National Travel Survey 1977/78: General Overview and Assessment

Report

The aim of this Report is to provide a general overview of all aspects of the National Travel Survey (NTS). The topics covered include the survey design and operation, public response to the survey, and corrections applied to the survey results. The NTS is compared to other surveys and some lessons learnt from the NTS about survey design and operations are outlined. Finally a number of aspects of non-urban travel in Australia are discussed, with particular reference to tourist travel.

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FOREWORD

From July 1977 to June 1978 the Bureau of Transport Economics (BTE) conducted the National Travel Survey (NTS). This was a major postal survey of non-urban travel in Australia. Several publications describing various aspects of this project and presenting some preliminary results have already been published by the BTE. The results appear to be of considerable interest to a wide range of transport interests.

The aim of this Report is to provide a general overview of all aspects of the NTS. The topics covered include the survey design and operation, public response to the survey, and corrections applied to the survey results. The NTS is compared with other surveys, and some lessons learnt from the NTS about survey design and operations are outlined. Finally, a number of aspects of non-urban travel in Australia are discussed, with particular reference to tourist travel.

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SUMMARY

The Bureau of Transport Economics (BTE) has carried out a general survey of non-urban travel in Australia. Knowledge of this survey, known as the National Travel Survey (NTS), has become widespread, particularly among organisations with interests in transport and tourism. As a result there has been a consistent demand from such organisations for detailed information on the scope and conduct of the NTS, and on the results obtained from it. The aim of this Report is to satisfy this demand by presenting a non-technical but comprehensive overview of the NTS.

The NTS was conducted over a period of twelve months, extending from July 1977 to June 1978. It took the form of a voluntary postal survey in which questionnaires were mailed to approximately 8000 households throughout Australia at the start of each month. These households were selected randomly from a set of geographic regions devised especially for the NTS.

Basically the intention in the NTS was to cover travel that might be considered as non-urban. To achieve this it was necessary to adopt a number of criteria for the type of journey which the survey was to cover. The most significant of these criteria was that only journeys to places 100 km or more from home were to be included in the survey. No restriction was placed on the journey duration; single-day trips in particular were included.

As a general philosophy in planning the NTS an attempt was made to achieve reasonably accurate estimates of various travel parameters considered to have a reasonable degree of significance. However of equal importance was the decision to ensure that the statistical errors associated with all estimates derived from the NTS would be known and hence the reliability of the various estimates could be assessed.

Many other travel surveys give little indication of the statistical reliability of estimates derived from their results.

This Report initially discusses the objectives of the NTS and the constraints imposed upon it. The form of the NTS was determined as a result of a consideration of both the objectives and constraints. In particular the financial constraints dictated that the survey take the form of a postal survey. Since the design of both the survey questionnaire and the covering letter to a large extent affect response rates and the accuracy of responses to any postal survey, both of these items were pilot-tested prior to conducting the main survey. This procedure resulted in considerable changes to the questionnaire design. Aspects such as the sampling procedure used, the definition of a geographic zoning system for sample distribution, the survey operation and the process of converting the returns to machine-readable form are outlined in this Report.

A supplementary household interview survey was conducted to gather information from sub-samples of both non-respondents and respondents to the postal survey. This information allowed the overall trip levels obtained from the NTS data to be adjusted for non-response bias in the data obtained from the postal component of the NTS. However, due to the financial constraints which limited the size of the supplementary interview survey only a qualitative estimate of the extent of response errors in the data could be obtained. The supplementary survey also served as a test vehicle for three attitudinal questions - a type which tends to be administered most effectively through personal interviews.

It is very difficult, with a survey the size of the NTS, to design all aspects of the survey perfectly. Some of the problems encountered during the operational and processing stages of the NTS are presented in this Report. The effect of various factors on survey response, with particular reference to the NTS, is discussed. Overall the response rate to the NTS was 47 per cent

which, although slightly below the expected figure of 50 per cent, is nevertheless considered quite satisfactory for a postal survey of this nature.

A number of tables showing the characteristics of non-urban travel made by the population as a whole, as estimated from the NTS data, have been prepared. This Report highlights the characteristics of non-urban travel in Australia, and the effect various household and personal characteristics have on this type of travel. From the NTS it was estimated that some 58.7 million person-trips(1) took place in 1977-78. Each household in Australia generated an average of 14.1 non-urban person-trips in the year of the survey. Some 84 per cent of these trips were undertaken by car and over 6 per cent by air. Other modes comprised the remaining 10 per cent of trips made. Seasonal and regional variations in travel are also discussed in this Report, especially the effect of Easter and the school and university holidays. For example it was found that the proportion of holiday trips doubled in January compared to the rest of the year. The characteristics of tourist and business travel in Australia are examined, together with the interaction among various travel parameters themselves. Travel along major corridors and to specific tourist and holiday areas such as the Blue Mountains in N.S.W., the Barossa Valley in S.A., Central Australia and so on has characteristics which are quite different from the characteristics of other non-urban travel. It was noteworthy for example that 60 per cent of trips to the Blue Mountains was for the purpose of sightseeing and recreation and that a significantly higher proportion than average involved rail travel. Other distinctions are highlighted in the Report. A brief summary of the comments NTS respondents made concerning non-urban travel in Australia is also included. Finally, an assessment of how well the NTS objectives were met is presented.

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(1) All estimates refer only to the type of non-urban travel covered by the NTS.

CHAPTER 1 - INTRODUCTION

The Bureau of Transport Economics (BTE) has been aware for some time that comparatively little information on Australian domestic personal travel is available to transport planners. In particular there is a need for comprehensive and up-to-date information for use in studies involving the evaluation of existing and future investment in transport infrastructure and the formulation of plans in the tourism industry.

A variety of surveys have been conducted in the past by an equally diverse range of organisations associated with planning in the travel and tourism fields. These surveys were usually designed to meet particular objectives. For example, mode-specific, route-specific and recreational travel surveys have all been conducted at various levels in the past. This information is undoubtedly valuable in its own right, but extensive and sometimes questionable assumptions may be necessary to justify the use of data from such surveys in general transport planning.

In response to the need for information across most of the passenger transport spectrum, the BTE initially envisaged conducting an all-encompassing travel survey. However, it soon became apparent that the initial broad concepts had to be modified in order to satisfy various practical and resource constraints. The philosophy adopted was to design a survey to provide fundamental information on non-urban travel in Australia, and to produce this information in a form which would allow it to represent a benchmark or reference point for the planning of more restricted or specialised surveys in the future(1). The lack of a sufficiently comprehensive data base has created difficulties in planning surveys to obtain specialised

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(1) This framework or starting point is essential. The value of the results from future surveys will be enhanced if they are compatible in terms of basic definitions and assumptions with those of other surveys.

information and may even have resulted in the unnecessary implementation of such surveys. The BTE's survey was known as the National Travel Survey (NTS) and was conducted over the period July 1977 to June 1978. It was basically a survey of non-urban passenger travel within Australia.

Participation in the NTS was on a purely voluntary basis. Questionnaires were mailed to approximately 8000 households per month. Each questionnaire was designed to allow trips satisfying certain criteria made by members of the household to be recorded. The households receiving the questionnaires were selected randomly within a set of regions devised specifically for the NTS (NTS regions).

An important objective in designing the NTS was to ensure that the population in the more remote areas of Austalia was adequately represented in the NTS. The definition of NTS regions primarily as sampling regions allowed the distribution of the total sample to be controlled, ensuring that the sparsely populated areas of Australia were adequately represented in the survey. Travel characteristics of the population in the sparsely populated areas were virtually unknown and had not been the subject of previous travel or tourism surveys.

Householders were asked to record various details of trips made by members of the household to places in excess of 100 kilometres from home during the previous month. All households were encouraged to complete those parts of the questionnaire relating to personal and household information whether or not they had undertaken appropriate travel during the period in question. The NTS data therefore allows the demographic and economic characteristics of non-travellers as well as travellers to be assessed.

The survey was conducted by mail as this was the most cost-effective means of obtaining statistically reliable results through a sufficiently large sample. This method of conducting the survey, however, imposes its own limitations on the results

which can reasonably be obtained. In particular, to maximise response it was necessary both to limit the range of information requested in the questionnaire and to design it for ease of completion by most respondents.

OUTLINE OF THIS REPORT

This Report describes the aims and design of the NTS, reviews its general operation, and discusses some of the results obtained. Specifically, Chapter 2 outlines the detailed objectives of the survey. Chapter 3 discusses the various influences and constraints on the design of the survey and describes the methodology employed. The NTS has produced a large volume and range of results. Those of general interest are discussed in Chapter 4, while Chapter 5 draws conclusions and (in line with one of the objectives of the NTS) suggests areas where more specialised surveys may be warranted.

CHAPTER 2 - OBJECTIVES OF THE SURVEY

In general terms, the NTS was designed to provide non-urban[1] travel data covering the whole of Australia, all modes of transport and all seasons of the year. However, planning for the general operation of the NTS and, more specifically, the design of the questionnaire to be used required the definition of certain specific objectives which the survey was to meet. Based on the broad aims outlined in Chapter 1, the specific objectives of the NTS can be identified as follows:

- to estimate overall trip generation levels for non-urban passenger travel;

- to provide a realistic level of information on travel between regions, with appropriate emphasis on those regions (or the transport corridors joining them) which are regarded as being of 'major importance';

- to identify and investigate a limited number of personal and household characteristics which might influence various travel parameters;

- to provide data on seasonal variation in travel characteristics and patterns;

- to serve as a basic framework for further research into non-urban passenger travel;

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(1) A trip is defined as a journey starting and finishing at home. In the context of the NTS, non-urban travel is defined as all trips satisfying the following criteria.
- The trip involved travel to a destination at least 100 km away from home.
- The trip was not a regular journey to work, nor was it made as a crew member of a bus, plane, train or ship.
- The trip involved only travel entirely within Australia.

- to serve as a vehicle for other surveys or investigations which might be integrated with the NTS for reasons of convenience or economy.

Particular emphasis was given overall to establishing the statistical reliability of estimates derived from the NTS data.

These objectives are discussed at greater length in the remainder of this Chapter.

GENERATION LEVELS

Prior to the NTS, information on travel generation rates was patchy and based on a variety of different sources. Most importantly, very little information was known on the characteristics of same-day travel, that is, travel involving no overnight accommodation. Furthermore, no reliable information was available on the travel characteristics of the population in the remote rural areas of Australia. It was not possible to draw other than very broad conclusions from the available information sources. The NTS was designed to provide estimates of passenger travel generation rates for all modes of travel. This information is essential in planning future transport facilities since knowledge of existing traffic levels is a pre-requisite in any analysis of future requirements.

Since the survey extended over twelve months it also provides a useful indication of seasonal influences on these generation rates. Furthermore, travel generation rates (and other such variables) can be related to the social, demographic and economic characteristics of different communities because, in addition to details on household travel, the NTS also collected information on household composition, household income and vehicle ownership. Information of this nature has direct policy and planning implications, as well as serving a specific purpose for future research activities within the BTE and similar organisations.

INTERREGIONAL TRAVEL PATTERNS

In the past, very little information has been available on the magnitude of travel between population centres or regions, and there has certainly been an almost complete lack of consistent and statistically valid data. The need for reliable information on travel patterns[1] is fundamental to most aspects of non-urban passenger transport planning. The requirement to gather information of this type influenced the sampling procedure and the general form of the NTS more than any other objective. Ideally, it would have been desirable to collect information on travel between each smallest practical geographic or population unit and all other such units. However, as the size of these units is reduced, the sample size available for allocation to each unit from a fixed total survey sample is reduced correspondingly. In turn, the statistical reliability of geographically disaggregated information is increasingly compromised. The aim in the NTS has been to strike a suitable balance between the constraints on the resources available for the survey and the need for information on non-urban travel in Australia. As a result of these considerations, it was decided that the NTS would be aimed at obtaining statistically acceptable interregional travel patterns, although individual trip details would be coded on a somewhat finer basis[2] for inclusion in the data base generated from the survey.

This approach will facilitate analyses aimed at deriving detailed travel pattern information, albeit at a reduced accuracy relative to estimates made on a geographically coarser basis. Coding of individual trip details on a placename basis should be

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(1) 'Travel pattern', as used in this Report, is synonymous with the phrase 'trip distribution'. Both are used to mean the distribution of destinations (on a regional basis) for trips originating in a particular region.

(2) A geographic zoning and coding system was devised by the BTE for this purpose. The system, described by Aplin and Hirsch (1978a), involves a comprehensive list of about 8500 places in Australia with associated numerical codes.

particularly useful for authorities associated with tourism. For example, it is possible to use the data base to examine trips involving a particular place either as an origin or destination and to carry out investigations of the characteristics of these trips.

PARAMETERS INFLUENCING TRAVEL

In order to achieve a thorough understanding of travel behaviour, sufficient information must be available to permit the relationship between travel characteristics and the general characteristics of the population to be investigated. Knowledge of travel characteristics alone will not allow such insight to be achieved.

It is universally accepted that a wide range of social, economic and personal characteristics influence individual travel patterns and habits. These characteristics include, for example, age, sex, income and occupation. However, the lack of data has meant that hitherto it has not been possible to estimate the relative importance of some of these characteristics in influencing travel generation levels for non-urban travel in Australia.

Data deficiencies in this area can be attributed in part to the understandable reluctance of the public to divulge detailed personal and household information. Particular care was taken in designing the NTS questionnaire so as to minimise adverse public reaction(1). The survey questionnaire and covering letters emphasised the confidential nature of all information provided by respondents and the information sought was kept to a minimum. Information on social, economic and personal characteristics will allow assessment of the influence of various

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(1) Public response to the survey is discussed further in Chapter 3 of this Report. However, it is worth noting at this point that only fourteen items of correspondence directly objecting to the survey were received from the public.

personal and household characteristics on non-urban travel behaviour. Equally important, however, is the fact that knowledge of these characteristics in the survey sample permits the degree to which the sample is representative of the general population to be assessed. Appropriate statistical techniques can then be applied to the survey results to make them more applicable to the population as a whole. The characteristics relating to individual household members which were sought in the survey are:

- sex;
- age;
- marital status;
- major activity, for example, 'Employed full-time', 'Home-duties' and so on;
- actual occupation of householders in full-time or part-time employment;
- possession of driving licence.

In addition to these characteristics relating to individual household members, the NTS also sought the following information relating to the household as a whole:

- numbers and types of vehicles available for use by members of the household;
- total gross income of the household.

The above information, although less detailed than might be ideal in an unconstrained situation, nevertheless constitutes a valuable basis for performing useful econometric analysis.

SEASONAL VARIATIONS

The degree to which the NTS could be designed to provide data on seasonal variations in travel behaviour was determined by the total sample size available for the survey and the geographical and time distribution of this sample. It was also related to the accuracy with which people can be expected to recall trips which they had made over a short period of time. Ideally the survey could have been designed to allow identification and measurement of extreme peaks in travel demand, such as on Easter Thursday and Christmas Eve. However, the limited sample size of the NTS precluded accurate measurement of such extremely short-term peaks. In any case this type of information on short-term peak travel movements is probably more appropriately obtained by direct measurement of passenger movements.

Nevertheless, it was still possible for the NTS to gather consistent information on seasonal variations in travel generation and distribution. There are two reasons why this objective was set for the survey:

- direct measurement of passenger movements, even if possible over a long period of time, will not provide information on non-travellers(1);

- direct measurement of passenger movements can be extremely costly, and prohibitively so if carried out on anything like the scale of the NTS.

The basic objective of the NTS in relation to seasonal variations was achieved through the gathering of travel patterns on a monthly basis. The NTS was thus designed to yield interregional travel patterns of limited but acceptable statistical validity

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(1) In order to analyse travel behaviour, knowledge of the characteristics of people who do not travel is as important as knowledge of the characteristics of travellers.

and coverage for each month over a twelve month period. On the one hand as explained by Moll (1978), the NTS data relating to seasonal variations are only of reasonable accuracy for travel between pairs of regions with fairly substantial flows. On the other hand, the parallel objective of assessing seasonal variations in such parameters as overall travel generation levels and the characteristics of trip makers was met with much greater accuracy.

FUTURE RESEARCH FRAMEWORK

The provision of a coherent framework for future research was another of the more important aims of the NTS. The concept of the NTS as a benchmark or reference point for other work has already been discussed in Chapter 1. In attempting to set up such a benchmark, the BTE (along with many other organisations) found that the general lack of a framework for non-urban passenger travel was almost as serious as the lack of the data itself. This factor was evident in such organisational details as regional definitions, coding conventions for modes of travel, personal characteristics, reasons for travel and so on.

In an attempt to overcome these problems and in order to permit the results of the NTS to be related to other data sources, both past and future, the zoning and coding systems adopted for the NTS were chosen to be as compatible as possible with established systems. For example, classifications based on Australian Bureau of Statistics (ABS) standards have been used where possible. However, because of the unique nature of the NTS, certain features of this project had no precedent in Australia. Coding and classification systems relating to these features were devised by balancing the degree of detail to be sought from respondents against the natural reluctance of the community to supply a large amount of detail. It is to be hoped that the coding systems (some of which are unique) developed for the NTS can at least form a basis for future surveys where no appropriate system of classification has already been established.

INTEGRATION WITH OTHER SURVEYS

During both its planning and operational phases, the NTS was discussed with other government agencies (both State and Commonwealth) interested in transport and tourism throughout Australia. Some of these organisations are engaged in planning survey activities of their own. In such cases, they have often expressed interest in the NTS, not only because of the value of the NTS data, but also from the point of view of compatibility of coding conventions and sampling schemes.

As previously mentioned, the NTS was designed to provide a suitable basis for the general planning of more specialised transport surveys in the future. Towards this end, the techniques developed for the NTS should be applicable fairly generally, although they will obviously require appropriate modifications tailored to particular circumstances.

Attitudinal questions have the potential to make a very useful contribution to transport planning, particularly in ensuring that transport services are responsive to changes in community attitudes and expectations. The supplementary household interview survey conducted as part of the NTS provided an opportunity for examining the potential of such attitudinal surveys. The supplementary interviews were considered an ideal vehicle for this purpose since attitudinal surveys almost inevitably require the interview approach. Whereas the major component of each interview was aimed at eliciting factual information on the characteristics of the household and on any travel undertaken, certain attitudinal questions were aimed at determining information on subjective opinions (attitudes) held by interviewees on topics related to travel. Three of these attitudinal sub-surveys were undertaken at various stages during the twelve months of the interview programme. Interviewees in the first three months of the NTS were asked for the alternative courses of action they would have considered had it not been

possible for them to undertake the particular trips, as reported in the NTS. Interviewees in the following five months of the NTS were questioned about the reasons for their particular mode choice for each trip reported. The attitudinal question incorporated in the final few months of the supplementary interview phase concerned the attitudes of travellers to train travel. Both train and non-train travellers were asked their opinion of the train service (if any) offered on the route they travelled[1].

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(1) Processing and analysis of the results of the attitudinal questions have not yet been completed. Preliminary results are discussed in Chapter 3.

CHAPTER 3 - SURVEY DESIGN AND METHODOLOGY

The scope and form envisaged for the NTS changed considerably as initial concepts were modified to meet specific constraints. This Chapter first identifies these constraints through a discussion of issues associated with the design of the survey itself and the various operational systems needed for survey planning and day-to-day administration. The supplementary interview survey commissioned to provide data for evaluation of response error and non-response bias encountered during the main phase of the NTS is then outlined and the necessity for statistical correction of the main survey data will be explained. The Chapter concludes with an examination of the overall public reaction to the survey.

CONSTRAINTS

As previously mentioned, the aim in designing the NTS was to strike a suitable balance between resource constraints and the need for reliable information on non-urban travel in Australia. The principal constraints were a fixed financial budget and the allocation of staff.

In order to satisfy the objectives set for the survey as outlined in Chapter 2, the survey had to have the following broad characteristics.

- The survey was to be carried out on a national basis, with all parts of Australia represented, appropriate emphasis being given to travel generated within rural areas.

- All modes of travel were to be covered.

- The survey was to be conducted over a twelve month period in order to assess temporal variations in travel behaviour.

In order to satisfy these requirements and achieve a statistically acceptable sample size under a fixed budget constraint, it was necessary to conduct the survey by mail. However, while allowing cost advantages, this method of conducting the survey also resulted in certain technical disadvantages. In particular it effectively limited the amount and complexity of the information which could be collected in the NTS. The nature of these limits will be examined later in this Chapter.

A further constraint on the NTS was the form of the sampling base used. The only sources of household addresses available to the BTE and convenient to use[1] were the Federal electoral rolls in all States apart from South Australia (S.A.). Since the South Australian electoral roll was not available to the BTE on computer tape, addresses in S.A. were selected at random from the S.A. Valuer-General's property file which was made available in a suitable form. Elsewhere addresses of households to be surveyed were selected at random from the electoral rolls. As unnaturalised persons are ineligible to vote, this population group was consequently under-represented in the NTS sample in all States and Territories except S.A. However, since NTS questionnaires were sent to 'The Householder' at electors' registered addresses, some households containing only unnaturalised members would have been sampled at addresses where previous residents had not advised the Electoral Office of the change of address. In addition an address was eligible for sampling even if only one member of that household was a registered elector. Aplin and Flaherty (1976a) estimated that only some three to four per cent of household addresses would

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(1) Because of the large total household sample size involved it was not practical to generate and process the sample manually. Efficient use of computer techniques was essential, requiring the basic sample of addresses to be available to the BTE in machine readable form. Only the Federal electoral rolls (with the exception of S.A. as discussed) were available in this form.

be excluded from the electoral rolls on this basis. Hotels, hostels, military establishments, hospitals and other institutions(1) were also excluded from the sample, as the NTS was essentially a household survey. The operational approach used in the NTS would have required considerable alteration to allow institutions such as these to be surveyed appropriately. Certainly another style of questionnaire would have been required.

QUESTIONNAIRE DESIGN

Whereas personal interview surveys benefit from the stimulus to response which results from the dialogue between interviewer and potential respondent, mail surveys conducted on a voluntary basis must depend on such techniques as persuasive covering letters, clear, tidy and simple questionnaires, reply-paid envelopes and an efficient reminder or follow-up system to maximise response. Regardless of the method to be used, it was important that the NTS be designed to request information likely to be readily remembered by, or accessible to, the households in the sample. Although it would have been useful to ascertain accurate details of all travel undertaken by a household over, say, the year prior to receipt of the NTS questionnaire, this was clearly beyond the recall abilities of most potential respondents. The results of such a survey would have had very questionable reliability. As a result two decisions were taken which assisted in determining the eventual form of the NTS.

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(1) Such institutions are not always readily identifed from the address and in any case serious problems exist in automatically identifying such institutions from the address. The only practical method of automatically identifying likely institutions was from the number of enrolled electors residing at an address. In the case of the NTS, an address was regarded as an institution if six or more electors resided there. It was considered unlikely that a family group would comprise more than five electors and that the travel behaviour of households with more than six electors was likely to relate more closely to that of a group of independent individuals. Such addresses were therefore rejected from the sample.

It was decided to request only details about non-urban trips to places in excess of 100 km (60 miles) from home. This screened out shorter distance travel and assisted general recall, since shorter trips are more likely to be forgotten than longer, more substantial trips. Although this minimum distance exceeded the criterion used in the previous most comprehensive travel survey (ATRC 1974), that survey also required that trips to be surveyed involved at least one overnight stay away from home. The NTS was aimed at surveying single day travel as well as travel of longer duration. From a recall point of view it was therefore judged desirable to use the greater minimum distance criterion as specified.

- Information was requested concerning trips made during the calendar month prior to the month of receipt of the questionnaire, rather than over a longer period. A month was considered to be the maximum period over which a respondent could be expected to accurately recall all the various details requested by the NTS questionnaire in respect of non-urban travel undertaken recently. Ideally it would have been desirable to request details of trips undertaken only during the last week or fortnight, as the recall accuracy of respondents would have been even higher. However, this would have required a far more intensive survey operation, which would not have been feasible given the general objectives of the survey and the resource limitations imposed.

Pilot Tests

Two preliminary designs of the questionnaire, covering letter and reminder letter were pilot tested before the final design was adopted for the main survey commenced in mid-1977. The response rates and the impact of various operational decisions

on these response rates will be discussed later, but it is appropriate to discuss here the improvements made in the design of the questionnaire as a result of the experience derived from two pilot surveys.

The questionnaire in its initial, intermediate and final forms[1] consisted of four general Sections as follows.

- *Personal details*. This Section sought information which could subsequently be used for the classification of travel details (for example, by sex or age) and provide a uniform method to record persons who travelled. These details also allowed the characteristics of the survey sample to be compared with those of the population as outlined in Chapter 2.

- *Travel information*. Constituting the basis of the survey, this Section sought details on the number of trips undertaken by members of the household, destinations, modes, purposes, duration of travel, duration at destination, and the number of persons travelling.

- *Household data*. Household characteristics which could affect the travel patterns of members of the household were requested in this Section. Characteristics investigated included household income and vehicle availability.

- *Comments*. Space was also provided for any additional information which the householder might wish to furnish concerning the trips undertaken, and also for any general comments on travel in Australia.

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(1) Examples of these questionnaires, and the final covering letter and reminder letter are shown in Appendix I.

The first pilot survey indicated that substantial alterations were needed to the inital questionnaire design and accompanying instructions (Aplin and Flaherty 1976b). Personal interviews of a small sample of respondents and non-respondents in this pilot survey indicated that both the survey form and accompanying instructions were too long and appeared quite complex. A significant number or errors were made by respondents, especially in responding to the questions designed to obtain personal information and details on travel. In view of these findings the survey questionnaire was substantially revised. The revised questionnaire incorporated the previously separate instruction sheet. Instructions were considerably condensed and included within an improved and simplified questionnaire layout. However the most significant alteration to the questionnaire was required as a result of the complexity of the initial questionnaire design. In the initial design, respondents were requested to indicate the towns and other places visited at each stage of the trip. This would have allowed the detailed route to be derived for each trip. Unfortunately the complexity required in the questionnaire design to elicit this type of information militated against its reliability. It was therefore decided to delete the requirement for detailed route information in the questionnaire and concentrate attention only on the main destination and the place visited furthest from home. This permitted considerable simplification of the questionnaire design. Less significant changes included the following.

- The minimum trip length from home to destination (one-way) was decreased from 150km (93 miles) to 100km (60 miles). This alteration was made in response to suggestions from outside organisations interested in the results of the NTS.

- Respondents were asked to exclude work trips[1].

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(1) This was intended to exclude regular inter-urban and intra-urban commuter travel. Commuter travel is best measured by more direct methods such as monitoring ticket sales, on board surveys or even traffic counts.

- The instruction to respondents to exclude trips made as a crew-member on a bus, train, aircraft or ship was clarified. Respondents were asked to include trips made as the driver of a commercial motor vehicle (except a bus).

- In requesting mode details the broad 'Road' category used in the earlier questionnaire was replaced by two tick boxes for travel by 'Bus' or by 'Car, motorcycle or truck'. This allowed road travel by commercial carrier to be separated from other road travel.

- New questions were included to obtain information on the type(s) of accommodation used during the trip and the number of nights spent at the destination (or main destination if there were several) of the trip.

- A question asking respondents to classify their dwelling into one of six categories was also excluded from the revised questionnaire.

The revised questionnaire was tested in a second pilot survey, three months before the NTS was due to commence. In general, it was completed with apparently reasonable accuracy, and there were fewer omissions(1). Nevertheless some minor textual alterations were made to the questionnaire on the basis of these results and advice received from various survey authorities(2). The more important of these final alterations are summarised below.

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(1) The results of the second pilot survey are discussed by Piko (1977).

(2) Improvements to the questionnaire and the survey in general were suggested by
- Mr K. Brewer, Survey Research Centre, Australian National University
- Professor P.R. Stopher, Transportation Centre, Northwestern University, U.S.A.
- Tourism Branch, Department of Industry and Commerce
- Australian Bureau of Statistics
- State tourism authorities
- Australian Road Research Board (ARRB)

- The heading 'CONFIDENTIAL' at the top of the questionnaire was emphasised by the addition of a sentence to the effect that replies would be seen only by authorised BTE representatives.

- In an attempt to speed replies, a request to return the form within seven days was included on the front of the questionnaire and in the accompanying letters.

- The definition of a trip was altered to read '...wholly within Australia' in order to ensure that people did not include domestic travel associated with an overseas journey.

- The 'Car, motorcycle or truck' mode category in the pilot questionnaire was further divided into separate categories for each, and the 'Bus' category was renamed 'Bus/coach'.

- The two sets of tick boxes for weekly and annual household income groups were amalgamated into one set to minimise confusion.

For the remainder of this Report, the terms 'trip' and 'non-urban travel' will apply to all person-trips which meet the criteria discussed above.

Covering and Reminder Letters

The importance of covering letters in gaining co-operation from potential respondents to a mail survey cannot be overemphasised. The main objective of the covering letter is to motivate the potential respondent to co-operate in the survey by explaining succinctly the purpose of the survey and the potential benefits which can be expected to accrue to the community as a result of it.

The covering 'letter' used in the first pilot survey was actually a six paragraph message. It was followed by three pages of instructions for completing the questionnaire. As previously mentioned, the instructions were later condensed and incorporated in the questionnaire for the second pilot survey. It was then possible to print the message in letter form on a separate piece of paper to be inserted into the questionnaire. The opportunity was taken to shorten and simplify the text of the covering letter.

Further changes were made to the covering letter after the second pilot survey. The revised letter (used in the main survey):

- stressed the value of the survey results in planning improved highways, rail links airports etc;

- included a deadline, requesting that the form be returned within seven days;

- stressed that the form should be returned even if no one in the household had made any trips of the type described.

These changes were of course all aimed at maximising response to the survey. The seven-day deadline was also incorporated in order to maximise response to the initial mailing during the fortnight before reminder questionnaires were addressed and despatched to non-respondent households. It was considered that inclusion of some form of arbitrary though realistic deadline would be more effective than none at all. However Nevin and Ford (1976) found that the inclusion of a deadline date in the cover letter did not stimulate a heavier or more immediate response, and that in fact it seemed to decrease the rate of returns after that date. Their results also suggested that if no deadline date was included in the cover letter, recipients appear to implicitly assume a seven-day deadline as an acceptable response period. It should be emphasised that Nevin *et al.* (1976) used specific five-day, seven-day and nine-day

deadline dates in their experiments, while the NTS cover letter and questionnaire merely requested return of the questionnaire 'within seven days'(1). Nevin *et al*. (1976) found that a longer deadline had a favourable influence on overall response rates: those for the five-day, seven-day and nine-day deadlines were 43 per cent, 49 per cent and 53 per cent respectively, while the control group (with no deadline) had a response rate of 50 per cent.

The NTS reminder covering letter also requested return of the accompanying questionnaire within seven days, and was couched in polite but emphatic terms. Nevin *et al*. (1976) despatched differently worded reminder letters to two sub-samples of non-respondents to the initial mailing of a survey. Their tersely worded reminder letter achieved significantly greater response than a casually worded letter. In fact the tersely worded reminder generated an extra 38 per cent response (when compared with the situation if no reminders had been sent out) while the casually worded reminders only achieved an extra 23 per cent response. It was found that tersely worded reminders generated an almost consistent two-thirds greater response (than the casually worded letter) throughout the return period of eighteen days.

Although the work of Nevin and Ford might suggest that the deadline and the covering letters used in the NTS could have been designed more effectively, there is an obvious problem in adopting without qualification such academic advice for surveys

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(1) No deadline was specified on questionnaires and covering letters used in the second NTS pilot survey. Of the original pilot survey questionnaires actually returned, approximately 85 per cent had been returned within about fourteen days of the initial mailout (Piko 1977). However this pilot survey was restricted to New South Wales (N.S.W.), Australian Capital Territory (A.C.T.) and Victoria (Vic.), with obvious implications on postal delays as compared with a fully national sample. A roughly similar time-dependent response was obtained in the NTS proper indicating the likely effectiveness of the seven-day period.

conducted by official government bodies such as the BTE. Such bodies clearly have a responsibility in terms of considering the rights and sensitivities of private citizens. This was an important aspect in the NTS and the final forms of the covering letter and the questionnaire were developed with this consideration very much in mind.

NTS REGIONS

One significant objective of the NTS was to provide a realistic level of information on travel between pre-defined regions. The accuracy of NTS results and consequent estimates of travel between regions depends on the size of the survey sample available in each region. For acceptable statistical reliability each region requires a certain minimum sample size to be represented in the survey, regardless of the population or other measure of size of the region. Hence the greater the number of regions, the higher the total sample size (that is the sum of the regional sample sizes) must be in order to cover all regions adequately. However, it would not have been possible to achieve statistically acceptable results using a regional system of more than one hundred regions, as the total sample size required would have exceeded the resources available for the survey. It was estimated that the minimum acceptable number of regions required to cover Australia was about fifty (Aplin *et al*. 1978a). Three criteria for an appropriate regional system had to be satisfied. These were as follows.

- The regions should represent reasonably homogeneous populations in terms of their respective travel patterns.

- The regions should allow important non-urban corridors to be identified and surveyed at statistically appropriate levels.

- As far as possible, the regions should be compatible with other established regional systems, particularly those commonly used for data collection.

Several existing regional systems were examined in order to determine if any satisfied the above criteria. The systems examined included:

- ABS Census Collector districts (or aggregations of these);
- Federal Electoral Divisions;
- Australian Government Regions (AGRs) as developed by the former Department of Urban and Regional Development (DURD 1975);
- a geographic co-ordinate system (that is, a grid system similar to the latitude-longitude system);
- the system used by the Australian Travel Research Conference (ATRC) for a survey of tourism in Australia (ATRC 1974).

The regional system most suited for use in the NTS was the system of AGRs developed by DURD. However, some modifications to this system were necessary for the following reasons.

- Each of the State capital cities (except Brisbane and Hobart) consisted of several AGRs, whereas for the NTS they could more appropriately be considered as single regions.
- Some of the AGRs (particularly those in Western Australia (W.A.)) were not closely comparable to the remainder in terms of apparent trip generation and attraction parameters.
- Some AGRs have unusual geographic shapes which inhibited their use in the NTS.
- The AGR adjacent to the Brisbane AGR totally surrounds the latter. For the purposes of the NTS the two regions would more appropriately constitute a single NTS region.

. The A.C.T., Northern Territory (N.T.) and northern S.A. were not included in the AGR system.

Considerable re-design of AGR boundaries was therefore required to produce a system of regions which satisfied the criteria mentioned previously. This resulted in a reduction of the original seventy-six AGRs to sixty-four NTS regions. Of these, forty-three are identical in all respects to existing AGRs. Of the remaining twenty-one NTS regions, seventeen were formed by amalgamating or dividing AGRs, while the remaining four related to the A.C.T., N.T. and northern S.A. Amalgamation of AGRs was invariably carried out by joining two or more complete AGRs to form one NTS region. On the other hand, when an AGR was divided into a number of NTS regions, the divisions were always made along Local Government Areas (LGA) boundaries. The AGRs consist of an integral number of LGAs. Consequently, this means that all NTS boundaries follow LGA boundaries and each NTS region contains an integral number of LGAs. This is useful from a statistical viewpoint, as a number of other data inventory systems are also based on LGA boundaries. Maps showing the boundaries of the NTS regions resulting from this process are shown in Appendix II.

SAMPLING PHILOSOPHY

Once the NTS regions were defined as the basic sampling zones for the survey, it was possible to consider the allocation of the survey sample. As previously mentioned, the NTS was designed to provide fundamental information on non-urban travel in Australia, and to represent a benchmark or reference point for the planning of more restricted or specialised surveys in the future. As the NTS was to be a national survey of non-urban travel it was considered essential to have adequate coverage of residents in country districts as well as in the cities. Ideally it would have been desirable to conduct the NTS as an intensive census-type operation, but this was not feasible due to the very large expense involved.

