050	400	120	90	150	-	-	20	3 830	11.7

TABLE 5.1 (Cont.) BUSINESS UNITS BY TOTAL TAXABLE INCOME AND FLEET SIZE: ROAD TRANSPORT (FOR HIRE AND REWARD) OPERATORS, AUSTRALIA, 1982-83

Total taxable income ($)	*Fleet size (trucks)*								*Total*	
	1	*2*	*3*	*4*	*5-9*	*10-19*	*20 and over*	*Not stated*[a]	*(number)*	*(per cent)*
Profit 10 000 -24 999	6 510	1 270	360	180	170	60	10	20	8 570	26.2
Profit 25 000 -49 999	640	300	230	130	180	20	20	40	1 550	4.7
Profit 50 000 -99 999	30	100	30	70	100	40	20	-	380	1.2
Profit 100 000 and over	30	20	20	10	30	60	90	-	260	0.8
Not stated	7 370	1 640	720	350	590	160	90	500	11 410	34.9
Total	21 880	4 810	1 980	1 060	1 460	510	290	690	32 680	100.0
Per cent	(66.9)	(14.7)	(6.1)	(3.2)	(4.5)	(1.6)	(0.9)	(2.1)	(100.0)	

a. Includes a small number of business units with nil trucks operating at 30 June 1983.

\- nil or rounded to zero

Note Figures may not add to totals due to rounding.

TABLE 5.2 BUSINESS UNITS BY GROSS INCOME FROM CARRIAGE OF FREIGHT AND MAIN BASIS OF OPERATION: ROAD TRANSPORT (FOR HIRE AND REWARD) OPERATORS, AUSTRALIA, 1982-83

Gross income from carriage of freight ($)	*Main basis of operation*								
		Prime contractor		*Sub-contractor*					
	Freight forwarder	*Tied*	*Not tied*	*Tied*	*Not tied*	*Freelance operator*	*Other/ not stated*	*Total*	*Per cent*
9 999 or less	-	100	40	90	-	540	20	790	2.4
10 000-24 999	40	210	360	1 600	900	1 590	330	5 030	15.4
25 000-49 999	20	1 070	550	3 920	1 470	2 200	530	9 750	29.8
50 000-99 999	20	500	530	1 310	1 400	1 750	300	5 810	17.8
100 000-199 999	50	230	400	610	320	970	140	2 720	8.3
200 000-499 999	30	230	420	90	110	380	160	1 420	4.3
500 000-999 999	20	80	160	40	20	70	20	400	1.2
1 000 000 and over	50	100	200	10	40	40	30	490	1.5
Not stated	90	510	480	1 130	670	2 400	1 000	6 290	19.2
Total	330	3 030	3 140	8 790	4 920	9 950	2 530	32 680	100.0
Per cent	(1.0)	(9.3)	(9.6)	(26.9)	(15.)	(30.4)	(7.7)	(100.0)	

- nil

Note Figures may not add to totals due to rounding.

TABLE 5.3 BUSINESS UNITS BY FLEET SIZE AND GROSS INCOME PER TRUCK FROM CARRIAGE OF FREIGHT: ROAD TRANSPORT (FOR HIRE AND REWARD) OPERATORS AND OWNER-DRIVERS, AUSTRALIA, 1982-83

Fleet size (trucks)	*Gross income per truck from carriage of freight ($)*								*Total*	
	Less than 20 000	*20 000-39 999*	*40 000-59 999*	*60 000-79 999*	*80 000-99 999*	*100 000-119 999*	*120 000 and over*	*Not stated*	*(number)*	*(per cent)*
1	3 030	7 850	3 710	1 410	1 040	800	390	3 650	21 880	66.9
	(13.8)	(35.9)	(17.0)	(6.5)	(4.8)	(3.7)	(1.8)	(16.7)	(100.0)	
2	1 330	1 180	560	350	40	70	190	1 100	4 810	14.7
	(27.5)	(24.5)	(11.5)	(7.2)	(0.9)	(1.4)	(3.9)	(22.9)	(100.0)	
3	480	470	310	170	40	60	10	450	1 980	6.1
	(24.1)	(23.5)	(15.9)	(8.5)	(2.0)	(2.8)	(0.5)	(22.8)	(100.0)	
4	130	290	170	140	50	20	40	220	1 060	3.2
	(12.4)	(27.6)	(15.6)	(13.4)	(5.1)	(1.5)	(3.8)	(20.7)	(100.0)	
5-9	160	290	220	140	90	40	130	390	1 460	4.5
	(11.0)	(20.1)	(14.7)	(9.8)	(6.3)	(2.8)	(8.8)	(26.4)	(100.0)	
10-19	20	80	90	40	60	20	90	100	510	1.6
	(4.2)	(15.9)	(17.7)	(8.3)	(12.1)	(4.4)	(18.4)	(19.1)	(100.0)	

TABLE 5.3 (Cont.) BUSINESS UNITS BY FLEET SIZE AND GROSS INCOME PER TRUCK FROM CARRIAGE OF FREIGHT: ROAD TRANSPORT (FOR HIRE AND REWARD) OPERATORS AND OWNER-DRIVERS, AUSTRALIA, 1982-83

Fleet size (trucks)	*Gross income per truck from carriage of freight ($)*								*Total*	
	Less than 20 000	*20 000-39 999*	*40 000-59 999*	*60 000-79 999*	*80 000-99 999*	*100 000-119 999*	*120 000 and over*	*Not stated*	*(number)*	*(per cent)*
20 and over	10	30	40	20	40	20	70	70	290	0.9
	(1.5)	(10.2)	(14.1)	(6.0)	(14.3)	(6.9)	(22.4)	(24.5)	(100.0)	
Not stated[a]	90	180	30	-	40	30	10	310	690	2.1
	(12.7)	(26.8)	(4.1)	-	(5.1)	(4.3)	(1.4)	(45.7)	(100.0)	
Total	5 240	10 380	5 120	2 280	1 410	1 060	930	6 290	32 680	100.0
Per cent	(16.0)	(31.8)	(15.7)	(7.0)	(4.3)	(3.2)	(2.8)	(19.2)	(100.0)	
Owner-drivers	2 360	6 190	2 780	1 030	760	400	220	2 390	16 110	
Per cent	(14.6)	(38.4)	(17.2)	(6.4)	(4.7)	(2.5)	(1.4)	(14.8)	(100.0)	

a. Includes a small number of business units with nil trucks operating at 30 June 1983.

Notes 1. Figures may not add to totals due to rounding.
2. Figures in parentheses are percentages.

TABLE 5.4 AVERAGE GROSS INCOME PER TRUCK FROM CARRIAGE OF FREIGHT BY AVERAGE ANNUAL DISTANCE PER TRUCK AND FLEET SIZE: ROAD TRANSPORT (FOR HIRE AND REWARD) OPERATORS AND OWNER-DRIVERS, AUSTRALIA, 1982-83

(Average gross income per truck from carriage of freight ($))

Average distance travelled per truck per year in a fleet	*Fleet size (trucks)*								
	1	*2*	*3*	*4*	*5-9*	*10-19*	*20 and over*	*All fleets*	*Owner-drivers*
Less than 20 000	24 600	17 400	18 900	23 700	24 300	43 200	41 800	24 700	24 400
20 000-39 999	30 000	26 200	27 800	39 300	50 100	102 800	92 300	46 600	29 800
40 000-59 999	42 100	29 700	36 900	67 000	52 100	68 800	120 500	76 700	40 500
60 000-79 999	50 000	43 600	47 200	38 700	74 200	53 700	127 900	64 300	45 900
80 000-99 999	49 400	44 800	65 900	47 800	72 200	110 700	167 800	97 400	46 300
100 000-119 999	67 600	57 800	46 200	71 800	84 500	91 800	126 000	83 600	61 300
120 000-139 999	75 000	62 600	66 900	55 500	92 800	191 100	85 600	91 400	74 200
140 000-179 999	90 400	60 500	72 500	67 700	115 400	126 800	139 000	96 400	93 100
180 000 and over	90 500	97 200	49 000	103 300	106 500	196 400	88 100	103 400	79 100
Not stated	70 500	43 300	29 100	40 000	63 700	159 000	163 700	80 900	77 500
All fleets	47 300	39 500	36 100	49 000	65 700	104 600	120 800	67 700	46 900

TABLE 5.5 BUSINESS UNITS BY FLEET SIZE AND GROSS INCOME PER KILOMETRE FROM CARRIAGE OF FREIGHT: ROAD TRANSPORT (FOR HIRE AND REWARD) OPERATORS AND OWNER-DRIVERS, AUSTRALIA 1982-83

	Gross income per kilometre from carriage of freight ($)								*Total*	
Fleet size (trucks)	*Less than 0.50*	*0.50 -0.99*	*1.00 -1.49*	*1.50 -1.99*	*2.00 -2.49*	*2.50 -3.99*	*3.00 and over*	*Not stated*	*(number)*	*(per cent)*
1	2 310	6 500	3 270	1 360	890	320	610	6 620	21 880	66.9
	(10.5)	(29.7)	(15.0)	(6.2)	(4.1)	(1.5)	(2.8)	(30.3)	(100.0)	
2	1 350	1 020	490	100	60	40	190	1 570	4 810	14.7
	(28.1)	(21.1)	(10.2)	(2.1)	(1.2)	(0.8)	(3.9)	(32.6)	(100.0)	
3	420	460	200	80	60	10	60	680	1 980	6.1
	(21.4)	(23.3)	(10.2)	(4.2)	(3.0)	(0.5)	(3.0)	(34.5)	(100.0)	
4	200	200	100	70	40	20	30	400	1 060	3.2
	(18.9)	(19.0)	(9.0)	(6.3)	(3.7)	(2.1)	(2.9)	(38.0)	(100.0)	
5- 9	220	260	150	90	40	50	40	610	1 460	4.5
	(15.2)	(18.0)	(10.2)	(6.0)	(2.7)	(3.3)	(2.7)	(41.9)	(100.0)	
10-19	40	120	70	60	20	20	40	160	510	1.6
	(7.7)	(23.2)	(13.1)	(12.2)	(2.8)	(2.9)	(7.5)	(30.5)	(100.0)	