The approach adopted for the NTS was to distribute the survey sample among the NTS regions according to the significance of the various travel corridors between them. In order to determine the relative significance of various interregional routes it was necessary to have some ex ante estimate of interregional travel flows. The process of obtaining these estimates is described by Aplin *et al*. (1976a). Basically, a gravity-type model was calibrated using data on interregional travel during 1973-74 (ATRC 1974). These data represented the most up-to-date travel information available at the time of planning the NTS. This information was judged to be the most suitable for planning the sampling policy of the NTS, even though the ATRC data related to only a comparatively small set of origin-destination (O-D) pairs. The gravity model calibrated using the ATRC data was subsequently used to estimate flows between all NTS regions. Thus a hierarchy of O-D pairs was established and these were classified as a major, secondary or minor according to the estimated numbers of person-trips generated annually between the respective regions(1). Regional sample sizes were then determined with two important constraints in mind. These were:

- a postal budget limited to some $36 000. Taking the anticipated response (using reply-paid envelopes) into account, it was estimated that about 8000 questionnaires could be mailed each month for the twelve months of the survey;

- the need to obtain survey results with acceptable statistical accuracy.

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(1) A list of the O-D pairs in each category is given by Moll and Russell (1978), together with maps showing their locations.

Specifically, the proportions of trips out of NTS regions were to be estimated on a monthly basis within 50 per cent relative error[1] for proportions greater than certain critical values[2]. These values were set according to the relative 'importance' of the O-D pairs as measured by their estimated travel levels (Moll *et al.* 1978), with proportions below the appropriate critical value being estimated to a lower degree of accuracy.

As a result, sample sizes in regions at the extremities of the major O-D pairs were high in absolute terms relative to those in minor O-D pairs. Sample sizes were also comparatively large in regions traversed by high traffic volumes between major origins and destinations. Table 3.1 indicates the actual number of households contacted in each NTS region. It also shows a considerable variation in the response rate from region to region, with generally lower rates for remote regions.

SURVEY OPERATION

The NTS was designed to obtain information on travel within Australia over the period July 1977 to June 1978. Considerable planning was undertaken before the first questionnaires were dispatched early in August 1977. As limited staff resources were available for the running of the survey, it was necessary

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(1) Relative error is defined as the ratio of the standard error of the estimated proportion and the estimated proportion itself. For example suppose that value of a proportion is estimated to be 0.25 from a sample survey. If the so-called standard error of this estimate is 0.125 then the relative error of the estimate is 0.125/0.25 or or 50 per cent. The standard error is determined by the value of the proportion being estimated and the size of the sample being used to perform this estimation.

(2) The critical values selected for the trip proportions were 0.15, 0.20 and 0.25 for major, secondary and minor corridors respectively. See Moll *et al.* (1978) for a detailed explanation of the reasons underlying the choice of these proportions and the interaction between the postal budget and statistical accuracy constraints.

TABLE 3.1 - COMPARISON OF PREDICTED AND ACTUAL RESPONSE FOR EACH NTS REGION - TWELVE MONTHS 1977-78

Region Number	Major Centre	Net Sample[a]	Expected Response[b]		Actual Response		Response Rate[c] (per cent)
			Households	Person-trips	Households	Person-trips	
A.C.T.							
101	Canberra	1 203	601	722	652	1 310	54
N.S.W.							
201	Lismore	1 781	890	1 069	748	1 190	42
202	Armidale	1 172	586	704	480	1 120	41
203	Dubbo	826	413	496	326	737	39
204	Broken Hill	857	428	514	314	556	36
205	Deniliquin	1 123	561	674	509	1 529	45
206	Albury	1 697	848	1 018	778	1 981	45
207	Wagga Wagga	1 408	704	845	592	1 572	42
208	Bathurst	1 184	592	710	494	1 193	41
209	Goulburn	1 778	889	1 067	677	1 726	38
210	Cooma	800	400	480	356	844	44
211	Newcastle	1 818	909	1 091	787	1 255	43
212	Gosford	1 785	892	1 071	832	1 287	46
213	Wollongong	1 774	887	1 064	752	1 310	42
214	Sydney	7 531	3 765	4 519	3 339	4 128	44
215	Grafton	1 806	903	1 084	798	1 304	44
216	Taree	1 781	890	1 069	786	1 224	44
Sub-total N.S.W.		29 121	14 560	17 473	12 568	22 956	43
Vic.							
301	Geelong	1 805	902	1 083	1 001	1 646	55
302	Warrnambool	370	185	222	206	652	55
303	Ballarat	1 802	901	1 081	888	2 366	49
304	Horsham	1 769	884	1 062	894	2 124	51
305	Mildura	810	405	486	409	823	50

TABLE 3.1 (Cont) - COMPARISON OF PREDICTED AND ACTUAL RESPONSE FOR EACH NTS REGION - TWELVE MONTHS 1977-78

Region Number	Major Centre	Net Sample[a]	Expected Response[b]		Actual Response		Response Rate[c] (per cent)
			Households	Person-trips	Households	Person-trips	
306	Bendigo	841	420	505	425	1 148	50
307	Shepparton	1 748	874	1 049	899	2 583	51
308	Wangaratta	1 792	896	1 075	923	2 028	51
309	Sale	827	413	496	427	1 075	51
310	Moe	1 772	886	1 063	870	2 277	49
311	Melbourne	9 458	4 729	5 675	4 839	7 017	51
Sub-total Vic.		22 994	11 497	13 796	11 781	23 739	51
Qld							
401	Brisbane	4 973	2 486	2 884	2 019	3 260	41
402	Gold Coast	1 795	897	1 077	1 045	1 397	58
403	Nambour	1 095	547	657	732	1 662	67
404	Bundaberg	1 106	553	664	524	834	47
405	Rockhampton	993	496	596	404	591	40
406	Mackay	1 783	891	1 070	777	1 291	43
407	Townsville	1 768	884	1 061	711	1 155	40
408	Cairns	829	414	497	312	412	37
409	Mount Isa	824	412	494	289	550	35
410	Longreach	696	348	418	261	719	37
411	Roma	828	414	497	338	938	41
412	Toowoomba	1 181	590	709	543	1 213	46
Sub-total Qld		17 871	8 935	10 723	7 955	14 022	44
S.A.							
501	Adelaide	3 310	1 655	1 986	1 746	1 878	53
502	Port Lincoln	827	413	496	418	823	51
503	Kadina	749	374	449	373	901	50

TABLE 3.1 (Cont) - COMPARISON OF PREDICTED AND ACTUAL RESPONSE FOR EACH NTS REGION - TWELVE MONTHS 1977-78

Region Number	Major Centre	Net Sample[a]	Expected Response[b]		Actual Response		Response Rate[c] (per cent)
			Households	Person-trips	Households	Person-trips	
504	Whyalla	859	429	515	413	861	48
505	Gawler	825	412	495	441	757	53
506	Victor Harbor	1 728	864	1 037	972	1 242	56
507	Murray Bridge	1 708	854	1 025	897	2 019	52
508	Mount Gambier	1 707	853	1 024	880	1 820	52
509	Woomera	465	232	279	243	887	52
Sub-total S.A.		12 178	6 089	7 307	6 383	11 188	52
W.A.							
601	Albany	258	129	155	113	178	44
602	Bunbury	157	78	94	73	208	46
603	Kalgoorlie	637	318	382	231	362	36
604	Northam	748	374	449	351	1 270	47
605	Port Hedland	788	394	473	406	1 010	52
606	Derby	321	160	193	113	261	35
607	Geraldton	781	390	469	358	873	45
608	Perth	1 828	914	1 097	920	773	50
609	Carnarvon	346	173	208	120	324	35
Sub-total W.A.		5 864	2 932	35 184	2 685	5 259	45

TABLE 3.1 (Cont) - COMPARISON OF PREDICTED AND ACTUAL RESPONSE FOR EACH NTS REGION TWELVE MONTHS 1977-78

Region Number	Major Centre	Net Sample[a]	Expected Response[b]		Actual Response		Response Rate[c] (per cent)
			Households	Person-trips	Households	Person-trips	
Tas.							
701	Hobart	842	421	505	425	641	50
702	Burnie	852	426	511	366	788	43
703	Launceston	843	421	506	404	732	47
704	Queenstown	433	216	226	163	561	38
Sub-total Tas.		2 970	1 485	1 782	1 358	2 722	45
N.T.							
801	Darwin	675	337	405	264	405	39
802	Alice Springs	599	299	359	273	396	46
Sub-total N.T.		1 274	637	764	537	801	42
TOTAL		93 475	46 737	56 085	43 919	81 997	47

(a) The net sample is the number of questionnaires mailed minus the number that could not be delivered by Australia Post.

(b) Prior to the NTS, an average response rate of 50 per cent and an average trip generation rate of 1.2 households/month were expected from the survey. Hence the expected number of households was one half of the net sample, and the expected number of person-trips was 1.2 times the number of households. See Moll (1978) for further details.

(c) The NTS response rate has been defined as the net number of valid responses received (that is, excluding refusals) divided by the net sample.

Source: Moll (1978) and NTS figures.

to maximise the use of computers for large routine tasks such as selection of the sample of addresses from the electoral roll, addressing questionnaires, determining the addresses of those households requiring a reminder questionnaire, and processing the large mass of data accumulated from the survey. The following Sections describe various aspects of survey planning and management which were critical to the success of the survey. Figure 3.1 illustrates the procedure in diagrammatic form. More detail relating to the survey procedure has been presented by Aplin and Hirsch (1978b).

Sampling Procedure

It has already been stated that the Federal electoral rolls were considered the most suitable sources of addresses for the NTS sample. The following procedures were used to obtain a list of household addresses for each monthly mailing of NTS questionnaires.

- Each distinct address was assigned its NTS region. Every fifth[1] address in each NTS region was then selected, in order to minimise subsequent processing.

- Duplicate addresses were discarded[2]. This situation arose when more than one elector resided at a particular address.

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(1) In most NTS regions this provided more addresses than were actually needed for the final NTS sample, but in some sparsely-populated regions it was later found necessary to supplement the sample manually by selection from the printed electoral rolls. The latter regions and their main centres were: region 410, Longreach; region 509, Woomera; region 606, Derby; region 609, Carnarvon; region 704, Queenstown; and region 802, Alice Springs.

(2) In the case of S.A., addresses were generated from the S.A. Valuer-General's property file. This file does not contain duplicate addresses, nor the number of electors at each address.

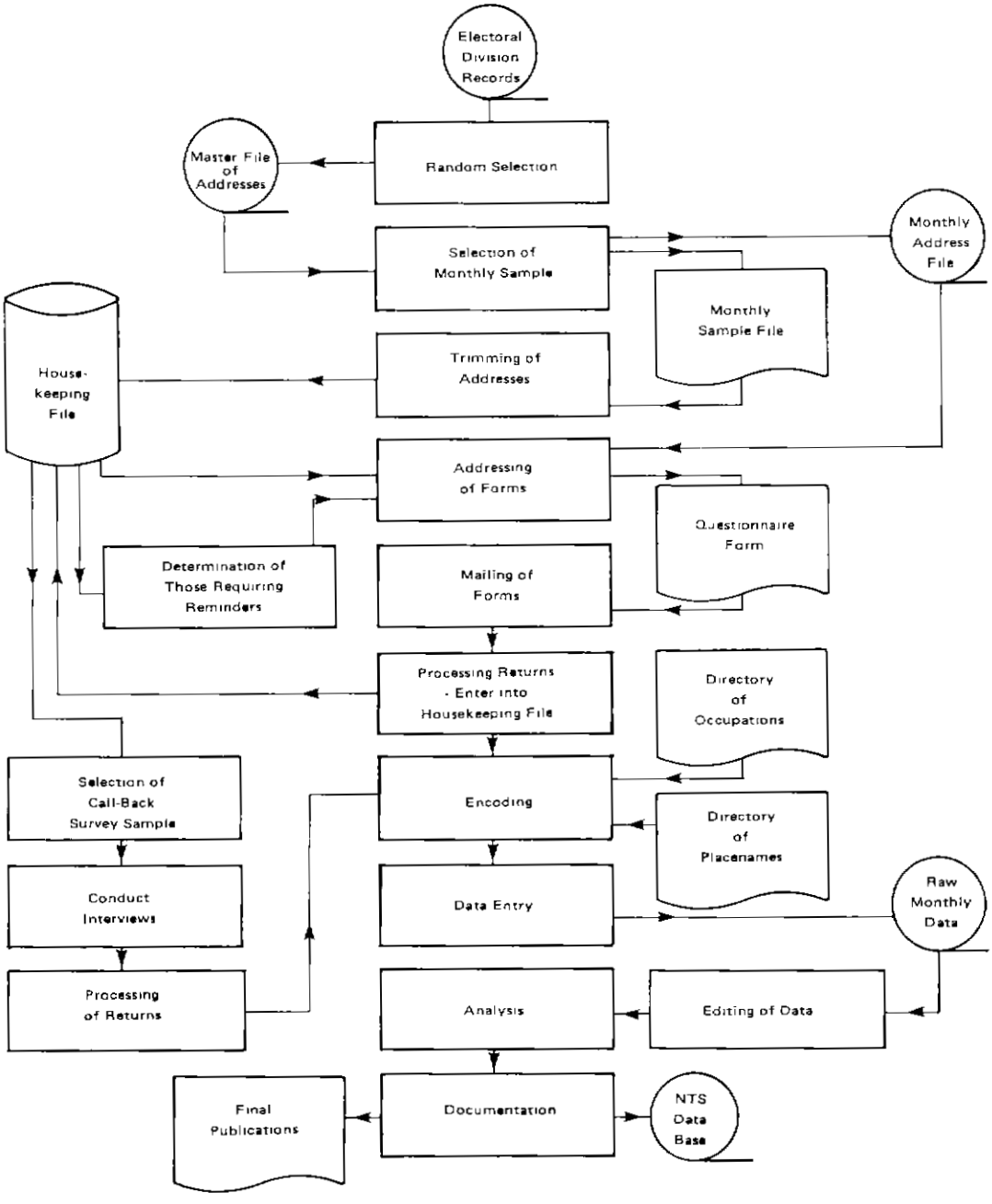

Figure 3.1
Schematic representation of NTS procedure

- The addresses accumulated for each NTS region were sorted into a random order to allow each household an equal chance of selection.

- Incomplete addresses were discarded.

- Twelve equally sized monthly files were selected using the regional sample sizes chosen. At this stage addresses at which six or more electors were registered were excluded in order to eliminate institutions from the sample(1).

- Addresses within each NTS region were subsequently sorted into postcode order to facilitate the use of bulk pre-sorted mail which attracts a reduced postal rate.

Survey Management

Questionnaires took the form of specially-printed continuous stationery in the standard computer page size (279mm by 380mm). About two weeks before the expected date of their dispatch, the questionnaires were addressed directly from the tapes containing the addresses of the households to be sampled in the particular month by using a high-speed line-printer. At the same time as the questionnaire forms were addressed, the sampling/addressing program inserted coding information which was used to identify respondents' addresses and regional locations. The addressed questionnaires were then delivered to a mailing contractor who inserted each questionnaire into a window-faced envelope together with a covering letter introducing the NTS to the householder and a reply-paid envelope for return of the completed questionnaire. The sealed outer envelopes were then batched

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(1) In the case of S.A., addresses were generated from the S.A. Valuer-General's property file. This file does not contain duplicate addresses, nor the number of electors at each address.

by postcode group and bagged in accordance with the regulations governing bulk pre-sorted mail. The questionnaires for each survey month were usually dispatched on the first day of the following month.

As replies were received, preliminary details of each were recorded in an on-line survey control system developed by the BTE for the NTS. Approximately fourteen days after the dispatch of the first questionnaires(1), the survey control system was used to identify households which had not responded in that time. These households were sent another questionnaire, together with a different covering letter and a reply-paid envelope. A sample of the covering letter used for the reminder phase is presented in Appendix I. It reminded householders of the NTS, and of the fact that the household was included in the sample for the month. The letter pointed out that no reply had been received from the household, and again requested the co-operation of the householder in completing and returning the questionnaire.

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(1) Fourteen days was the period determined from the second pilot survey (Piko 1977) as being appropriate for sending out reminders. Obviously, there is a trade-off involved in selecting this period. If reminders are sent out too early, they will be received by significant numbers of households which would have responded in any case. This is obviously uneconomic, and also causes unnecessary annoyance to those respondents. On the other hand, if reminders are sent out too late, householders will have difficulty in recalling details of trips, with a consequent drop in statistical accuracy. Another important requirement is to reduce as far as possible the delay between the cut-off date for 'original' returns and the date of dispatch of reminders. The on-line control system developed for the NTS was highly effective in this regard, and the addressing, enveloping and mailing procedure for reminders (similar to that already described) was carried out as quickly as possible.

Reminder questionnaires were identified by the addition of the letter 'R' to the respondent sequence number at the addressing phase. It was thus possible for the survey control system to keep track of response to the reminder mail-out. The system was designed to produce information allowing the progress of the survey in any particular region to be monitored on a day-to-day basis if necessary.

Coding Directories

As previously mentioned, preliminary details of completed questionnaires were recorded in the survey control system as they arrived. The questionnaires were put aside for subsequent coding and checking. The information contained on the completed questionnaire was compiled to produce the survey data base. Before entry to the data base, all the information on a questionnaire was converted to numerical form. Most of the information recorded on each questionnaire was coded easily, since it consisted of responses to multiple choice questions. However, it was necessary to develop coding directories of placenames and occupations so that these details could be transferred conveniently from the survey questionnaires to the data base. The occupation codes used for the NTS were based on the major occupation groups and sub-occupation groups used by the ABS. Further details of all the above-mentioned coding schemes have been presented by Hirsch (1979a).

Quality Checks

There were occasions where a respondent clearly misunderstood a question, or recorded an answer to a question which was inconsistent with his answers to other questions. For example, the marital status of an eight year old child should have been specified as 'Never married' on the NTS questionnaire. However, many respondents specified the marital status in this case as 'Other'. In such cases the appropriate correction was made

before the questionnaire details were recorded in the data base. However, if it was difficult to resolve a particular ambiguity, the information was not recorded in the data base. Hirsch (1979a) discusses these problems in more detail.

Inevitably a number of errors occur during the processes of coding information and converting it to data on magnetic tape. Verification of the data following key-punching reduces the key-punching error rate, though it does not eliminate all of these errors. Errors can be further reduced by performing both numerical range checks and internal logic checks on the coded data. These so-called edit checks are mandatory in order to achieve a reliable and accurate survey data base and were carried out in developing the NTS data base.

SUPPLEMENTARY SURVEY

If the results of a survey are to be useful, it is essential to have some indication of their applicability to the population as a whole. It is also desirable to be able to provide users of the data with methods of adjusting for any statistical biases that may have occurred. In the case of the NTS, a program of supplementary home interviews was designed to operate in conjunction with the main postal survey to provide the necessary additional information. Over 3000 interviews were conducted over a period of twelve months from September 1977 by a market research organisation, using addresses supplied each month by the BTE(1).

Objectives

The supplementary home interview survey was undertaken for two main reasons:

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(1) A pilot survey was also undertaken in Melbourne during August 1977 to test the interview questionnaire.

- to obtain personal, household and travel details of households which did not reply to either the original or the reminder mail questionnaires (that is, to obtain these details for a sample of non-respondents);

- to monitor the accuracy with which respondents completed the mail questionnaires.

The interview survey was regarded as a useful vehicle to investigate the reasons for non-response to the mail survey. It also provided an opportunity to assess the value of attitudinal questions, which can be administered most effectively in the context of a personal interview survey.

Questionnaire Design

Essentially, the interview process aimed at eliciting the same information as was requested in the mail survey. In any interview situation the co-operation of householders is influenced a great deal by the approach taken by the interviewer. At no stage was an attempt made to persuade an unwilling householder to respond to an interview. In fact, co-operation was received from most householders; about 78 per cent of respondents to the mail survey agreed to an interview. As might be expected, a somewhat lower proportion of non-respondents co-operated, but the success rate of 68 per cent nevertheless was regarded as being extremely satisfactory.

The interview approach to non-respondents to the mail survey was basically similar to that adopted for respondents. Non-respondents were reminded of the BTE survey and asked if they remembered receiving the form. They were also asked if they had particular reasons for not replying to the mail survey, and the nature of those reasons. If the interviewee concurred, the interviewer then ran through the various questions originally asked in the mail questionnaire in order to obtain the basic information required for the NTS.

A small sample of respondents to the mail survey was interviewed in order to allow some degree of comparison to be made between their original mail reply and the details supplied at the interview. It should be emphasised that the interviewer was provided with a copy of the respondent's trip record only from the completed form received by the BTE. No personal or household details were supplied to the interviewer in order to preserve the confidentiality of the mailed replies. Before terminating the interview, the interviewer compared the travel details in the postal return with those ascertained during the interview. An attempt was then made to resolve any discrepancies with the respondent. The interview procedure used with respondents who had not recorded any trips in their postal return was very similar, although the interviewer had no copy of the respondent's postal return. However, the interviewer would have known that the respondent's original response had indicated that no trips were made. The degree of co-operation received by interviewers from respondents who had not undertaken trips was identical with that from respondents who had indicated travel; both rates were at the 78 per cent level previously mentioned.

Interview Coverage

Specialised household interview surveys covering urban and non-urban areas are extremely expensive to conduct. It was therefore envisaged that only about 250 successful interviews would be achieved per month[1] within reasonable financial limitations. It was considered important to distribute them as widely as possible within Australia, although the number of rural interviews was limited to half the number of the urban interviews because of the high travelling costs involved. The urban areas included Newcastle, Wollongong and Canberra as well as the State capitals.

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(1) In the event, the extent of householder co-operation was such that an average of over 260 interviews were achieved from the pool of addresses supplied each month to the interviewing organisation.

It was not possible to cover all NTS regions each month and in any case interviewers were not available in some areas. It was, for example, not possible to schedule any interviews in the N.T. Some regions were only covered once each quarter. It was not envisaged that statistically sound travel distribution patterns could be derived from the interview results, but it has been possible to identify and at least partially adjust the NTS for biases in various statistical parameters estimated from the postal survey. As interviews were not held in all NTS regions it was not possible to do this on a regional basis except in areas such as urban areas where substantial monthly interview samples were scheduled. However, it has been possible to aggregate the rural regional results where necessary and allow at least some regional element to be retained in the process used to adjust for statistical bias (Hirsch and Russell, 1981).

The number of interviews scheduled for each NTS region was calculated using a process which took into account:

- the number of postal questionnaires distributed in the region;

- the urban rural ratio of 2:1 adopted in the interview sample size;

- the overall requirement for at least a total 250 successful interviews per month.

For the first three months, addresses supplied for interviews were divided into an equal number of postal survey respondents and non-respondents. This was designed to obtain a substantial coverage of respondents and allow a preliminary assessment of the accuracy with which mail questionnaires were being completed (that is, response error). To produce a reasonable sample size on which to base estimates of non-response bias the ratio of respondent to non-respondent addresses selected for interview was subsequently altered to 20:80 and finally to approximately 15:85 for the remainder of the survey.

The relatively high response rate to the interview survey is in part attributable to the arrangements made when the householder was absent or unavailable at the first call of the interviewer. In this situation a second call was made on a different day and at a different time from the first, at least one of the calls being made either on a Saturday or Sunday or after 6.30 p.m. on a weekday. If the householder was home but busy or unavailable at the first call, an attempt was made to arrange another time for the interview. In cases where the only person home was under eighteen years of age, the interviewer asked for the telephone number of the household in order to contact the householder later to arrange an interview.

Attitudinal Questions

Interviewees who had undertaken travel during the survey period were asked an additional question which varied over the course of the NTS. This question was attitudinal in nature; in other words, it was aimed at gathering information on the attitudes of householders to particular facets of travel. Reliable information of this nature is particularly difficult to obtain because, in seeking the information, questions must be phrased in such a way as to avoid leading or prompting the interviewee to respond in a certain manner. It is also, of course, essential to ensure that the question is easily and clearly understood.

For the first three months of the interview survey, interviewees were asked to indicate which of the following alternatives they would have adopted if it had not been possible to undertake the trip as specified:

- go to the same place using a different form of transport
- go to a different place using the same form of transport
- go to a different place using a different form of transport
- stay home.

This question was included in the interview survey to assist an investigation of factors influencing modal choice. Preliminary analysis of the results from the first month (surveying travel in July 1977) indicated that about 60 per cent of respondents answered that they would stay home; 19 per cent said that they would have gone to the same place using a different form of transport; 14 per cent would have gone to a different place using the same form of transport. Over 6 per cent failed to answer the question and an insignificant number answered that they would go to a different place using a different form of transport.

Further analysis of the answers from 187 householders who would have stayed at home as an alternative to making their trip indicated that over 56 per cent of car users and 60 per cent of aircraft users would have stayed home. Sample sizes in other user categories were insufficient to allow meaningful estimates.

During the following five months of the supplementary survey, interviewees who indicated undertaking travel during the survey periods were asked their main and other reasons for selecting the particular transport mode they had used. For the first of these five months (surveying travel in October 1977) the question was an 'open-ended' one; interviewees were asked to state their reasons without prompting. The results of the first month were then used to produce a card showing a set of possible reasons from which respondents were asked to choose in later months. Thus respondents in later months were more likely to realise that a broad spectrum of reasons could underly their modal choice. They were also, of course, likely to be influenced by reading those reasons on the card. The use of a card may therefore explain the difference between the results from two consecutive months which can be seen in Table 3.2.

TABLE 3.2 - MAIN REASON FOR MODE CHOICE STATED IN INTERVIEWS DURING DECEMBER 1977 AND JANUARY 1978

Main Reason	December 1977 (per cent)	January 1978 (per cent)
Convenience	41.9	49.5
Speed	16.2	10.8
Most economical way	11.4	7.5
No other transport available	10.5	17.2
Carriage of goods; business	10.5	4.3
Best for sightseeing	4.8	3.2
Comfort	3.8	7.5
Other	1.0	-
TOTAL	100.0	100.0

Note: Interviews during December 1977 and January 1978 concerned travel reported during October and November 1977 respectively.

Source : NTS supplementary survey.

The attitudinal question used for the final four months of the supplementary survey was a topical one in view of general concern at the size of the deficits currently incurred by Australian railway systems. If interviewees indicated rail as the main mode used for a trip during a given survey month, they were asked if they considered the particular train service adequate or whether it needed improvement in some way. If interviewees indicated that some improvement was required they were asked to indicate the general nature of that improvement. Interviewees who had travelled during the given survey month, but not by train, were asked if there was a train service between the origin and main destination of their trip. Where such a service existed interviewees were asked to indicate the improvements which would have to be made to the rail service before they would consider undertaking the journey by rail.

An 'open-ended' approach was used in all four months. Preliminary results from the first of these months (surveying travel in March 1978) indicate that over half of the seventy-seven non-train travellers interviewed had access to a train service for their trip, but most declined to comment on improvements necessary before they would consider travelling by train. This suggests that most would not be potential train travellers under any circumstances, and some explicitly stated that they would not contemplate changing from car travel. Of those who would consider train travel, most wanted a faster service. There were insufficient train users in the sample to justify any conclusion about the improvements to train services suggested by users of the service.

STATISTICAL ADJUSTMENTS

In surveys such as the NTS various factors can affect the validity[1] of the results. These factors include sampling bias, non-response bias and response errors. Of these, the most significant bias in the NTS was non-response bias. Consequently, the limited resources available for improving the validity of the NTS data were concentrated on obtaining a quantitative estimate of non-response bias. However, qualitative estimates of the extent and effect of sampling bias and response errors were also obtained. The following Sections contain a brief discussion of each of these factors and the method used to adjust for non-response bias in the NTS data. A more detailed discussion of each is presented by Hirsch *et al*. (1981).

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(1) In this context, validity is defined as the extent to which the data obtained from the postal survey represent the situation applying to the population as a whole.

Sampling Bias

Sampling bias occurs when all elements in the population do not have an equal chance of selection in a survey. There were three main sources which contributed to this bias in the case of the NTS. First, households that did not contain registered voters were excluded from the NTS, since addresses for the NTS sample were selected at random from the Federal electoral rolls for all States and Territories except S.A. In particular, unnaturalised persons would have been under-represented in the NTS sample, since only those unnaturalised persons forming part of a household with at least one registered elector would have been potential candidates for inclusion in the NTS.

The second source of bias occurred because addresses for the NTS sample were selected (on average) several months before use in the NTS. This was unavoidable since the master file of addresses was selected at the beginning of the twelve month period over which the NTS was conducted. New housing developments were consequently under-represented in the NTS sample. It was estimated that this excluded approximately 3 per cent of all households.

As noted previously, hotels, hostels, military establishments, hospitals and other such institutions were also excluded from the NTS sample. A survey of such institutions would have required a different questionnaire and sampling approach, which was considered impractical in view of the constraints imposed upon the NTS.

Response Errors

Inaccuracies will obviously arise when observations are incorrectly recorded by the respondent or, in the case of interview surveys, by the interviewer. These inaccuracies can be described as response errors. They can be minimised by careful design and pilot testing of the survey questionnaire to eliminate ambiguity or unnecessary complication. The accuracy

of survey data can also be affected by errors introduced during the processing phase, particularly during coding, data entry and other manipulation of the data. These particular sources of error can be minimised by careful checking of the results obtained in preliminary processing and the application of various logical checks to the survey data base.

The supplementary interview survey included a sample of both respondents and non-respondents to the postal survey. While the main purpose of this supplementary survey was to obtain quantitative data on the extent of non-response bias, sufficient data were also available to provide at least a qualitative analysis of response errors in the NTS data. There is some doubt as to which survey (postal or supplementary interview) elicited the most accurate response. While interview surveys normally elicit more accurate responses[1] than postal surveys, the time lapse between the receipt of the postal questionnaire and the conduct of the interview decreased the accuracy of responses to the supplementary interview survey to an unknown extent. Consequently, it is not possible to determine which of the two responses is the more accurate.

Analysis of returns of those respondents interviewed in the supplementary survey indicated that respondents tended to overestimate the number of trips made in a survey month by about 10 per cent. The distributions of trip characteristics as recorded by certain respondents to the NTS were compared with the distributions of the characteristics as reported by the same respondents in the supplementary interview survey. No significant differences were observed between the distributions of most of the trip characteristics. The only exception which did exhibit distributional differences were total duration of trip, duration at destination and party size. In the NTS

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(1) The exception however was household income. Respondents were less likely to disclose their correct household income to an interviewer in comparison with their reaction to a postal questionnaire.

respondents reported that 60 per cent of all trips had a total duration of two nights or less, compared with 65 per cent of all trips reported in the interview. Similarly, in the NTS 29 per cent of all trips were reported to have involved one or two nights at the main destination, compared with 35 per cent reported at the interview. Of all trips reported by these respondents to the NTS, 32 per cent were reported as having been made by persons travelling alone. In the supplementary interview however, the same respondents indicated that only 26 per cent of trips involved persons travelling alone.

The distributions of various household and personal characteristics as recorded on the postal questionnaire and at the interview were examined. This analysis showed little difference between these parameters as reported in the NTS and in the supplementary interview survey, indicating that these characteristics were reported reasonably accurately in the NTS. It is interesting to note that 13 per cent of respondent households refused to disclose their income at the interview, while only 6 per cent did not report their income on the postal questionnaire. This is in line with the findings of other researchers; respondents are less likely to provide information on their household income to an interviewer in comparison with their reaction to a postal questionnaire (which is probably perceived to be more impersonal).

Non-response Bias

Non-response bias occurs when elements (in this case households) selected for inclusion in the survey sample fail to participate in the survey. There were various reasons for non-response to the NTS, but the main one appeared to be lack of interest. The significance of non-response to any survey is that the characteristics of non-respondents are often quite different from those of respondents. Hence the results obtained directly from the survey cannot be regarded as being necessarily applicable to the population as a whole. For surveys such as

the NTS (which had an overall response rate of 47 per cent), some adjustment for non-response bias is crucial, since survey respondents may differ significantly from the population in the particular characteristics being surveyed. In fact, it was discovered that, in general, non-respondents to the NTS tended to undertake less travel than respondents. In addition, the distributions of household size, income and age of respondents to the NTS differed significantly in statistical terms from those of the population as a whole (as estimated from the 1976 Census). However, these differences are generally quite small.

Three methods of adjusting for non-response bias in the NTS data were investigated. Only the method finally adopted is discussed here; details of the other methods examined are discussed by Hirsch *et al*. (1981). Briefly, the method used consists of estimating the total number of trips made in a given period by the population as a whole, using the results from both the postal survey and the supplementary survey. The ratio of this estimate to the corresponding estimate obtained from the postal survey alone yields an estimate of the adjustment factor to be applied to the postal survey results to minimise the effects of non-response bias. Appropriate adjustment factors derived in this process can be applied to the trip generation rate(1) of specific geographic regions over given periods.

Since sampling in the NTS was done each month on the basis of NTS regions, it would have been preferable to calculate a separate adjustment factor for each of these geographic and temporal strata, that is, for each NTS region and for each month. However, because of the high cost of interviews it was impossible to sample sufficient non-respondents to achieve this degree of refinement. To obtain an adequate sample size for each calculation, it was necessary to combine NTS regions into groups of regions (regional aggregations) and months into groups of

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(1) For the NTS, the trip generation rate is defined as the average number of person-trips undertaken per household per month.

months (monthly aggregations). Appropriate regional and monthly aggregations were determined after performing statistical tests on the trip generation rates of each NTS region in each month (Hirsch *et al*. 1981). Tables 3.3 and 3.4 summarise the results obtained, showing the NTS regions comprising each regional aggregation, the adjustment factor for the NTS results derived for the regional aggregation and the standard error associated with each adjustment factor.

The adjustment factors shown in Tables 3.3 and 3.4 can be applied to the overall trip generation rate (as derived from the postal returns obtained in the NTS) of households in any regional aggregation or sub-region (NTS region, LGA, etc) within a regional aggregation, to obtain the adjusted total number of trips generated by the region under consideration. For example, the adjustment factor to be applied to the trip generation rate of households in NTS region 202 during the period July to December 1977 is 0.589, while the adjustment factor to be applied to the trip generation rate of the same households during the period January to June 1978 is 0.740. To estimate the total number of trips generated by a State, the (adjusted) total number of trips for each aggregation within the State are summed.

The trip generation rates estimated for any particular stratum of the population must also be adjusted for non-response bias. Since the NTS sample differed statistically from the population as a whole in certain characteristics, separate adjustment factors should be applied to the trip generation rate of each stratum under consideration. These adjustment factors would differ from each other and from the adjustment factor which would be applied to the unstratified trip generation rate, since respondents have been sampled at levels within the various strata, which are different from the representation of these strata in the population as a whole. Ideally all these individual adjustment factors should be calculated and applied to the appropriate trip generation rates. However this degree of refinement requires a considerable sample size of

TABLE 3.3 - ADJUSTMENT FACTORS[a] FOR USE OVER SIX MONTH PERIODS OF THE NTS

Regional Aggregation	NTS Regions	July-December (1977)		January-June (1978)	
		Adjustment Factor	Standard Error	Adjustment Factor	Standard Error
22	201, 202, 211, 212, 215, 216	0.589	0.048	0.740	0.092
24	214	0.704	0.080	0.762	0.061
31	301, 302, 303, 304	0.726	0.064	0.832	0.079
34	311	0.826	0.067	0.861	0.058
41	401	1.337	0.175	0.852	0.073
51	501	0.725	0.097	0.738	0.089

(a) To obtain unbiased estimates of trip generation rates and travel levels, estimates of these parameters as derived from the postal returns are multiplied by the appropriate adjustment factors.

Source: National Travel Survey 1977-78.

TABLE 3.4 - ADJUSTMENT FACTORS[a] FOR USE OVER ALL TWELVE MONTHS OF THE NTS

Regional Aggregation	NTS Regions	Adjustment Factor	Standard Error
21	101, 209, 210, 213	0.592	0.043
23	203, 204, 205, 206, 207, 208	0.638	0.078
32	305, 306, 307	0.784	0.110
33	308, 309, 310	0.728	0.063
42	402, 403, 404	0.676	0.038
43	405, 406, 407, 408	0.716	0.105
44	409, 410, 411, 412	0.626	0.138
52	502, 503, 505	0.733	0.051
53	504, 509	0.660	0.063
54	506, 507, 508	0.845	0.082
61	601, 602	0.784	0.052
62	603, 605, 606	0.660	0.063
63	604, 607, 609	0.660	0.063
64	608	0.606	0.059
71	701, 702, 703	0.948	0.121
72	704	0.733	0.051
81	801, 802	0.660	0.063

(a) To obtain unbiased estimates of trip generation rates and travel levels, estimates of these parameters as derived from the postal returns are multiplied by the appropriate adjustment factors.

Source: National Travel Survey 1977-78.

non-respondents and is generally precluded on economic grounds. This restriction also applies in the present situation. As mentioned previously, the differences in the distribution of various characteristics between the NTS sample and the population as a whole are generally quite small. Consequently the use of unstratified adjustment factors in the determination of stratified travel characteristics should not introduce an unacceptable degree of error.

A related situation applies when considering the distributions of various travel-related characteristics. Again, only partial adjustment for non-response bias is possible along the same lines as described above. However, a qualitative analysis of the differences in travel characteristics between respondents and non-respondents highlighted a number of points which are summarised here. It was found that the modal split of travel by non-respondents was statistically similar to that by respondents. Non-respondents travelled for sightseeing and recreational purposes more frequently than respondents (25 per cent compared with 17 per cent of trips made by respondents), with a corresponding decrease in the proportion of business trips made by non-respondents. Non-respondents were also more likely to spend one or two nights away from home (38 per cent of all trips compared with 31 per cent of all trips made by respondents). This is reflected in the difference between the distributions of the number of nights spent at the main destination by respondents and non-respondents. Non-respondents were less likely to stay with friends and relatives than respondents (49 per cent of all trips made by non-respondents compared with 54 per cent of all trips made by respondents), with a corresponding increase in their use of 'Other' forms of accommodation. Of all trips made by non-respondent households, 45 per cent were made by household members travelling alone. For respondent households, however, only 28 per cent of all trips involved a person travelling alone.

COMPARISON OF THE NTS WITH OTHER POSTAL SURVEYS

The supplementary interview survey was designed to provide data to allow an evaluation of the statistical reliability of the postal survey results and the subsequent adjustment of them. Another useful means of assessing the NTS is through a comparison of its performance with that of other postal surveys, particularly with reference to the parameters influencing non-response.

Factors Influencing Response

Herberlein and Baumgartner (1978) assessed a total of 98 previously published methodological studies of postal surveys. They were primarily interested in identifying the factors influencing response rates. Some of these factors have already been mentioned earlier in this Chapter. They found that two factors explained 51 per cent of the variance in final response rates. The factors were:

- the number of times the potential respondent was contacted[1] by the surveying organisation;

- the potential respondent's assessment of the relevance of the survey.

Other factors which Herberlein *et al*. (1978) found to influence response (independently of the number of contacts and the perceived relevance of the survey) included the following:

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(1) A diverse range of mail surveys was examined by Herberlein *et al*. (1978). Some employed advance contacts to advise prospective respondents that they were to receive a mailed questionnaire. Others concentrated on 'follow-up' or 'reminder' action after no response had been received to the questionnaire mailing. These contacts were generally by mail, although a few surveys apparently utilised telephone calls at some stage.

- government sponsorship;
- characteristics of the sample chosen for the survey;
- use of a special class of mail or a telephone for a second or third contact;
- use of metered or franked mail on the outer envelope for any postal contact.

All of the above factors are discussed below at greater length, with particular reference to the NTS and other surveys cited in the literature. It should be borne in mind that results of less successful surveys are not as likely to be published and thus made available to other researchers. The literature might therefore present a more optimistic picture than that which applies in reality.

Number of Contacts

Half of the surveys examined by Herberlein *et al*. (1978) involved only one postal contact with prospective respondents. These achieved an average response of 46 per cent (standard deviation 12.4 per cent). A second contact, generally involving the use of a follow-up or reminder procedure, increased response to 62 per cent if another copy of the questionnaire was included. Surveys with a total of three contacts achieved an average response rate of 81 per cent. Additional contacts were found to be of marginal value. Scott (1961) examined the response rates obtained in various surveys conducted by the Government Social Survey Office in Britain. These surveys usually involved particular segments of the population and the high response rates that were achieved are partly attributable to this. In postal surveys of telephone subscribers it was found that use of two

postal reminders[1] resulted in an additional 20 per cent response, raising total response to about 96 per cent. In a survey of poultry and pig farmers, final response was 86 per cent without the first reminder and 93 per cent with the normal Government Social Survey two-reminder procedure. Scott quotes other researchers (Clausen and Ford 1947 and Gray 1957) as finding that the proportion of returns to a reminder mailing was about the same as with the initial mailing.

It should be noted that high response rates such as those quoted by Scott are most likely to be achieved by surveys aimed only at particular sectors of the community. These specialised sectors usually have a direct interest in the results of the survey or in the further developments which may depend on these results. In contrast, the NTS was based on a sample which was designed to be as representative of the general population as possible. The NTS was essentially a two-contact survey[2]. The impact of the second contact on the NTS response rate was significant. The initial response rate averaged 26 per cent at the 'cut-off' time when reminder questionnaires were addressed

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(1) The two reminders normally used in the Government Social Survey consisted of
- a short letter to the non-respondent
- if no response to the first reminder, dispatch of another short letter or slip, together with the original letter, a second questionnaire and another return envelope.

(2) Financial constraints and the limited timescale of the NTS precluded the use of more than one reminder. Reminders were therefore sent only once to those households in the sample which had not replied. (A small number of households were contacted a third time as part of a supplementary home interview survey of a sample of NTS respondents and non-respondents. However, this supplementary survey was aimed at obtaining data on response error and non-response bias, rather than stimulating response to the main survey.) Additional contacts would have been of limited value in the NTS as the ability of potential respondents to recall the details of trips undertaken during the particular survey month would have diminished considerably during the subsequent period.

to those households which had not replied. The average response rate over the twelve months of the survey was 47 per cent, indicating that the reminder procedure had contributed about 20 per cent. The overall response rate was only slightly below that predicted on the basis of response rates achieved during the second NTS pilot survey (Piko 1977). Significantly, the proportion of responses received from the NTS reminder mailing was almost the same as the proportion received from the initial mailing. As mentioned previously, this phenomenon has been noted by other researchers (Clausen *et al.* 1947) and Gray (1957). While the initial response rate of the NTS was lower than most of those discussed in the literature, the effect of using reminder questionnaires appeared to be similar to that reported elsewhere.

Relevance of the Survey

The second most important factor identified by Herberlein *et al.* (1978) as influencing response rate was the potential respondent's assessment of the relevance of the survey. They found that surveys judged to be 'salient', 'possibly salient' or 'non-salient' achieved average response rates of 77 per cent, 66 per cent and 42 per cent respectively. Herberlein *et al.* (1978) also observed that the surveys in their sample which had been published in market research journals (presumably market evaluations of proposed and new consumer products) achieved an average 40 per cent response compared with 62 per cent for university-based surveys, 65 per cent for those appearing in scientific journals and 81 per cent for public health surveys. These were all basically postal surveys although a few utilised telephone contacts during the advance notice or reminder phases.

The degree of relevance attached to the NTS by the sample population is difficult to identify, although the overall response rate was 47 per cent, and an average of only 45 per cent of those households replying had reported travel in excess

of 100 kilometres from home during the particular month nominated in their questionnaires. Data from the supplementary household interview survey concerning non-respondents to the NTS indicate that they undertook significantly fewer trips than respondents. Thirty-six per cent of the non-respondents perceived their response to the NTS, or the survey itself, to be unnecessary or of limited relevance. Many did not appreciate the importance of replying to the survey even when they had not undertaken any travel.

Government Sponsorship

Government sponsorship appears to bring a definite advantage in terms of the ultimate response rate achieved in a survey. Scott (1961) noted that although the letters accompanying British Government Social Survey questionnaires were always worded as a request rather than a demand for information, it did appear that many recipients thought the government had the power to compel response. He conducted an experiment using identical questionnaires but with some covering letters bearing the letterhead of the Government Social Survey and others with the names of either of two non-government organisations. Although response to the government sponsored questionnaires lagged behind the others for the first week (42 per cent compared with 48 and 46 per cent) the dispatch of reminders for all three experiments resulted in a response rate of 93 per cent to the government survey after four weeks from the initial mailing(1). The other experiments resulted in 89 and 90 per cent response.

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(1) The survey related to radio and television. Scott noted that until non-respondents received reminders they may have found it difficult to imagine the Government being interested in their responses to questions on radio and television.

Herberlein *et al*. (1978) also found that government sponsored research achieved higher responses, independently of the number of contacts and relevance of the survey. They estimated the extra response at 12 per cent, assuming equal numbers of contacts and similar relevance to the respondent.

In Australia surveys conducted by the ABS have the authority of the Census and Statistics Act 1905-1973. This Act places an obligation on participants in a survey to answer the questions asked, and guarantees the confidentiality of the data obtained. In practice, individuals have rarely, if ever, been prosecuted for non-response to the Census, and 'under-enumeration' (including non-response) was estimated at only 2.71 per cent in the 1976 Census (ABS 1978a). Surveys conducted by the BTE do not of course have such authority, and no compulsion to reply was suggested in the covering letters issued with NTS questionnaires. Nevertheless, it is likely that government sponsorship of the NTS was a stimulus to response.

Characteristics of the Sample Chosen for the Survey

Surveys of the general population are likely to achieve a lower response rate than surveys of special sub-groups. Herberlein *et al*. (1978) observed that students, employees and military personnel are more likely to return questionnaires than are other groups in the population, such as the unemployed. Scott (1961) noted that non-respondents were more commonly married women. Those with an above average number of children in the household also represented a significant group who did not respond to surveys. Non-respondents also tended to have below average letter writing ability. Hochstim and Athanasopoulos (1970) found that persons reporting no organisational membership and no political activity were less likely to respond by mail, and this also applied to those with low education, job insecurity and no provision for medical care.

The NTS was designed as a survey of Australia's non-institutional population. It has already been mentioned that NTS respondents were more likely to have undertaken a non-urban trip than non-respondents, even though the covering letters accompanying the questionnaire specifically requested householders to reply even if they had not undertaken any trips. A comparison was also made between NTS respondents and the general population (using 1976 Census data) in order to identify differences in age and household income. The NTS and Census distributions for these variables are discussed and presented elsewhere in diagrammatic form (Hirsch *et al*. 1981). It is appropriate here to observe that the deficiency in response to the NTS was most marked in the 15-24 and 25-34 year age groups. In terms of household income, the NTS sample was best represented in the $2000-4000 and above $8000 categories, with deficiencies in the low income and $6000-8000 categories. It was also notable that response was relatively lower from remote areas, a point also noted by Scott (1961) in his survey of the literature.

Special Procedures for Later Contacts

Contacts which show some special attention and greater expense and effort by the investigator seem to increase the sense of importance of the survey (Herberlein *et al*. 1978). Hence the use of special deliveries, certified mail, telephone calls and personal contacts for the second or third contact increases response rates. However, these methods could not be used for the second contact in the NTS because of financial considerations.

Use of Metered or Franked Mail

Similarly, the use of metered or franked mail on the outer envelope may be perceived as an indicator of importance, since respondents may associate the use of this form of postage with governmental or other 'official' research sponsorship.

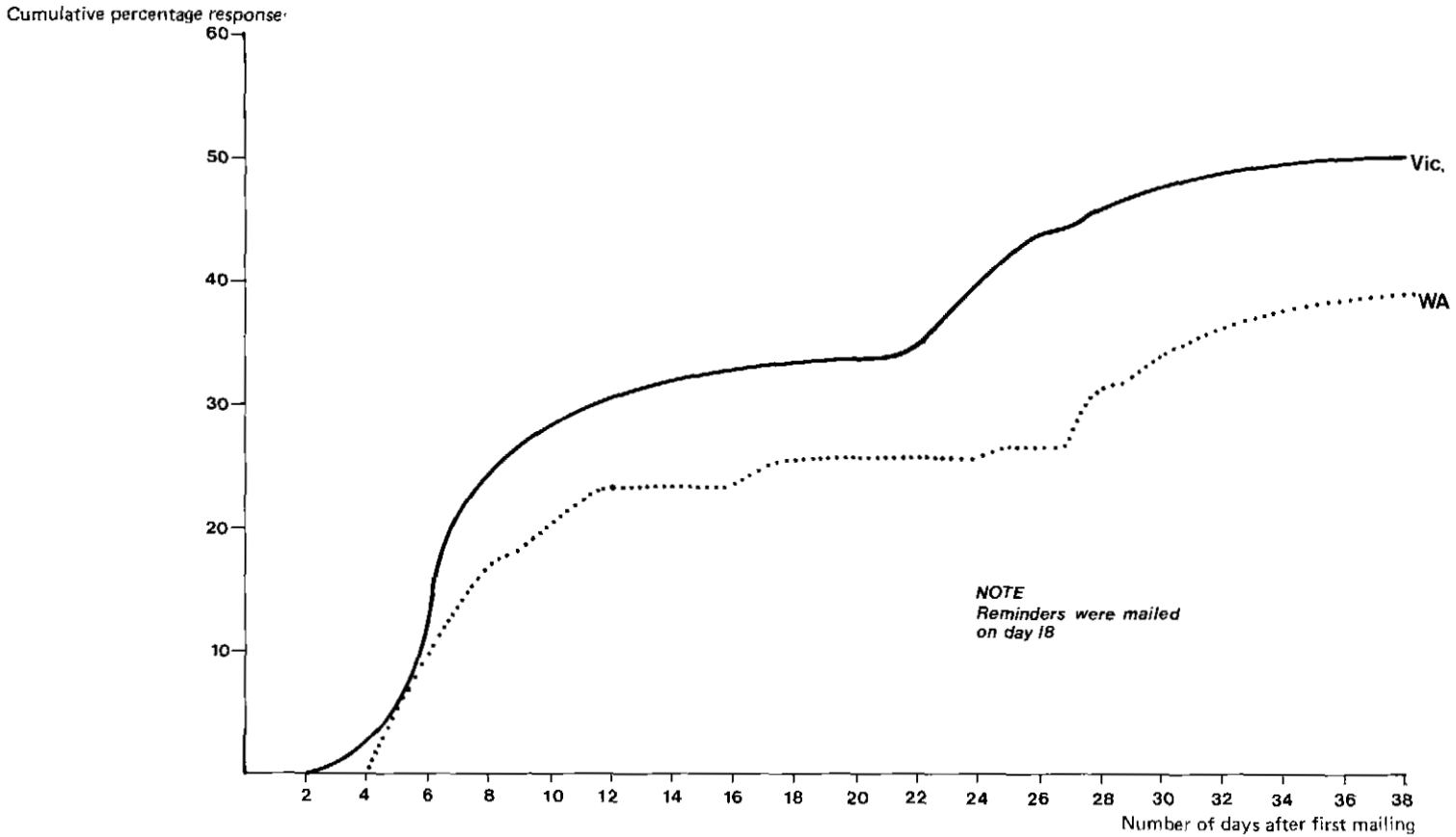

Figure 3.2
Variation of response between states –
cumulative percentage response for April 1977 for Victoria and Western Australia

Length of the Questionnaire

Surprisingly, the length (as opposed to the difficulty) of a questionnaire apparently has very little effect, if any, on the response rate to a survey (for more details see Scott 1961 and Herberlein *et al*. 1978). Rather than use a crowded layout it is better to spread the questions out, even at the expense of using an extra page.

PUBLIC RESPONSE TO THE NTS

Since reponse to the NTS was voluntary, the covering letter mailed with the questionnaires was designed to convince potential respondents that the survey was worthwhile. However, in view of the nature of the survey, a high response rate was not expected. The response rate of 47 per cent achieved was considered quite satisfactory. The response rate varied from State to State as Figure 3.2 illustrates for Victoria and Western Australia for a particular survey month. This Figure also shows the effect of reminders on the response curve; without reminders an overall response rate of approximately 30 per cent would have been achieved. The three to six day delay between the rise in the response rate for Victoria and for Western Australia resulted partly from the additional postal delays associated with mail to Western Australia. Table 3.1 contains the total response rates of each NTS region and State. The effect of seasonality on response rate could not be evaluated since it was swamped by the effect of various mail strikes throughout the survey and unexpected delays during the first two month's operation of the survey.

Very few direct complaints were received from the public about the NTS. In fact, of the 93 475 householders contacted, only ten wrote directly to the BTE to complain about the NTS, and another four wrote to their Members of Parliament. Approximately 880 householders returned the questionnaire without completing

it, and a further 100 completed the questionnaire but commented adversely on the survey. In all, one per cent of all householders contacted made some sort of complaint about the NTS.

As was anticipated, one or two questions proved more sensitive than other parts of the questionnaire. The question relating to total household income was not completed by 8 per cent of all respondents, but of these only 150 bothered to formalise their objection by way of comment. In fact, this question did not appear to be as sensitive as expected. Respondents also tended to be more reluctant to state their age than any other personal characteristic.

LESSONS LEARNT FROM THE NTS

Even though the NTS was planned as carefully as possible, a number of problems in the design of the NTS and its operation only became apparent during the course of the survey. These problems are outlined below and may be of assistance in planning future surveys.

The first problem is the obvious one of postal disruptions. While several minor mail strikes occurred throughout the survey, only one was sufficiently long enough to significantly affect the rate at which completed questionnaires were received. This was a two week strike in March 1978 affecting all mail coming into and leaving N.S.W. and the A.C.T. Figure 3.3 is a plot of the cumulative response obtained for Victoria during the survey months of September 1977 and February 1978(1). It illustrates the effect of a prolonged mail strike on survey response. In fact, the overall response rate for February was

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(1) Since the questionnaires were mailed at the end of the month being surveyed, a mail strike in March had most effect on returns for February.

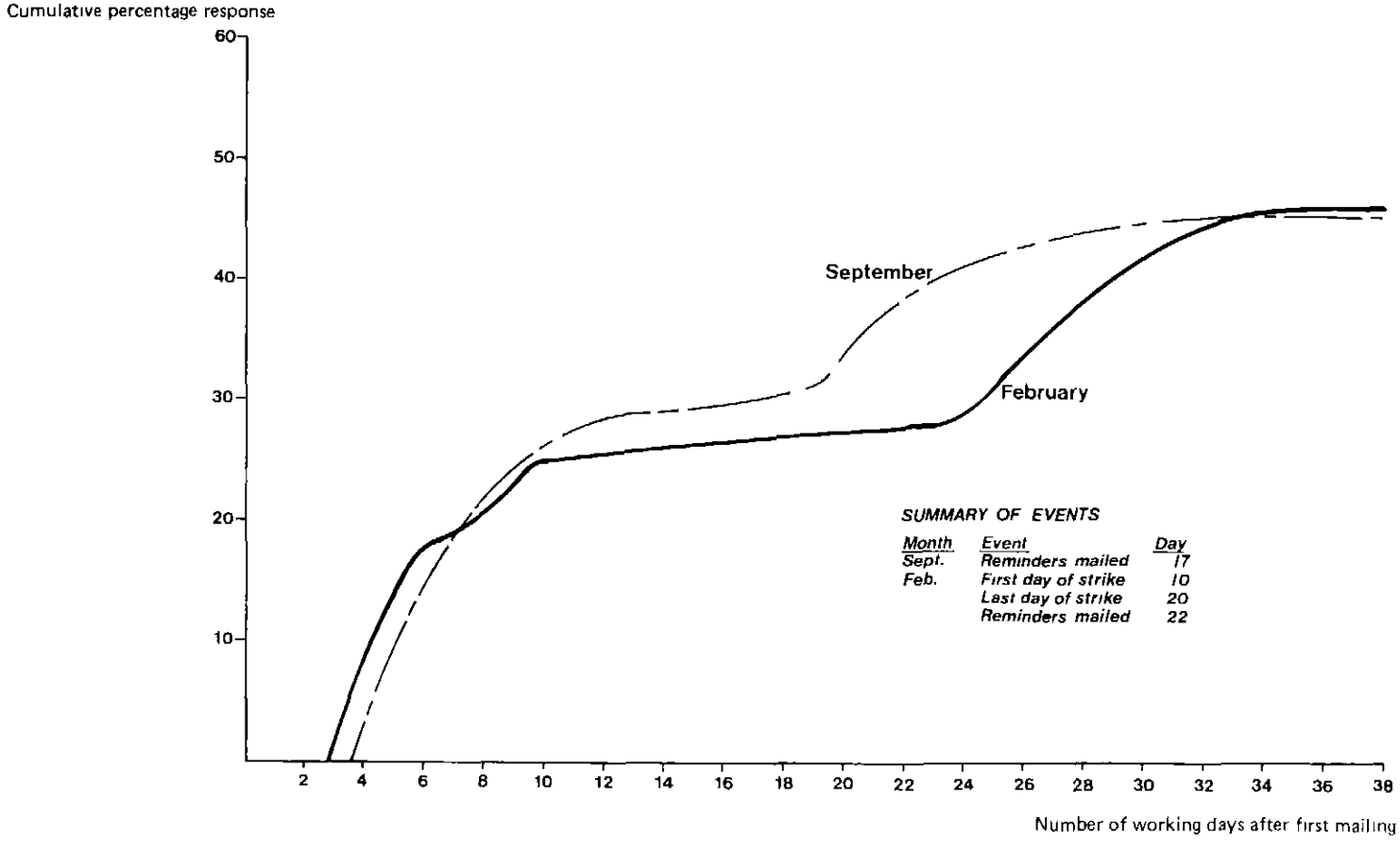

Figure 3.3
Effect of a mail strike on survey response — cumulative percentage response for Victoria for September 1977 and February 1978

not significantly lower than that for any other month. While this mail strike does not appear to have decreased the reponse rate, it did delay the mailing of reminders and the return of questionnaires. A delay in the receipt of reminders of respondents may have decreased the accuracy of trip information recorded on the questionnaires, since the recall period has been lengthened. However, it was not possible to measure the effect of this delay quantitatively.

The recall period was also extended to some extent during the first month of operation of the survey. This was caused by minor organisational difficulties, even though considerable thought had gone into planning the smooth operation of the NTS. This emphasised the desirability, in a survey of the magnitude of the NTS, to pilot test every phase of the operation of the survey and its processing, as well as the usual pilot tests of questionnaire design and response rates.

The sample for the second pilot survey was taken from Melbourne, Canberra and the Southern Tablelands area of N.S.W. The response rates obtained from this survey were used when deciding the sampling rates needed in the main survey to obtain a specified number of returns. However, at the conclusion of the NTS it was obvious that some rural areas had been undersampled, in particular those in the more remote parts of Australia. This difference in response rates also occurred in the second pilot survey, but was given insufficient weight when deciding sampling rates for the main survey.

Even though the questionnaire was extensively pilot tested, the final design used for the NTS questionnaire was not without its problems. First, it was not sufficiently emphasised that only details of travel in a particular month was required. Analysis of returns of respondents interviewed in the supplementary survey indicated that respondents tended to overstate the number of trips made in certain areas. In particular, this situation occurred in those cases in which the date on which the trip ended

was not specified (5 per cent of all trips made). Apparently a number of respondents included details of all non-urban trips made in the recent past or in the previous twelve months, rather than just those made in the particular survey month. Similarly, the questionnaire did not sufficiently emphasise that gross household income, not net income, was required. A further difficulty with the income question was that the income categories used for the NTS were not compatible with those used by the ABS in the last Census. However this situation was unavoidable since the BTE requested household income, while the ABS requested personal income. A number of more specific problems with the NTS questionnaire design are discussed by Hirsch *et al*. (1981).

If, for the supplementary interview survey, larger sample sizes had been selected in a number of rural areas, the accuracy of the adjustment factors for non-response bias could have been improved considerably. Performing appropriate statistical tests on the results from the first three months of the survey would have allowed the determination of a preliminary set of regional aggregations. As a result it may have been possible to ensure that sufficient non-respondents were sampled for interview from as many of these aggregations as the financial constraints allowed. In other words the distribution of the interview sample could possibly have been optimised to achieve more accurate adjustment factors given the overall constraints on the supplementary interview survey.

Although a number of difficulties with the design and operation of the NTS have been outlined above, none of these difficulties presented overwhelming problems in the analysis of the survey data. It is not clear that all of these difficulties could have been alleviated in any case given the practicalities involved in carrying out the survey within a given timescale. However they have been highlighted above and in more detail by Hirsch *et al*. (1981) as a guide in planning related surveys on such a large scale.

CHAPTER 4 - DISCUSSION OF RESULTS

The NTS was designed to cover various aspects of non-urban travel in Australia. In addition to travel parameters such as mode, duration of travel and accommodation used, information was also collected on various household and personal characteristics (such as household income and ages of household members) considered to be influential in determining travel patterns. The survey also permitted some degree of analysis of seasonal and regional variations in travel behaviour. Hence the scope of the survey permits detailed analyses of many different aspects of non-urban travel in Australia. This Chapter presents only a general overview of the characteristics of non-urban travel as determined from analysis of the NTS data(1). It should be noted that the results presented in this Report and the discussion based on these results refer only to types of travel covered by the NTS as defined in Chapter 2. In particular the minimum distance criterion involving travel to a place 100 km or more from home should be borne in mind. The discussion presented here includes the effect of household and personal characteristics on travel parameters and the variation of these parameters with the month of travel and the State in which the travel was generated. The characteristics of travel both to the capital cities and to several major tourist areas are compared with the characteristics of travel in general. Finally, comments volunteered by respondents to the NTS concerning travel in Australia are summarised.

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(1) During the course of the NTS a number of Occasional Papers have been prepared detailing the planning and conduct of the NTS and presenting both preliminary and final results in a significant amount of detail (Aplin *et al*. 1976a, Moll 1978, Moll *et al*. 1978, Hirsch and Aplin 1978a, b, Hirsch 1978, 1979b and Hirsch *et al*. 1981). These references should be consulted for further quantitative detail and more extensive discussion.

It should be noted that the term 'trip' as used in the following discussion refers to a 'person-trip'. Estimates of numbers of trips presented in this Chapter refer to the trips made by the population as a whole, rather than the number made by survey respondents alone. The estimates were produced by adjusting the survey results as outlined in the previous Chapter. Since non-respondents to the NTS had a considerably lower trip generation rate than respondents, the adjusted trip levels tend to be lower than those which are calculated directly from the NTS data. The adjustment factors presented in Tables 3.3 and 3.4 give an indication of the degree of reduction. Given the variety of information gathered in the NTS, a wide range of tabulated results can be generated. This Chapter contains a selection of tables of general interest, and discusses the results reflected in these tables. A more complete set of tables, together with relative errors for the estimates given in the tables, has been presented by Hirsch *et al*. (1981). The tables included in this Chapter contain the number of trips made by all households in Australia, tabulated by various household, personal and trip characteristics. As well, the distribution of trips (in terms of trip proportions) for each of these characteristics has been included. For example, Table 4.1 contains the distribution of trips over household income and household size. Table 4.1 also contains the trip generation rate of households in each of the various household income and size categories. Table 4.2 contains the modal split of trips made over the survey period categorised by age of traveller.

DEFINITION OF TERMS

Before discussing the results from the NTS, it was considered appropriate to define some of the terms used in the following Sections. First, it should be noted that NTS respondents were asked to specify all modes of travel, and to indicate which was the main mode of travel. The discussion in this Chapter refers to the main mode of travel or, if the main mode was not indicated, the first mode specified. The same applies to the stated reasons for travel.

TABLE 4.1 - TRIP PROPORTIONS BY INCOME AND HOUSEHOLD SIZE - 1977-78

Income Group	Household Size											Total	Average Trips /H'hold	Relative Error(a)
	1	2	3	4	5	6	7	8	9	Over 9	Not Stated			
$0-2000	0.001	0.003	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.558	0.119
$2001-4000	0.012	0.012	0.002	0.003	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.032	0.401	0.057
$4001-6000	0.004	0.025	0.007	0.007	0.004	0.001	0.001	0.000	0.002	0.000	0.000	0.052	0.646	0.056
$6001-8000	0.005	0.019	0.014	0.016	0.011	0.006	0.002	0.000	0.000	0.000	0.000	0.073	0.959	0.047
$8001-10000	0.008	0.025	0.022	0.035	0.017	0.008	0.002	0.001	0.000	0.000	0.000	0.118	1.112	0.039
$10001-15000	0.009	0.043	0.043	0.078	0.050	0.015	0.005	0.003	0.001	0.000	0.000	0.249	1.343	0.034
$15001-20000	0.003	0.038	0.032	0.050	0.033	0.016	0.004	0.002	0.001	0.000	0.000	0.179	1.500	0.036
$20001-25000	0.001	0.020	0.019	0.034	0.023	0.010	0.004	0.002	0.001	0.000	0.000	0.114	1.744	0.046
$25001-30000	0.001	0.008	0.007	0.014	0.013	0.006	0.003	0.002	0.001	0.000	0.000	0.055	1.815	0.057
Over $30000	0.001	0.008	0.009	0.017	0.016	0.012	0.004	0.002	0.001	0.001	0.000	0.071	2.183	0.057
Not stated	0.003	0.010	0.008	0.013	0.007	0.004	0.001	0.000	0.001	0.000	0.000	0.049	0.762	0.062
Total	0.048	0.212	0.165	0.269	0.175	0.078	0.028	0.013	0.008	0.002	0.002	1.000		
Avg. Trips H'hold	0.351	0.813	1.228	1.606	1.954	2.172	2.455	2.574	3.119	2.762	0.209			
Relative Error(a)	0.066	0.040	0.045	0.043	0.052	0.075	0.115	0.154	0.285	0.269	0.322			

(a) Relative error is defined as the ratio of the standard error of the estimated proportion to the value of the estimated proportion.

Source: National Travel Survey 1977-78.

TABLE 4.2 - PERSON-TRIPS ('000) BY AGE OF PERSON TRAVELLING AND VEHICLE TYPE - 1977-78

Age of Person Travelling (Yrs)	Vehicle Type									Total	Proportion
	Aircraft	Bus	Car	Truck	Motorcycle	Ship	Train	Other	Not Stated		
0-16	391	347	12 576	196	8	28	283	43	94	13 966	(0.238)
17-24	346	213	6 561	153	126	27	199	36	60	7 721	(0.131)
25-32	348	48	4 664	291	34	4	74	14	33	5 510	(0.094)
30-34	384	62	4 339	322	6	3	92	19	76	5 303	(0.090)
35-39	359	56	3 495	243	1	10	41	12	22	4 238	(0.072)
40-44	345	40	3 051	188	5	6	55	65	37	3 791	(0.065)
45-49	300	55	3 021	157	2	6	55	20	42	3 658	(0.062)
50-54	394	64	3 249	124	0	2	121	31	36	4 022	(0.068)
55-59	257	67	2 414	67	0	3	82	25	34	2 949	(0.050)
Over 60	411	356	4 039	46	2	9	488	20	87	5 458	(0.093)
Not stated	96	57	1 807	36	3	0	67	9	33	2 108	(0.036)
Total	3 632	1 365	49 216	1 823	188	98	1 557	291	555	58 725	
(Proportion)[a]	(0.062)	(0.023)	(0.838)	(0.031)	(0.003)	(0.002)	(0.027)	(0.005)	(0.009)		

(a) Note that total of proportions may not be unity due to rounding.

Source: National Travel Survey 1977-78.

Unless otherwise specified, the term 'Business' trip will apply in the following to any trip classified as 'Other business' in the NTS questionnaire. It excludes travel undertaken for the purpose of delivering freight. Trips made to deliver freight do not include those made as a crew member of a bus, train, aircraft or ship. Trips classified under 'Personal affairs' include, for example, those made to consult lawyers, medical practitioners or other professional persons, to go shopping, to take a child to boarding school, and so on.

The term 'Other' when applied to accommodation refers to holiday flats, cabins, and cars or trucks (that is, travellers sleeping in their vehicles by the roadside).

The calculated travel distances are great circle distances between the population centroids of the origin and destination LGAs, since detailed travel route specifications were not requested on the NTS questionnaire(1). Hence accurate calculations of actual travel distances could not be made with the resources available for the NTS.

GENERAL RESULTS

After adjusting the NTS data for non-response bias, it was estimated that 58.7 million trips (satisfying the previously specified criteria) were made in Australia from July 1977 to June 1978. Each household in Australia generated an average of 1.18 non-urban trips each month, or 14.11 non-urban trips in the year of the survey.

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(1) Consideration was given to this question when planning the NTS. However, the increased complexity which would have been imposed on the questionnaire design militated against this information being sought.

A considerable volume of published literature indicated that a number of household and personal characteristics were influential in determining non-urban travel patterns. This influence was also apparent in the results from the NTS, some of which are discussed in the remainder of this Chapter.

Household Characteristics

Three household characteristics were examined to determine their effect on non-urban travel patterns. These characteristics were:

- household income;
- household size;
- the number of vehicles available for use by household members.

It was found that the trip generation rate (that is, the average number of trips undertaken per household per month) increased as the income of the household increased (see Table 4.1). The only exceptions were those households with incomes of less than $2000. The trip generation rate of households in this category was considerably higher than that of households with an income from $2001 to $4000[1].

Household size had a similar effect on trip generation rates. As the household size increased, the trip generation rate also tended to increase (Table 4.1). However, the average number of trips made by each member of a large household (that is, one

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(1) The sample size on which the trip generation estimate for households with incomes less than $2000 was based was rather less than the sample sizes for the other income categories. However, notwithstanding the higher error of the estimate for households with a total annual income of less than $2000, the higher trip generation rate for these households is statistically significant at the 5 per cent level.

containing five or more persons) was actually less than the average number of trips made by members of households containing two to four persons. For example, the trip generation rate of a household containing four persons was 1.61 trips per household per month or 0.40 trips per person per month. Similarly, a household containing six persons had a trip generation rate of 2.17 trips per person per month. In other words, each member of a household containing four persons made an average of 0.40 trips each month, while each member of a household containing six persons made an average of 0.36 trips each month.

If the distributions of households and trips over vehicle availability are compared (see Hirsch *et al.* 1980), it is obvious that as the number of vehicles available to members of a household increased, the trip generation rate of the household also increased, at least for households having up to four vehicles.

Personal Characteristics

Two personal characteristics were examined for their effect on non-urban travel patterns. These were:

- age of each person travelling;
- occupation of each person travelling.

The distribution of the number of trips by age of traveller (see Table 4.2) was compared with the age distributions of the survey sample and the population (ABS 1978b). From this it was evident that persons aged less than seventeen or more than sixty generated fewer trips per capita than the average for the population as a whole. The trip generation rates of the rest of the population did not appear to vary significantly for different age groups.

The same method was used to gain some estimate of the trip generation levels of persons in various occupation categories (Table 4.3). Professional, managerial, clerical, sales and transport workers generated relatively more trips than the average for the population. In contrast students and retired persons generated relatively fewer trips than the average for the population in line with the observation concerning the travel propensities of persons aged less than seventeen years and over sixty years respectively.

Travel Characteristics

The NTS obtained information on a number of characteristics associated with non-urban travel. Those discussed in this Report include:

- mode(s) of travel;
- reason(s) for travel;
- number of nights spent at the main destination of the trip;
- accommodation used;
- distance travelled.