TABLE 5.5 (Cont.) BUSINESS UNITS BY FLEET SIZE AND GROSS INCOME PER KILOMETRE FROM CARRIAGE OF FREIGHT: ROAD TRANSPORT (FOR HIRE AND REWARD) OPERATORS AND OWNER-DRIVERS, AUSTRALIA 1982-83

	Gross income per kilometre from carriage of freight ($)								*Total*	
Fleet size (trucks)	*Less than 0.50*	*0.50 -0.99*	*1.00 -1.49*	*1.50 -1.99*	*2.00 -2.49*	*2.50 -3.99*	*3.00 and over*	*Not stated*	*(number)*	*(per cent)*
20 and over	10	50	40	20	20	10	40	100	290	0.9
	(2.4)	(18.5)	(13.7)	(6.2)	(7.2)	(3.4)	(14.7)	(34.2)	(100.0)	
Not Stated[a]	100	30	50	30	-	50	10	410	690	2.1
	(14.5)	(4.9)	(7.1)	(4.4)	-	(7.4)	(1.6)	(60.0)	(100.0)	
Total	4 650	8 640	4 370	1 810	1 120	520	1 020	10 560	32 680	100.0
Per cent	(14.2)	(26.4)	(13.4)	(5.5)	(3.4)	(1.6)	(3.1)	(32.3)	(100.0)	
Owner-drivers	1 790	4 780	2 660	1 040	570	290	400	4 580	16 110	
Per cent	(11.1)	(29.7)	(16.5)	(6.5)	(3.6)	(1.8)	(2.5)	(28.4)	(100.0)	

a. Includes a small number of business units with nil trucks operating at 30 June 1983.

Notes 1. Figures may not add to totals due to rounding.
2. Figures in parentheses are percentage.

TABLE 5.6 BUSINESS UNITS BY GROSS INCOME PER KILOMETRE FROM CARRIAGE OF FREIGHT AND MAIN BASIS OF OPERATION: ROAD TRANSPORT (FOR HIRE AND REWARD) OPERATORS, AUSTRALIA, 1982-83

Gross income per kilometre from carriage of freight ($)	*Main basis of operation*							*Total*	
		Prime contractor		*Sub-contractor*			*Other/*		
	Freight forwarder	*Tied*	*Not tied*	*Tied*	*Not tied*	*Freelance operator*	*not stated*	*(number)*	*(per cent)*
Less than 0.50	40	320	470	1 080	890	1 600	260	4 650	14.2
	(11.7)	(10.5)	(14.9)	(12.3)	(18.0)	(16.1)	(10.4)		
0.50-0.99	90	890	840	2 580	1 640	2 320	290	8 640	26.4
	(27.7)	(29.2)	(26.6)	(29.4)	(33.3)	(23.3)	(11.5)		
1.00-1.49	40	410	410	1 350	660	1 250	250	4 370	13.4
	(10.5)	(13.6)	(13.0)	(15.4)	(13.4)	(12.6)	(9.7)		
1.50-1.99	20	60	130	600	240	660	100	1 810	5.5
	(7.2)	(2.0)	(4.1)	(6.9)	(4.8)	(6.6)	(3.8)		
2.00-2.49	10	130	90	370	210	240	80	1 120	3.4
	(1.4)	(4.4)	(2.8)	(4.2)	(4.2)	(2.4)	(3.0)		
2.50-2.99	-	50	100	210	60	60	40	520	1.6
	-	(1.5)	(3.3)	(2.3)	(1.3)	(0.6)	(1.5)		

TABLE 5.6 (Cont.) BUSINESS UNITS BY GROSS INCOME PER KILOMETRE FROM CARRIAGE OF FREIGHT AND MAIN BASIS OF OPERATION: ROAD TRANSPORT (FOR HIRE AND REWARD) OPERATORS, AUSTRALIA, 1982-83

Gross income per kilometre from carriage of freight ($)	*Main basis of operation*							*Total*	
		Prime contractor		*Sub-contractor*			*Other/*		
	Freight forwarder	*Tied*	*Not tied*	*Tied*	*Not tied*	*Freelance operator*	*not stated*	*(number)*	*(per cent)*
3.00 and over	20	200	140	290	40	180	150	1 020	3.1
	(6.2)	(6.6)	(4.4)	(3.3)	(0.8)	(1.8)	(5.9)		
Not stated	120	970	970	2 300	1 190	3 640	1 370	10 560	32.3
	(34.7)	(32.3)	(30.9)	(26.2)	(24.2)	(36.6)	(54.2)		
Total	330	3 030	3 140	8 790	4 920	9 950	2 530	32 680	100.0
	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	
Per cent	(1.0)	(9.3)	(9.6)	(26.9)	(15.0)	(30.4)	(7.7)	(100.0)	

\- nil or rounded to zero

Notes 1. Figures may not add to totals due to rounding.
2. Figures in parentheses are percentages.

TABLE 5.7 AVERAGE GROSS INCOME PER KILOMETRE FROM CARRIAGE OF FREIGHT BY AVERAGE ANNUAL DISTANCE PER TRUCK AND FLEET SIZE: ROAD TRANSPORT (FOR HIRE AND REWARD) OPERATORS AND OWNER-DRIVERS, AUSTRALIA, 1982-83

(Average gross income per kilometre from carriage of freight ($))

Average distance travelled per truck per year in a fleet	*Fleet size (trucks)*								
	1	*2*	*3*	*4*	*5-9*	*10-19*	*20 and over*	*All fleets*	*Owner-drivers*
Less than 20 000	2.00	1.50	1.53	1.72	2.12	2.96	2.87	1.99	1.98
20 000-39 999	1.11	0.94	1.01	1.37	1.70	3.51	3.07	1.65	1.09
40 000-59 999	0.91	0.63	0.77	1.33	1.09	1.40	2.56	1.62	0.88
60 000-79 999	0.76	0.66	0.72	0.58	1.13	0.75	1.95	0.97	0.71
80 000-99 999	0.58	0.53	0.79	0.54	0.82	1.27	1.81	1.10	0.55
100 000-119 999	0.65	0.58	0.45	0.69	0.81	0.88	1.22	0.81	0.59
120 000-139 999	0.62	0.50	0.55	0.44	0.75	1.45	0.63	0.73	0.60
140 000-179 999	0.59	0.40	0.45	0.44	0.73	0.80	0.88	0.62	0.60
180 000 and over	0.44	0.45	0.24	0.36	0.38	0.94	0.46	0.47	0.38
All fleets	0.78	0.60	0.67	0.79	0.90	1.25	1.99	1.06	0.76

TABLE 5.8 OWNER-DRIVERS BY YEAR TRUCK PURCHASED AND NEW OR SECONDHAND WHEN PURCHASED: AUSTRALIA, 30 JUNE 1983

Year truck purchased	*Status of truck at purchase*			*Total*	
	New	*Second hand*	*Not stated*	*(number)*	*(per cent)*
Before 1974	410	310	-	730	4.5
1974	100	180	-	280	1.7
1975	160	130	-	290	1.8
1976	340	350	-	690	4.3
1977	250	240	30	520	3.2
1978	340	820	30	1 180	7.3
1979	750	860	-	1 610	10.0
1980	660	1 090	-	1 750	10.9
1981	990	1 710	-	2 700	16.8
1982	910	1 420	-	2 330	14.5
January to June 1983	370	510	30	910	5.6
Not stated	80	250	2 790	3 120	19.4
Total	5 360	7 870	2 870	16 110	100.0
Per cent	(33.3)	(48.9)	(17.8)	(100.0)	

- nil

Note Figures may not add to totals due to rounding.

TABLE 5.9 OWNER-DRIVERS BY YEAR TRUCK PURCHASED AND CURRENT OWNERSHIP STATUS: AUSTRALIA, 30 JUNE 1983

Year truck purchased	*Ownership status*				*Total*	
	Owned	*Leased*	*Hire purchase*	*Not stated*	*(number)*	*(per cent)*
Before 1974	690	-	30	-	730	4.5
1974	280	-	-	-	280	1.7
1975	290	-	-	-	290	1.8
1976	670	-	30	-	690	4.3
1977	420	70	30	-	520	3.2
1978	1 100	50	30	-	1 180	7.3
1979	1 020	400	170	20	1 610	10.0
1980	950	500	280	20	1 750	10.9
1981	1 120	570	960	60	2 700	16.8
1982	1 070	510	740	30	2 330	14.5
January to June 1983	430	170	290	20	910	5.6
Not stated	260	-	150	2 700	3 120	19.4
Total	8 290	2 270	2 700	2 850	16 110	100.0
Per cent	(51.5)	(14.1)	(16.7)	(17.7)	(100.0)	

- nil

Note Figures may not add to totals due to rounding.

TABLE 5.10 OWNER-DRIVERS BY TRUCK PURCHASE PRICE AND NEW OR SECOND HAND WHEN PURCHASED: TRUCKS OWNED OR ON HIRE PURCHASE[a], AUSTRALIA, 30 JUNE 1983

	Status of truck at purchase			*Total*	
Purchase price[b] ($)	*New*	*Second hand*	*Not stated*	*(number)*	*(per cent)*
Less than 10 000	-	1 490	-	1 490	13.5
10 000-19 999	430	1 650	-	2 080	18.9
20 000-29 999	550	880	60	1 490	13.5
30 000-39 999	310	660	-	970	8.9
40 000-49 999	260	430	-	690	6.3
50 000-59 999	350	190	-	530	4.9
60 000-69 999	230	160	-	390	3.6
70 000-79 999	270	90	30	380	3.5
80 000-89 999	130	120	-	250	2.3
90 000-99 999	210	130	-	330	3.0
100 000 and over	520	390	80	1 000	9.1
Not stated	490	890	-	1 380	12.6
Total	3 750	7 070	170	10 990	100.0
Per cent	(34.1)	(64.4)	(1.5)	(100.0)	

a. Excludes estimated 2270 owner-drivers with truck on lease and 2850 owner-drivers with truck ownership status not stated (see Table 5.9).
b. Adjusted to 1983 prices.

\- nil

Note Figures may not add to totals due to rounding.

TABLE 5.11 OWNER-DRIVERS BY DEPOSIT AS PERCENTAGE OF PURCHASE PRICE AND NEW OR SECOND HAND WHEN PURCHASED: TRUCKS OWNED OR ON HIRE PURCHASE[a], AUSTRALIA, 30 JUNE 1983

Deposit as percentage of purchase price	*Status of truck at purchase*			*Total*	
	New	*Second hand*	*Not stated*	*(number)*	*(per cent)*
Less than 10	110	210	-	330	3.0
10-19	270	510	-	770	7.0
20-29	410	640	30	1 080	9.8
30-39	620	520	30	1 170	10.6
40-49	180	340	30	550	5.0
50-59	280	390	-	660	6.0
60-69	150	100	-	250	2.3
70-79	-	180	-	180	1.6
80-89	20	-	-	20	0.2
90-100	100	310	-	410	3.8
Not stated	1 600	3 880	90	5 570	50.7
Total	3 750	7 070	170	10 990	100.0
Per cent	(34.1)	(64.4)	(1.5)	(100.0)	

a. Excludes estimated 2270 owner-drivers with truck on lease and 2850 owner-drivers with truck ownership status not stated (see Table 5.9).

\- nil

Note Figures may not add to totals due to rounding.

TABLE 5.12 OWNER-DRIVERS BY MONTHLY LEASE PAYMENT: TRUCK LEASED[a], AUSTRALIA, 30 JUNE 1983

Monthly lease payment ($)	*Owner-drivers*	
	(number)	*(per cent)*
200-399	200	9.0
400-599	390	17.4
600-799	300	13.1
800-999	260	11.7
1 000-1 199	290	12.9
1 200-1 399	200	8.8
1 400-1 599	230	10.1
1 600-1 799	130	5.6
1 800-1 999	100	4.6
2 000 and over	110	5.0
Not stated	40	2.0
Total	2 270	100.0

a. Excludes estimated 2850 owner-drivers with truck ownership status not stated (see Table 5.9).

Note Figures may not add to totals due to rounding.

CHAPTER 6 CONCLUDING REMARKS

The Survey of Trucking Operations, 1982-83 was conducted in early 1984 by the Bureau of Transport Economics in conjunction with the National Road Freight Industry Inquiry. Its primary purpose was to collect statistical information on commercial trucking operations to assist the Inquiry in its deliberations.[1]

This information focussed primarily on the structure of commercial truck activity including administrative, operational and equipment details. Advantage was taken of the opportunity presented by the survey to collect some task-related information.

The survey itself was developed and conducted within a very tight timetable and consequently, some elements of the questionnaire and procedures may not have been fully optimised.

Nevertheless, it is felt that the survey has provided a broad profile of commercial trucking operations in terms of:

- industries participating;
- structure and operations of business units;
- truck types;
- employment;
- freight carried;
- distance travelled; and
- industries served and generating travel.

The financial data were limited both by the low level of response to income questions and the absence of cost data. However, the data do

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1. The NRFII subsequently reported with a package of recommendations for the road freight industry (NRFII 1984).

suggest that the financial performance of operators with two or three trucks may be worse than that of either single truck or large fleet operators. Further investigation is needed in this area to clarify this point although some overseas evidence suggests this would not be unexpected.

APPENDIX I SURVEY QUESTIONNAIRE

DESIGN

The questionnaire was developed by the Bureau in consultation with the National Road Freight Industry Inquiry. An over-riding consideration in the design of the questionnaire was the requirement to achieve a balance between acquiring detailed and reliable information on a variety of topics and the level of response likely to be achieved. It was decided that in order to achieve a satisfactory level of response the survey questionnaire should not seek information which was likely to be too sensitive or which would require respondents to make detailed reference to records. Within these constraints it was considered that an acceptable amount of reliable information could be obtained on some of the characteristics of the trucking industry.

Trials

A draft questionnaire was trialled in Melbourne and in several Victorian country areas.

The aim of the trials was to establish that the questionnaire:

- was comprehensible;
- was easy for respondents to complete; and
- did not seek information that was not readily available to respondents.

In addition, the time taken to complete the questionnaire was assessed to evaluate the trade-off between obtaining comprehensive information and a satisfactory level of response. The results of the trials were also used to assess the likely extent of data checking and editing required and to establish processing procedures.

The sample was selected from the Victorian motor vehicle registry file with the aid (in some instances) of a telephone directory to obtain business units covering a broad cross-section of industries, fleet

sizes and urban and rural areas. (Full details of the use of motor vehicle registry files for sample selection are given in Appendix II.)

A total of 38 business units were sent questionnaires of which 30 responded and were subsequently interviewed.

The severe time constraints for the survey precluded more detailed testing.

INTRODUCTORY LETTER

A covering letter was mailed with the questionnaire to introduce the survey to respondents and to provide some background information. The requirement that the questionnaire be answered from the point of view of the trucking operation (that is, by the administratively self-contained business unit) was emphasised to reinforce the explanation provided on the questionnaire.

A pre-paid addressed envelope was included for respondents to return completed questionnaires.

QUESTIONNAIRE FORM

The structure of the questionnaire (and the covering letter) is as shown.

Bureau of Transport Economics

Our Reference:

PLEASE COMPLETE THE QUESTIONNAIRE EVEN IF YOU USE TRUCKS ONLY AS PART OF YOUR BUSINESS ACTIVITY.

SURVEY OF TRUCKING OPERATIONS FOR THE NATIONAL ROAD FREIGHT INDUSTRY INQUIRY

The Bureau of Transport Economics (BTE) is conducting this survey on behalf of the National Road Freight Industry Inquiry. As you are probably aware, the Inquiry was established because of a belief on the part of the Government that there are serious structural deficiencies in the freight transport industry as both trucking operators and the railways are losing money. Some information about the BTE, together with the Terms of Reference of the Inquiry, are enclosed for your information.

In announcing the Inquiry, the Minister for Transport stated that the "freight transport industry is a multi-billion dollar industry that significantly affects every aspect of Australian primary industry, manufacturing and retailing". The Minister also noted that, despite the obvious importance of this industry, there was a lack of information on its most fundamental characteristics. This need for factual information, particularly on the structure of commercial road freight activity, led to this survey.

One of the main reasons for the lack of information is the difficulty in obtaining appropriate details, particularly from small operators and owner drivers. While the pressures of business make it difficult to devote time to a survey, it is important that all operators of trucks respond if comprehensive and representative information is to be gathered. The effectiveness of this survey, and to some extent the Inquiry, depends on obtaining your co-operation if the problems faced by the industry are to be assessed in a way that will lead to lasting solutions.

You have been sampled because you or your business had a truck registered at August 1982. The BTE has taken every precaution to ensure that you don't receive more than one questionnaire. However, in the unlikely event that you do, would you please return the additional copy to the BTE and indicate that you have already received a questionnaire. The survey covers the period of the last financial year (1 July 1982 to 30 June 1983) and the details of your fleet should be those as at 30 June 1983, irrespective of whether you or your business changed equipment during the financial year or the period since that date.

Level 5, Civic Permanent Centre, Allara Street, Canberra City, A.C.T. 2601
Correspondence to PO Box 501, Civic Square, ACT 2608, Australia
Telex: 61733
Telephone: (062) 67 9811

The survey is aimed at obtaining information from businesses which use trucks as part of their commercial activity. This includes all hire and reward operators (including owner drivers) as well as businesses in other industries where truck operations are ancillary to the main activity, for example in agriculture.

The questions should be answered from the point of view of the business entity that operates your truck(s). Where trucks are registered to several individuals or businesses, the answers should relate to the trucking operation as a whole. Where trucks are operated in several administratively self-contained divisions, the questions should be answered in respect of this particular self-contained division and not the parent company or any equivalent divisions in other States.

Your answers to questions in this survey will be treated with the strictest confidence and will not be released to any other government department or authority. Publication will be in aggregate form by geographic region only.

A summary of the results of the survey will be forwarded to you after its completion in exchange for your contribution to this survey.

May I again emphasise the importance of the survey, and thank you in advance for your participation.

(G.K.R. Reid)
Director

March 1984

BUREAU OF TRANSPORT ECONOMICS

The Bureau of Transport Economics (BTE) is a professional research body which undertakes independent studies and investigations to assist the Commonwealth Government in formulating policy relating to all modes of transport. Although formally linked to the Commonwealth Department of Transport, the Bureau has a considerable degree of professional and administrative autonomy, and reports directly to the Minister for Transport on its program of research work.

The BTE was originally set up in 1970, but was established in its present form by a Commonwealth Government Cabinet Decision in November 1976. Its primary function is to advise the Commonwealth Government on the economic, financial and technical aspects of transport in Australia. In pursuit of this overall function, the BTE analyses the nature, capacity, performance and financing of transport systems, which includes the collection, analysis and dissemination of information relating to transport activities.

The BTE has a secondary function of assisting State and local governments, Commonwealth and State instrumentalities and the private sector to identify and address transport problems.