Of the estimated total of 58.7 million trips made in Australia between July 1977 and June 1978, 49.2 million, or approximately 84 per cent, involved the car as the main mode of travel (Table 4.2). This result is not particularly surprising in view of the large private and public investment in road transport. A car is often the most convenient mode of travel, since it has the flexibility to allow both deviations to be made along the route and to provide transport at the destination. Although fuel costs have increased substantially since that time in 1977-78 the car would still have been regarded as the cheapest form

TABLE 4.3 - PERSON-TRIPS ('000) BY OCCUPATION OF PERSON TRAVELLING AND TRIP PURPOSE - 1977-78

Occupation of Person Travelling	Trip Purpose								Total	(Proportion)[a]
	Deliver Freight	Other Business	Visiting Friends	Recreation	Holiday	Personal Affairs	Other	Not Stated		
Employed										
-Professional	73	1 342	1 769	1 314	1 085	829	352	37	6 801	(0.116)
-Managerial	73	1 099	451	416	422	266	113	19	2 858	(0.049)
-Clerical	25	318	1 201	870	821	455	221	18	3 929	(0.067)
-Sales worker	145	935	598	513	383	278	111	19	2 983	(0.051)
-Farmer	118	600	265	162	133	369	120	17	1 786	(0.030)
-Miner	0	11	14	9	17	15	4	0	69	(0.001)
-Transport and Communication	672	174	368	278	251	211	63	12	2 030	(0.035)
-Tradesman	164	594	1 442	1 142	932	618	324	57	5 272	(0.090)
-Service	15	319	540	334	261	265	96	10	1 840	(0.031)
-Not stated	65	358	458	267	274	186	97	18	1 723	(0.029)
Looking for work	14	62	279	171	112	176	92	6	912	(0.016)
Retired	14	202	1 572	689	654	699	174	103	4 105	(0.070)
Student	88	751	3 069	2 671	2 849	1 375	574	91	11 469	(0.195)
Home-duties	78	669	2 487	1 469	1 537	1 402	408	57	8 108	(0.138)
Other	55	320	1 689	776	829	591	250	25	4 534	(0.077)
Not stated	16	38	98	35	44	34	29	10	305	(0.005)
Total	1 614	7 793	16 301	11 117	10 604	7 769	3 028	500	58 725	
(Proportion)[a]	(0.027)	(0.133)	(0.278)	(0.189)	(0.181)	(0.132)	(0.052)	(0.009)	(1.000)	

(a) Note that total of proportions may not be unity due to rounding.

Source: National Travel Survey 1977-78.

of transport in many situations[1]. A further 3.63 million trips (6.2 per cent) were made by aircraft. An attempt to compare this figure with official civil aviation statistics was made, but difficulties were encountered in locating compatible figures for comparisons. This problem is discussed in more detail by Hirsch *et al*. (1980). However, it does appear that the NTS estimate is somewhat lower than the civil aviation figures. The remaining 5.9 million trips were undertaken by bus, truck or train in almost equal proportions. Motorcycles, ships and other vehicles were used to a comparatively minor degree on the non-urban trips considered in the NTS.

The NTS indicated that some 28 per cent of all non-urban trips were made to visit friends or relatives (Table 4.3). Holiday trips and trips made for sightseeing or recreational purposes each comprised a further 18 or 19 per cent of all trips made in 1977-78. An additional 13 per cent of all trips were business trips, with a similar percentage undertaken for personal affairs. Not surprisingly, the proportion of all trips made to deliver freight (excepting those made as a crew member of a bus, train, aircraft or ship which were excluded from the survey) only accounted for 3 per cent of all trips made in 1977-78.

The NTS indicated that almost 33 per cent of all non-urban trips were day trips and did not involve any overnight stops at the main destination (Table 4.4). Overall, most trips were of short duration, a further 31 per cent involving no more than two nights spent away from home. More than seven nights were spent at the main destination on only 11 per cent of trips. Of those trips involving at least one night's stay at the main destination,

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(1) Most households purchase a car for day-to-day use from their place of residence. Hence the cost of purchasing and maintaining a car tends not to be attributed to any non-urban travel undertaken in the car.

TABLE 4.4 - PERSON-TRIPS ('000) BY DURATION AT MAIN DESTINATION AND ACCOMMODATION - 1977-78

Duration at Destination (Nights)	Accommodation						Total	(Proportion) [a]
	Hotel or Motel	Friends Home	Caravan or Tent	Other	Not Stated	Not Applicable		
0	-	-	-	-	-	19 073	19 073	(0.325)
1	2 518	3 778	831	876	63	-	8 066	(0.137)
2	2 033	5 214	1 638	1 280	100	-	10 265	(0.175)
3-7	2 855	6 690	2 387	1 421	114	-	13 467	(0.229)
8-14	747	2 063	871	803	63	-	4 547	(0.077)
15-28	136	731	366	291	31	-	1 554	(0.026)
29-56	35	180	65	69	30	-	379	(0.006)
Over 56	16	21	11	17	10	-	76	(0.001)
Not stated	101	273	94	206	623	-	1 298	(0.022)
Total	8 441	18 951	6 262	4 963	1 035	19 073	58 725	
(Proportion) [a]	(0.144)	(0.323)	(0.107)	(0.085)	(0.018)	(0.325)		

(a) Note that total of proportions may not be unity due to rounding.

Source: National Travel Survey 1977-78.

a friend's or relative's home was used for accommodation on almost half of these trips (Table 4.4). This observation tends to be consistent with the relatively large proportion of all trips which were made to visit friends and relatives. Hotels and motels proved to be the next most popular choice of accommodation, accounting for some 21 per cent of trips involving accommodation at the destination. Caravans and tents provided accommodation on a further 16 per cent of trips involving overnight stops at the main destination.

Non-urban trips also tended to be generally quite short. As Table 4.5 illustrates, some 75 per cent of all trips appear to have been less than 300km in length (one way). However, some care must be taken when interpreting the figures in this table since:

- the distances were calculated on the basis of population centroids of LGAs rather than specific places;

- the distances calculated were great circle distances, which can be considerably different from the route distances of land-based modes and are invariably somewhat smaller;

- NTS respondents sometimes included trips that were slightly shorter than the 100km limit specified on the NTS questionnaire.

VARIATION OF TRAVEL BETWEEN STATES AND TERRITORIES

Travel generated in each State and Territory was analysed to highlight any significant differences in the characteristics of travel generated in various parts of Australia. The first major difference observed concerns the overall trip generation rate for each State and Territory for 1977-78. As Table 4.6 illustrates, these trip generation rates varied considerably. It is interesting to note that this variation was reflected by

TABLE 4.5 - PERSON-TRIPS ('000) BY DISTANCE AND VEHICLE TYPE - 1977-78

Distance (km)	Vehicle Type									Total	(Proportion)(a)
	Aircraft	Bus	Car	Truck	Motorcycle	Ship	Train	Other	Not Stated		
Intra-LGA	13	8	554	60	4	1	2	9	7	659	(0.011)
0-100	39	323	16 634	586	60	39	348	72	182	18 282	(0.311)
101-150	65	285	10 224	345	26	12	259	26	119	11 360	(0.193)
151-200	36	88	5 566	211	22	8	148	51	68	6 198	(0.106)
201-300	236	181	6 772	220	30	12	185	24	49	7 708	(0.131)
301-400	266	157	3 016	76	7	4	108	19	22	3 674	(0.063)
401-600	501	101	2 324	61	7	2	193	20	19	3 229	(0.055)
601-800	1 090	68	1 788	123	10	2	193	19	33	3 325	(0.057)
801-1000	193	18	561	25	11	1	37	19	11	875	(0.015)
Over 1000	1 194	136	1 777	115	13	19	84	32	46	3 416	(0.058)
Total	3 632	1 365	49 216	1 823	188	98	1 557	291	555	58 725	
(Proportion)(a)	(0.062)	(0.023)	(0.838)	(0.031)	(0.003)	(0.002)	(0.027)	(0.005)	(0.009)		

(a) Note that total of proportions may not be unity due to rounding.

Source: National Travel Survey 1977-78.

similar variations in the durations of stay at the main destinations and in the distances travelled. If a relatively large number of trips per household were generated in a State or Territory those trips tended to involve longer stays at the main destination as well as greater travel distances.

The most notable variations in modal parameters occurred in the A.C.T. and the N.T. From the 1976 Census (ABS 1978c) it is apparent that the income of A.C.T. households is on average higher than that of the population as a whole. Since air travel is generally the most expensive method of travel within Australia, it seems likely that, in comparison with persons on lower incomes, persons with higher incomes will tend to choose the convenience and speed offered by air travel at the increased cost. In fact, 12 per cent of trips from the A.C.T. were made using aircraft, while only 6 per cent of trips generated in Australia as a whole were made by air. Figure 4.1 shows the modal split of travel in the A.C.T., N.T. and the rest of Australia. The high proportion of air travel from the A.C.T. (and the even higher proportion from the N.T.) in comparison with other areas is indicated. The high proportion of air travel in the N.T. was due to a large extent to the high proportion of business trips in the N.T. and the characteristics of the N.T. generally associated with its 'remoteness'. The high proportion of business travel was also reflected in an increased number of trips in the N.T. having been paid for by employers, and an increased number of persons travelling alone. Both these characteristics tend to be typical of business travel.

EFFECT OF HOLIDAY PERIODS

The NTS was designed to cover a full twelve month period so that the effect of variations in travel patterns over a year could be examined. The main factors causing these variations in travel patterns were found to be the school and university holidays. During the NTS the school and university holidays occurred during

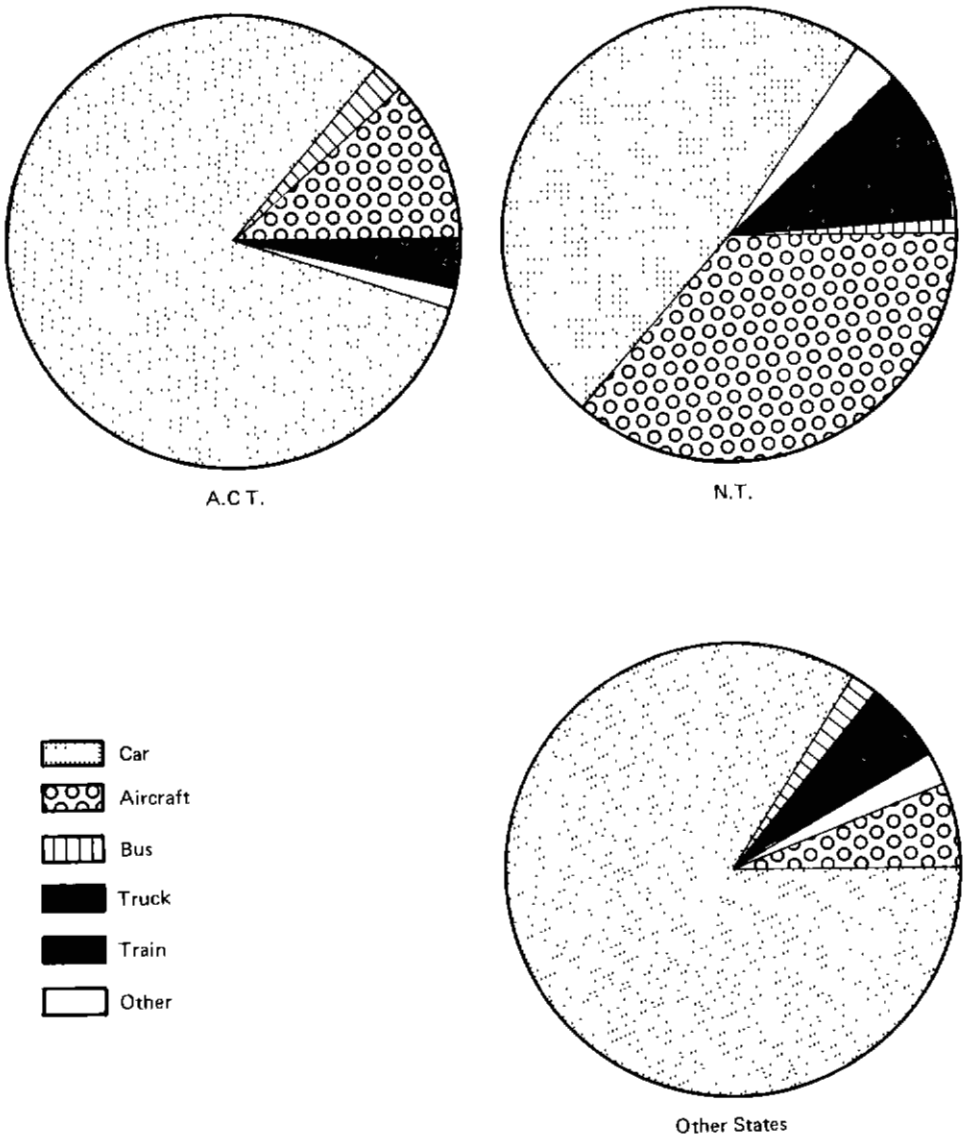

Figure 4.1
Variations in trip proportions by vehicle type and State or Territory 1977-78

TABLE 4.6 - TRIP GENERATION LEVELS BY STATE AND TERRITORY - 1977-78

State		Number of Trips Generated ('000)	Trip Generation Rate (Person-Trips/ Household/Month)
Australian Capital Territory	A.C.T.	866	1.270
New South Wales	N.S.W.	18 567	1.038
Victoria	Vic.	18 423	1.369
Queensland	Qld	9 878	1.376
South Australia	S.A.	4 548	0.971
Western Australia	W.A.	3 650	0.853
Tasmania	Tas.	2 549	1.744
Northern Territory	N.T.	245	0.892
Australia		58 725	1.176

Source: National Travel Survey 1977-78.

the months of August, September, December, January, February and May[1]. These months will be referred to as 'holiday' months for the purposes of the following discussion. The effect of Easter, which fell during March in 1978 was also quite marked.

(1) It should be noted that the discussion here is based on the results for the twelve months from July 1977 to June 1978. However, the assumption is made in discussing the NTS results for a particular month or period that the period in question is typical of other years as well and that the relative effects which are highlighted also appear in other years.

The most noticeable effect of the school and university holidays was, obviously, the increase in holiday travel, especially during January (which is the only month representing a holiday month in all parts of Australia). Figure 4.2 shows the distributions of purpose of travel during December 1977, January 1978 and the other months of the survey combined. As Figure 4.2 illustrates, the percentage of holiday trips doubled during January. The comparatively large number of people spending Christmas with relatives is reflected in the marked relative increase in the number of trips made to visit friends and relatives during December. It is also interesting to note that the proportion of trips made to deliver freight remained reasonably constant throughout the year. A further noteworthy effect which was observed in connection with the Christmas holidays was that NTS respondents appeared to be undertaking a higher rate of business travel in the two months prior to Christmas. This was evident from the increased number of business trips made in October and November, with a corresponding decrease in the number of these trips undertaken in December and January.

Figure 4.3 indicates the distributions of trip duration for travel during January, February and March and for the remaining months aggregated. Trips tended to extend over a much longer duration throughout the holiday months. Of all trips ending in January 1978, for example, 30 per cent involved at least eight nights away from home, compared with only 12 per cent of trips during the rest of the year, as Figure 4.3 illustrates. During March the proportion of trips involving three to seven nights away from home increased considerably, since it may be presumed that many people spent Easter away from home. The distribution of the duration of trips in February should also be noted. During this month there was an increase in the proportion of trips involving eight to fourteen nights away from home, and a large decrease in the proportion of trips involving three to seven nights away from home.

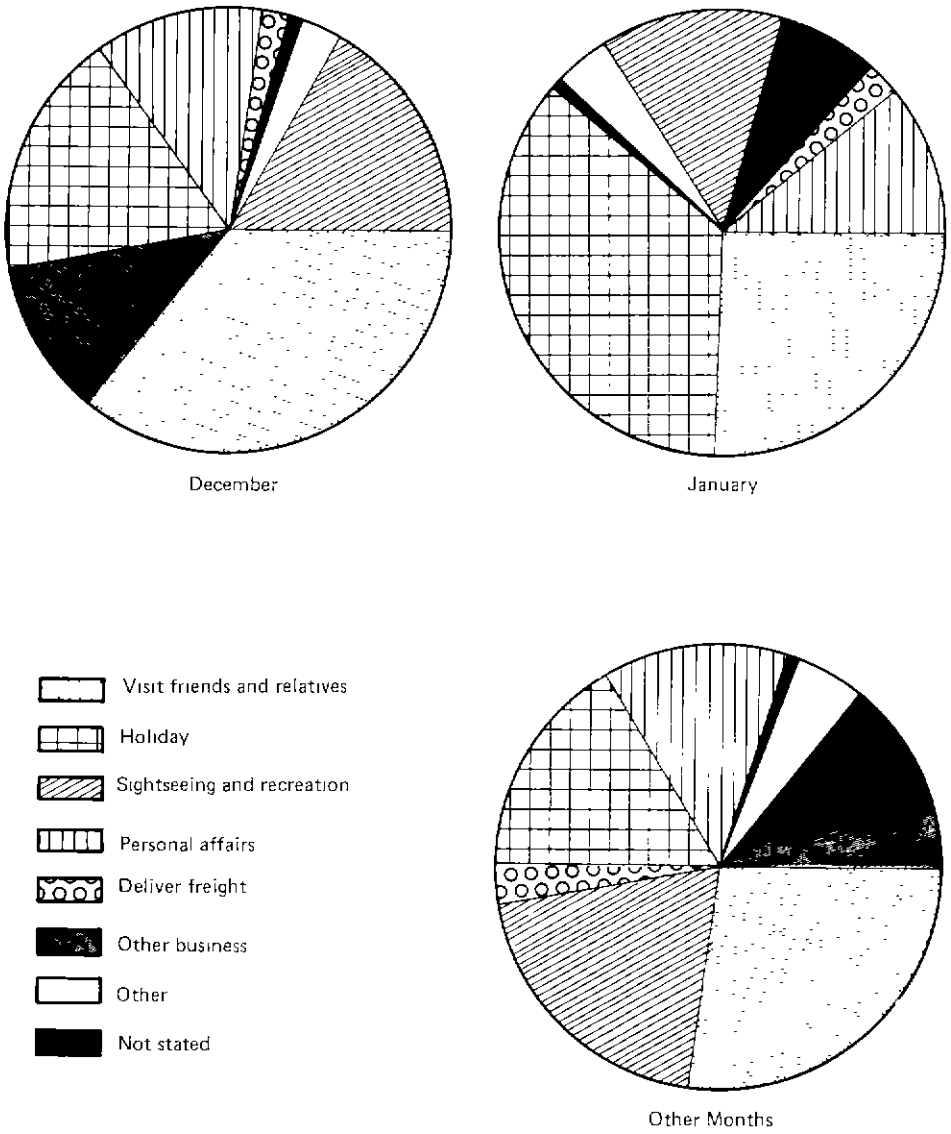

Figure 4.2
Variations in trip purposes by month 1977-78

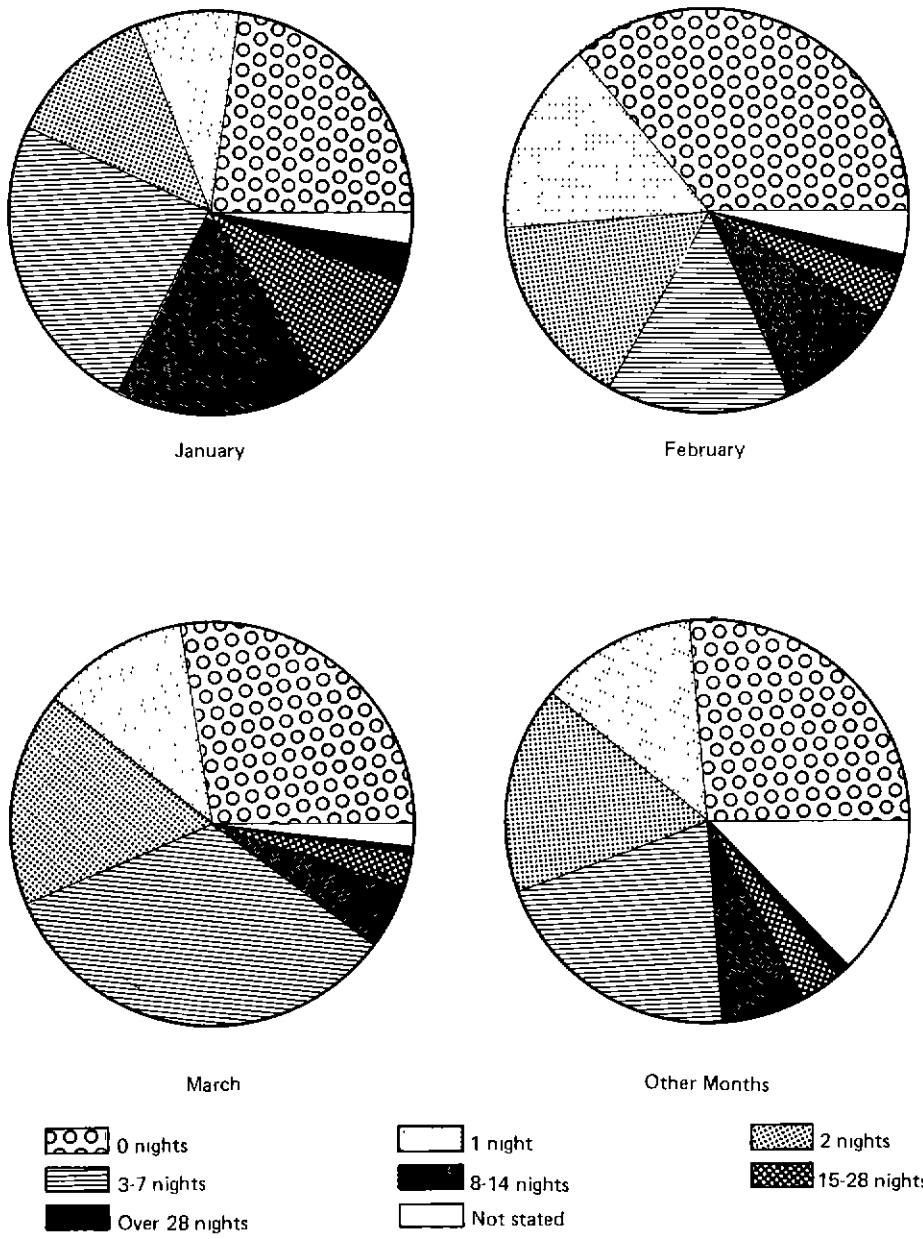

Figure 4.3
Variations in the duration of trips by month 1977-78

During January the proportion of trips involving use of caravans, tents, holiday flats and cabins for accommodation increased considerably, while the proportion of trips involving use of hotels and motels for accommodation decreased(1). This situation is illustrated diagrammatically in Figure 4.4 which shows the distributions of accommodation used on travel during a number of months of the survey. Caravans and tents were a more common form of accommodation during the main summer months. Since the main purpose of travel during December was to visit friends and relatives, it is not surprising to discover that staying at a friend's or relative's home represented a higher proportion of accommodation used than in the remainder of the year. However, Figure 4.4 also shows that friends or relatives homes clearly represent the highest proportion of all accommodation used throughout the year.

The influence of the holiday periods and the Easter period on some other travel parameters is illustrated in Table 4.7. Trip generation rates tended to increase during the holiday months. The proportion of car travel also increased, no doubt because of the factors mentioned above (perceived cost, convenience and flexibility). It is also noticeable from Table 4.7 that large party sizes tended to be increasingly represented in these holiday periods.

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(1) The decrease in the number of trips involving use of hotels or motels is not as great as the decrease in the proportion, since more trips are made during January. It should also be remembered that NTS respondents were only asked to specify the accommodation used at the main destination, but were not asked to specify any accommodation used while travelling. It is probable that use of hotels and motels for accommodation on route also varies with the month of travel.

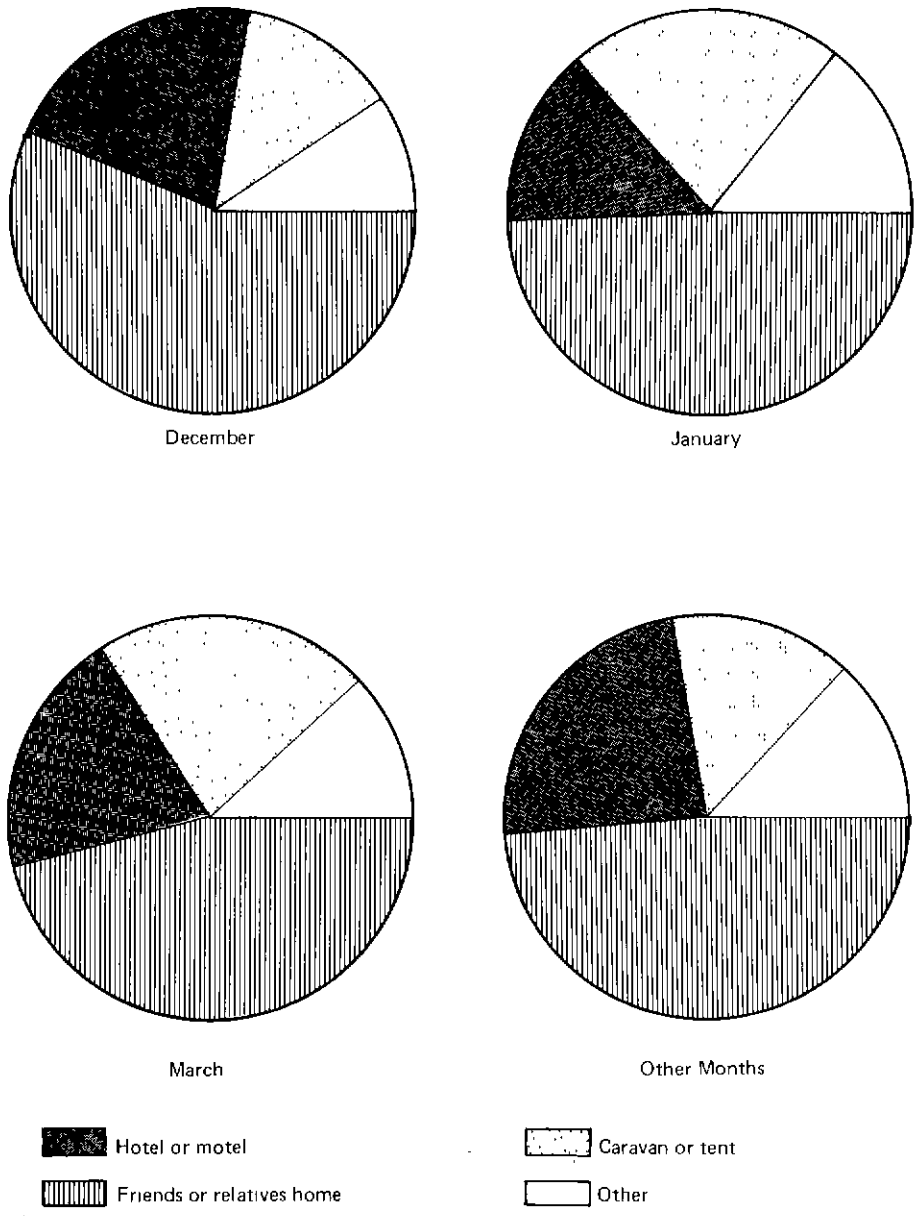

Figure 4.4
Variations in accomodation used by month 1977-78

TABLE 4.7 - TRAVEL CHARACTERISTICS BY MONTH - 1977-78

Month	Average Trip Generation Rate (Person-trips/ Household/Month)	Proportion of Trips by Car	Proportion of Trips With Parties of Four or More Persons[a]
July	0.975	0.828	0.290
August	1.133	0.827	0.341
September	1.208	0.842	0.368
October	1.068	0.781	0.249
November	1.125	0.807	0.304
December	1.209	0.855	0.344
January	1.486	0.873	0.439
February	1.208	0.839	0.352
March	1.264	0.854	0.338
April	1.077	0.850	0.293
May	1.201	0.844	0.367
June	1.093	0.829	0.296

(a) This refers to the proportion of person-trips involving four or more members of a household travelling together.

Source: National Travel Survey 1977-78.

EFFECT OF HOUSEHOLD CHARACTERISTICS ON TRAVEL PARAMETERS

The household characteristics covered in the NTS tended to influence to some degree not only the overall travel levels of households, but also their choice of various qualities associated with travel, such as mode of travel and accommodation used. Since household income and size are correlated to some degree, the following discussion is developed in terms of household income alone. In broad terms the effects identifiable for households of higher income also apply to households of greater size because of the correlation between these two characteristics.

Household income obviously influences the buying power of a household, and consequently choices of mode of travel and accommodation used. Since low income households tend to have a lower rate of car ownership and to be unable to afford air fares, they travelled to a large extent by bus and particularly train (since this is the cheaper of these two modes). The NTS results also indicated that lower income households travelled less frequently for holidays, and when they did, were more likely to stay at a friend's or relative's home than households of middle or higher income. Members of low income households were generally in occupations that required little or no business travel and this was reflected in the low proportion of business travel represented. Figure 4.5 illustrates the relative levels of travel on given modes as a function of household income. Figure 4.5 shows that middle and higher income households represented increasing proportions of travel undertaken by car and air. In particular the NTS results showed that the highest proportion of car travel was undertaken by middle income households. In relative terms high income households used aircraft twice as frequently as the rest of the population did. They were also much more likely to use hotels, motels, cabins and holiday flats for accommodation. In addition to the obvious relationship between these choices and the relatively higher income of households making these choices there is an additional interaction between the two. Households with higher incomes travelled relatively more frequently on business, again resulting in an increase in air travel and in usage of commercial accommodation, both being characteristic of business travel. The effect of household income on mode and purpose of travel, and accommodation used can be seen in more detail in Figure 4.5 and Tables 4.8 and 4.9 respectively.

Households which had no motor vehicles available for use were obviously much less likely to travel by car, truck or motorcycle when travelling. However, these households still made a surprisingly high proportion of all their trips (43 per cent)

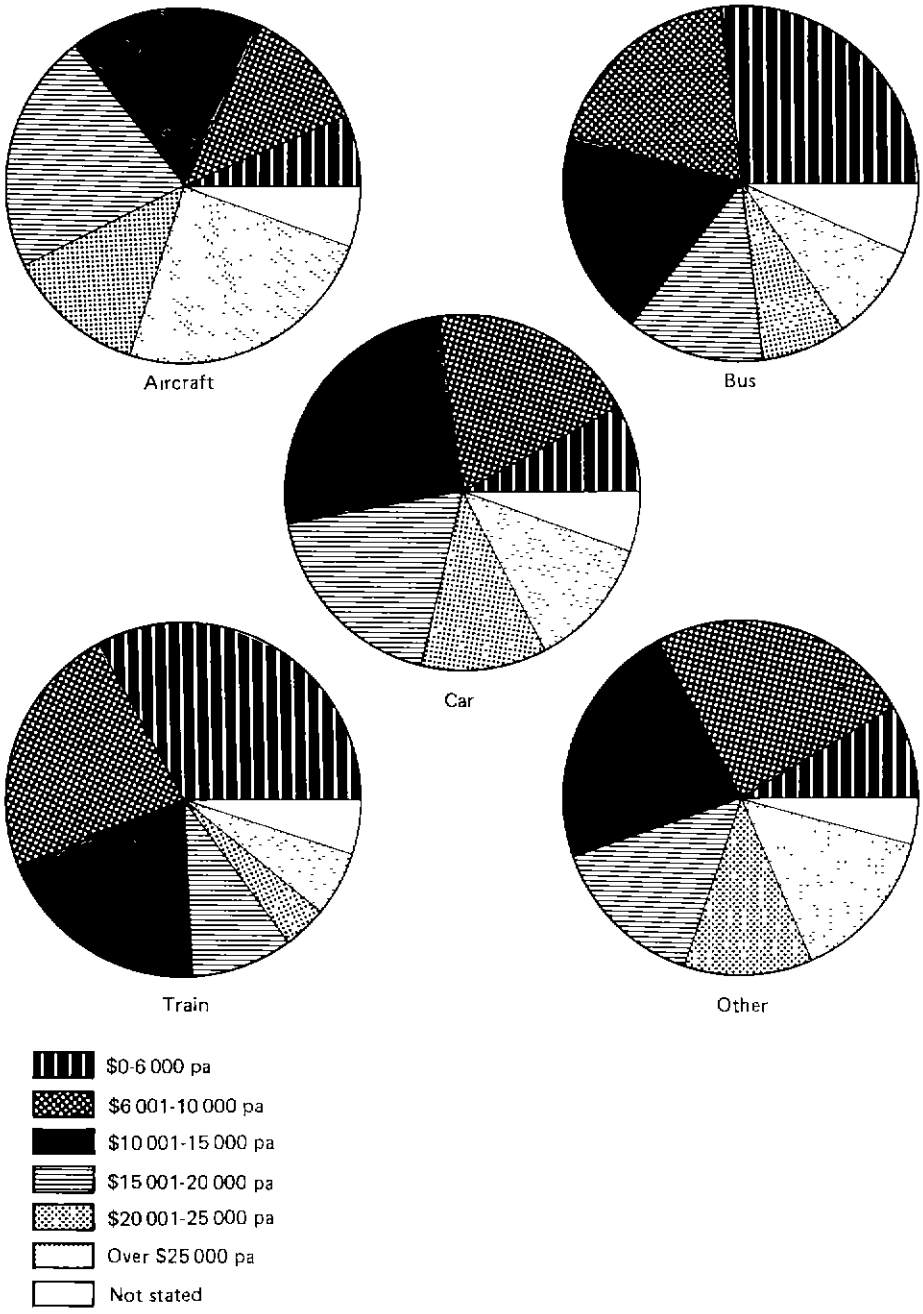

Figure 4.5
Variations in household income by choice of mode

TABLE 4.8 - PERSON-TRIPS ('000) BY HOUSEHOLD INCOME AND TRIP PURPOSE - 1977-78

Income Group	Trip Purpose								Total	(Proportion)[a]
	Deliver Freight	Other Business	Visiting Friends	Recreation	Holiday	Personal Affairs	Other	Not Stated		
$0-2000	14	52	154	53	46	61	10	4	394	(0.007)
$2001-4000	32	139	685	245	290	304	121	68	1 883	(0.032)
$4001-6000	72	290	1 154	437	423	472	159	59	3 066	(0.052)
$6001-8000	188	425	1 252	684	715	741	239	54	4 299	(0.073)
$8001-10000	258	888	2 145	1 231	1 130	913	333	36	6 935	(0.118)
$10001-15000	370	1 857	4 436	2 643	2 661	1 883	657	105	14 612	(0.249)
$15001-20000	227	1 460	2 838	2 124	2 066	1 233	527	69	10 543	(0.180)
$20001-25000	110	984	1 501	1 782	1 204	845	220	45	6 692	(0.114)
$25001-30000	51	517	652	649	812	351	214	23	3 270	(0.056)
Over $30000	214	828	815	713	713	516	359	6	4 164	(0.071)
Not stated	76	353	671	558	544	448	188	31	2 868	(0.049)
Total	1 614	7 793	16 301	11 117	10 604	7 769	3 028	500	58 725	
(Proportion)[a]	(0.027)	(0.133)	(0.278)	(0.189)	(0.181)	(0.132)	(0.052)	(0.009)		

(a) Note that total of proportions may not be unity due to rounding.

Source: National Travel Survey 1977-78.

TABLE 4.9 - PERSON-TRIPS ('000) BY HOUSEHOLD INCOME AND ACCOMMODATION - 1977-78

Income Group	Accommodation						Total	(Proportion) [a]
	Hotel or Motel	Friends Home	Caravan or Tent	Other	Not Stated	Not Applicable		
$0-2000	46	168	16	17	21	126	394	(0.007)
$2001-4000	233	877	113	103	77	480	1 883	(0.032)
$4001-6000	359	1 279	234	152	71	970	3 066	(0.052)
$6001-8000	413	1 539	429	263	149	1 506	4 299	(0.073)
$8001-10000	801	2 274	730	434	132	2 566	6 935	(0.118)
$10001-15000	1 981	4 802	1 624	1 085	215	4 905	14 612	(0.249)
$15001-20000	1 623	3 309	1 374	855	130	3 251	10 543	(0.180)
$20001-25000	1 058	1 789	767	679	63	2 336	6 692	(0.114)
$25001-30000	628	926	358	491	43	824	3 270	(0.056)
Over $30000	915	1 094	306	575	47	1 231	4 164	(0.071)
Not stated	385	893	312	309	92	878	2 868	(0.049)
Total	8 441	18 951	6 262	4 963	1 035	19 073	58 725	
(Proportion) [a]	(0.144)	(0.323)	(0.107)	(0.085)	(0.018)	(0.325)		

(a) Note that total of proportions may not be unity due to rounding.

Source: National Travel Survey 1977-78.

by car, presumably by travelling with friends who owned cars. As Figure 4.6 illustrates, rail was the major alternative mode choice when no car was available for use by the household, while the proportion of air travel by these households increased only slightly in comparison. Obviously a large proportion of households with no access to a motor vehicle are those households which cannot afford to run a motor vehicle and hence must use the cheaper modes when travelling.

EFFECT OF PERSONAL CHARACTERISTICS ON TRAVEL PARAMETERS

Personal characteristics such as age and occupation of household members also influence travel characteristics. While these personal characteristics are related to each other and to the household characteristics discussed earlier, it was considered worthwhile to discuss some of the characteristics of travel by specific age and occupation groups.

The travel behaviour of persons younger than seventeen was found to be quite different from the rest of the population. For instance, they rarely used expensive alternatives such as aircraft, hotels and motels. Instead, friends' and relatives' homes, and caravans and tents tended to represent the forms of accommodation used. Children normally travelled to visit friends and relatives, or for sightseeing, recreational or holiday purposes(1). Children tended not to be included in business travel and only slightly more often in travel associated with personal affairs. Elderly persons (that is, those older than sixty) also exhibited different travel behaviour from the population as a whole. Although their overall travel generation rates were lower than average for the population as a whole, their modal choice distribution also indicated much less reliance

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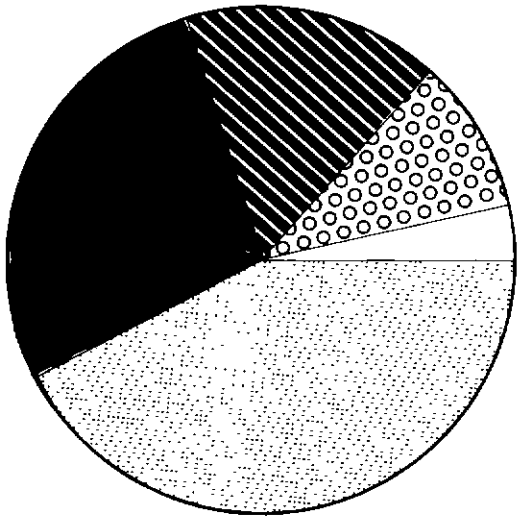
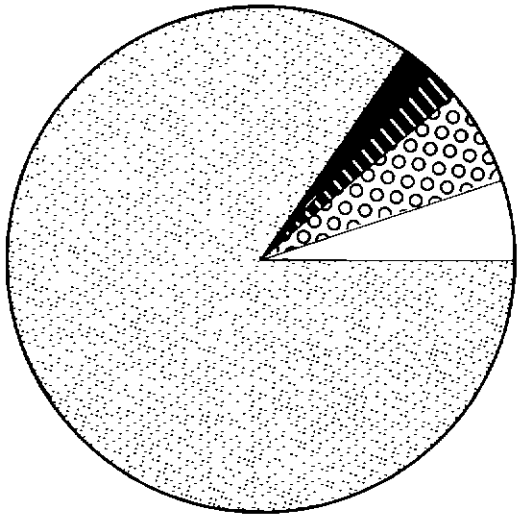
(1) More strictly, trips on which children were taken tended to have these purposes. In discussing personal characteristics in this Section, it is assumed that the trip purpose applied to all members of the travelling party.



Households with no vehicles available



Households with at least one vehicle available

Aircraft
Bus
Car
Train
Other

Figure 4.6
Effect of vehicle availability on modal choice

on cars, motorcycles and so on. The use of the other modes tended to be more significant in their travel behaviour. Elderly persons visited and stayed with friends and relatives comparatively more frequently than other sections of the population. They rarely stayed in caravans and tents, and used holiday flats and cabins only to a very limited extent. The majority of motorcycle users were less than thirty years of age, with 67 per cent being aged twenty-four or less, and a further 18 per cent having ages between twenty-five and twenty-nine years. Truck travellers were also reasonably young, 57 per cent being aged between twenty-five and forty-four years. The highest proportion of travellers by air and those staying at hotels and motels were aged between thirty-five and sixty years. This is consistent with the typical age-income relationship of most individuals and also reflects the distribution of ages of business travellers.

Twenty per cent of all trips made by professional, managerial and sales workers were business trips. On such trips hotels and motels were frequently used for accommodation, the employer payed all fares involved and the trip was frequently undertaken by aircraft (except for sales workers). Over 50 per cent of all trips made by farmers were made for business purposes or on personal affairs. Not surprisingly, farmers travelled by truck comparatively more frequently than the rest of the population, and almost half of their trips were day trips. Of those trips undertaken by farmers involving the payment of fares, 16 per cent (compared with the average of 8 per cent for all trips) were paid for by their employer or their own business, presumably the farm. Workers in transport and communication obviously travelled by truck very frequently to deliver freight. They used 'Other' accommodation (such as cabins and their vehicle) for overnight stops with much greater frequency than the rest of the population.

TOURIST AND NON-TOURIST TRAVEL

In the following discussion, the reasons for travel, as determined from the NTS, have been classified into three broad categories as follows.

- 'Tourist travel' is travel undertaken for 'Holiday' or for 'Sightseeing or recreation' purposes.

- 'Business travel' includes 'Delivery of freight' and trips undertaken for 'Other business'.

- 'Other travel' is travel undertaken to 'Visit friends and relatives', on 'Personal affairs', or for any other reason not included in the two categories above.

The effect of various household and personal characteristics on trip purposes was discussed in the previous two Sections and will not be repeated here. Tables showing the distributions of these characteristics for each type of travel have been presented by Hirsch *et al.* (1981). This Section discusses the influence of the type of travel on choice of mode and accommodation used.

Business travel was the only specific type of travel with a significantly different modal split from the overall modal split. As Figure 4.7 illustrates, business travellers comparatively frequently travelled by aircraft and by truck. Nevertheless, 64 per cent of all business trips were still made by car, a surprisingly high percentage. From examination of Table 4.10 it can be seen that 40 per cent of all trips made by aircraft and 82 per cent of all trips made by truck represented business trips, with a corresponding decrease in the use of other modes for business trips.

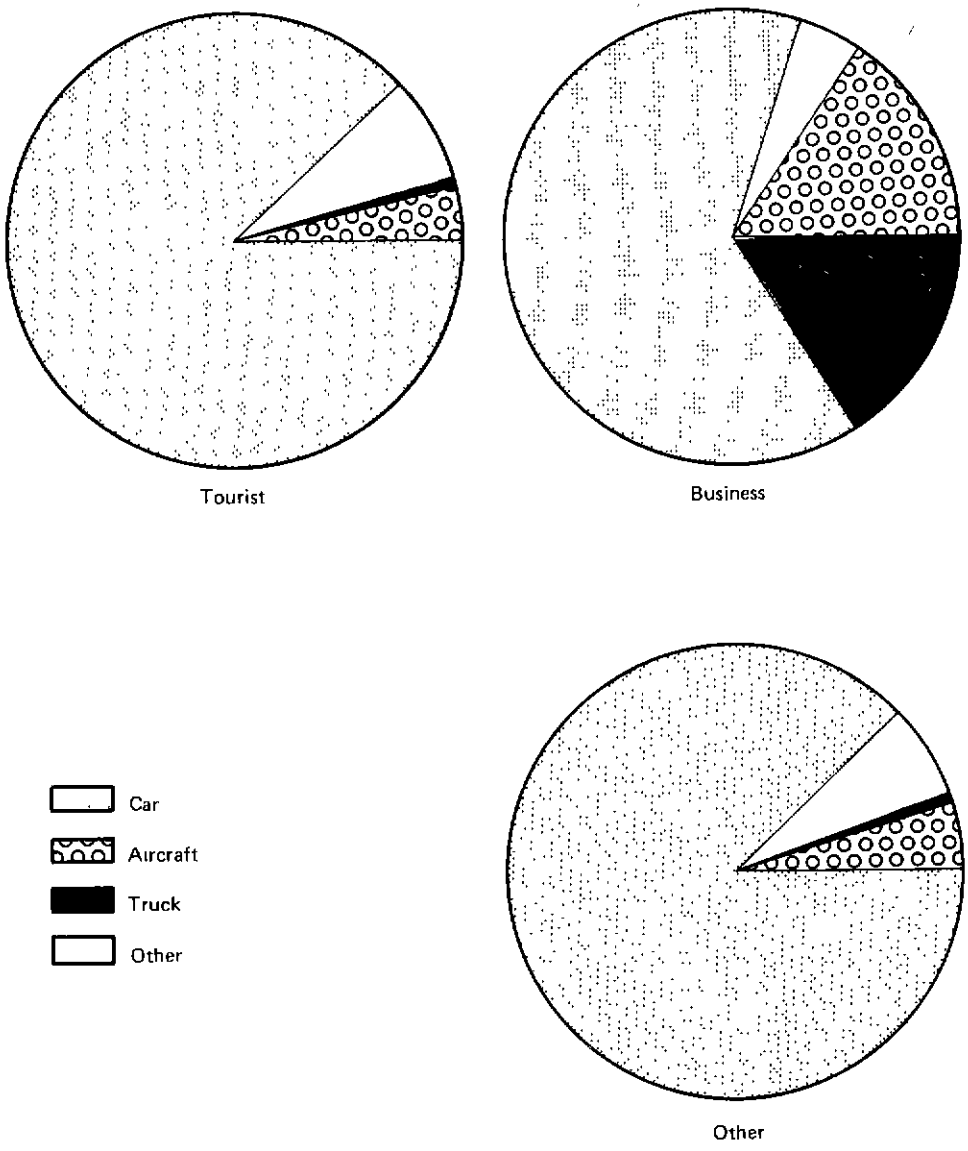


Figure 4.7
Variations in modal choice by type of travel

TABLE 4.10 - TRIP PROPORTIONS BY TYPE OF TRAVELLER AND VEHICLE TYPE - 1977-78
(PROPORTIONS FOR EACH VEHICLE TYPE)

Type of Traveller	Vehicle Type									Total
	Aircraft	Bus	Car	Truck	Motorcycle	Ship	Train	Other	Not Stated	
Tourist	0.230	0.549	0.388	0.072	0.498	0.873	0.307	0.343	0.251	0.370
Business	0.403	0.056	0.122	0.823	0.029	0.019	0.091	0.303	0.201	0.160
Other	0.363	0.364	0.483	0.099	0.473	0.109	0.588	0.353	0.370	0.462
Not stated	0.004	0.030	0.006	0.006	0.000	0.000	0.015	0.000	0.178	0.009
Total	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Source: National Travel Survey 1977-78.

Fifty per cent of all business trips were day trips. Hotels and motels were used for accommodation for 55 per cent of the remaining business trips. As expected, both friends' and relatives' homes, and caravans and tents were relatively unpopular choices of accommodation for business travellers. The accommodation used for business travel could be broken down into two components; hotels and motels were generally used on trips made for 'Other business', while 'Other' accommodation was used on trips made to deliver freight. Figure 4.8 illustrates the distributions of accommodation used for the different types of travel. For tourist travel involving at least one night at the main destination, caravans, tents and 'Other' (that is, holiday flats and cabins) were used for accommodation for 52 per cent of all such trips made, with friends' and relatives' homes being used much less frequently than for other types of trips. Only 26 per cent of all tourist travel involved day trips which were made predominantly for sightseeing or recreation. Travel for 'Other' purposes was frequently made to visit friends or relatives, so the increased use of their homes for accommodation is not at all surprising.

Table 4.11 indicates the distribution of types of travellers using particular forms of accommodation. Caravans and tents were used predominantly by tourist travellers, and friend's and relative's homes by those travelling for 'Other' reasons. All types of travellers were represented to a reasonable extent among the users of hotel and motel accommodation. However, tourist travellers represented the highest proportion of these users.

INTERACTION OF TRAVEL PARAMETERS

Travel parameters such as the purpose of the trip or the distance travelled influenced the choice of other parameters such as the mode or accommodation used. Purpose of a trip, for instance, had quite a noticeable influence on the duration of the trip.

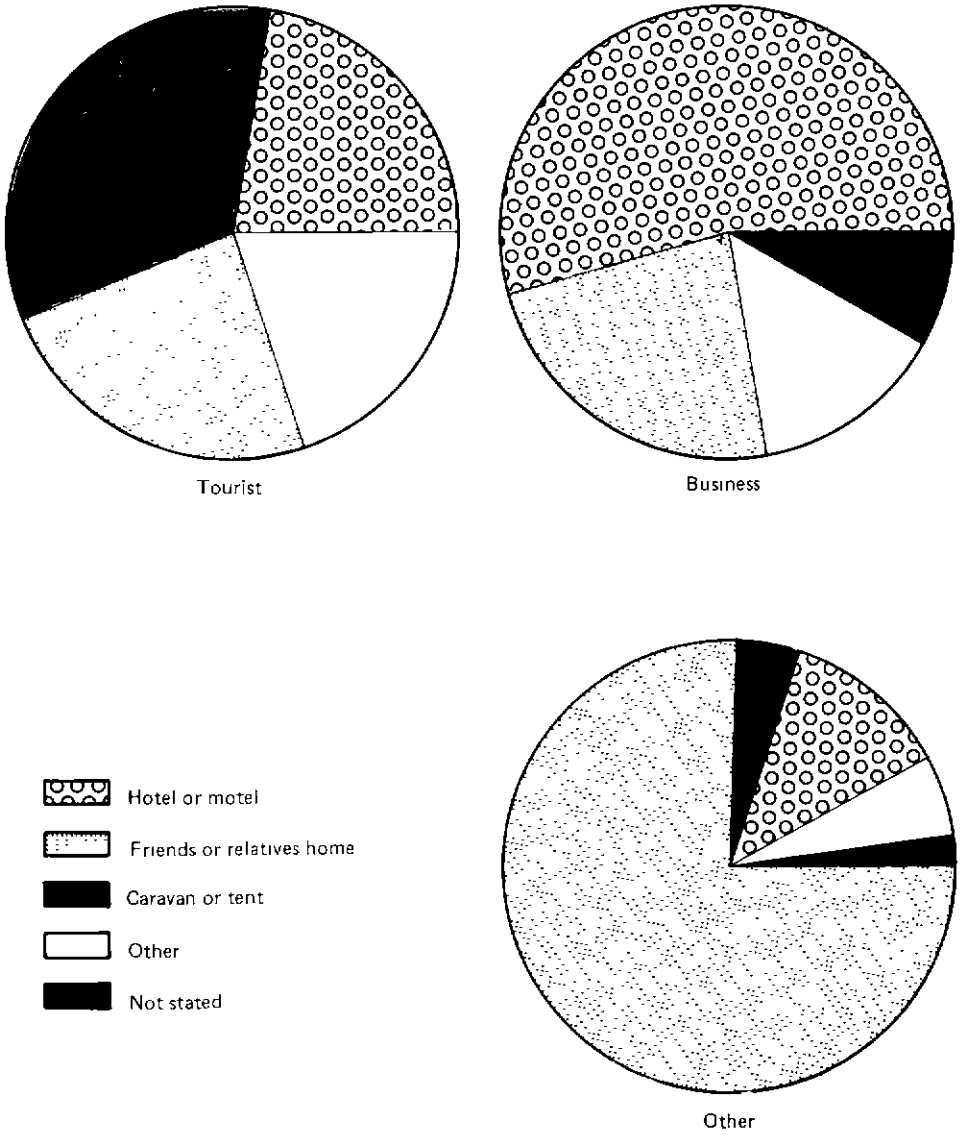


Figure 4.8
Variations in choice of accomodation by type of travel

TABLE 4.11- TRIP PROPORTIONS BY TYPE OF TRAVELLER AND ACCOMMODATION - 1977-78
(PROPORTIONS FOR EACH ACCOMMODATION CATEGORY)

Type of Traveller	Accommodation						Total
	Hotel or Motel	Friends Home	Caravan or Tent	Other	Not Stated	Not Applicable	
Tourist	0.442	0.198	0.829	0.642	0.314	0.298	0.370
Business	0.305	0.058	0.031	0.136	0.195	0.245	0.160
Other	0.265	0.739	0.135	0.219	0.391	0.447	0.462
Not stated	0.008	0.005	0.005	0.003	0.101	0.010	0.009
Total	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Source: National Travel Survey 1977-78.

Trips made to deliver freight were generally day trips (67 per cent), as were trips made for personal affairs or for sightseeing or recreation. Holiday trips, however, almost always involved at least three nights at the main destination.

The size of the party travelling had a noticeable effect on the mode used. For car travel, a high proportion of journeys involved travel by two or more persons. Journeys by only one person dominated travel by other modes. As Table 4.12 illustrates, approximately 60 per cent of trips made by any mode other than car were made by a person travelling alone, whereas only 22 per cent of all car trips were made by a person travelling alone. The size of the party had a similar effect on the choice of accommodation. In comparison with persons travelling accompanied, persons travelling alone were much more likely to stay in hotels or motels and less likely to stay in caravans and tents. In fact, hotels and motels were used by parties of four persons or more for only 10 per cent of all trips made by such parties, no doubt reflecting the comparatively high cost of this form of accommodation.

As the distance to be travelled increased, use of cars for transport decreased, showing that travellers appeared less willing to drive longer distances. As expected travel by air tended to increase with distance with some 30 per cent of air travel involving distances between 600 and 800 km (Table 4.5). The distributions of trips by distance for the remaining modes are quite interesting. The proportions of travel by bus and truck increased with trip length to 400 km at which distance the proportions decreased. Similarly, the proportion of travel by train increased with trip length to 600 km and then decreased. The distance travelled also influenced the type of accommodation used at the main destination. Hotels and motels were used for approximately 30 per cent of longer trips, involving at least one night at the main destination.

TABLE 4.12 - PERSON-TRIPS ('000) BY PARTY SIZE AND VEHICLE TYPE - 1977-78

Party Size	Vehicle Type									Total	(Proportion)[a]
	Aircraft	Bus	Car	Truck	Motorcycle	Ship	Train	Other	Not Stated		
1 Person	2 253	776	10 865	1 251	102	25	840	160	274	16 544	(0.282)
2 Persons	779	329	12 497	369	62	18	444	29	102	14 627	(0.249)
3 Persons	280	71	7 117	56	25	31	105	42	49	7 775	(0.132)
4 Persons	224	88	10 034	104	0	14	117	36	68	10 684	(0.182)
5 Persons	56	61	5 772	24	0	8	50	8	16	5 996	(0.102)
6 Persons	14	15	2 135	18	0	3	1	13	34	2 233	(0.038)
7 Persons	0	17	551	2	0	0	0	0	7	577	(0.010)
8 Persons	21	3	168	0	0	0	0	0	6	199	(0.003)
9 Persons	5	5	55	0	0	0	0	4	0	68	(0.001)
Over 9 Persons	0	0	21	0	0	0	0	0	0	21	(0.000)
Total	3 632	1 365	49 216	1 823	188	98	1 557	291	555	58 725	
(Proportion)[a]	(0.062)	(0.023)	(0.838)	(0.031)	(0.003)	(0.002)	(0.027)	(0.005)	(0.009)		

(a) Note that total of proportions may not be unity due to rounding.

Source: National Travel Survey 1977-78.

As would be expected distance travelled and duration of trip were related to some extent. Consequently, as the duration of the trips increased, use of aircraft increased and use of cars decreased. However, this did not apply to the accommodation used. Hotels and motels were relatively more frequently used on trips of short duration, while caravans and tents were less likely to be used for such trips.

Since a large proportion of trips made by aircraft and truck were business trips, a relatively high proportion (38 per cent compared with 8 per cent overall) of trips made by aircraft and truck were paid for by the traveller's employer or his own business.

MAJOR CORRIDORS

Since transport planning for non-urban travel often focuses on specific corridors, a number of the more important corridors were selected and tabulated against the mode and purpose of travel along the corridor (Tables 4.13 and 4.14). It is interesting to note that only a comparatively small proportion (12 per cent) of all non-urban travel occurred along these corridors(1).

Table 4.13 indicates that a large proportion of travel from one capital city to another was undertaken by aircraft, with a corresponding decrease in the use of cars for this type of travel. This can be attributed both to the distance involved and some reluctance on the part of travellers to drive in unfamiliar urban areas. However, travel along corridors between a capital city and an associated large centre fairly close to

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(1) A corridor is described by the two places representing the end points. In the present context, travel along a corridor implies travel from the first place to the second. Travel commencing or finishing at intermediate places on the corridor is not included here.

TABLE 4.13 - PERSON-TRIPS ('000) BY VEHICLE TYPE FOR SEVERAL MAJOR CORRIDORS - 1977-78

Major Corridors	Vehicle Type									Total	(Proportion)(a)
	Aircraft	Bus	Car	Truck	Motorcycle	Ship	Train	Other	Not Stated		
Sydney-Melbourne	217	0	183	25	0	0	20	0	2	447	(0.008)
Melbourne-Sydney	278	4	237	37	0	2	25	2	10	595	(0.010)
Sydney-Brisbane	97	0	138	10	0	0	10	0	0	255	(0.004)
Brisbane-Sydney	138	4	69	1	0	0	5	0	2	219	(0.004)
Sydney-Canberra	50	23	333	36	0	0	10	2	0	454	(0.008)
Canberra-Sydney	35	11	159	0	1	0	3	1	0	211	(0.004)
Sydney-Newcastle	25	7	649	15	5	0	42	0	0	743	(0.013)
Newcastle-Sydney	2	9	167	12	0	0	29	0	3	223	(0.004)
Sydney-Wollongong	0	0	267	13	2	0	3	2	2	290	(0.005)
Wollongong-Sydney	0	15	136	3	0	3	11	0	1	169	(0.003)
Melbourne-Canberra	26	2	98	0	0	0	0	0	0	126	(0.002)
Canberra-Melbourne	29	1	21	0	0	0	0	2	0	53	(0.001)
Melbourne-Adelaide	90	12	143	4	2	0	19	0	2	272	(0.005)
Adelaide-Melbourne	34	6	97	1	0	0	7	0	6	151	(0.003)
Melbourne-Ballarat	0	11	469	0	0	0	2	0	7	489	(0.008)
Ballarat-Melbourne	0	2	248	2	1	0	8	0	2	262	(0.004)
Melbourne-Bendigo	2	4	369	2	0	0	14	0	9	399	(0.007)
Bendigo-Melbourne	0	1	82	0	1	0	6	0	0	90	(0.002)
Melbourne-Shepparton	0	0	155	5	0	0	4	0	7	171	(0.003)
Shepparton-Melbourne	0	3	152	20	0	0	9	0	11	195	(0.003)
Melbourne-Moe/Morwell	2	2	149	2	0	0	3	0	0	158	(0.003)
Moe/Morwell-Melbourne	0	1	150	2	0	0	8	0	0	162	(0.003)
Melbourne-Albury/Wodonga	3	0	145	5	0	0	12	0	2	168	(0.003)
Albury/Wodonga-Melbourne	7	1	128	6	0	0	14	0	0	156	(0.003)
Brisbane-Toowoomba	9	36	159	0	1	0	0	0	0	206	(0.004)
Toowomba-Brisbane	0	6	65	8	0	0	0	0	1	80	(0.001)
Perth-Bunbury	0	2	122	0	0	0	0	0	0	124	(0.002)
Bunbury-Perth	0	0	77	0	0	2	4	0	0	83	(0.001)
Other Corridors	2 586	1 203	48 049	1 614	175	92	1 290	282	487	51 777	(0.882)
Total	3 632	1 365	49 216	1 823	188	98	1 557	291	555	58 725	
(Proportion)(a)	(0.062)	(0.023)	(0.838)	(0.031)	(0.003)	(0.002)	(0.027)	(0.005)	(0.009)		

(a) Note that total of proportions may not be unity due to rounding.

Source: National Travel Survey 1977-78.

TABLE 4.14 - PERSON-TRIPS ('000) BY PURPOSE FOR SEVERAL MAJOR CORRIDORS - 1977-78

Major Corridors	Purpose								Total	(Proportion)(a)
	Deliver Freight	Other Business	Visiting Friends	Recreation	Holiday	Personal Affairs	Other	Not Stated		
Sydney-Melbourne	25	159	143	20	59	33	7	0	447	(0.008)
Melbourne-Sydney	48	163	139	11	162	61	11	2	595	(0.010)
Sydney-Brisbane	13	85	81	12	44	20	0	0	255	(0.004)
Brisbane-Sydney	1	71	67	10	44	13	13	0	219	(0.004)
Sydney-Canberra	39	98	146	61	46	53	12	0	454	(0.008)
Canberra-Sydney	1	34	95	28	19	22	11	0	211	(0.004)
Sydney-Newcastle	15	78	352	79	93	112	15	0	743	(0.013)
Newcastle-Sydney	26	26	66	37	16	39	12	0	223	(0.004)
Sydney-Wollongong	13	27	118	88	0	42	0	2	290	(0.005)
Wollongong-Sydney	8	8	52	49	3	42	5	1	169	(0.003)
Melbourne-Canberra	0	25	14	47	28	11	2	0	126	(0.002)
Canberra-Melbourne	0	23	17	3	1	5	3	0	53	(0.001)
Melbourne-Adelaide	11	37	86	29	75	23	11	0	272	(0.005)
Adelaide-Melbourne	1	27	47	18	31	5	13	9	151	(0.003)
Melbourne-Ballarat	0	68	152	190	4	61	10	3	489	(0.008)
Ballarat-Melbourne	9	55	89	35	6	57	11	2	262	(0.004)
Melbourne-Bendigo	2	27	263	65	14	25	0	4	399	(0.007)
Bendigo-Melbourne	0	7	51	6	5	13	6	0	90	(0.002)
Melbourne-Shepparton	3	21	98	13	16	12	7	0	171	(0.003)
Shepparton-Melbourne	31	33	63	9	13	40	4	2	195	(0.003)
Melbourne-Moe/Morwell	0	21	62	28	12	16	17	2	158	(0.003)
Moe/Morwell-Melbourne	0	34	55	29	6	27	10	1	162	(0.003)
Melbourne-Albury/Wodonga	5	23	62	19	42	11	5	0	168	(0.003)
Albury/Wodonga-Melbourne	8	23	58	13	15	26	9	5	156	(0.003)
Brisbane-Toowoomba	0	34	79	48	3	27	14	0	206	(0.004)
Toowoomba-Brisbane	7	7	35	6	0	15	10	0	80	(0.001)
Perth-Bunbury	0	8	35	32	8	18	14	8	124	(0.002)
Bunbury-Perth	0	2	48	6	2	24	0	0	83	(0.001)
Other Corridors	1 348	6 566	13 729	10 126	9 837	6 917	2 795	458	51 777	(0.882)
Total	1 614	7 793	16 301	11 117	10 604	7 769	3 028	500	58 725	
(Proportion)(a)	(0.027)	(0.133)	(0.278)	(0.189)	(0.181)	(0.132)	(0.052)	(0.009)		

(a) Note that total of proportions may not be unity due to rounding.

Source: National Travel survey 1977-78.

the capital (such as Newcastle and Ballarat) rarely involved the use of aircraft. As expected, the proportion of travel by car increased in these cases and in some cases use of other modes such as train and bus also became comparatively more significant. For example, at least 13 per cent of travel from Newcastle to Sydney was undertaken by train and 16 per cent of all travel from Brisbane to Toowoomba was undertaken by bus.

From Table 4.14 it can be seen that business travel accounted for a substantial proportion of travel between capital cities. One quarter of trips between Melbourne and Adelaide constituted holiday travel, while an even higher proportion of all trips from Melbourne to Canberra was undertaken for the purposes of sightseeing or recreation. Travel along corridors involving a capital city and an associated large regional centre was dominated by visits to friends or relatives, and for the purpose of conducting personal affairs. At least one-fifth of all travel from either Ballarat or Moe/Morwell to Melbourne constituted business travel. However, in the other direction from Melbourne to Ballarat, sightseeing or recreational travel represented a significant component.

TRAVEL TO SPECIFIC DESTINATIONS

From the point of view of the respective business communities the level and characteristics of travel to specific destinations(1) is of particular interest. This applies particularly to those places with a high tourist potential. A number of tourist areas and centres of large population were identified (see Table III.1 in Appendix III) and the nature of travel to these places investigated. The travel parameters in

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(1) The discussion in this Section refers to places specified in the NTS as main destinations. The only other information available from the NTS on places visited relates to the places visited 'Furthest from home'. Travel to places in this category has not been included in the present analysis.

which the most interesting variations occurred were purpose of trip, mode and accommodation used, and duration of stay at the main destination. Tables III.2 to III.5 contain the distribution of each of these parameters for each destination region selected for analysis. These tables contain many points of interest. However, lack of space allows only discussion of the most general and significant of these points. A more extensive discussion is given by Hirsch *et al*. (1981). This Section is limited to discussion of travel to the capital cities, to six major tourist areas and to a number of holiday areas. In the following discussion the travel characteristics of each area is discussed in turn. Reference to Table III.2 to III.5 in Appendix III should be made for further details.

The proportion of trips to each of the capital cities made by air was considerably above that of air travel in general. Air travel represented a particularly significant proportion of travel to Darwin. Over 50 per cent of all trips to Darwin involved the use of aircraft, with trips by bus also representing a high proportion. Further, the proportion of trips to Sydney by train was three times the proportion of rail travel overall.

Approximately 20 per cent of all trips to the capital cities were made for business purposes. Consistent with the analysis of major corridors presented in the previous Section it was found that travel on personal affairs also represented a high proportion of travel to the capital cities, while sightseeing, recreation and holidays represented lower travel proportions. The exception to this generalisation was Darwin. The proportion of trips to Darwin represented by holiday trips (28 per cent) was much higher than the average for all travel and was reflected by a corresponding decrease in the proportion of trips made to visit friends and relatives in Darwin.

Since fewer travellers visited friends and relatives in Darwin, hotels and motels were used on the highest proportion of trips to Darwin involving overnight stay. Similarly, travel to both Hobart and Canberra, also involved the use of hotels and motels

comparatively frequently. Travel to the other capitals, however, was more likely to involve accommodation at a friend's or relative's home. Caravans, tents and 'Other' forms of accommodation were not represented on a high proportion of trips to a capital city. Trips to a capital city also tended to involve at least one overnight stay. A high proportion of trips to Darwin involved a stay of three or more nights. The sizes of household parties travelling to capital cities were generally smaller than usual, no doubt reflecting the increased proportion of business trips.

Of all travellers to the Blue Mountains in N.S.W., almost 60 per cent went for sightseeing and recreational purposes. Many of these trips were day trips not involving an overnight stay. A large proportion of the remaining trips to the Blue Mountains involved a stay of between three and seven nights. Use of hotels or motels as accommodation was also more common than average. Eleven per cent of trips to the Blue Mountains involved train travel. This is quite a high proportion in comparison with the rail share of non-urban travel in general. The numbers of household members travelling together tended to be somewhat below the numbers of persons travelling together in general. This appears somewhat surprising but is probably a reflection of the attraction the Blue Mountains have for the older age groups as opposed to the younger family groups.

Travel to the Barossa Valley in S.A. had similar characteristics to those discussed above for travel to the Blue Mountains. Trips for sightseeing and recreation represented a higher proportion (29 per cent) of trips to the Barossa Valley than for travel in general. Almost all trips were either day trips or involved from three to seven nights stay in the Barossa Valley. Hotels, motels, caravans and tents represented significant proportions of accomodation used. 'Other' forms of accommodation were used rarely and in fact the NTS did not manage to sample any trips involving use of this type of accommodation in the Barossa

Valley. Again sizes of household parties travelling to this area were smaller than party sizes undertaking non-urban travel in general. A very high proportion (95 per cent) of trips to the Barossa were made by car, other trips to this area involving travel by bus and truck.

Characteristics of travel to three different snowfields were investigated. The snowfields selected for examination were the Snowy Mountains in N.S.W., the area around Eildon and Mount Buller in Victoria, and the area around Bright, Mount Beauty, Mount Buffalo and Mount Feathertop (referred to as the Victorian Alps in Tables III.2 to III.5 and in the following discussion). Most trips to the snowfields were taken for the purposes of sightseeing and recreation, and for holidays. Day trips to these areas were relatively uncommon. An unusually large proportion of weekend trips was made to both Victorian areas, while a large proportion of trips to the Snowy Mountains and the Victorian Alps involved a stay of between three and fourteen nights. The fact that accommodation at the snowfields was not with friends or relatives was reflected in the NTS results. 'Other' forms of accommodation (in this case cabins) were much more popular in all three areas in comparison with accommodation associated with travel in general. Hotels and motels accounted for 40 per cent of the accommodation used in the Snowy Mountains and the Victorian Alps. Caravans and tents were used in a similar proportion to their use in non-urban travel overall. This is not so surprising when it is considered that these areas contain national parks and scenery which attracts visitors in summer as well as in winter. Most trips to the Victorian snowfields and Mount Buller were made by car. However, both aircraft and buses accounted for a significant proportion of travel to the Snowy Mountains, each mode accounting for some 17 per cent of trips(1).

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(1) Note that on trips involving more than one mode the discussion here is in terms of the mode used for the longest travel distance.

The NTS results indicated that the Gold and Sunshine Coasts in Queensland were visited primarily for sightseeing and recreation, or for holidays. 'Other' forms of accommodation such as holiday flats and cabins accounted for about 26 per cent of the accommodation used on trips to these ares. Hotels and motels were used on a similar proportion of trips to the Gold Coast. Caravans and tents were more common forms of accommodation on the Sunshine Coast. The proportion of trips to these areas involving a stay of eight days or more was twice the overall proportion of trips involving this length of stay. Most trips to these areas were by car. However, a higher proportion (9 per cent) of trips to the Gold Coast were made by aircraft in comparison with the average proportion of air travel. The same situation applied to bus travel to the Sunshine Coast. The size of the household parties travelling to these areas also tended to be above average.

As with travel to Darwin, travel to Alice Springs and central Australia had several distinct characteristics. One quarter of all travel to this area was made by aircraft. Bus and truck each accounted for a further 16 per cent of travel, so that only 40 per cent of all trips to Alice Springs and central Australia involved car travel. This reflects the long distance from the eastern seaboard (where the population is concentrated) and the relatively poor condition of many of the roads serving these areas. The majority of trips to Alice Springs and central Australia were taken for holidays, sightseeing and recreation, and for business purposes. The proportion of business travel to Alice Springs was surprisingly high, and further analysis is required before this can be explained adequately. Few people, having travelled so far to reach Alice Springs, left the same day as they arrived. Most remained at least two nights in the area with hotels and motels accounting for most of the accommodation used. Caravans and tents were also a popular form of accommodation. Since most travellers do not have friends and relatives in Alice Springs, it follows that use of hotels, motels, caravans and tents would increase in comparison with travel overall.

Again, since few travellers have friends or relatives in Cairns or Green Island, accommodation with friends or relatives accounted for only a small proportion of trips to these areas. Use of hotels and motels was especially high for these trips. Almost 50 per cent of travel to Cairns and Green Island was holiday travel. Consequently, these trips were generally of longer duration compared with travel overall. At least half of the trips to these areas involved stopovers of at least three days. A quarter of the trips to Cairns and Green Island involved travel by bus or aircraft with the car accounting for a rather lower than average proportion of trips. The sizes of household parties travelling to this area were generally smaller than household party sizes overall.

There are a number of other areas to which a very high proportion of holiday trips were made. Coffs Harbour, Port Macquarie, Nowra and Jervis Bay in N.S.W. and Yorke Peninsula in S.A. are the most significant of these areas. Others can be isolated from Table III.3. In general, cars represented the main mode of travel to these areas. As for the more significant and well-known tourist areas discussed above, the proportion of holiday trips involving a stopover of at least three days was much higher than the average for all travel. Similarly, friend's and relative's homes were rarely used for accommodation, though the main choice of alternative accommodation depended on the area under consideration. For example, since Coffs Harbour and Port Macquarie are areas with reasonable hotel and motel accommodation, hotels and motels represented the main form of accommodation use. However, on the Yorke Peninsula caravans and tents were most popular.

A high proportion of sightseeing and recreation trips were made to a number of areas, the most significant of which were Mount Gambier and Victor Harbor in S.A., and Swan Hill, Rutherglen and Yarrawonga in Victoria. The characteristics of this type of travel were very similar to those of holiday travel, as discussed above. Ballarat and its environs attracted a

reasonable amount of sightseeing and recreation travel, but travel to this area had quite different characteristics from those described above. Almost two thirds of all trips to Ballarat and the area around it were day trips, rather than trips involving overnight accommodation. For a large proportion of the remaining trips, friend's or relative's homes represented the accommodation used.