NATIONAL ROAD FREIGHT INDUSTRY INQUIRY
TERMS OF REFERENCE

To inquire into, report upon and make recommendations relating to Australia's road freight transport industry with particular reference to:

1. The ability of the industry to meet the needs of transport users economically, efficiently, and effectively.

2. The impact of regulation on the industry and the extent to which greater or lesser regulation of the industry by the Federal, State and Territory Governments is desirable and practicable.

3. The involvement of heavy vehicles in road crashes and the factors involved, especially any related to the current commercial conditions in the industry.

4. The impact of existing truck financing practices on the industry and possible means by which financing arrangements could be improved.

5. The effect of competition from rail on the industry and the extent to which this reflects differing levels of cost recovery from rail and road freight transport.

6. The need for a national research program relating to the road freight transport sector and areas of investigation which might usefully be pursued and, if required, how it might most appropriately be undertaken and the results disseminated.

7. Such other matters which are referred by the Minister for Transport.

Bureau of Transport Economics

NATIONAL ROAD FREIGHT INDUSTRY INQUIRY
SURVEY OF TRUCKING OPERATIONS

This questionnaire is intended to be answered without reference to records. Careful estimates will do.

Please complete this questionnaire from the point of view of the **business unit** as shown on the back page of the questionnaire. If trucks are operated in several self-contained divisions, the questions should be answered for THIS particular division and NOT the parent company.

Confidentiality: All the information you provide will be held in the strictest confidence by the Bureau of Transport Economics, and will be used for statistical purposes only.

Reply Date: Please complete and return this questionnaire in the enclosed postage-paid envelope by 27 APRIL 1984.

Assistance: If you need any help in completing this questionnaire please contact Mr Ian Hart by telephone on Canberra (062) 679916 (reverse charges).

Please answer the following questions to determine whether you need to complete the full questionnaire.

Was this business unit a registered owner of a truck or trucks of tare weight 2 tonnes or more at 31 AUGUST 1982?

(tick one box only)

Yes ☐ 1. No ☐ 2.

Did this business unit use a truck of tare weight 2 tonnes or more for carrying goods or equipment at any time during the 12 months ended 30 JUNE 1983?

If you used your truck(s) mainly for **PRIVATE** purposes only, then you should answer **NO** to this question.

(tick one box only)

Yes ☐ 1. No ☐ 2.

If you answered **NO** to **either** of the above two questions then **you should not complete any further questions.** Please return the questionnaire in the enclosed postage-paid envelope. While you do not have to answer any more questions, it is important that you return the questionnaire to the BTE so that a complete analysis can be made.

If you answered **YES** to **both** of the above questions please answer the following:

Are you able to answer the questions from the point of view of the business unit, and provide details on the number of trucks and employees?

(tick one box only)

Yes ☐ 1. No ☐ 2.

If you answered **YES** please turn to the next page.

If the answer to this question is **NO** then either:

- forward the questionnaire for completion to a person who could provide the necessary information;

  or

- turn to the last page of this questionnaire and provide details of a contact who you think could supply the information. Then return the questionnaire in the enclosed postage-paid envelope.

PART 1 — BACKGROUND

Question 1 — Please indicate the way this business unit was organised at 30 JUNE 1983:

(tick one box only)

- Sole proprietorship ☐ 1.
- Partnership ☐ 2.
- Division or business unit incorporated as a separate company but part of a larger organisation ☐ 3.
- Division or business unit not incorporated as a separate company but part of a larger organisation ☐ 4.
- Incorporated company ☐ 5.
- Trust ☐ 6.
- Other, including co-operative, welfare or charitable organisation (please specify) ..... ☐ 7.

Question 2 — Please indicate the number of trucks with a tare weight of 2 tonnes or more registered at 31 AUGUST 1982 to this business unit:

Include all trucks registered in business or family names related to this business unit.
Exclude all vehicles hired with a driver eg. sub-contractors vehicles.
Exclude cranes and fork lifts.

	State of Registration								
	NSW	Vic	QLD	SA	WA	Tas	NT	ACT	**TOTAL**
Number of trucks	.....	.....	.....	.....	.....	.....	.....	.....	.....

Question 3 — Is this business unit a member of any transport industry associations?

(tick one box only)

Yes ☐ 1. No ☐ 2.

If yes, please list the associations: .....

.....

.....

PART 2 — OPERATIONAL DETAILS

Question 4 — Please indicate the main industry in which THIS BUSINESS UNIT was engaged at 30 JUNE 1983:

INDUSTRY (tick one box only)

- Agriculture, forestry, fishing and hunting ☐ 1.
- Building and construction ☐ 2.
- Electricity, gas and water ☐ 3.
- Manufacturing ☐ 4.
- Mining, quarrying ☐ 5.
- Road transport (for hire and reward) ☐ 6.
- Other transport ☐ 7.
- Wholesale and retail trade ☐ 8.
- Other (please specify) ☐ 9.

Question 5 — Please estimate, as a percentage of the total distance travelled, the main types of freight carried by your truck(s) of tare weight 2 tonnes or more during the 12 months ended 30 JUNE 1983:

TYPE OF FREIGHT	PER CENT
Empty (no payload)	.....
Non-bulk, containerised	.....
Non-bulk, non-containerised (break-bulk)	.....
Refrigerated, containerised (reefer container)	.....
Refrigerated, non-containerised (in refrigerated vans)	.....
Livestock	.....
Bulk solid (tipper)	.....
Bulk liquid (tanker, concrete agitator)	.....
Other (please specify)	.....
TOTAL	100

Question 6 — Please estimate, as a percentage of the total distance travelled, the types of routes on which your truck(s) of tare weight 2 tonnes or more operated during the 12 months ended 30 JUNE 1983:

A distance of less than 100 km is considered to be SHORT.

TYPE OF DISTANCE/AREA	PER CENT
Long distance interstate	.....
Long distance within one State or Territory	.....
Short distance, urban areas	.....
Short distance, non-urban areas	.....
Short distance, urban and non-urban areas	.....
TOTAL	100

Question 7 — On average, what is the distance travelled (in kilometres) by each of your trucks of tare weight 2 tonnes or more during the 12 months ended 30 JUNE 1983?

Trucks operating over long distances ..... km

Trucks operating over short distances ..... km

PART 3 — EMPLOYMENT DETAILS

Question 8 — How many working proprietors, working partners and other employees were associated with the business unit at 30 JUNE 1983?

Truck drivers are those persons mainly engaged in driving trucks.
'Other function' includes mechanic, dispatcher, fork lift operator, etc.
Exclude sub-contractors and their employees
Exclude operators hired with equipment.
Exclude unpaid helpers.

CATEGORY OF EMPLOYEE	Working Proprietors & Working Partners	Employees	TOTAL
Trucking operations			
Full time — truck driver	.....	.....	.....
— other function	.....	.....	.....
Part time — truck driver	.....	.....	.....
— other function	.....	.....	.....
Other activities	.....	.....	.....
TOTAL EMPLOYED	.....	.....	.....

PART 4 — FLEET DETAILS

Question 9 — How many trucks with a tare weight of 2 tonnes or more were operated by this business unit at 30 JUNE 1983?

Include under OWNED all trucks purchased with personal loans or other private financial arrangements.
Exclude all trucks registered in your name or the name of your business unit but operated by another business unit or division.
Exclude all vehicles hired with a driver.

	Number Owned	Number On Hire Purchase	Number On Lease From A Financial Institution	Number On Lease From Other Business Units	Number Of Other Trucks
VEHICLE TYPE					
Rigid trucks with a tare weight of					
2 tonnes but less than 3 tonnes	.....	.....	.....	.....	.....
3 tonnes but less than 4 tonnes	.....	.....	.....	.....	.....
4 tonnes but less than 8 tonnes	.....	.....	.....	.....	.....
8 tonnes or more	.....	.....	.....	.....	.....
Total number of rigid trucks	.....	.....	.....	.....	.....
Articulated trucks with a tare weight for the usual prime mover and trailer combination of					
less than 9 tonnes	.....	.....	.....	.....	.....
9 tonnes but less than 11 tonnes	.....	.....	.....	.....	.....
11 tonnes or more	.....	.....	.....	.....	
Total number of articulated trucks	.....	.....	.....	.....	.....
TOTAL NUMBER OF TRUCKS	.....	.....	.....	.....	.....
Number of trucks with 'IS plates'	.....	.....	.....	.....	.....

If your answer to Question 4 was ROAD TRANSPORT (hire and reward) please go to Question 10. OTHERWISE, do not answer any more questions, complete the address details on the back page of the questionnaire and return the questionnaire to the Bureau of Transport Economics in the enclosed postage-paid envelope.

PART 5 — HIRE AND REWARD OPERATORS

Question 10 — In how many months of the year ended 30 JUNE 1983 did this business unit operate a truck of tare weight 2 tonnes or more?

Number of months ....

Question 11 — Please indicate the main basis on which this business unit operates:

A prime contractor enters into a contract to carry freight directly with the consignor of that freight (the shipper).
A sub-contractor enters into a contract to carry freight for a freight forwarder or a prime contractor.
A freelance operator has no fixed pattern of employment.
A tied contractor carries freight for one customer only.

(tick one box only)

Freight forwarder	☐ 1.
Prime contractor — tied or painted	☐ 2.
— not tied or painted	☐ 3.
Sub-contractor — tied or painted	☐ 4.
— not tied or painted	☐ 5.
Freelance operator	☐ 6.
Other (please specify)	☐ 7.

Question 12 — Please indicate the type of arrangement for freight loads MOST OFTEN used by this business unit during the 12 months ended 30 JUNE 1983:

(tick one box only)

Written contract	☐ 1.
Verbal contract	☐ 2.
Letter of intent	☐ 3.
Preferential loading	☐ 4.
No fixed loading	☐ 5.
Other, please specify	☐ 6.