COMMENTS MADE BY NTS RESPONDENTS

In addition to the formal questions relating to personal, household and travel characteristics, the NTS questionnaire also contained space for respondents to submit general comments on travel in Australia. Because these comments provided opinions on a wide range of issues it is not possible to attach great statistical rigour to the information obtained in this way. Nevertheless a qualitative assessment of the comments received and the general thrust of these comments is of some interest.

Of the 43 500 or so respondents to the NTS approximately 16 per cent volunteered one or more comments in relation to travel in Australia. Since most non-urban travel in Australia is undertaken by car, it was not surprising to find that almost two-thirds of these respondents commented on the Australian road system, and other aspects associated with travel by road. By far the most frequent comment related to complaints about the poor condition of roads in Australia. Many NTS respondents also considered that both air fares and accommodation costs in Australia were very expensive. In fact, some respondents commented favourably on travel overseas as compared with travel in Australia. In particular, these respondents noted the relative cheapness of air fares for overseas travel as compared with domestic air fares and the improved quality of factors such as service in restaurants and hotels overseas.

Although only around 3 per cent of respondents who provided comments referred to coach travel, the majority of these comments tended to be favourable. Qualities of coach travel which met with approval included their comparatively low fares, reliability and quality of service and so on. This was the only form of travel for which the number of favourably disposed comments exceeded the number of unfavourable ones.

In contrast some 11 per cent of respondents who provided comments, indicated displeasure with various aspects of the non-urban rail system. Typical features which respondents criticised were the unsatisfactory service levels, low reliability of rail services, uncomfortable rolling stock and so on. Only 2 per cent of respondents who commented found some aspects of rail travel to be favourable.

The fact that most comments reflected unfavourably on some aspect of travel should be balanced against the voluntary nature of these comments. In a general sense respondents are much more likely to voice complaints when given the opportunity than they are to indicate their approval of some situation. This brief analysis of comments received in the NTS should therefore be considered in this light.

CHAPTER 5 - CONCLUDING REMARKS

The objectives of the NTS were discussed in some detail at the beginning of this Report. At this stage it is considered appropriate to discuss the extent to which the NTS met these objectives, and to indicate areas requiring further investigation.

As planned, the NTS provides reasonable estimates of overall trip generation levels of non-urban passenger travel in Australia. The overall annual trip generation level for all of Australia as estimated from the NTS is accurate to 5 per cent at a 95 per cent confidence level. Trip generation levels for individual regions, months, or household characteristics can be calculated to a lesser degree of accuracy since lower effective sample sizes were available in the various strata of these parameters.

Of those travel corridors regarded as being of 'major importance' on the basis of the initial information used for planning the NTS (Moll *et al*. 1978), most were sampled at a level which produced the desired number of trips. However, travel along a few corridors, such as Sydney to Wollongong or Melbourne to Moe, was not estimated to the degree of accuracy originally planned. Problems associated with the preliminary information used for planning and structuring the NTS were responsible for certain shortcomings such as these. The problems were essentially technical in nature (Hirsch *et al*. 1981). However, data from the NTS should allow more accurate sampling levels to be obtained for any survey of non-urban passenger travel conducted in the future. To varying degrees of accuracy, the NTS provided information not only on travel along specific corridors, but also on travel from all regions of Australia.

It is hoped that the data from the NTS will provide a basic framework for future research into non-urban passenger travel. To further this aim, the steps involved in designing and conducting the NTS and processing the resultant data have been

carefully documented in various BTE publications on the NTS and have been reviewed in some detail in this Report. During the course of the survey certain deficiencies in the design of the survey became apparent. It is not clear that all of these deficiencies could have been overcome in any case, but the problems which arose have been documented to assist similar efforts in the future. Perhaps the most significant point which was highlighted was the desirability of pilot testing each stage of the operation of the survey, including the processing of returns. Practical considerations may preclude this in many circumstances but it represents an ideal which should be aimed for. Problems related to the planning of sampling levels will be related to the adequacy of the information available during planning of the survey. Overall, the sampling levels achieved in the NTS proved to be adequate although deficiencies became apparent in particular instances. However the comprehensive information produced by the NTS will certainly facilitate quantitative planning for future surveys.

The data collected in the NTS permitted investigations of the effects of several personal and household characteristics on various travel parameters. Household income was found to have a definite effect on travel behaviour, since it influences the buying power of the household. This effect was reflected in both the overall level of travel undertaken by households and the choice of mode and accommodation associated with travel. For instance, 'low' income households tended to choose the cheaper modes of travel and accommodation, and travelled less for holidays than average. 'Low' income households also generated fewer trips than households with 'middle' or 'high' incomes. While unavailability of a motor vehicle greatly reduced the number of car trips made by a household, it was found that such households still undertook more trips by car than by any other single mode. The alternative modal choices of these households were generally the cheaper modes (train and, to a lesser extent, bus). Personal characteristics such as the age and occupation of each person travelling also had a noticeable

effect on travel behaviour. Children aged less than seventeen years generated fewer trips per capita than the population in general. Such persons were not represented in the category of business travel and only accounted for a very minor proportion of travel undertaken to carry out 'Personal affairs'. Persons aged over sixty years also generated fewer trips per capita than the population in general, with a relative decrease in business travel. Elderly persons were more likely to travel by bus or train and to stay with friends and relatives than the population overall, with corresponding decreases in travel by car and use of caravans and tents. The NTS also confirmed that persons with occupations classified as professional, managerial, sales or transport generated more business trips than the average for the whole population.

The NTS was conducted over a twelve month period so that information on short-term variations in travel behaviour could be collected. Analysis of the NTS data showed that school and university holidays had a significant effect on travel characteristics. During these periods there was a large increase in holiday travel, resulting in trips of much longer duration than normal and in increased usage of caravans, tents, cabins and holiday flats for accommodation. Over Christmas an increased proportion of travellers visited friends and relatives. Easter also had a very noticeable effect on non-urban travel, with an upsurge in trips on which three to seven days were spent at the main destination. Caravans and tents were obviously more popular as forms of accommodation in the summer months during which these forms of accommodation accounted for a substantially increased proportion of all accommodation used. Data for the NTS was gathered on a monthly basis with the general intention of examining reasonably broad trends over the twelve month period. Although the NTS questionnaire allowed respondents to indicate the actual dates on which trips ended, this information was

requested primarily for purposes of survey control. These dates were not sufficiently reliable to permit analysis of travel on specific days or over particular weekends for example. Such very short-term studies require specialised approaches to be really effective.

A most important feature of the NTS is the wide coverage it provides of two areas of non-urban passenger travel about which little was known. The areas in question are:

- the characteristics of travel by car;

- the characteristics of day trips.

Of all non-urban travel covered by the NTS, 84 per cent of trips were made by car. However, cars represented a lower proportion of trips made to deliver freight or for business purposes. As the distance to be travelled increased, the use of aircraft increased relative to car travel, but this was balanced by an increasing tendency to engage in car travel as the number of persons in the household party travelling increased. Since travel by car represented such a large proportion of non-urban travel, a great deal of attention to this method of travel is warranted, especially in view of the fact that the majority of comments volunteered by NTS respondents expressed dissatisfaction with a number of aspects of travel by road in Australia.

Aircraft, hotels and motels were commonly used by persons travelling for business purposes. In fact the NTS indicated that 40 per cent of all trips made by aircraft and almost 30 per cent of trips involving the use of hotels and motels for accommodation were business trips. The preferred mode for holiday, sightseeing and tourist travel in general was the car. While hotels and motels obviously represented a significant form of accommodation on these leisure trips, the use of caravans, tents, cabins and holiday flats was also very high. Eighty per

cent of holiday trips lasted at least 3 days, 30 per cent being in excess of a week in duration. Correspondingly, the majority of sightseeing and recreation trips lasted no more than two days, with half being only day trips.

Non-urban travel was generally quite short. Seventy-five per cent of all non-urban trips involved travel of less than 300 km(1) to the main destination and 30 per cent of all non-urban trips were day trips. In fact, for non-urban travel overall, only 30 per cent of trips were of more than three days duration. Day trips were more likely to be made by car or truck and reflected mainly trip purposes of 'Deliver freight', 'Business', 'Sightseeing or recreation' and 'Personal affairs'. Obviously, shorter travel distances than average were involved on such trips.

Travel to several popular tourist areas was analysed. The Blue Mountains in N.S.W. and the Barossa Valley in S.A., for example, attracted a high proportion of holiday trips and trips made for sightseeing and recreation purposes. Travel to these areas had two distinct components - day trips from comparatively nearby centres, and trips involving three to seven nights in the area. Train trips represented a much higher proportion of travel to the Blue Mountains than of non-urban travel in general, while bus and aircraft were comparatively popular means of travel to Alice Springs and central Australia, and to Cairns and Green Island. Hotels and motels were frequently used for accommodation in these areas, but caravans and tents also represented a significant proportion of accommodation in the Barossa Valley, Cairns and Green Island.

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(1) For ease of calculation, distances were calculated on the basis of great circle distances from LGA centroids rather than route distances and as such may be understated by as much as 30 per cent.

This Report has illustrated the wide range of information which was obtained from the NTS. It is clearly not possible to examine and summarise the information in its entirety in a single publication. The discussion presented in this Report has been aimed at indicating some of the results of analysis of the NTS data, which can be considered to be of reasonably general interest. As noted, a number of other BTE publications related to the NTS present important technical considerations which are relevant to a thorough interpretation and application of the NTS data.

In a general sense, analysis of the NTS data has indicated a very high degree of consistency with the situation that might have been expected on the basis of previous information. The analysis so far has highlighted few features of non-urban travel in Australia which might be considered surprising. For example, the forms of accommodation used were found to be consistent with what might have been expected from the season of the year, the location of the destination, purpose of trip and so on. However, it is important to emphasise that the NTS data now permits these various effects to be quantified to a considerable degree of refinement. This is most significant since although it appears that the qualitative nature of non-urban travel behaviour could have been predicted from non-travel characteristics, the NTS was required in order both to confirm this general consistency and to specify it in quantitative terms.

Interest in the NTS results has been indicated from a wide cross-section of organisations engaged in activities related to travel and tourism. It is clear that some fairly specialised analyses of the NTS data would be desired by some organisations. Because of limited resources the BTE is not in a position to carry out such specialised analyses, and as a result has arranged for the NTS data base to be made available to organisations with appropriate analytical interests in it. A manual (Hirsch 1979a) has been published to facilitate the use and interpretation of the data base by such organisations.

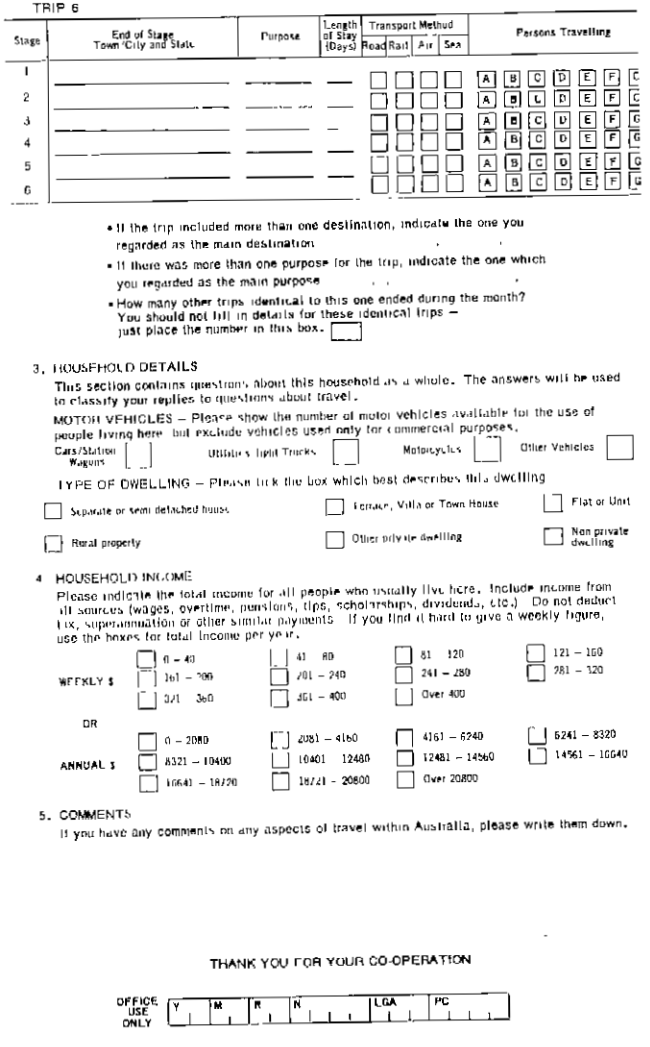
APPENDIX I - NTS QUESTIONNAIRE FORMS AND COVERING LETTERS

This Appendix contains examples of the initial, intermediate and final forms of the NTS questionnaire, and the final covering letter and reminder letter used for the survey.

The initial questionnaire design is shown in Figures I.1 and I.2. For this questionnaire the month of travel was specified in the covering letter, rather than on the questionnaire itself. This questionnaire was divided into five sections, as follows:

- Section 1, which requested personal details of each member of the household;
- Section 2, which requested details of trips ending in the survey month;
- Section 3, which requested household details;
- Section 4, which requested household income;
- Section 5, which invited respondents to make comments on travel within Australia.

It became clear from the pilot test of this questionnaire that respondents would have had considerable difficulty in providing the travel information sought. As a result the questionnaire was extensively re-designed. The resultant questionnaire for the survey month of March 1977 is shown in Figures I.3 and I.4. A pilot test in this month led to further modifications of the questionnaire, this time fairly minor. An example of the final questionnaire used for the month of June 1978 is shown in Figures I.5 and I.6. Similar forms were used for the other months of the survey, the designated month being changed appropriately on the questionnaire.



TRIP 6

Stage	End of Stage Town/City and State	Purpose	Length of Stay (Days)	Transport Method: Road	Rail	Air	Sea	Persons Travelling: A	B	C	D	E	F	G
1														
2														
3														
4														
5														
6														

- If the trip included more than one destination, indicate the one you regarded as the main destination
- If there was more than one purpose for the trip, indicate the one which you regarded as the main purpose
- How many other trips identical to this one ended during the month? You should not fill in details for these identical trips – just place the number in this box. ☐

3. HOUSEHOLD DETAILS

This section contains questions about this household as a whole. The answers will be used to classify your replies to questions about travel.

MOTOR VEHICLES – Please show the number of motor vehicles available for the use of people living here but exclude vehicles used only for commercial purposes.

Cars/Station Wagons ☐ Utilities (Light Trucks ☐ Motorcycles ☐ Other Vehicles ☐

TYPE OF DWELLING – Please tick the box which best describes this dwelling

☐ Separate or semi detached house ☐ Terrace, Villa or Town House ☐ Flat or Unit

☐ Rural property ☐ Other private dwelling ☐ Non private dwelling

4 HOUSEHOLD INCOME

Please indicate the total income for all people who usually live here. Include income from all sources (wages, overtime, pensions, tips, scholarships, dividends, etc.) Do not deduct tax, superannuation or other similar payments. If you find it hard to give a weekly figure, use the boxes for total income per year.

WEEKLY $	☐ 0 – 40	☐ 41 – 80	☐ 81 – 120	☐ 121 – 160
	☐ 161 – 200	☐ 201 – 240	☐ 241 – 280	☐ 281 – 320
	☐ 321 – 360	☐ 361 – 400	☐ Over 400	
OR				
ANNUAL $	☐ 0 – 2080	☐ 2081 – 4160	☐ 4161 – 6240	☐ 6241 – 8320
	☐ 8321 – 10400	☐ 10401 – 12480	☐ 12481 – 14560	☐ 14561 – 16640
	☐ 16641 – 18720	☐ 18721 – 20800	☐ Over 20800	

5. COMMENTS

If you have any comments on any aspects of travel within Australia, please write them down.

THANK YOU FOR YOUR CO-OPERATION

OFFICE USE ONLY | Y | M | R | N | LGA | PC |

BUREAU OF TRANSPORT ECONOMICS

CONFIDENTIAL

NATIONAL TRAVEL SURVEY 1976/77

Please read the letter that comes with this form before you fill in any details

1. PERSONAL DETAILS

How many people usually live here? ☐

Please complete the following details for each person

PERSON	SEX	MARITAL STATUS	OCCUPATIONAL STATUS	DRIVING LICENCE HELD	AGE (YEARS)
A	☐ Male ☐ Female	☐ Now Married ☐ Never Married ☐ Other	☐ Employed full-time ☐ Employed part-time ☐ Looking for work ☐ Retired or Pensioner ☐ Student ☐ Housewife ☐ Other	☐ Yes ☐ No	
B	☐ Male ☐ Female	☐ Now Married ☐ Never Married ☐ Other	☐ Employed full time ☐ Employed part time ☐ Looking for work ☐ Retired or Pensioner ☐ Student ☐ Housewife ☐ Other	☐ Yes ☐ No	
C	☐ Male ☐ Female	☐ Now Married ☐ Never Married ☐ Other	☐ Employed full time ☐ Employed part time ☐ Looking for work ☐ Retired or Pensioner ☐ Student ☐ Housewife ☐ Other	☐ Yes ☐ No	
D	☐ Male ☐ Female	☐ Now Married ☐ Never Married ☐ Other	☐ Employed full-time ☐ Employed part time ☐ Looking for work ☐ Retired or Pensioner ☐ Student ☐ Housewife ☐ Other	☐ Yes ☐ No	
E	☐ Male ☐ Female	☐ Now Married ☐ Never Married ☐ Other	☐ Employed full time ☐ Employed part time ☐ Looking for work ☐ Retired or Pensioner ☐ Student ☐ Housewife ☐ Other	☐ Yes ☐ No	
F	☐ Male ☐ Female	☐ Now Married ☐ Never Married ☐ Other	☐ Employed full time ☐ Employed part time ☐ Looking for work ☐ Retired or Pensioner ☐ Student ☐ Housewife ☐ Other	☐ Yes ☐ No	
G	☐ Male ☐ Female	☐ Now Married ☐ Never Married ☐ Other	☐ Employed full time ☐ Employed part time ☐ Looking for work ☐ Retired or Pensioner ☐ Student ☐ Housewife ☐ Other	☐ Yes ☐ No	

If you want your address to remain confidential, please tear off this strip

Figure 1.1
Initial form of the NTS questionnaire - Pages 1 and 4

Figure I.2
Initial form of the NTS questionnaire - Page 2 and 3

2. TRAVEL INFORMATION

Please read the instructions on the letter that comes with this form before you commence. If no people who usually live here made any trips which would qualify under the rules given in the instructions please tick this box ☐ and go to section 3. Otherwise, please record details of each trip made by people who usually live here.

TRIP 1

Stage	End of Stage Town/City and State	Purpose	Length of Stay (Days)	Transport Method Road	Rail	Air	Sea	Persons Travelling A	B	C	D	E	F	G
1				☐	☐	☐	☐	A	B	C	D	E	F	G
2				☐	☐	☐	☐	A	B	C	D	E	F	G
3				☐	☐	☐	☐	A	B	C	D	E	F	G
4				☐	☐	☐	☐	A	B	C	D	E	F	G
5				☐	☐	☐	☐	A	B	C	D	E	F	G
6				☐	☐	☐	☐	A	B	C	D	E	F	G

- If the trip included more than one destination, indicate the one you regarded as the main destination
- If there was more than one purpose for the trip, indicate the one which you regarded as the main purpose
- How many other trips identical to this one ended during the month? You should not fill in details for these identical trips – just place the number in this box ☐

TRIP 2

Stage	End of Stage Town/City and State	Purpose	Length of Stay (Days)	Transport Method Road	Rail	Air	Sea	Persons Travelling A	B	C	D	E	F	G
1				☐	☐	☐	☐	A	B	C	D	E	F	G
2				☐	☐	☐	☐	A	B	C	D	E	F	G
3				☐	☐	☐	☐	A	B	C	D	E	F	G
4				☐	☐	☐	☐	A	B	C	D	E	F	G
5				☐	☐	☐	☐	A	B	C	D	E	F	G
6				☐	☐	☐	☐	A	B	C	D	E	F	G

- If the trip included more than one destination, indicate the one you regarded as the main destination
- If there was more than one purpose for the trip, indicate the one which you regarded as the main purpose
- How many other trips identical to this one ended during the month? You should not fill in details for these identical trips – just place the number in this box ☐

TRAVEL PURPOSES AND REASONS FOR INTERRUPTING JOURNEY

To conduct business (B)
To deliver freight or goods (DG)
To visit relatives or friends (VRF)
To pursue personal affairs (PA)
To change from one method of transport to another (CM)
To take an overnight rest before continuing journey (OR)
Sightseeing, recreation or holiday (SRH)
Other (O)

TRIP 3

Stage	End of Stage Town/City and State	Purpose	Length of Stay (Days)	Transport Method Road	Rail	Air	Sea	Persons Travelling A	B	C	D	E	F	G
1				☐	☐	☐	☐	A	B	C	D	E	F	G
2				☐	☐	☐	☐	A	B	C	D	E	F	G
3				☐	☐	☐	☐	A	B	C	D	E	F	G
4				☐	☐	☐	☐	A	B	C	D	E	F	G
5				☐	☐	☐	☐	A	B	C	D	E	F	G
6				☐	☐	☐	☐	A	B	C	D	E	F	G

- If the trip included more than one destination, indicate the one you regarded as the main destination
- If there was more than one purpose for the trip, indicate the one which you regarded as the main purpose
- How many other trips identical to this one ended during the month? You should not fill in details for these identical trips – just place the number in this box ☐

TRIP 4

Stage	End of Stage Town/City and State	Purpose	Length of Stay (Days)	Transport Method Road	Rail	Air	Sea	Persons Travelling A	B	C	D	E	F	G
1				☐	☐	☐	☐	A	B	C	D	E	F	G
2				☐	☐	☐	☐	A	B	C	D	E	F	G
3				☐	☐	☐	☐	A	B	C	D	E	F	G
4				☐	☐	☐	☐	A	B	C	D	E	F	G
5				☐	☐	☐	☐	A	B	C	D	E	F	G
6				☐	☐	☐	☐	A	B	C	D	E	F	G

- If the trip included more than one destination, indicate the one you regarded as the main destination
- If there was more than one purpose for the trip, indicate the one which you regarded as the main purpose
- How many other trips identical to this one ended during the month? You should not fill in details for these identical trips – just place the number in this box ☐

TRIP 5

Stage	End of Stage Town/City and State	Purpose	Length of Stay (Days)	Transport Method Road	Rail	Air	Sea	Persons Travelling A	B	C	D	E	F	G
1				☐	☐	☐	☐	A	B	C	D	E	F	G
2				☐	☐	☐	☐	A	B	C	D	E	F	G
3				☐	☐	☐	☐	A	B	C	D	E	F	G
4				☐	☐	☐	☐	A	B	C	D	E	F	G
5				☐	☐	☐	☐	A	B	C	D	E	F	G
6				☐	☐	☐	☐	A	B	C	D	E	F	G

If the trip include more than one destination, indicate the one you regarded as the main destination

If there was more than one purpose for the trip, indicate the one which you regarded as the main purpose

How many other trips identical to this one ended during the month? You should not fill in details for these identical trips – just place the number in this box. ☐

Section III

HOUSEHOLD DETAILS

INSTRUCTIONS—these details relate to the household as a whole

- When answering the motor vehicles question *include* company cars and other vehicles which are not owned by members of the household but which are regularly available to at least one of them
- When answering the income question give only the *combined* income for the whole household
  - include income from all sources (wages, overtime, child endowment pensions etc.)
  - *do not deduct* tax superannuation etc
- Both weekly and equivalent yearly incomes are shown. Choose the figure most convenient for indicating the total income of the household

A How many motor vehicles are available for use by members of this household?

Refer to the notes at the top of this Section. If no vehicles in a particular class are available write 0 for that class

______ Cars (including station wagons)

______ Utilities and light trucks

______ Motor cycles

______ Other vehicles

B. What is the combined income of members of the household?

Refer to the notes at the top of this Section and tick *one box only*

PER WEEK	PER YEAR
☐ Less than $39	☐ Less than $2000
☐ Over $39 to $77	☐ Over $2000 to $4000
☐ Over $77 to $115	☐ Over $4000 to $6000
☐ Over $115 to $154	☐ Over $6000 to $8000
☐ Over $154 to $192	☐ Over $8000 to $10 000
☐ Over $192 to $288	☐ Over $10 000 to $15 000
☐ Over $288 to $385	☐ Over $15 000 to $20 000
☐ Over $385 to $481	☐ Over $20 000 to $25 000
☐ Over $481	☐ Over $25 000

Section IV

COMMENTS

INSTRUCTIONS

- Please write down any additional information you consider useful for adequately describing recent long distance travel by members of the household. In particular [illegible] in any way (e.g. travel on a working holiday)
- Please write any general comments you have on travel in Australia
- If space is insufficient enclose a separate sheet of paper

THANK YOU FOR YOUR CO-OPERATION

R76/1070
Cat No 77 2380 3

BUREAU OF TRANSPORT ECONOMICS

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NATIONAL TRAVEL SURVEY 1977/78

Section I

PERSONAL DETAILS

INSTRUCTIONS

- The members of this household are regarded as those persons usually living and eating together there as a domestic unit. A person living alone is also a household
- Please complete the following details for *each person* who is a member of this household. *Include* children
- Answer the Occupation question only for those people employed full or part time

PERSON	SEX	MARITAL STATUS	OCCUPATIONAL STATUS *Tick one box for each person*	OCCUPATION *See notes above*	AGE	DRIVING LICENCE
1	☐ Male ☐ Female	☐ Now married ☐ Never married ☐ Widowed ☐ Other	☐ Employed Full-time ☐ Employed Part-time ☐ Looking for work ☐ Retired Pensioner ☐ Student ☐ Home-duties ☐ Other		Years	☐ Yes ☐ No
2	☐ Male ☐ Female	☐ Now married ☐ Never married ☐ Widowed ☐ Other	☐ Employed Full-time ☐ Employed Part-time ☐ Looking for work ☐ Retired Pensioner ☐ Student ☐ Home-duties ☐ Other		Years	☐ Yes ☐ No
3	☐ Male ☐ Female	☐ Now married ☐ Never married ☐ Widowed ☐ Other	☐ Employed Full-time ☐ Employed Part-time ☐ Looking for work ☐ Retired Pensioner ☐ Student ☐ Home-duties ☐ Other		Years	☐ Yes ☐ No
4	☐ Male ☐ Female	☐ Now married ☐ Never married ☐ Widowed ☐ Other	☐ Employed Full-time ☐ Employed Part-time ☐ Looking for work ☐ Retired Pensioner ☐ Student ☐ Home-duties ☐ Other		Years	☐ Yes ☐ No
5	☐ Male ☐ Female	☐ Now married ☐ Never married ☐ Widowed ☐ Other	☐ Employed Full-time ☐ Employed Part-time ☐ Looking for work ☐ Retired Pensioner ☐ Student ☐ Home-duties ☐ Other		Years	☐ Yes ☐ No
6	☐ Male ☐ Female	☐ Now married ☐ Never married ☐ Widowed ☐ Other	☐ Employed Full-time ☐ Employed Part-time ☐ Looking for work ☐ Retired Pensioner ☐ Student ☐ Home-duties ☐ Other		Years	☐ Yes ☐ No
7	☐ Male ☐ Female	☐ Now married ☐ Never married ☐ Widowed ☐ Other	☐ Employed Full-time ☐ Employed Part-time ☐ Looking for work ☐ Retired Pensioner ☐ Student ☐ Home-duties ☐ Other		Years	☐ Yes ☐ No
8	☐ Male ☐ Female	☐ Now married ☐ Never married ☐ Widowed ☐ Other	☐ Employed Full-time ☐ Employed Part-time ☐ Looking for work ☐ Retired Pensioner ☐ Student ☐ Home-duties ☐ Other		Years	☐ Yes ☐ No
9	☐ Male ☐ Female	☐ Now married ☐ Never married ☐ Widowed ☐ Other	☐ Employed Full-time ☐ Employed Part-time ☐ Looking for work ☐ Retired Pensioner ☐ Student ☐ Home-duties ☐ Other		Years	☐ Yes ☐ No

A	
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March 1977

Figure 1.3

Intermediate form of the NTS questionnaire - Page 1 and 4

Figure 1.4
Intermediate form of the NTS questionnaire - Pages 2 and 3

Section II

TRIPS ENDING IN MARCH 1977

INSTRUCTIONS—please read carefully before filling in trip details

- A trip is defined as a journey *within Australia* by one or more members of this household. A trip starts and finishes at home.
- Do *not* include trips made as a crew-member on a bus, train, aircraft or ship. However, trips made as the driver of a commercial motor vehicle (except a bus) *should* be included.
- Do *not* include trips involving travel to or from work.
- Include *only* trips which involved travel to at least one place 100 km (60 miles) or more from home.
- Include *only* trips which ended (at home) during MARCH 1977 *regardless of when they started*.
- Complete a trip column for each trip (by one or more members of this household) which follows the rules given above. In some cases, several members of this household may have travelled together for part of the trip, but some of them may have separated from the party (for example to visit another city). In such cases, regard each group as having made a *separate* trip. This should only be done in the case of a substantial separation (*not*, for instance, if one group only visits a local beach, etc.)
- When recording details of transport methods and payment of fares, do *not* include the following:
  - Local transport such as city trains, buses or taxis
  - Transport to and from airports, railway stations and so on
  - River crossings by car ferries

	TRIP 1	TRIP 2	TRIP 3	TRIP 4	TRIP 5
A **What was the destination of the trip?** If more than one place was visited, record the name of the place regarded as the *main* destination	City/Town State	City/Town State	City/Town State	City/Town State	City/Town State
B **How many nights were spent there?**	Nights If no nights were spent there, write 0 and go onto item D	Nights If no nights were spent there, write 0 and go onto item D	Nights If no nights were spent there, write 0 and go onto item D	Nights If no nights were spent there, write 0 and go onto item D	Nights If no nights were spent there, write 0 and go onto item D
C **What types of accommodation were used during the time spent there?** Tick one box for *each* type of accommodation used	☐ Hotel or motel ☐ Friends or relatives ☐ Caravan or camp ☐ Other	☐ Hotel or motel ☐ Friends or relatives ☐ Caravan or camp ☐ Other	☐ Hotel or motel ☐ Friends or relatives ☐ Caravan or camp ☐ Other	☐ Hotel or motel ☐ Friends or relatives ☐ Caravan or camp ☐ Other	☐ Hotel or motel ☐ Friends or relatives ☐ Caravan or camp ☐ Other
D **What were the reasons for making the trip as a whole?** Tick one box for each reason. If you have ticked *more* than one box, *circle* the box you ticked which gives the *main* reason for going to the place you wrote in item A above	☐ Personal or family business ☐ Business ☐ Deliver freight or goods ☐ Holiday ☐ Sightseeing or recreation ☐ Visit friends or relatives ☐ Other	☐ Personal or family business ☐ Business ☐ Deliver freight or goods ☐ Holiday ☐ Sightseeing or recreation ☐ Visit friends or relatives ☐ Other	☐ Personal or family business ☐ Business ☐ Deliver freight or goods ☐ Holiday ☐ Sightseeing or recreation ☐ Visit friends or relatives ☐ Other	☐ Personal or family business ☐ Business ☐ Deliver freight or goods ☐ Holiday ☐ Sightseeing or recreation ☐ Visit friends or relatives ☐ Other	☐ Personal or family business ☐ Business ☐ Deliver freight or goods ☐ Holiday ☐ Sightseeing or recreation ☐ Visit friends or relatives ☐ Other
E **During the trip, which place visited was furthest from home?**	City/Town State	City/Town State	City/Town State	City/Town State	City/Town State
F **What were the main methods of transport used during the trip?** Please refer to the notes at the top of this section and tick one box for each method of transport used. If you have ticked *more* than one box, *circle* the box you ticked which gives the method of transport used to travel the greatest distance	☐ Car, motorcycle or truck ☐ Aircraft ☐ Bus ☐ Train ☐ Ship or boat ☐ Other	☐ Car, motorcycle or truck ☐ Aircraft ☐ Bus ☐ Train ☐ Ship or boat ☐ Other	☐ Car, motorcycle or truck ☐ Aircraft ☐ Bus ☐ Train ☐ Ship or boat ☐ Other	☐ Car, motorcycle or truck ☐ Aircraft ☐ Bus ☐ Train ☐ Ship or boat ☐ Other	☐ Car, motorcycle or truck ☐ Aircraft ☐ Bus ☐ Train ☐ Ship or boat ☐ Other
G **Which members of this household went on this trip?** Please tick numbers corresponding to those used to identify individual household members in Section I	1 4 7 2 5 8 3 6 9	1 4 7 2 5 8 3 6 9	1 4 7 2 5 8 3 6 9	1 4 7 2 5 8 3 6 9	1 4 7 2 5 8 3 6 9
H **When did the trip end, and how many nights were spent away from home?**	Nights Date ended /3/77	Nights Date ended /3/77	Nights Date ended /3/77	Nights Date ended /3/77	Nights Date ended /3/77
I. **Who paid for any fares related to the trip?** Please refer to the notes at the top of this section and tick the appropriate box or boxes	☐ No fares involved ☐ Household member(s) ☐ Employer ☐ Other	☐ No fares involved ☐ Household member(s) ☐ Employer ☐ Other	☐ No fares involved ☐ Household member(s) ☐ Employer ☐ Other	☐ No fares involved ☐ Household member(s) ☐ Employer ☐ Other	☐ No fares involved ☐ Household member(s) ☐ Employer ☐ Other
J **How many other trips identical to this one (except for the date) ended during the month?** You need not fill in a trip column for these identical trips	If no identical trips were made, write 0	If no identical trips were made, write 0	If no identical trips were made, write 0	If no identical trips were made, write 0	If no identical trips were made, write 0

Please use the space provided in Section IV to record any further important or unusual details of these trips.