Question 13 — Please indicate, as a percentage of the total distance travelled by your trucks of tare weight 2 tonnes or more, the industries which this business unit serves:

This question relates to the industry from which your freight was consigned irrespective of whether freight was carried for a freight forwarder or as a prime or sub-contractor. For example, if you picked up a load of fuel from a refinery then the industry serviced would be 'manufacturing'.

INDUSTRY	PER CENT
Agriculture, forestry, fishing and hunting	.....
Building and construction	.....
Electricity, gas and water	.....
Manufacturing	.....
Mining, quarrying	.....
Wholesale and retail trade	.....
Other, please specify	.....
Unknown	.....
TOTAL	100

Question 14 — Please estimate your gross and taxable income from HIRE AND REWARD OPERATIONS for the 12 months ended 30 JUNE 1983:

INCOME

Gross income — from the carriage of freight	$.....
— from other sources	$.....
Total gross income	$.....
Total taxable income — profit	$.....
— loss	$.....

If you consider yourself to be in the category of an 'owner driver' then go to Question 15 — OTHERWISE, do not answer any more questions, please complete the address details on the back page of the questionnaire and return the questionnaire to the Bureau of Transport Economics in the enclosed postage-paid envelope.

PART 6 — OWNER DRIVERS

Question 15 — Do you belong to a union?

(tick one box only)

Yes, because it is a requirement of the industry for which I carry freight	☐ 1.
Yes, other reasons	☐ 2.
No	☐ 3.

Question 16 — Please provide the following details for your truck(s) of tare weight 2 tonnes or more, as at 30 JUNE 1983:

If you own, lease or have on hire purchase more than 5 trucks please give details of the 5 trucks most recently acquired.
Include only those trucks that you currently own, lease or have on hire purchase.
Include under OWNED all vehicles purchased with personal loans or other private financial arrangements.

	Truck Number				
	1	2	3	4	5
Truck type (R = rigid) (A = articulated)	.....	.....	.....	.....	.....
Tare weight (tonnes)	.....	.....	.....	.....	.....
Year acquired (19..)	.....	.....	.....	.....	.....
Was the truck new (N) or was it second hand (U)	.....	.....	.....	.....	.....
Is the truck owned (T), leased (L) or on hire purchase (H)	.....	.....	.....	.....	.....
For trucks on lease (L) state monthly lease payments ($)	.....	.....	.....	.....	.....
ANSWER THE FOLLOWING ONLY FOR TRUCKS OWNED OR ON HIRE PURCHASE					
Purchase price ($'000)	.....	.....	.....	.....	.....
Value of deposit paid on purchase ($'000)	.....	.....	.....	.....	.....
Amount of original loan required ($'000)	.....	.....	.....	.....	.....
Amount of loan outstanding at 30 June 1983 ($'000)	.....	.....	.....	.....	.....

.....

Please state the name and telephone number of the person who answered the questionnaire or who would be able to answer the questionnaire if it has not been completed. Also, please show any corrections to the above address.

NAME OF CONTACT: .....

TITLE: .....

BUSINESS NAME: .....

ADDRESS: .....

.....

.....

TELEPHONE No.: .....

The BTE would like to thank you for your co-operation in participating in this survey.

APPENDIX II SURVEY SAMPLING, MAILING PROCEDURE AND PROCESSING

SAMPLING

Introduction

The primary objective of the sample selection process was to obtain an unbiased sample of administratively self-contained trucking operations. The only available population for sample selection consisted of the August 1982 files of trucks registered at Australian motor registries, which were provided to the Bureau through the Australian Bureau of Statistics and with the approval of the various State and Territory motor registries.

The scope of this survey made it necessary to exclude all non-freight carrying vehicles before generating the sample. Tow trucks, camper vans, fire engines, ambulances, buses and other classes of trucks primarily registered for non-freight carrying purposes were also removed from the population, based on vehicle type codes on the registry tapes.

Removal of small trucks was also considered necessary because these vehicles are often used for private non-freight transport tasks. The only suitable datum common to all motor vehicle registry records is tare weight, and, because the delimitation between a motor car licence and a truck driver's licence is two tonnes tare in all States, it was decided that this would provide the best available cut-off point for small vehicles. The population of trucks was thereby reduced to all trucks weighing two tonnes tare or more and capable of carrying freight.

Sample selection for main survey

In the course of determining the size of the sample for the survey, wastage due to non-response, incomplete questionnaires and non-contact due to changes of address were estimated. The Bureau's pessimistic expectations were that approximately one in six questionnaires would be usable for analysis.

Of the information required by the NRFII, the issues relating to owner-drivers were considered to be important, but as owner-drivers are a small component of the road transport industry there was a risk of selecting a sample size which was too small for collecting owner-driver related data, producing imprecise results. A relative standard error of 3 per cent was considered to be acceptable in the estimation of total owner-driver numbers and this error level, combined with the estimate of usable responses, was used to calculate the required sample size of at least 20 000 business units. This corresponded to a sample of 7.5 per cent of the edited population of trucks.

Random numbers were generated using a computer program containing a tested mixed congruential random number generator. After each number was generated, a check for prior selection was made by constructing a binary tree of numbers selected so far. Each number was checked to the nodes of the tree using a binary search until either the number was found (that is, the number was not unique therefore another random number was chosen) or until the end of the tree was reached (that is, the number was unique and added to the tree). After the required quantity of numbers had been chosen the tree was traversed in a way that created a list of numbers in numerical order. This method generates a fixed set of random numbers with possible values between '1' and the number of trucks registered at a particular State or Territory motor registry. The list of random numbers was used to 'point' to records in the motor registry files and thus produce the sample of trucks for that State. This process was carried out on each State and Territory motor registry file.

The address information contained on the registry files was often incorrect or truncated and required editing. For example, postcodes were missing and were added by clerical staff to the sample files.

As the sample selected comprised individual trucks, further clerical manipulation of the sample was required to ensure that only one survey questionnaire was sent to each business unit operating an administratively self-contained trucking operation. Using computer-based techniques the sample of trucks selected from each State was sorted into an order that placed vehicles belonging to owners with the same name in consecutive positions in the file. By clerical examination of these lists, duplicate entries (that is, trucks registered to the same business unit) were identified and removed from the samples. A further sort by postcode identified fleets with similar, though not identical names, but with identical addresses. These excess records were also removed from the sample. As the removal of duplicate records was anticipated before sample selection, the

number of trucks in the original sample was inflated to compensate for this process. Vehicles registered to State or local government authorities were also removed from the sample and an estimate of their proportion of the population made.

The resultant sample size achieved was 20 354 business units, to which questionnaires were mailed.

SURVEY OPERATIONS

Timetable

The survey was carried out under very tight time constraints. The mailing of 20 354 letters and questionnaires was conducted during the first week of April 1984, followed by first reminders (16 356 cards) two or three weeks later. Second and final reminders, enclosing an additional copy of a questionnaire (numbering 11 655) were mailed in early May 1984. In view of the time constraints for presenting survey analyses to the NRFII, a cut-off date for processing of questionnaire responses was set at mid-June 1984.

Processing

The coding procedure adopted was designed to be suitable for statistical analysis. The questionnaires were examined for correctable inconsistencies and completeness, and in some cases respondents were contacted by telephone to resolve unclear responses. Multi-State truck owners were checked to ensure that double counting did not occur as a result of a division of a business unit responding on behalf of another.

Update control

The categories of response were codified according to 'return to sender', 'respondent already replied', 'out of scope', 'partial response', etc. These response codes were entered on a computer file for up-to-date mailing control.

EDITING OF UNIT RECORD DATA

After the survey data had been keypunched for computer analysis, they were further examined to identify and eliminate as many errors as possible. These errors were of two types. The easier to identify and correct were the coding and keypunch errors. The more difficult errors to find and eliminate were those appearing as inconsistencies in information contained within an individual survey response. As many as possible of both types of errors were identified and corrected

using range and consistency checks. Where many respondents appeared to have problems with particular aspects of the questionnaire, the matter was noted for further investigation in the follow-up surveys (see Appendix III).

RESPONSE DETAILS

As the survey returns were received their response type as indicated in Table II.1 was recorded on the name and address file. This enabled weekly tables of responses to be produced. The response details for each State were readily available, so that areas of low response were readily identified and appropriate action taken. For example, analysis of the response pattern suggested that returns from Queensland were being received at a lower rate than from other areas. Adjustments were made to the mailing schedule to accommodate this situation. Table II.1 contains a summary of the response data for questionnaires returned before the cut-off date 18 June 1984.

The overall response rate was high with 73.2 per cent of questionnaires being returned before the cut-off date. Of this total, nearly one-half were returned unanswered with 38.6 per cent of the respondents considering themselves out of scope because they either did not own or use a truck during the period in question, or they considered its use to have been mainly for private purposes. Returns-to-sender accounted for a further 8.0 per cent leaving 51.8 per cent of the returned questionnaires (37.9 per cent of all questionnaires) as usable for analysis.

The follow-up surveys (see Appendix III) found that approximately 84 per cent of the respondents who classified themselves as out of scope were really in-scope and had misunderstood the questions which determined this distinction. The follow-up surveys also established that a significant proportion of these misinterpretations were made by respondents in the agricultural industry who believed that the use of a truck on a farm constituted private and not commercial use. Queensland, South Australia and Western Australia all had high out of scope rates. These States also have a high proportion of farm trucks.

The general level of response to this survey was higher than anticipated. This response rate was assisted by the fact that trucking operators were keen to assist the NRFII. In addition, publicity for the survey was generated through a number of road transport industry associations, with mention of the survey in various journals and newsletters.