Figure I.5
Final form of the NTS questionnaire - Page 1 and 4

Section III

HOUSEHOLD DETAILS

DIRECTIONS—these details relate to the household as a whole

- When answering the motor vehicles question **include** company cars and other vehicles which are not owned by members of the household but which are regularly available to at least one of them
- When answering the income question give only the **combined** income for the whole household
  - include income from all sources (wages, overtime, child endowment, pensions etc.)
  - **do not deduct** tax, superannuation etc

A. **How many motor vehicles are available for use by members of this household?**

Refer to the notes at the top of this Section. If no vehicles in a particular class are available write '0' for that class

_____ Cars (including station wagons)
_____ Motor cycles
_____ Utilities and light trucks
_____ Other vehicles

B. **What is the combined income of members of the household?**

Refer to the notes at the top of this Section and tick **one box only**

Both weekly and equivalent yearly incomes are shown to assist you in choosing the correct box

- ☐ Less than $30 per week / Less than $2000 per year
- ☐ Over $70 to $77 per week / Over $4000 to $4000 per year
- ☐ Over $77 to $115 per week / Over $4000 to $6000 per year
- ☐ Over $115 to $154 per week / Over $6000 to $8000 per year
- ☐ Over $154 to $192 per week / Over $8000 to $10000 per year
- ☐ Over $192 to $288 per week / Over $10000 to $15000 per year
- ☐ Over $288 to $385 per week / Over $15000 to $20000 per year
- ☐ Over $385 to $481 per week / Over $20000 to $25000 per year
- ☐ Over $481 to $577 per week / Over $25000 to $30000 per year
- ☐ Over $577 per week / Over $30000 per year

Section IV

COMMENTS

INSTRUCTIONS

- Please write down any additional information you consider useful for adequately describing recent long-distance travel by members of the household. In particular indicate if the type of travel you recorded in Section II is continued as may way (e.g. travel on a working holiday)
- Please write any general comments you have on travel in Australia
- If space is insufficient, enclose a separate sheet of paper

THANK YOU FOR YOUR CO-OPERATION

R78/1240

Cat No 7724127

BUREAU OF TRANSPORT ECONOMICS

NATIONAL TRAVEL SURVEY 1977/78

CONFIDENTIAL
REPLY WILL ONLY BE SEEN BY AUTHORISED BTE REPRESENTATIVES

Section I

PERSONAL DETAILS

DIRECTIONS

- The members of this household are regarded as those persons usually living and eating together here as a domestic unit. A person living alone is also a household
- Please complete the following details for **each person** who is a member of this household **including** children
- Answer the 'Occupation' question only for those people employed full or part time

PERSON	SEX	MARITAL STATUS	MAJOR ACTIVITY *Tick one box for each person*	OCCUPATION *See notes above*	AGE	DRIVING LICENCE
1	☐ Male ☐ Female	☐ Never married ☐ Now married ☐ Widowed ☐ Other	☐ Employed Full time ☐ Student ☐ Employed Part time ☐ Home-duties ☐ Looking for work ☐ Other ☐ Retired Pensioner	_____ _____	Years	☐ Yes ☐ No
2	☐ Male ☐ Female	☐ Never married ☐ Now married ☐ Widowed ☐ Other	☐ Employed Full time ☐ Student ☐ Employed Part-time ☐ Home duties ☐ Looking for work ☐ Other ☐ Retired Pensioner	_____ _____	Years	☐ Yes ☐ No
3	☐ Male ☐ Female	☐ Never married ☐ Now married ☐ Widowed ☐ Other	☐ Employed Full time ☐ Student ☐ Employed Part time ☐ Home-duties ☐ Looking for work ☐ Other ☐ Retired Pensioner	_____ _____	Years	☐ Yes ☐ No
4	☐ Male ☐ Female	☐ Never married ☐ Now married ☐ Widowed ☐ Other	☐ Employed Full time ☐ Student ☐ Employed Part time ☐ Home-duties ☐ Looking for work ☐ Other ☐ Retired Pensioner	_____ _____	Years	☐ Yes ☐ No
5	☐ Male ☐ Female	☐ Never married ☐ Now married ☐ Widowed ☐ Other	☐ Employed Full time ☐ Student ☐ Employed Part time ☐ Home-duties ☐ Looking for work ☐ Other ☐ Retired Pensioner	_____ _____	Years	☐ Yes ☐ No
6	☐ Male ☐ Female	☐ Never married ☐ Now married ☐ Widowed ☐ Other	☐ Employed Full-time ☐ Student ☐ Employed Part time ☐ Home duties ☐ Looking for work ☐ Other ☐ Retired Pensioner	_____ _____	Years	☐ Yes ☐ No
7	☐ Male ☐ Female	☐ Never married ☐ Now married ☐ Widowed ☐ Other	☐ Employed Full-time ☐ Student ☐ Employed Part-time ☐ Home duties ☐ Looking for work ☐ Other ☐ Retired Pensioner	_____ _____	Years	☐ Yes ☐ No
8	☐ Male ☐ Female	☐ Never married ☐ Now married ☐ Widowed ☐ Other	☐ Employed Full time ☐ Student ☐ Employed Part-time ☐ Home-duties ☐ Looking for work ☐ Other ☐ Retired Pensioner	_____ _____	Years	☐ Yes ☐ No
9	☐ Male ☐ Female	☐ Never married ☐ Now married ☐ Widowed ☐ Other	☐ Employed Full time ☐ Student ☐ Employed Part time ☐ Home-duties ☐ Looking for work ☐ Other ☐ Retired Pensioner	_____ _____	Years	☐ Yes ☐ No

THE HOUSEHOLDER,
FLAT 1
2 SMITH ST
JOHNSTOWN 2372.

A	202	Office Use Only
N	279	
I	2157	
C	6608R	

JUNE 1978

PLEASE RETURN THIS FORM WITHIN SEVEN DAYS.

Section II **DETAILS OF TRIPS ENDING IN JUNE 1978 ONLY**	**DIRECTIONS—please read carefully before filling in trip details** • A trip is defined as a journey **wholly within Australia** by one or more members of this household. A trip starts and finishes at home. • Do **not** include trips made **as a crew-member** on a bus, train, aircraft or ship. However, trips made as the driver of a commercial motor vehicle (except a bus) **should** be included. • Do **not** include trips involving travel to or from work. • Include **only** trips which involved travel to at least one place 100km (60 miles) or more from home. • Include **only** trips which ended (at home) during JUNE 1978, **regardless of when they started.** • Complete a trip column for each trip (by one or more members of this household) which follows the rules given above. In some cases, several members of this household may have travelled together for part of the trip, but some of them may have separated from the party (for example to visit another city). In such cases, regard each group as having made **a separate** trip. This should only be done in the case of a substantial separation (**not** for instance, if one group only visits a local beach etc.) • When recording details of transport methods and payment of fares, do **not** include the following: —Local transport such as city trains, buses or taxis —Transport to and from airports, railway stations and so on —River crossings by car ferries **IF NO ONE IN THIS HOUSEHOLD MADE ANY TRIPS SATISFYING THESE CONDITIONS PLEASE TICK THIS BOX AND GO TO SECTION III** ☐				
	TRIP 1	**TRIP 2**	**TRIP 3**	**TRIP 4**	**TRIP 5**
A **What was the destination of the trip?** If more than one place was visited record the name of the place regarded as the **main** destination	________ ________ City/Town State	________ ________ City/Town State	________ ________ City/Town State	________ ________ City/Town State	________ ________ City/Town State
B **How many nights were spent there?**	______ Nights If no nights were spent there write 0 and go to item D	______ Nights If no nights were spent there write 0 and go to item D	______ Nights If no nights were spent there write 0 and go to item D	______ Nights If no nights were spent there write 0 and go to item D	______ Nights If no nights were spent there write 0 and go to item D
C **What types of accommodation were used during the time spent there?** Tick one box for **each** type of accommodation used	☐ Hotel or motel ☐ Friends or relatives home ☐ Caravan campervan or tent ☐ Other	☐ Hotel or motel ☐ Friends or relatives home ☐ Caravan campervan or tent ☐ Other	☐ Hotel or motel ☐ Friends or relatives home ☐ Caravan campervan or tent ☐ Other	☐ Hotel or motel ☐ Friends or relatives home ☐ Caravan campervan or tent ☐ Other	☐ Hotel or motel ☐ Friends or relatives home ☐ Caravan campervan or tent ☐ Other
D **What were the reasons for making the trip as a whole?** Tick one box for each reason. If you have ticked **more** than one box, **circle** the box you ticked which gives the **main** reason for going to the place you wrote in item A above	☐ Deliver freight or goods ☐ Other business ☐ Visit friends or relatives ☐ Sightseeing or recreation ☐ Holiday ☐ Personal or family affairs ☐ Other	☐ Deliver freight or goods ☐ Other business ☐ Visit friends or relatives ☐ Sightseeing or recreation ☐ Holiday ☐ Personal or family affairs ☐ Other	☐ Deliver freight or goods ☐ Other business ☐ Visit friends or relatives ☐ Sightseeing or recreation ☐ Holiday ☐ Personal or family affairs ☐ Other	☐ Deliver freight or goods ☐ Other business ☐ Visit friends or relatives ☐ Sightseeing or recreation ☐ Holiday ☐ Personal or family affairs ☐ Other	☐ Deliver freight or goods ☐ Other business ☐ Visit friends or relatives ☐ Sightseeing or recreation ☐ Holiday ☐ Personal or family affairs ☐ Other
E **During the trip, which place visited was furthest from home?**	________ ________ City/Town State	________ ________ City/Town State	________ ________ City/Town State	________ ________ City/Town State	________ ________ City/Town State
F **What were the main methods of transport used during the trip?** Please refer to the notes at the top of this section and tick one box for each method of transport used. If you have ticked **more** than one box **circle** the box you ticked which gives the method of transport used to travel the greatest distance	☐ Aeroplane ☐ Motorcycle ☐ Bus/Coach ☐ Ship/Boat ☐ Car ☐ Train ☐ Truck ☐ Other	☐ Aeroplane ☐ Motorcycle ☐ Bus/Coach ☐ Ship/Boat ☐ Car ☐ Train ☐ Truck ☐ Other	☐ Aeroplane ☐ Motorcycle ☐ Bus/Coach ☐ Ship/Boat ☐ Car ☐ Train ☐ Truck ☐ Other	☐ Aeroplane ☐ Motorcycle ☐ Bus/Coach ☐ Ship/Boat ☐ Car ☐ Train ☐ Truck ☐ Other	☐ Aeroplane ☐ Motorcycle ☐ Bus/Coach ☐ Ship/Boat ☐ Car ☐ Train ☐ Truck ☐ Other
G. **Which members of this household went on the trip?** Please tick numbers corresponding to those used to identify individual household members in Section I	1 4 7 2 5 8 3 6 9	1 4 7 2 5 8 3 6 9	1 4 7 2 5 8 3 6 9	1 4 7 2 5 8 3 6 9	1 4 7 2 5 8 3 6 9
H **When did the trip end and how many nights were spent away from home?**	______ ______/6/78 Nights Date ended	______ ______/6/78 Nights Date ended	______ ______/6/78 Nights Date ended	______ ______/6/78 Nights Date ended	______ ______/6/78 Nights Date ended
I **Who paid for any fares related to the trip?** Please refer to the notes at the top of this section and tick the appropriate box or boxes	☐ No fares involved ☐ Household member(s) ☐ Employer s or own business ☐ Other	☐ No fares involved ☐ Household member(s) ☐ Employer s or own business ☐ Other	☐ No fares involved ☐ Household member(s) ☐ Employer s or own business ☐ Other	☐ No fares involved ☐ Household member(s) ☐ Employer s or own business ☐ Other	☐ No fares involved ☐ Household member(s) ☐ Employer s or own business ☐ Other
J **How many OTHER trips identical to this one (except for the date) ended during the month?** You need not fill in a trip column for these other identical trips	______ If no other identical trips were made write 0	______ If no other identical trips were made write 0	______ If no other identical trips were made write 0	______ If no other identical trips were made write 0	______ If no other identical trips were made write 0
	Please use the space provided in Section IV to record any further important or unusual details of these trips				**PLEASE TURN OVER**

Figure 1.6

Final form of the NTS questionnaire - Pages 2 and 3

As can be seen from Figures I.3 to I.6 the overall structure of the intermediate and final forms of the questionnaire were very similar. Both forms were divided into four sections, as follows:

- Section I, which requested personal details of each member of the household;
- Section II, which requested details of trips ending in the survey month;
- Section III, which requested household details;
- Section IV, which invited respondents to make comments on travel within Australia.

On the first page of the form in the lower right hand corner, there is a box marked 'Office Use Only'. Four codes were entered in this box which provided identification of the sample address. Referring to the box in question, the codes were as follows.

- Code 'A' was the AGR number which relates to the sample address.
- Code 'N' was the relevant NTS region number.
- Code 'L' was the relevant LGA number.
- Code 'C' was a unique sequence number for the particular sample address.

All the necessary instructions required to complete the questionnaire were contained within the form itself. The covering letter sent with the questionnaire was designed to introduce the survey to the householder and to prompt a response. Figures I.7 and I.8 contain examples of the covering letter and reminder letter used in the NTS, respectively.

BUREAU OF TRANSPORT ECONOMICS

NATIONAL TRAVEL SURVEY 1977/78

Dear Householder,

The Bureau of Transport Economics (BTE) is a research organisation attached to the Commonwealth Department of Transport. A large part of the BTE's work involves planning for an efficient national transport system. To assist in this a National Travel Survey, the first of its kind in Australia, is being conducted over a period of twelve months. The results of this survey will be used to plan improved highways, rail links, airports and so on.

The aim of the National Travel Survey is to obtain details of people's trips within Australia to places 100 km (60 miles) or more from home. The enclosed questionnaire has a series of questions about any such trips which ended during the last month. We are also asking for a limited amount of background information about the household as a whole, and about individual members of the household. You will note that the questionnaire is marked CONFIDENTIAL. This means that replies will only be seen by BTE representatives working on this particular survey The replies will be destroyed after processing.

Your household was chosen at random to participate in this survey. In the interests of economy, we have only sent out a limited number of questionnaires. It is therefore very important that you should complete your questionnaire carefully and return it within SEVEN DAYS, using the reply-paid envelope. It is essential that you return the form EVEN IF NO PERSON IN THE HOUSEHOLD MADE A TRIP OF THE TYPE DESCRIBED. In this case, complete the remainder of the form and indicate in the appropriate section that no trips were made. Please read the instructions on the questionnaire carefully. If you have any queries about the questionnaire or about the National Travel Survey itself, please write to:

Bureau of Transport Economics,
P.O. Box 495,
CANBERRA CITY. A.C.T. 2601

May I again emphasise the importance we attach to this survey, and thank you in advance for your participation.

Yours faithfully,

(G. K R. Reid)
Acting Director

Figure I.7
Specimen covering letter sent with initial questionnaire

BUREAU OF TRANSPORT ECONOMICS

NATIONAL TRAVEL SURVEY 1977/78

Dear Householder,

The Bureau of Transport Economics is currently conducting a survey (known as the National Travel Survey) to find out details of people's travel within Australia. Your household was included in a sample for this survey, and you should have received a questionnaire within the last two weeks.

The success of this survey depends very much on the number of replies we receive. You may not yet have had an opportunity to complete your questionnaire and return it. It is possible that you have mislaid your questionnaire, or that it was not delivered in the first place. Therefore, we have enclosed a new copy for your convenience. Please complete and return the form within SEVEN DAYS. As with the original questionnaire, this copy is marked CONFIDENTIAL. This means that replies will only be seen by BTE representatives working on this particular survey. The replies will be destroyed after processing.

Please remember that it is important that you return the questionnaire EVEN IF NO ONE IN THE HOUSEHOLD HAS MADE A TRIP OF THE TYPE DESCRIBED. In this case, complete the remainder of the form and indicate in the appropriate section that no trips were made.

If you have already returned your original questionnaire, please accept my thanks and ignore this reminder. If you have any queries about the questionnaire or about the National Travel Survey itself, please write to:

Bureau of Transport Economics,
P.O. Box 495,
CANBERRA CITY. A.C.T. 2601

May I again emphasise the importance we attach to this survey, and thank you in advance for your participation.

Yours faithfully,

(G. K. R. Reid)
Acting Director

Figure I.8
Specimen covering letter sent with reminder questionnaire

APPENDIX II - DESCRIPTION OF NTS REGIONS

Table II.1 presents a list of the 64 NTS regions which were devised for this study (Aplin *et al.* 1978). The regions are listed by State and Territory and the region name and number have been included. In addition, an estimate of the population of each region is provided, together with approximate population centroid co-ordinates.

Maps showing the boundaries of the NTS regions are included in this Appendix.

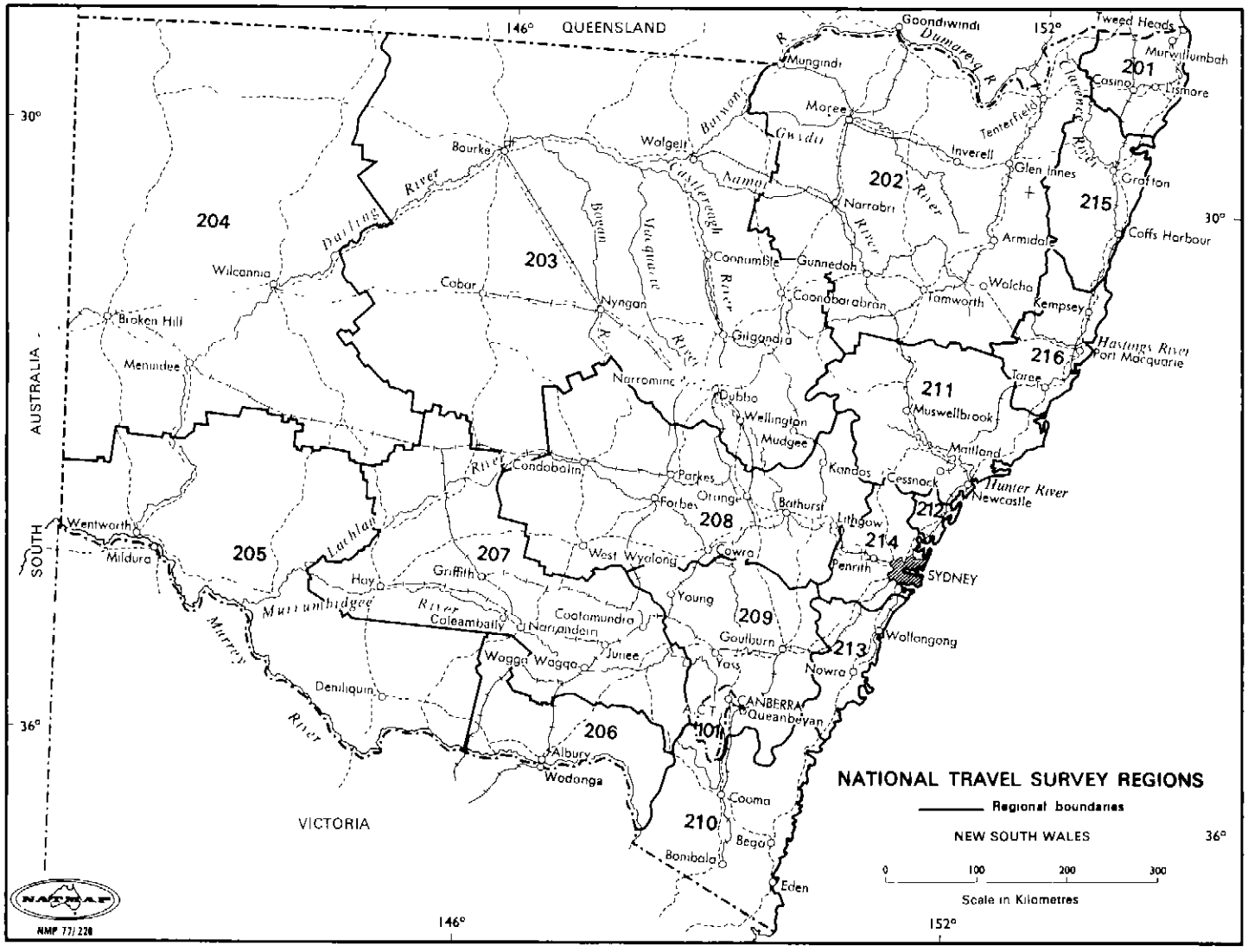
TABLE II.1 - DESCRIPTION OF NTS REGIONS

State or Territory	Region Name	Region Number	Population	Co-ordinates of Centroid Latitude (Degrees)	Longitude (Degrees)
Australian Capital Territory	Australian Capital Territory	101	196 935	35.25 S	149.25 E
New South Wales	Lismore	201	106 180	28.67 S	153.08 E
	Armidale	202	168 015	30.10 S	150.75 E
	Dubbo	203	99 004	30.75 S	148.00 E
	Broken Hill	204	32 386	31.67 S	142.25 E
	Deniliquin	205	36 537	35.50 S	147.33 E
	Albury	206	54 439	35.00 S	144.00 E
	Wagga	207	134 737	34.67 S	147.42 E
	Bathurst	208	155 462	33.50 S	149.33 E
	Goulburn	209	80 741	35.00 S	149.17 E
	Cooma	210	47 210	36.33 S	149.50 E
	Newcastle	211	419 612	32.67 S	150.90 E
	Gosford	212	120 774	33.40 S	151.50 E
	Wollongong	213	270 127	34.75 S	150.80 E
	Sydney	214	2 901 208	33.75 S	151.00 E
	Grafton	215	73 259	31.50 S	153.75 E
	Taree	216	71 665	29.80 S	153.25 E
Victoria	Geelong	301	181 008	38.25 S	144.20 E
	Warrnambool	302	95 779	38.25 S	142.50 E
	Ballarat	303	103 456	37.50 S	143.75 E
	Horsham	304	54 456	36.60 S	142.40 E
	Mildura	305	68 605	34.80 S	143.00 E
	Bendigo	306	130 134	36.60 S	144.50 E
	Shepparton	307	120 720	36.50 S	154.60 E
	Wangaratta	308	72 201	36.40 S	146.70 E
	Sale	309	56 513	37.85 S	147.60 E
	Moe	310	113 270	38.30 S	146.30 E
	Melbourne	311	2 649 134	38.00 S	145.00 E
Queensland	Brisbane	401	696 740	27.50 S	153.20 E
	Gold Coast	402	310 130	27.80 S	153.00 E
	Nambour	403	164 110	26.80 S	152.85 E
	Bundaberg	404	152 095	25.25 S	152.58 E
	Rockhampton	405	126 395	23.75 S	150.92 E
	Mackay	406	77 038	21.34 S	149.00 E
	Townsville	407	145 460	19.50 S	146.80 E
	Cairns	408	124 661	17.32 S	147.75 E
	Mount Isa	409	41 058	20.75 S	140.00 E
	Longreach	410	14 063	23.92 S	145.00 E
	Roma	411	27 876	27.42 S	148.25 E
	Toowoomba	412	155 313	27.50 S	151.65 E

TABLE II.1 (CONT) - DESCRIPTION OF NTS REGIONS

State or Territory	Region Name	Region Number	Population	Co-ordinates of Centroid Latitude (Degrees)	Longitude (Degrees)
South Australia	Adelaide	501	903 003	34.92 S	138.83 E
	Port Lincoln	502	31 425	34.25 S	134.92 E
	Kadina	503	21 579	34.17 S	137.92 E
	Whyalla	504	82 727	32.58 S	137.83 E
	Gawler	505	38 504	34.25 S	138.67 E
	Victor Harbour	506	34 914	35.42 S	138.42 E
	Murray Bridge	507	58 591	35.00 S	139.42 E
	Mount Gambier	508	57 698	35.55 S	139.42 E
	Woomera	509	14 948	29.50 S	135.70 E
Western Australia	Albany	601	63 355	33.42 S	118.17 E
	Bunbury	602	68 335	33.83 S	116.00 E
	Kalgoorlie	603	39 691	30.30 S	122.00 E
	Northam	604	39 569	31.25 S	117.00 E
	Port Hedland	605	38 687	20.50 S	117.00 E
	Derby	606	15 130	15.75 S	125.00 E
	Geraldton	607	45 219	29.50 S	115.50 E
	Perth	608	819 078	32.17 S	115.92 E
	Carnarvon	609	13 128	24.00 S	117.58 E
Tasmania	Hobart	701	191 296	42.75 S	147.25 E
	Burnie	702	88 861	41.17 S	146.00 E
	Launceston	703	109 569	41.42 S	147.00 E
	Queenstown	704	12 565	41.83 S	145.50 E
Northern Territory	Darwin	801	71 737	14.00 S	133.00 E
	Alice Springs	802	24 785	23.40 S	133.50 E

Source: The population figures were obtained from the Census of Population and Housing conducted by the Australian Bureau of Statistics on 30 June 1976 (ABS 1978c). The co-ordinates of NTS region centroids are estimates obtained after detailed examination of the relevant maps, together with a knowledge of the population centres in each region.


QUEENSLAND
NEW SOUTH WALES
VICTORIA
AUSTRALIA
SOUTH
146°
152°
30°
36°
Goondiwindi
Tweed Heads
Murwillumbah
Mungindi
Casino
Lismore
Moree
Tenterfield
Inverell
Glen Innes
Grafton
Bourke
Walgett
Narrabri
Armidale
Coffs Harbour
Wilcannia
Cobar
Nyngan
Coonamble
Gunnedah
Walcha
Tamworth
Kempsey
Broken Hill
Coonabarabran
Gilgandra
Hastings River
Port Macquarie
Menindee
Narromine
Dubbo
Taree
Wellington
Muswellbrook
Mudgee
Maitland
Condobolin
Parkes
Kandos
Cessnock
Hunter River
Newcastle
Wentworth
Forbes
Orange
Bathurst
Lithgow
Mildura
West Wyalong
Cowra
Penrith
SYDNEY
Hay
Griffith
Young
Murrumbidgee River
Coleambally
Coolamundra
Narrandera
Goulburn
Wollongong
Wagga Wagga
Junee
Yass
Nowra
Deniliquin
CANBERRA
A.C.T.
Queanbeyan
Albury
Wodonga
Cooma
Bega
Bombala
Eden
Darling River
Barwon River
Castlereagh River
Namoi River
Gwydir River
Dumaresq R.
Clarence River
Boggan River
Macquarie River
Murray River
Lachlan River
201
202
203
204
205
206
207
208
209
210
211
212
213
214
215
216
101
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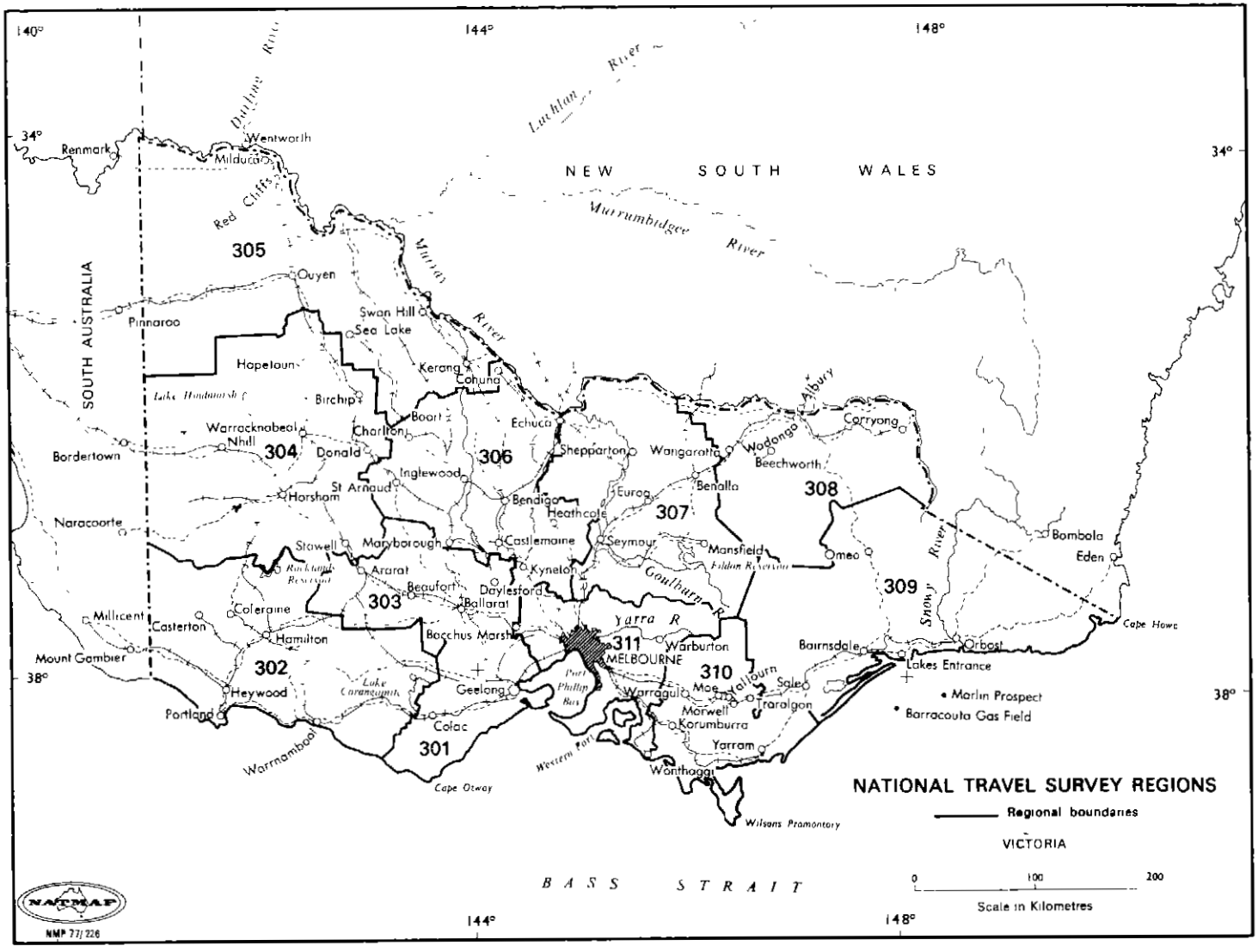
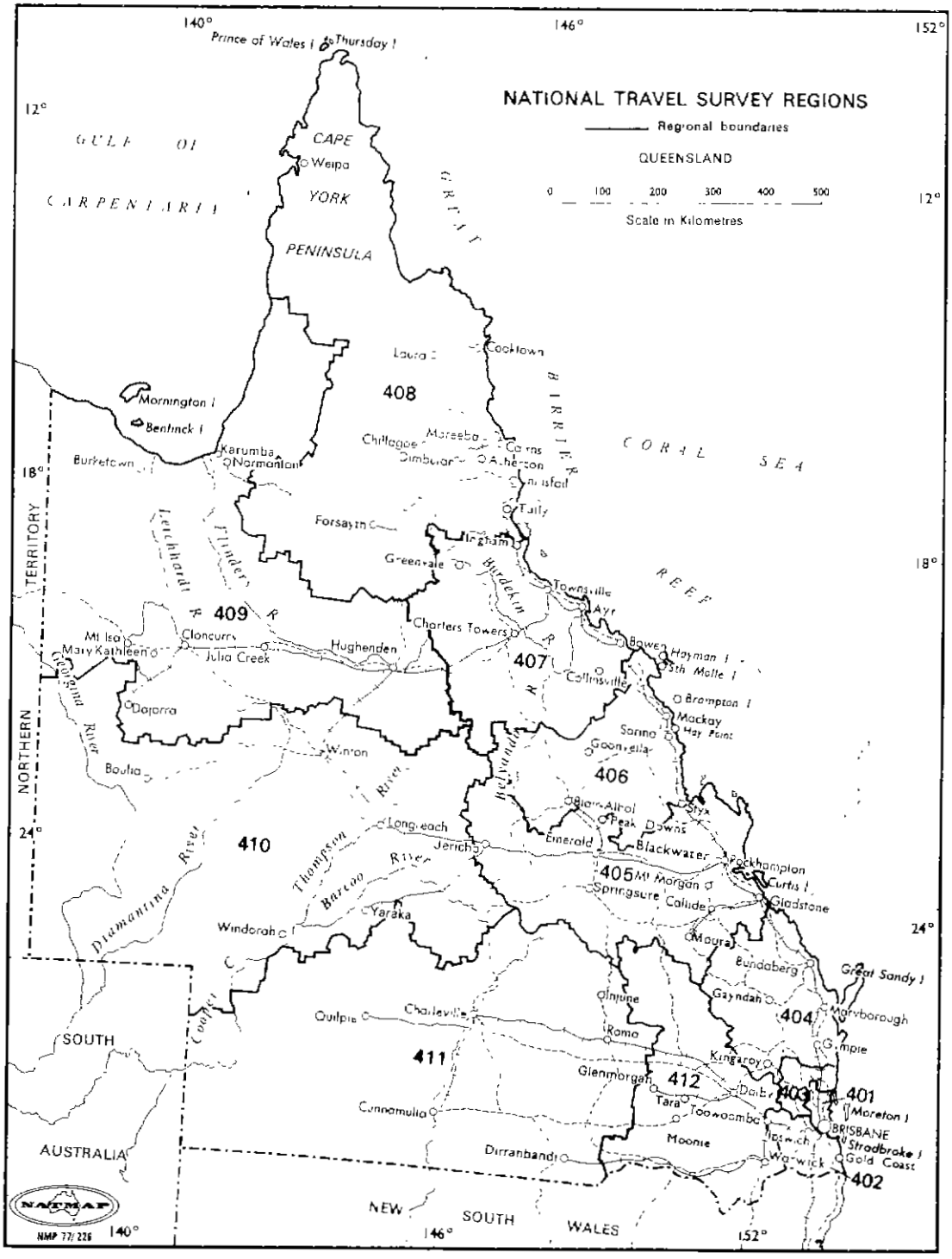
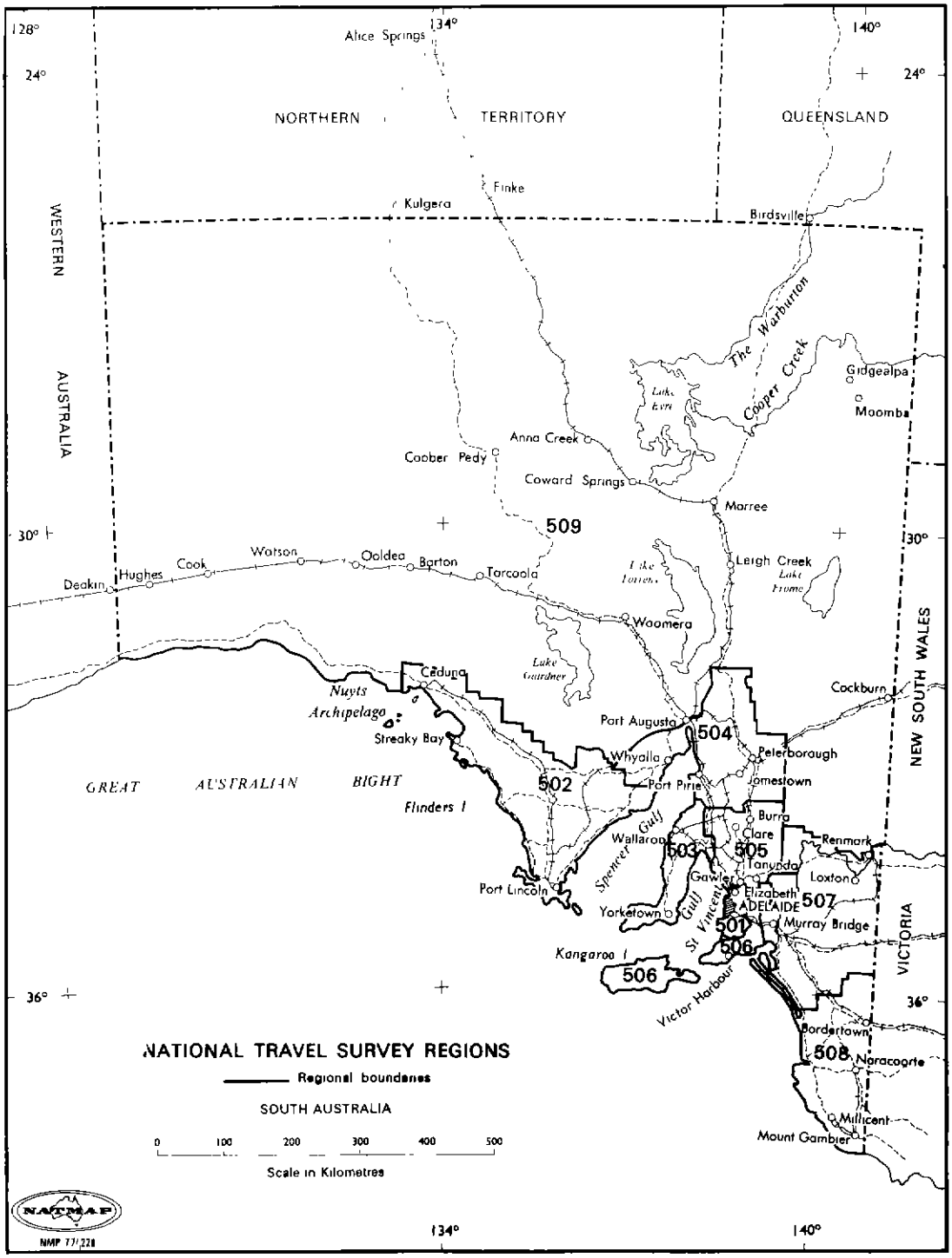
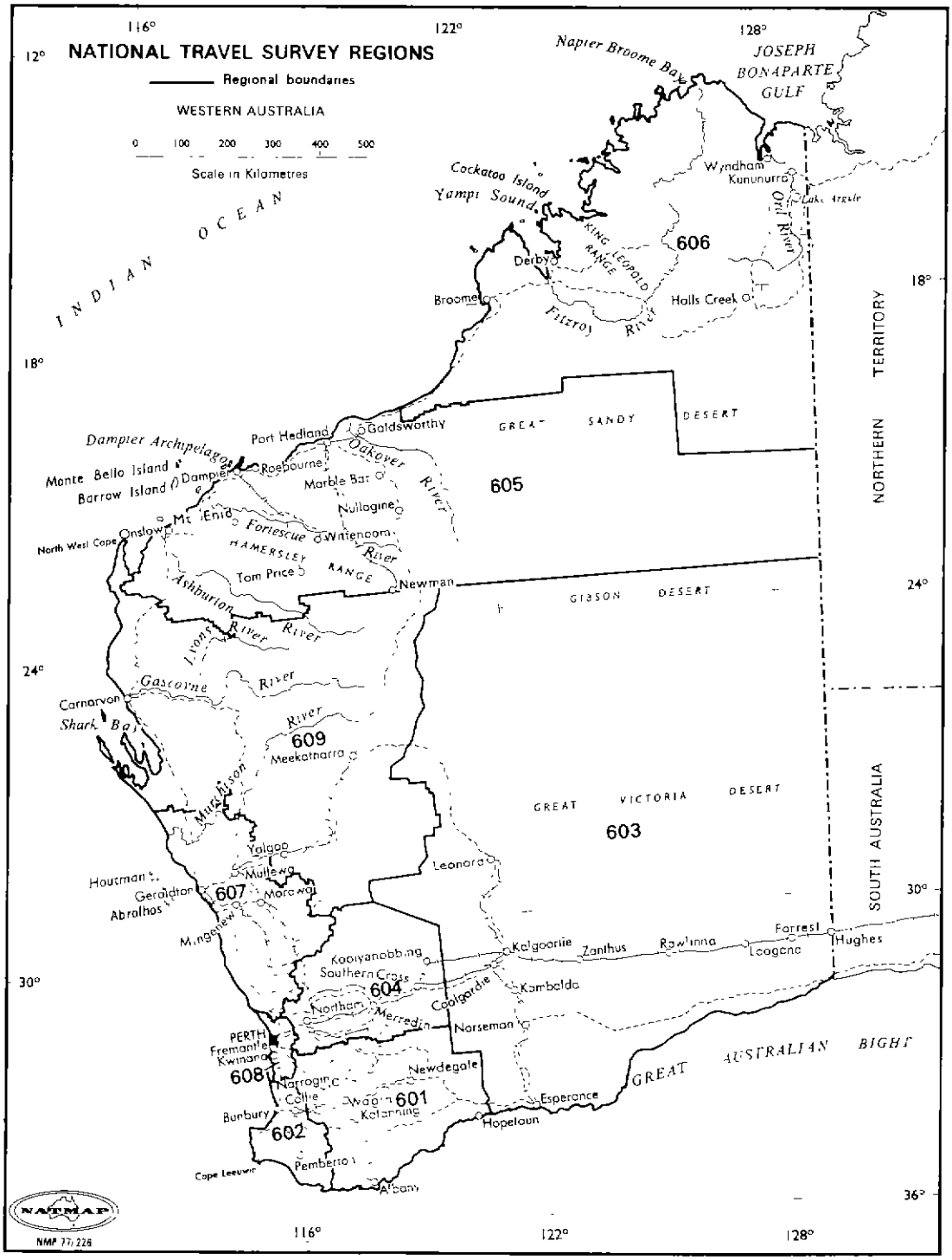
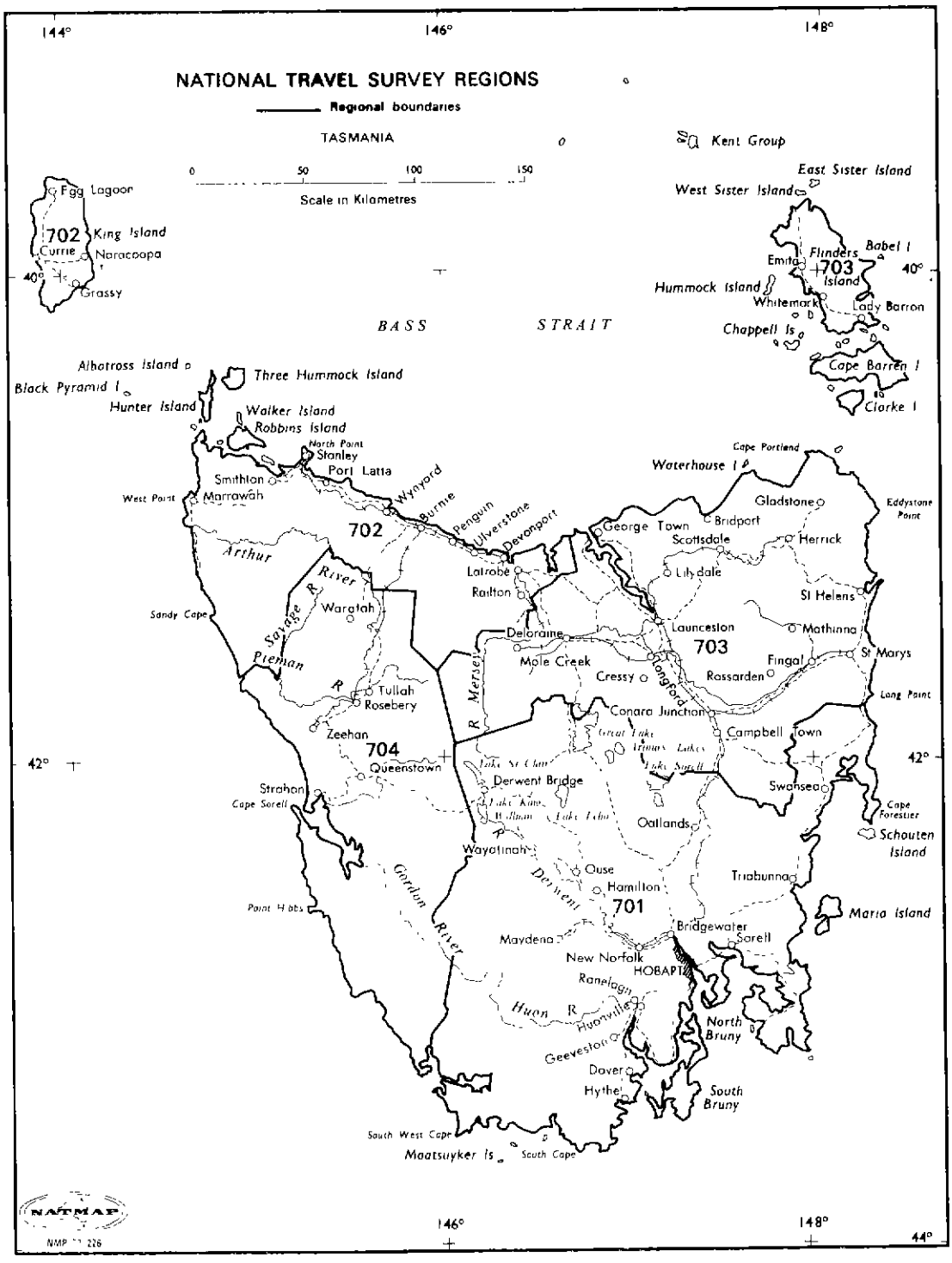
100
200
300
Scale in Kilometres
NAMAP
NMP 77/228