TABLE II.1 RESPONSE TYPE BY STATE: AT CUT-OFF DATE 18 JUNE 1984

State[a]	Response type: Non-responses	Returns to sender	Duplicate questionnaires	Out of scope	Refusals	Usable responses	Total
New South Wales	2 003	329	52	1 511	24	2 360	6 279
	(31.9)	(5.2)	(0.8)	(24.1)	(0.4)	(37.6)	(100.0)
Victoria	1 321	380	23	1 466	17	2 055	5 262
	(25.1)	(7.2)	(0.4)	(27.9)	(0.3)	(39.1)	(100.0)
Queensland	1 132	241	37	1 226	10	1 290	3 936
	(28.8)	(6.1)	(0.9)	(31.1)	(0.3)	(32.8)	(100.0)
South Australia	402	96	22	616	7	839	1 982
	(20.3)	(4.8)	(1.1)	(31.1)	(0.4)	(42.3)	(100.0)
Western Australia	449	96	37	763	7	868	2 220
	(20.2)	(4.3)	(1.7)	(34.4)	(0.3)	(39.1)	(100.0)
Tasmania	104	27	4	147	4	233	519
	(20.0)	(5.2)	(0.8)	(28.3)	(0.8)	(44.9)	(100.0)

TABLE II.1 (Cont.) RESPONSE TYPE BY STATE: AT CUT-OFF DATE 18 JUNE 1984

	Response type						
State[a]	*Non-responses*	*Returns to sender*	*Duplicate questionnaires*	*Out of scope*	*Refusals*	*Usable responses*	*Total*
Northern Territory	20	8	-	8	-	23	59
	(33.9)	(13.6)	-	(13.6)	-	(39.0)	(100.0)
Australian Capital Territory	28	8	-	13	-	48	97
	(28.9)	(8.2)	-	(13.4)	-	(49.5)	(100.0)
Australia	5 459	1 185	175	5 750	69	7 716	20 354
	(26.8)	(5.8)	(0.9)	(28.2)	(0.3)	(37.9)	(100.0)

a. State of registration of truck through which business unit was selected. This is usually, but not always, the same as the State of the business unit.

\- nil

Note Figures in parentheses are per cent.

APPENDIX III FOLLOW-UP SURVEYS

Follow-up surveys were undertaken by Reark Research Pty Ltd to identify and determine the extent of bias in the main postal survey. These surveys were designed to provide information for the development of adjustment factors to minimise errors in estimates from the main survey. The potential areas of bias investigated were:

- incomplete information about the population of business units that were in-scope;
- differences in response rate by the size of the business unit, as measured by the number of trucks in its fleet;
- differences in response rate by the type of business unit;
- differences in the measured characteristics of respondents and non-respondents; and
- misinterpretation of the questionnaire.

The first two categories largely arose from the use of a sample frame which comprised trucks rather than administratively self-contained business units. This introduced an additional dimension to the areas of possible bias usually associated with sample surveys.

TELEPHONE AND FACE-TO-FACE INTERVIEWS

Given the nature of the possible sources of bias, the following approaches were undertaken:

- telephone interviews of a sample comprising approximately 500 respondents who claimed that they used their trucks for private purposes, in order to accurately estimate the population of trucks used for commercial purposes;
- telephone interviews of a sample comprising approximately 1000 non-respondents, to examine whether there was any non-response bias by size and type of business for enumeration adjustments;
- face-to-face interviews of a sample comprising approximately 550

non-respondents to examine non-response bias on a question by question basis; and

- face-to-face interviews of approximately 150 respondents to examine interpretation of questions.

The same questionnaire used for the main survey was administered in the face-to-face surveys.

Telephone survey

The telephone survey was primarily concerned with the first three categories of bias described previously. The questions asked were:

- the three control questions on the first page of the postal survey questionnaire;
- Question 2 of the questionnaire (relating to registration details by State at 31 August 1982);
- repeat of Question 2 but referring to 30 June 1983; and
- Question 4 (relating to main industry classification in which the business unit was engaged at 30 June 1983).

If the answer to Question 4 was 'Transport - for Hire and Reward', an additional question was asked, namely:

- whether the hire and reward operator considered himself or herself to be an owner-driver.

The telephone interviews were conducted Australia-wide during the period 28 May to 15 June 1984. The investigation of respondents who claimed they were private users of trucks involved 552 interviews. Only 86 were found to be actual private users. The response rate was 75 per cent. The investigation of non-respondents comprised 1021 interviews of non-respondents and a further 155 interviews of business units which had responded late. The response rate was 63 per cent. The reason for the majority of non-response for the telephone investigations was non-contact, with only 8 per cent of the non-response being due to refusal.

Analysis of the telephone survey results revealed that:

- As expected, the majority of business units or individuals who claimed in their postal return that they used their truck(s) for private purposes had misinterpreted the question and in fact did use the truck(s) as part of a commercial activity.
- Differences in response rate by type of business particularly

affected the agriculture, manufacturing and the wholesale and retail sectors. The relatvely low response by business units engaged in agriculture was mainly due to this group not considering their trucks to be part of their business activity.

- Large fleet operators did not respond to the same extent as small and single truck operators.

It should be noted that bias factors are correlated. Fleet size is correlated with industry type, and industry type, in turn, affected the response to the question of private use of trucks. Nevertheless, individual adjustment factors for fleet size and industry applied independently were found sufficient to remove most significant bias.

Face-to-face survey

The purpose of the face-to-face survey was primarily to check the correctness of the interpretation of the questionnaire. The survey was conducted over the period 28 May to 22 June 1984 in the following cities and districts:

- Sydney;
- Albury-Wodonga;
- Adelaide; and
- South Australian Riverland.

Sample selection from each of these areas was guided by the need to minimise the field interviewers' travel. Because of the large numbers of in-scope business units in the Sydney and Adelaide metropolitan areas, random sampling was used for these cities.

In the course of the interviews of non-respondents, 933 in-scope business units were contacted. The response rate was 55 per cent. Among the respondents 218 in-scope business units were contacted. The response rate for the latter investigation was 79 per cent.

ANALYSIS OF FACE-TO-FACE INTERVIEW DATA

Data from a total of 512 non-respondent interviews and 172 respondent interviews were analysed. The findings were used to qualify the results of the main survey where appropriate but were not used for numerical adjustment. Hence the analyses of the interviews were confined to the following:

- a comparison of individual records, that is, comparison of the

172 respondent records in the interview survey with the records of the same respondents in the survey proper;

- a comparison of the respondents' and non-respondents' data sets in the interview survey; and
- a comparison of the main survey data and interview survey data.

Comparison of individual responses

Of the 172 respondents' records obtained in the face-to-face survey, 170 were used in the final analysis. The following observations were derived from the 170 records:

- Fewer respondents in the interview survey identified themselves as being in the building and construction industry (Question 4), than in the main survey, with an apparent shift to the 'other' industries (Table III.1).
- The question on whether the respondents were tied or painted (Question 11) was apparently not well understood (Table III.2).

TABLE III.1 COMPARISON OF ANSWERS OF 170 RESPONDENTS ON INDUSTRY

(per cent)

Industry in which business engaged	*Main survey*	*Face-to-face interviews*
Agriculture, forestry, etc	15.3	15.3
Building and construction	16.5	12.4
Electricity, gas and water	-	1.2[a]
Manufacturing	11.8	10.0
Mining, quarrying	2.4	1.8[a]
Road transport (for hire and reward)	29.4	30.0
Wholesale and retail trade	18.8	17.1
Other	5.9	12.4
Total	100.0	100.0

a. Figures are based on small subsamples and should be used with caution.

\- nil

Note Figures may not add to totals due to rounding.

- While the total of prime contractors in Question 11 was consistent, respondents were not clear as to the distinction between sub-contractors and freelance operators (Table III.2).
- For Question 12, the personal interview data accentuated 'verbal contract' as being the type of arrangement most often used for freight loads (personal interview, 70.6 per cent of all arrangements; main survey, 60.0 per cent), with the main shift occurring from the 'other' category (personal interview, 9.8 per cent; main survey, 16.0 per cent).
- Employment of drivers in the main survey appears to be under-enumerated, mostly due to an apparent predisposition of ancillary

TABLE III.2 COMPARISON OF ANSWERS OF 170 RESPONDENTS ON MAIN BASIS OF OPERATION

(per cent)

Main basis of operation	*Main survey*	*Face-to-face interviews*
Prime contractor		
tied or painted	10.0	7.8
not tied or painted	18.0	21.6
Total (prime contractor)	28.0	29.4
Sub-contractor		
tied or painted	20.0	29.4
not tied or painted	12.0	21.6
Total (sub-contractor)	32.0	51.0
Freight forwarder	6.0	3.9[a]
Freelance operator	22.0	15.7
Other/not stated	12.0	-
Total	100.0	100.0

a. Figures are based on small subsamples and should be used with caution.

\- nil

Note Figures may not add to totals due to rounding.

operators to incorrectly state 'nil' employed truck drivers (from Table III.3).

- The main survey received a better response than the interview survey to the income question (Question 14), probably due to the sensitivity of the information.
- In the interview survey there was a higher proportion of respondents in the hire and reward sector who nominated the building and construction and the manufacturing industries as their main industries served (Question 13). The differences are shown in Table III.4.

Face-to-face interview data on respondents and non-respondents

The interviews of the 170 respondents to the main survey and the 512 non-respondents to the main survey were conducted in selected city and rural areas in order to explore differences in response between these

TABLE III.3 COMPARISON OF ANSWERS OF 170 RESPONDENTS ON NUMBER OF TRUCK DRIVERS

(per cent)

	Road transport for hire and reward		*All industries*	
Truck drivers[a] *in business unit*	*Main survey*	*Face-to-face interviews*	*Main survey*	*Face-to-face interviews*
Nil	8.0	2.0[b]	20.6	8.8
1	34.0	47.1	26.5	36.5
2	6.0[b]	2.0[b]	9.4	9.4
3-5	20.0	21.6	15.3	12.9
6-10	18.0	17.6	14.1	19.4
11-20	8.0	5.9[b]	6.5	5.9
21 and over	6.0[b]	3.9[b]	7.6	7.1
Total	100.0	100.0	100.0	100.0

a. Full-time and part-time.
b. Figures are based on small subsamples and should be used with caution.

Note Figures may not add to totals due to rounding.

groups in similar areas. The results, which may not be representative of Australia as a whole, indicated the following:

- Respondents indicated a higher proportion of incorporated companies (34.9 per cent) than non-respondents (29.7 per cent) and fewer sole partnerships (14.5 per cent) than non-respondents (21.7 per cent).
- The differences in main type of route on which trucks operated (as a percentage of total distance travelled) were substantial (Table III.5).
- In particular, the main distance travelled was significantly different, with 23.2 per cent of respondents specifying long distance compared to 15.6 per cent of non-respondents. These figures appear to reflect a greater tendency for long distance truck operators to participate in the survey.
- Employment characteristics differed between the respondent and non-respondent groups. The one-driver working proprietor or working partner operation was more prevalent in the non-respondent group (32.8 per cent of all operations) than in the respondent group (24.4 per cent). Field officers observed that contact proved most difficult with this class of operation.

TABLE III.4 COMPARISON OF ANSWERS OF 170 RESPONDENTS ON MAIN INDUSTRY SERVED: ROAD TRANSPORT (FOR HIRE AND REWARD) OPERATORS

(per cent)

Industry served	*Main survey*	*Face-to-face interviews*
Agriculture, forestry, etc	18.2	12.9
Building and constuction	21.2	29.0
Manufacturing	42.4	54.8
Mining, quarrying	9.1[a]	3.2[a]
Not stated	9.1[a]	-
Total	100.0	100.0

a. Figures are based on small subsamples and should be used with caution.

\- nil

Note Figures may not add to totals due to rounding.

. Based on only small sample sizes, respondents' stated gross incomes generally exceeded non-respondents' stated gross incomes.

TABLE III.5 COMPARISON OF ANSWERS OF RESPONDENTS AND NON-RESPONDENTS ON MAIN ROUTE TRAVELLED

(per cent)

Main route travelled[a]	*Respondents*	*Non-respondents*
Long distance		
interstate	11.0	8.8
within State	12.2	6.8
Short distance		
urban	50.6	65.2
non-urban	16.3	8.6
urban and non-urban	8.7	9.8
Not stated	1.2	0.8
Total	100.0	100.0

a. As percentage of total distance travelled.

APPENDIX IV ENUMERATION AND ADJUSTMENT FOR BIAS

INTRODUCTION

In designing a sample survey a method of estimating population figures must be developed. A common method is to 'raise' the sample number of an item under consideration (for example, employment) by a certain factor so that the sum of raised values across all the sample units is the estimate of the population figure for that item. This method takes into account:

- the joint probability of a sample unit being selected and of that sample unit responding given selection;
- a correction for non-response bias; and
- a correction for measurement bias.

These three factors are combined into a single factor commonly referred to as the sample weight.

SAMPLE WEIGHT

The sample weights were calculated as follows.

Probability of selection

As indicated in Chapter 2 and Appendix II the probability of selecting a business unit was proportional to the number of trucks owned by that business unit on a State or Territory motor registry file.

The probability of selection of a business unit can be calculated simply from the following:

$$\Pr(\text{business unit being selected in a given attempt}) = 1 - \Pr(\text{business unit not being selected, in a given attempt})$$

$$= 1 - \frac{N-m}{N}$$

where N = total number of trucks in the population

and m = number of trucks in that business unit.

For selecting a sample of n business units, the probability of selecting a particular business unit with m trucks from a population frame of N trucks is as follows:

Pr (business unit of size m being selected)

$$= 1 - \Pr(\text{business unit not being selected})$$

$$= 1 - \frac{(N-m)}{N} \cdot \frac{(N-m-1)}{(N-1)} \cdots \frac{(N-m-n+1)}{(N-n+1)}$$

$$= 1 - \frac{(N-m)!\,(N-n)!}{(N-m-n)!\,N!}$$

This figure is termed the unadjusted probability of selection. The probability of responding given that a unit had been selected was determined using a weighted average of response rates of the States in which a business reported that it had trucks registered. The sample weights were derived from the inverse of the joint probability of selection and of responding given selection.

The enumeration process was subject to potential distortions in the State estimates because of the way the sample weights were determined for businesses with trucks registered in more than one State. The probability of responding (given that a business was selected) was computed as a weighted average, and consequently where the number of trucks registered in other States was relatively large, the probability determined was significantly influenced by the response rates in the adjoining States. This distortion was clearly identified for the Territories, whose high response rates were effectively reduced by comparatively higher numbers of trucks of the same fleet in other States, resulting in an over-enumeration of trucks for the Territories. A revised weighting procedure was applied for the Territories' survey data to eliminate this distortion. Similar adjustments were not made in the enumeration process between States, because distortions were less obvious and were not necessarily unidirectional.

Indicative values of the weights determined for single truck fleets

and large truck fleets were 35 and 2 respectively. This variation reflects the difference in the probability of selection with single truck fleets having a 7 per cent chance of selection and fleets larger than twenty-five trucks having a very high chance of selection. The variation from State to State was much less because of the smaller variation in the response rate between States.

CORRECTION FOR MEASUREMENT AND NON-RESPONSE BIAS

In Appendix III it was noted that on analysing the telephone interviews the following points emerged:

- Respondents misunderstood the question relating to private use of trucks, with only 16 per cent of respondents who said that they were private users actually being genuine private users of trucks. Adjustment for private users was made within the probability of selection by adjusting both population and sample sizes accordingly.
- There was a significant difference between respondents to the main survey and respondents to the telephone interviews who were non-respondents to the main survey, especially with respect to industry and fleet size.

It was also noted that industry is correlated with the level of non-response in the survey, as well as with the propensity to misunderstand the question on private use of trucks. Nevertheless, individual adjustment factors for fleet size and industry applied independently were found sufficient to remove most significant bias. Corrections were made for bias by incorporating these adjustment factors in the sample weight.

There was a significant difference between the survey data and the telephone interview data, in the proportions of single truck and multiple truck fleets.

The fleet size adjustment factors were calculated by taking into account the response rate as well as the relative proportions between the survey data and the telephone interview data. The following is a description of the method used.

If x_1 is the proportion of fleets of a particular size in the main survey, and x_2 is the similar proportion in the telephone interview data then let

$$x = Rx_1 + (1-R)x_2$$

where R = proportion of the main survey that responded to the question on how many trucks the business unit had registered at 30 August 1982,

and x = composite estimate for the proportion of fleets of the particular size under consideration.

The adjustment factor was then calculated as being equal to

$$\frac{x}{Rx_1}$$

The calculated adjustment factors for fleet size are shown in Table IV.1.

The adjustment factors for industry were calculated in a similar manner (Table IV.2).

VALIDATION OF THE ENUMERATION PROCESS

There are no independent estimates of the population of the chosen survey units, (administratively self-contained trucking operations) to enable a check to be made of the validity of the enumeration process. However, a check can be made using estimates of in-scope trucks. Question 2, which asked respondents to indicate how many trucks they had registered in each State and Territory as at 31 August 1982, was

TABLE IV.1 ADJUSTMENT FACTORS FOR FLEET SIZE BY STATE

	Factor	
State	*One truck*	*Multiple trucks*
New South Wales	1.030	1.072
Victoria	1.026	1.093
Queensland	1.043	1.074
South Australia	1.018	1.010
Western Australia	1.029	1.017
Tasmania	1.018	1.014
Northern Territory	1.048	1.060
Australian Capital Territory	1.009	1.019

included primarily to enable calculation of the sample weights. The survey estimates based on this question can, however, be compared with the number of trucks on the State registries adjusted to eliminate out of scope trucks.

Table IV.3 is a composite table showing estimates of the in-scope truck populations derived in two ways. The first is a calculation based on motor vehicle registries' records adjusted downwards by the out of scope State and local government trucks, and estimates of trucks used mainly for private purposes (an adjustment which was based on follow-up survey results). The second derivation represents the estimates from the survey.

As seen from Table IV.3, there is good agreement between the two estimates of truck numbers State-by-State, indicating that the enumeration process involved was fundamentally sound. The 'calculated' Australian total of 285 020 trucks involves the use of a simple number-raised estimation technique and there are reasons to suggest that the total is slightly overstated. For example, this estimate makes no allowance for the likely existence of records on the State registry files representing 'deregistered' vehicles (which have not been notified to the registries) whereas this is accounted for in the survey estimates.

TABLE IV.2 ADJUSTMENT FACTORS FOR INDUSTRY

Industry	*Factor*
Agriculture, forestry, etc	1.057
Building and construction	0.981
Electricity, gas and water	1.198
Manufacturing	0.903
Mining, quarrying	1.050
Road transport (for hire and reward)	1.036
Other transport	1.066
Wholesale and retail trade	0.879
Other	0.821

TABLE IV.3 CALCULATION AND COMPARISON OF IN-SCOPE TRUCK POPULATIONS BY STATE: MOTOR REGISTRIES' RECORDS AND SURVEY ESTIMATES, AUSTRALIA, 31 AUGUST 1982

	New South Wales	*Victoria*	*Queensland*	*South Australia*	*Western Australia*	*Tasmania*	*Northern Territory*	*Australian Capital Territory*	*Total*
Calculation-									
Commerical truck numbers[a]	92 923	78 877	57 503	28 666	33 692	7 795	806	1 303	301 565
Original sample of truck records	6 959	5 912	4 301	2 160	2 524	575	61	99	22 591
Adjustment for multiple selections in fleets	680	650	365	178	304	56	2	2	2 237
Survey sample (business units)	6 279	5 262	3 936	1 982	2 220	519	59	97	20 354
Reported 'private users' of trucks	1 511	1 466	1 226	616	763	147	8	13	5 750
In-scope truck numbers (motor registries)[b]	88 580	74 610	54 030	26 940	31 440	7 370	790	1 270	285 020

TABLE IV.3 (Cont.) CALCULATION AND COMPARISON OF IN-SCOPE TRUCK POPULATIONS BY STATE: MOTOR REGISTRIES' RECORDS AND SURVEY ESTIMATES, AUSTRALIA 31 AUGUST 1982

	New South Wales	*Victoria*	*Queensland*	*South Australia*	*Western Australia*	*Tasmania*	*Northern Territory*	*Australian Capital Territory*	*Total*
Survey estimate-									
Enumerated results	85 330	71 870	51 930	26 820	31 510	7 020	1 050	1 260	276 810
Relative standard error (per cent)	(5.6)	(6.0)	(6.8)	(6.0)	(8.3)	(10.2)	(36.7)	(17.4)	(0.3)

a. Truck numbers on State motor registries after exclusion of State and local government trucks.
b. In-scope truck numbers were estimated by

$$C\left(1 - \frac{S_{rp}}{S_t}\,PT\right)$$

where C = commerical truck numbers
S_{rp} = sample of reported 'private users' of trucks
S_t = survey sample of in-scope business units
P = proportion of reported private users who were genuine private users
T = average number of trucks in genuine 'private' fleets.

Note Figures may not add to totals due to rounding.

APPENDIX V RELIABILITY OF ESTIMATES

INTRODUCTION

The estimates presented in this Paper are based on a sample of business units and they may differ from the figures which would have been obtained from a complete census using the same questionnaire and procedures. One measure of the likely difference is the standard error. There are about two chances in three that a sample estimate will differ by less than one standard error from the figure that would have been obtained from a comparable complete enumeration, and about 19 chances in 20 that the difference will be less than two standard errors.

Some estimates in this Paper, particularly small estimates in the bodies of tables, are subject to relatively high standard errors and should be used with caution.

The imprecision due to sampling variability, which is measured by the standard error, should not be confused with other inaccuracies such as those which may occur because of errors in reporting by respondents. Where there is evidence of these non-sampling errors, special comment is made throughout the Paper.

STANDARD ERROR ESTIMATES

In probability samples, standard errors can be estimated from the survey data. For this survey a number of difficulties arose.

Broadly speaking the sample of business units was stratified by State and selected with probability proportional to the number of trucks registered at 31 August 1982. Stratification and probability proportional to size selection usually gives considerable gains in efficiency (in terms of lower standard error for a given sample size) compared to simple random sampling. However, these theoretical gains were not fully realised primarily because the initial sample frame comprised trucks and not business units. In particular the

stratification by State was imperfect because a business unit could be represented on more than one State or Territory motor registry file, and the probabilities of selection were not known at the time of selection but were based on information provided by respondents to the survey.

A number of other factors lessened the efficiency of the sample and introduced complications for the estimation of standard errors. These were:

- the level of non-response;
- adjustment factors to correct for non-response bias were estimated from follow-up surveys and introduced additional sampling error; and
- problems of partial response whereby the non-response to certain questions (particularly income questions) was high.

In the event, standard error estimates based on simple random sampling within State stratification were adopted. Retaining State stratification was found to make little difference to the approximation. This could be expected from the fact that the same sampling fraction for trucks was used in the initial selection for each of the various State and Territory motor registry files.

On balance, it is felt that the standard error estimates presented in this Appendix are slightly pessimistic, particularly in relation to estimates not subject to high partial response problems.

The standard errors are presented as relative standard errors; that is, standard errors as a percentage of the associated estimate.

Table V.1. is a reference table which provides approximate relative standard errors that can be used in relation to any estimate of number of business units.

Tables V.2, V.3 and V.4 show approximate relative standard errors for estimates by State of trucks operated at 30 June 1983, employment in trucking operations and distance travelled respectively.

TABLE V.1 RELATIVE STANDARD ERRORS FOR ESTIMATES OF BUSINESS UNITS

Number of business units	*Relative standard error (per cent)*
50	63.7
100	45.1
200	31.9
300	26.0
400	22.5
500	20.1
600	18.4
700	17.0
800	15.9
900	15.0
1 000	14.2
2 000	10.0
3 000	8.2
4 000	7.0
5 000	6.3
10 000	4.4
20 000	3.0
30 000	2.4
40 000	2.0
50 000	1.7
100 000	0.9

TABLE V.2 RELATIVE STANDARD ERRORS FOR TRUCKS OPERATED AT 30 JUNE 1983 BY STATE

State or Territory[a]	*Trucks*	*Relative standard error (per cent)*
New South Wales	86 570	5.8
Victoria	72 570	6.0
Queensland	52 880	6.8
South Australia	27 380	6.1
Western Australia	31 180	8.4
Tasmania	7 150	10.1
Northern Territory	860	40.9
Australian Capital Territory	1 280	16.5
Australia	279 880	2.9

a. According to State or Territory of business unit, not truck registration.

TABLE V.3 RELATIVE STANDARD ERRORS FOR EMPLOYMENT IN TRUCKING OPERATIONS BY STATE

State or Territory	*Employment in trucking operations*	*Relative standard error (per cent)*
New South Wales	114 860	6.9
Victoria	107 990	10.3
Queensland	72 200	11.3
South Australia	38 170	11.7
Western Australia	41 980	12.6
Tasmania	10 270	18.8
Northern Territory	1 230	49.2
Australian Capital Territory	2 920	37.4
Australia	389 610	4.5

TABLE V.4 RELATIVE STANDARD ERRORS FOR DISTANCE TRAVELLED BY STATE

State or Territory[a]	*Distance travelled (thousand vehicle km)*	*Relative standard error (per cent)*
New South Wales	3 152 200	12.8
Victoria	2 620 000	12.6
Queensland	1 691 500	17.4
South Australia	931 300	17.3
Western Australia	851 400	21.3
Tasmania	222 400	27.2
Northern Territory	37 500	70.3
Australian Capital Territory	56 900	55.3
Australia	9 563 200	6.8

a. State or Territory of business unit, not where travel occurs.

APPENDIX VI CALCULATION OF FLEET DISTANCE

The calculation of the total distance travelled during 1982-83 by trucks in each fleet made use of the responses to survey Questions 6, 7 and 9 as follows.[1]

Derivations

The total number (T) of truck equivalents[2] in the fleet is given by:

$$T = t_l + t_s \qquad \text{(VI.1)}$$

where t_l, t_s = the number of truck equivalents operating over long distances and short distances respectively.

The total distance travelled by all trucks in a fleet during 1982-83 is given by:

$$k = t_l K_l + t_s K_s \qquad \text{(VI.2)}$$

where K_l, K_s = the average distance travelled per truck during 1982-83 over long distances and short distances respectively (Question 7).

By definition, Question 6

$$\frac{t_l K_l}{t_s K_s} = \frac{P_l}{P_s} = P$$

---

1. Upper case symbols refer to answers provided on the questionnaire, while lower case symbols refer to measures to be derived.
2. Full year equivalent number of trucks available for operation. In the absence of a more suitable measure this was defined for each survey respondent as the number of trucks reported as operating at 30 June 1983 (Question 9) if greater than zero; otherwise, the number of trucks registered at 31 August 1982 (Question 2).

where P_l = sum of percentage responses for long distance interstate and long distance within State or Territory

and P_s = sum of percentage responses for short distance urban, non-urban and mixture of urban and non-urban.

Therefore

$$t_l K_l = P t_s K_s \qquad \text{(VI.3)}$$

From equations (VI.2) and (VI.3)

$$t_s K_s (P+1) = k$$

$$\text{ie } t_s = \frac{k}{K_s(P+1)} \qquad \text{(VI.4)}$$

which produces the number of truck equivalents operating over short distances in terms of the distance travelled (k) by all trucks in a fleet.

Similarly

$$t_l = \frac{k}{K_l\left(1+\frac{1}{P}\right)} \qquad \text{(VI.5)}$$

refers to the number of truck equivalents in a fleet operating over long distances.

Combining equations (VI.1), (VI.4) and (VI.5), the total distance travelled (in 1982-83) by a fleet is calculated by

$$k = \frac{T}{\frac{1}{K_l\left(1+\frac{1}{P}\right)} + \frac{1}{K_s(P+1)}} \qquad \text{(VI.6)}$$

The total distance travelled was then apportioned according to the 'per cent' responses received to Question 5 (type of freight carried during 1982-83) and Question 6 (type of route).

Finally, a substitution of 'k' was made into Equations (VI.4) and (VI.5) to derive the truck equivalents t_s and t_l.

REFERENCES

Australian Bureau of Statistics (1983a), *Survey of Motor Vehicle Usage, Twelve Months ended 30 September 1982*, Cat. No. 9208.0, Canberra.

__ (1983b), *Motor Vehicle Census - Australia 30 September 1982*, Cat. No. 9309.0, Canberra.

Bayliss, Brian T., (1965), *European Transport*, Kenneth Mason, London, 1965.

National Road Freight Industry Inquiry (NRFII) (1984), *National Road Freight Industry Inquiry Report, September 1984*, AGPS, Canberra.

Round Table on Transport Economics (1973), *Report of the Twenty-Third Round Table on Transport Economics*, European Conference of Ministers of Transport, Paris.