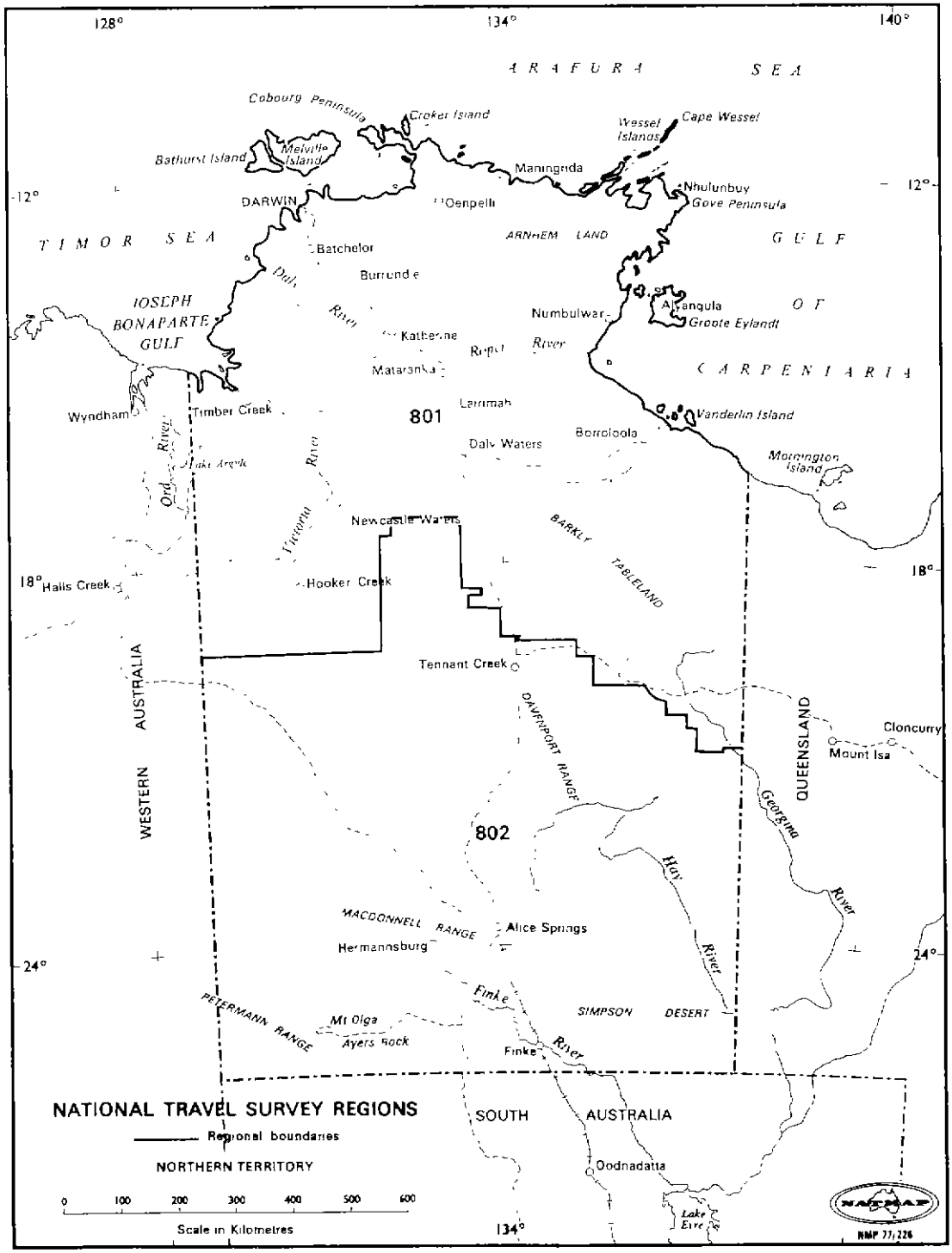

140°
144°
148°
34°
38°
NEW SOUTH WALES
SOUTH AUSTRALIA
BASS STRAIT
Murrumbidgee River
Murray River
Darling River
Lachlan River
Goulburn R.
Yarra R.
Snowy River
Albury
Wentworth
Renmark
Mildura
Red Cliffs
Ouyen
Pinnaroo
Swan Hill
Sea Lake
Hopetoun
Lake Hindmarsh
Birchip
Kerang
Cohuna
Boort
Charlton
Echuca
Warracknabeal
Nhill
Bordertown
Donald
Inglewood
St Arnaud
Horsham
Naracoorte
Stawell
Maryborough
Castlemaine
Bendigo
Heathcote
Shepparton
Wangaratta
Wodonga
Corryong
Beechworth
Benalla
Euroa
Seymour
Mansfield
Omeo
Bombala
Eden
Cape Howe
Kyneton
Ararat
Beaufort
Daylesford
Ballarat
Millicent
Casterton
Coleraine
Hamilton
Mount Gambier
Bacchus Marsh
MELBOURNE
Warburton
Bairnsdale
Orbost
Lakes Entrance
Heywood
Portland
Lake Corangamite
Geelong
Port Phillip Bay
Warragul
Moe
Sale
Traralgon
Morwell
Korumburra
Yarram
Colac
Warrnambool
Cape Otway
Western Port
Wonthaggi
Wilsons Promontory
Marlin Prospect
Barracouta Gas Field
305
304
306
307
308
309
310
311
303
302
301
NATIONAL TRAVEL SURVEY REGIONS
Regional boundaries
VICTORIA
0
100
200
Scale in Kilometres
NATMAP
NMP 77/226


NATIONAL TRAVEL SURVEY REGIONS
Regional boundaries
QUEENSLAND
0 100 200 300 400 500
Scale in Kilometres
140°
146°
152°
12°
18°
24°
GULF OF CARPENTARIA
CAPE YORK PENINSULA
Prince of Wales I
Thursday I
Weipa
Cooktown
Laura
Mornington I
Bentinck I
Burketown
Karumba
Normanton
Chillagoe
Mareeba
Cairns
Atherton
Innisfail
Tully
Forsayth
Ingham
Greenvale
Townsville
Ayr
Bowen
Hayman I
Whitsunday I
Brampton I
Mackay
Hay Point
Sarina
Collinsville
Charters Towers
Hughenden
Cloncurry
Julia Creek
Mt Isa
Mary Kathleen
Dajarra
Boulia
Winton
Longreach
Jericho
Emerald
Blackwater
Rockhampton
Curtis I
Gladstone
Mt Morgan
Springsure
Collinsville
Moura
Bundaberg
Great Sandy I
Maryborough
Gympie
Gayndah
Kingaroy
Dalby
Toowoomba
Tara
Roma
Injune
Charleville
Quilpie
Windorah
Yaraka
Cunnamulla
Dirranbandi
Moonie
Ipswich
Warwick
BRISBANE
Moreton I
Stradbroke I
Gold Coast
Coolangatta
NORTHERN TERRITORY
SOUTH AUSTRALIA
NEW SOUTH WALES
408
409
410
411
412
407
406
405
404
403
401
402
Flinders R
Leichhardt R
Gregory River
Diamantina River
Thompson River
Barcoo River
Burdekin R
Fitzroy R
GREAT BARRIER REEF
CORAL SEA
NAMAP
NMP 77/226


128°
134°
140°
24°
30°
36°
NORTHERN TERRITORY
QUEENSLAND
WESTERN AUSTRALIA
NEW SOUTH WALES
VICTORIA
Alice Springs
Finke
Kulgera
Birdsville
The Warburton
Cooper Creek
Gidgealpa
Moomba
Lake Eyre
Anna Creek
Coober Pedy
Coward Springs
Marree
509
Leigh Creek
Lake Frome
Lake Torrens
Deakin
Hughes
Cook
Watson
Ooldea
Barton
Tarcoola
Woomera
Lake Gairdner
Ceduna
Nuyts Archipelago
Streaky Bay
Port Augusta
504
Cockburn
Whyalla
Peterborough
Jamestown
GREAT AUSTRALIAN BIGHT
502
Flinders I
Port Pirie
Burra
Clare
Wallaroo
503
505
Renmark
Tanunda
Gawler
Loxton
Spencer Gulf
Port Lincoln
Elizabeth
ADELAIDE
507
Yorketown
Gulf St Vincent
501
Murray Bridge
506
Kangaroo I
506
Victor Harbour
Bordertown
508
Naracoorte
Millicent
Mount Gambier
NATIONAL TRAVEL SURVEY REGIONS
Regional boundaries
SOUTH AUSTRALIA
0 100 200 300 400 500
Scale in Kilometres
NATMAP
NMP 77/228


NATIONAL TRAVEL SURVEY REGIONS
Regional boundaries
WESTERN AUSTRALIA
0 100 200 300 400 500
Scale in Kilometres
INDIAN OCEAN
JOSEPH BONAPARTE GULF
Napier Broome Bay
Cockatoo Island
Yampi Sound
Wyndham
Kununurra
Lake Argyle
Ord River
606
Derby
Broome
Halls Creek
King Leopold Range
Fitzroy River
NORTHERN TERRITORY
Dampier Archipelago
Port Hedland
Goldsworthy
GREAT SANDY DESERT
Monte Bello Island
Barrow Island
Dampier
Roebourne
Oakover River
Marble Bar
605
Nullagine
Mt Enid
Fortescue River
Whitenoom
Onslow
North West Cape
Hamersley Range
Tom Price
Newman
Ashburton River
Lyons River
GIBSON DESERT
Gascoyne River
Carnarvon
Shark Bay
609
Meekatharra
Murchison River
GREAT VICTORIA DESERT
603
Yalgoo
Leonora
Houtman Abrolhos
Geraldton
607
Mullewa
Morawa
Mingenew
Kalgoorlie
Zanthus
Rawlinna
Forrest
Eoagene
Hughes
SOUTH AUSTRALIA
Kooryanobbing
Southern Cross
604
Kambalda
Coolgardie
Northam
Merredin
Norseman
PERTH
Fremantle
Kwinana
6081
Newdegate
Narrogin
Collie
Wagin
601
Kalanning
Esperance
GREAT AUSTRALIAN BIGHT
Bunbury
602
Hopetoun
Pemberton
Cape Leeuwin
Albany
NATMAP
NMP 77/226
116°
122°
128°
12°
18°
24°
30°
36°


NATIONAL TRAVEL SURVEY REGIONS
Regional boundaries
TASMANIA
Scale in Kilometres
0
50
100
150
144°
146°
148°
40°
42°
44°
Egg Lagoon
King Island
Currie
Naracoopa
Grassy
702
Kent Group
East Sister Island
West Sister Island
Babel I
Flinders Island
703
Emita
Hummock Island
Whitemark
Lady Barron
Chappell Is
Cape Barren I
Clarke I
BASS STRAIT
Albatross Island
Three Hummock Island
Black Pyramid I
Hunter Island
Walker Island
Robbins Island
North Point
Stanley
Port Latta
Smithton
Marrawah
West Point
Wynyard
Burnie
Penguin
Ulverstone
Devonport
Arthur River
Savage R
Pieman R
Sandy Cape
Waratah
Tullah
Rosebery
Zeehan
704
Queenstown
Strahan
Cape Sorell
Gordon River
Point Hibbs
Latrobe
Railton
Deloraine
Mole Creek
R Mersey
Cressy
Longford
Launceston
703
Conara Junction
Waterhouse I
Cape Portland
Gladstone
Eddystone Point
George Town
Bridport
Scottsdale
Herrick
Lilydale
St Helens
Mathinna
Fingal
St Marys
Rossarden
Long Point
Campbell Town
Swansea
Cape Forestier
Schouten Island
Maria Island
Great Lake
Lake St Clair
Derwent Bridge
Lake King William
Lake Echo
Lakes Sorell
Oatlands
Wayatinah
Ouse
Hamilton
701
Derwent R
Triabunna
Bridgewater
Sorell
Maydena
New Norfolk
HOBART
Ranelagh
Huon R
Huonville
North Bruny
South Bruny
Geeveston
Dover
Hythe
South West Cape
Maatsuyker Is
South Cape
NATMAP
NMP 226


128°
134°
140°
ARAFURA SEA
Cobourg Peninsula
Croker Island
Wessel Islands
Cape Wessel
Bathurst Island
Melville Island
Maningrida
12°
DARWIN
Oenpelli
Nhulunbuy
Gove Peninsula
TIMOR SEA
Batchelor
ARNHEM LAND
GULF OF CARPENTARIA
Burrundie
Daly River
JOSEPH BONAPARTE GULF
Numbulwar
Angula
Groote Eylandt
Katherine
Roper River
Mataranka
Larrimah
Wyndham
Timber Creek
801
Vanderlin Island
Borroloola
Daly Waters
Ord River
Lake Argyle
Victoria River
Mornington Island
Newcastle Waters
BARKLY TABLELAND
18°
Halls Creek
Hooker Creek
Tennant Creek
WESTERN AUSTRALIA
DAVENPORT RANGE
QUEENSLAND
Cloncurry
Mount Isa
802
Georgina River
Hay River
MACDONNELL RANGE
Alice Springs
Hermannsburg
24°
Finke
SIMPSON DESERT
PETERMANN RANGE
Mt Olga
Ayers Rock
Finke River
NATIONAL TRAVEL SURVEY REGIONS
Regional boundaries
NORTHERN TERRITORY
SOUTH AUSTRALIA
Oodnadatta
0 100 200 300 400 500 600
Scale in Kilometres
134°
Lake Eyre
NMP 77/226

APPENDIX III - ANALYSIS OF TRAVEL TO PARTICULAR DESTINATIONS

This Appendix presents information concerning the characteristics of travel to a number of specific destinations. The destinations chosen represent centres known to attract considerable numbers of travellers, and include the capital cities, major tourist and holiday areas, and centres of large population. Each destination analysed in this Appendix consists of a number of LGAs and/or individual towns or places. Table III.1 lists the LGAs or towns comprising each destination. Towns are described by means of the placecodes developed by Aplin *et al.* (1978). Some destinations are actually NTS regions. In each of these cases, the NTS region has been listed since these NTS regions generally contain a large number of LGAs. In such cases, the directory produced by Aplin *et al.* (1978) should be consulted to obtain a complete description of each destination. The destinations are arranged alphabetically in Tables III.2 to III.5.

Tables III.2 to III.5 contain the total number of trips made to each destination, together with the distribution of trips over each travel characteristic under consideration. Note that the analysis presented here has been performed in terms of the main destinations specified in the NTS. Travel to places specified as being the places visited 'Furthest from home' but not as 'main destinations' is not included in these tabulations.

The tables in this Appendix cover the twelve months of the survey (1977-78). They provide information about the following characteristics of travel to a number of destinations:

- vehicle type (Table III.2);
- purpose (Table III.3);

- accommodation (Table III.4);

- duration at destination (Table III.5).

The NTS questionnaire included a request to record all the types of vehicles used and to indicate the main type of vehicle. Table III.2 classifies trips by the main type of vehicle. Where a number of types of vehicles were stated, but no indication of the main type of vehicle was given, the first type shown was assumed to be the main type in preparing this table. This also applies to the reason for travel (Table III.3).

A number of trips did not involve an over-night stay at the main destination. The type of accommodation used for these trips has been recorded in Table III.4 as 'Not applicable' rather than 'Not stated'.

TABLE III.1 - DESCRIPTION OF DESTINATIONS

Destination	LGAs within the Destination	Placecodes of places within the Destination
Adelaide	All LGAs in NTS Region 501	-
Albany	6001	-
Albury-Wodonga	2002, 3205	-
Alice Springs and central Australia	All LGAs in NTS region 802	-
Armidale	2003	-
Australian Capital Territory	All LGAs in NTS region 101	-
Ballarat & environs	3012, 3014, 3165	-
Barossa Valley	5002, 5115	50392, 50653
Bendigo	3023, 3063	-
Blue Mountains	2021	21034
Brisbane	All LGAs in NTS region 401	-
Broken Hill	2032	-
Bundaberg	4176	-
Cairns and Green Island	4180	40407
Coffs Harbour	-	20475, 20476, 20477, 21797
Darwin	LGAs 8005 to 8028	-
Eildon-Mount Buller area	3112	30559
Geelong and Bellarine Peninsula	3020, 3073, 3074, 3134, 3170	30032, 30422, 30633, 30647, 30783, 31015, 31289, 31314, 31317, 31319
Geraldton	6049	-

TABLE III.1 (Cont) - DESCRIPTION OF DESTINATIONS

Destination	LGAs within the Destination	Placecodes of places within the Destination
Gold Coast	4208	-
Gosford-Woy Woy, The Entrance	All LGAs in NTS region 212	-
Goulburn	2076	-
Hobart	7008, 7017, 7021	70346, 70354, 70414, 70423, 70482, 70495, 70519, 70522, 70575, 70645, 70686
Launceston	7027	-
Lismore	2110	-
Mackay & Brampton Island	4231	41200
Maryborough	4235	-
Melbourne	All LGAs in NTS region 311	-
Mount Gambier	5070	-
Mount Isa	4241	-
Newcastle	2106, 2144	-
Nowra and Jervis Bay	-	20049, 20227, 20586, 20600, 20884, 21011, 21551, 21857, 21895
Orange	2149	-
Perth	All LGAs in NTS region 608	-
Port Macquarie	2154	-
Proserpine and nearby islands	4257	40850

TABLE III.1 (Cont) - DESCRIPTION OF DESTINATIONS

Destination	LGAs within the Destination	Placecodes of places within the Destination
Rockhampton, Yeppoon, Great Keppel Island	4262	40238, 40325, 40535, 41095, 41202
Rutherglen and Yarrawonga	3160, 3211	20544, 21459
Shepparton - Mooroopna	3167	-
Snowy Mountains	2168	-
Sunshine Coast	-	40179, 40243, 40620, 40653, 40662, 40663, 40744, 40745, 40926, 40949, 41221
Swan Hill	3178	
Sydney	All LGAs in NTS region 214 except 2021 and place 21034	-
Tamworth	2176	-
Toowoomba	4273	-
Townsville and Magnetic Island	4275	-
Victor Harbour	-	50779
Victorian snowfields	3028	-
Wagga Wagga	2191	-
Warrnambool	3197	-
Whyalla	5128	-
Wollongong	2165, 2208	-
Yorke Peninsula	5026, 5029, 5063, 5126, 5133	-

Source: National Travel Survey 1977-78.

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ANALYSIS OF TRAVEL BY DESTINATION REGION

TABLE III 2. TRIP PROPORTIONS BY DESTINATION REGION AND VEHICLE TYPE

DESTINATION REGION	NUMBER OF PERSON-TRIPS ('000)	VEHICLE TYPE								
		AIRCRAFT	BUS	CAR	TRUCK	MOTORCYCLE	SHIP	TRAIN	OTHER	NOT STATED
ADELAIDE	1647	0.135	0 046	0 717	0 039	0.001	0.000	0.036	0.002	0.004
ALBANY	189	0.067	0.037	0 853	0 032	0.000	0.000	0.011	0.000	0.000
ALBURY-WODONGA	505	0.018	0.010	0 876	0.028	0.000	0 001	0 041	0.000	0 025
ALICE SPRINGS & CENTRAL AUSTRALIA	127	0 257	0 161	0.397	0 162	0.000	0 000	0.000	0.021	0.003
ARMIDALE	172	0 048	0 020	0.874	0.042	0 000	0 000	0 000	0 000	0.016
AUSTRALIAN CAPITAL TERRITORY	1052	0.111	0 035	0.779	0.054	0 001	0 000	0 015	0.002	0 003
BALLARAT AND ENVIRONS	761	0.006	0.025	0.929	0 021	0 002	0.001	0.004	0.000	0 013
BAROSSA VALLEY	70	0.005	0 028	0.954	0 013	0 000	0.000	0.000	0.000	0 000
BENDIGO	657	0.011	0 009	0 928	0 007	0.000	0 000	0.024	0.000	0.021
BLUE MOUNTAINS	576	0 006	0 011	0 849	0.013	0.004	0 000	0.116	0.000	0.001
BRISBANE	2078	0.141	0 041	0 719	0.058	0.001	0.000	0 027	0.000	0 012
BROKEN HILL	82	0.045	0 012	0.764	0.031	0.004	0.000	0 079	0.000	0 032
BUNDABERG	156	0.063	0 022	0.852	0.022	0 024	0.000	0.006	0 000	0.012
CAIRNS AND GREEN ISLAND	275	0.208	0 071	0.643	0 023	0 012	0.019	0 007	0 007	0 008
COFFS HARBOUR	245	0 023	0 002	0.882	0 011	0.000	0 000	0.054	0 006	0 019
DARWIN	116	0 511	0.066	0 361	0.026	0 015	0.000	0.002	0 016	0.000
EILDON-MOUNT BULLER AREA	300	0.000	0 012	0.977	0.005	0.000	0 000	0.000	0.000	0.006
GEELONG AND BELLARINE PENINSULA	895	0 011	0.008	0.909	0.002	0.002	0.029	0.019	0.004	0.016
GERALDTON	172	0.052	0.026	0.837	0.046	0.000	0.000	0 000	0.018	0.021
GOLD COAST	1571	0 085	0.011	0 861	0.007	0.000	0.000	0.018	0.001	0.017
GOSFORD-WOY WOY, THE ENTRANCE	1301	0.004	0 033	0.907	0 005	0 002	0.000	0 026	0.011	0 012
GOULBURN	149	0.012	0 024	0 747	0 077	0.027	0 000	0.071	0.010	0 031
HOBART	649	0.207	0.044	0.701	0.021	0 000	0.000	0.012	0 012	0.002
LAUNCESTON	465	0.086	0 018	0.867	0 005	0 002	0.000	0.017	0.002	0.001
LISMORE	189	0.016	0.016	0.788	0.102	0.000	0 000	0.072	0 000	0 006
MACKAY AND BRAMPTON ISLAND	216	0 162	0.031	0.753	0 005	0.000	0.002	0.005	0.000	0.042
MARYBOROUGH	133	0.062	0 039	0.844	0.030	0.000	0.000	0 000	0.000	0.025
MELBOURNE	6247	0.087	0.015	0 800	0 050	0.002	0.001	0.033	0.001	0 011
MOUNT GAMBIER	152	0 027	0.047	0 875	0.022	0 000	0.000	0.023	0 000	0.007
MOUNT ISA	76	0.164	0 014	0.645	0 134	0.000	0 000	0 000	0 024	0.019
NEWCASTLE	1103	0 052	0 012	0.808	0 064	0.005	0 000	0 050	0.000	0 009
NOWRA AND JERVIS BAY	417	0 000	0.004	0 939	0.013	0 000	0 000	0.044	0 000	0.000
ORANGE	182	0.024	0 004	0.815	0.071	0 000	0.000	0.049	0 009	0.028
PERTH	1674	0.117	0.028	0.779	0.033	0.002	0 003	0.021	0.006	0 010
PORT MACQUARIE	254	0.010	0.022	0.962	0.002	0.000	0 000	0.000	0.000	0 004

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ANALYSIS OF TRAVEL BY DESTINATION REGION

TABLE III.2 (CONT) TRIP PROPORTIONS BY DESTINATION REGION AND VEHICLE TYPE

DESTINATION REGION	NUMBER OF PERSON-TRIPS ('000)	VEHICLE TYPE								
		AIRCRAFT	BUS	CAR	TRUCK	MOTORCYCLE	SHIP	TRAIN	OTHER	NOT STATED
PROSERPINE AND NEARBY ISLANDS	109	0.074	0.030	0.752	0.097	0 009	0 009	0.010	0.000	0 018
ROCKHAMPTON, YEPPOON, GREAT KEPPEL ISLAND	253	0.122	0.020	0.786	0.030	0.000	0.000	0.035	0.000	0 007
RUTHERGLEN AND YARRAWONGA	229	0 000	0 000	0 972	0.012	0.000	0.000	0 008	0.006	0.002
SHEPPARTON-MOOROOPNA	369	0.004	0.002	0.915	0.047	0.000	0.000	0.013	0.000	0.019
SNOWY MOUNTAINS	312	0.175	0.169	0.638	0.003	0.000	0 000	0.009	0.000	0.005
SUNSHINE COAST	827	0.022	0.044	0.890	0.007	0.021	0.004	0.009	0 004	0 000
SWAN HILL	225	0.013	0.043	0.918	0.006	0 000	0.000	0.015	0 004	0.002
SYDNEY	4546	0.176	0 032	0.664	0.035	0.002	0.001	0.080	0 003	0 007
TAMWORTH	221	0.023	0.055	0.808	0.014	0.000	0 000	0 034	0.000	0.066
TOOWOOMBA	424	0.058	0.127	0.788	0.016	0 003	0.000	0 007	0.000	0.001
TOWNSVILLE AND MAGNETIC ISLAND	341	0.166	0.015	0.764	0.008	0.012	0.005	0.018	0.007	0 004
VICTOR HARBOR	136	0.022	0 012	0.939	0.021	0.000	0.000	0.002	0.000	0 004
VICTORIAN SNOWFIELDS	360	0.015	0.070	0 904	0 003	0.001	0.000	0.003	0.000	0.003
WAGGA WAGGA	445	0 035	0 067	0 851	0.016	0.000	0.000	0.018	0.002	0.012
WARRNAMBOOL	267	0.024	0.009	0.899	0 026	0.000	0.000	0.033	0.000	0.010
WHYALLA	80	0.050	0.050	0 882	0 005	0.000	0.000	0.000	0 010	0.004
WOLLONGONG	431	0 011	0.007	0.902	0.032	0.007	0.000	0.023	0.006	0.013
YORKE PENINSULA	222	0.000	0.007	0.981	0.010	0 000	0 000	0.000	0.000	0 002

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ANALYSIS OF TRAVEL BY DESTINATION REGION

TABLE III.3. TRIP PROPORTIONS BY DESTINATION REGION AND PURPOSE

DESTINATION REGION	NUMBER OF PERSON-TRIPS ('000)	PURPOSE							
		DELIVER FREIGHT	OTHER BUSINESS	VISITING FRIENDS	RECREATION	HOLIDAY	PERSONAL AFFAIRS	OTHER	NOT STATED
ADELAIDE	1647	0 046	0 190	0.252	0.080	0.185	0.186	0.052	0 010
ALBANY	189	0.042	0 342	0.183	0.194	0.145	0.025	0 069	0.000
ALBURY-WODONGA	505	0.023	0.201	0.264	0 087	0 142	0 184	0.096	0.003
ALICE SPRINGS & CENTRAL AUSTRALIA	127	0.025	0.315	0.047	0.282	0.248	0.027	0 056	0 000
ARMIDALE	172	0.045	0.102	0.362	0.079	0 051	0.237	0 112	0.012
AUSTRALIAN CAPITAL TERRITORY	1052	0.051	0.202	0.283	0 140	0 112	0.158	0.052	0 002
BALLARAT AND ENVIRONS	761	0.020	0.129	0.339	0.299	0 028	0 132	0.042	0.011
BAROSSA VALLEY	70	0 000	0 159	0.298	0 290	0 180	0.058	0.013	0 002
BENDIGO	657	0.011	0.091	0.513	0.173	0.045	0.112	0 045	0 009
BLUE MOUNTAINS	576	0.015	0.051	0.130	0.581	0 125	0 047	0 049	0.001
BRISBANE	2078	0 063	0 192	0.293	0 071	0 105	0.208	0.066	0.003
BROKEN HILL	82	0 077	0 301	0.149	0 200	0 176	0.066	0.022	0 009
BUNDABERG	156	0.017	0.107	0.297	0.038	0.097	0.366	0 046	0 000
CAIRNS AND GREEN ISLAND	275	0 015	0 071	0.165	0 136	0.467	0.051	0.078	0 018
COFFS HARBOUR	245	0.018	0.079	0.215	0.149	0.428	0.068	0.038	0 005
DARWIN	116	0.025	0.219	0.145	0 113	0 284	0.111	0 092	0.011
EILDON-MOUNT BULLER AREA	300	0.015	0.098	0.153	0,442	0,243	0.042	0.007	0 000
GEELONG AND BELLARINE PENINSULA	895	0.007	0 078	0.387	0 171	0 205	0.087	0.053	0.014
GERALDTON	172	0.003	0 387	0.148	0.059	0.275	0.037	0.093	0 000
GOLD COAST	1571	0.003	0.052	0.230	0.252	0.345	0.086	0 014	0 018
GOSFORD-WOY WOY, THE ENTRANCE	1301	0.005	0 072	0.320	0 214	0 272	0.072	0.029	0.016
GOULBURN	149	0.052	0,297	0,316	0.125	0.017	0.181	0.010	0.000
HOBART	649	0.021	0.208	0.219	0 111	0.186	0.173	0 072	0.008
LAUNCESTON	465	0.022	0 281	0.295	0 157	0.042	0.146	0.043	0.015
LISMORE	189	0.097	0 283	0.275	0.067	0.091	0.112	0.073	0 003
MACKAY AND BRAMPTON ISLAND	216	0.007	0 202	0.163	0 051	0.202	0 291	0.085	0.000
MARYBOROUGH	133	0 000	0 111	0.518	0.103	0.073	0.149	0.043	0.000
MELBOURNE	6247	0.039	0.150	0 292	0.151	0.130	0.177	0.054	0 007
MOUNT GAMBIER	152	0.021	0.144	0.229	0.328	0 095	0 071	0.110	0.002
MOUNT ISA	76	0 014	0.269	0 328	0.038	0 102	0.085	0.151	0.014
NEWCASTLE	1103	0.063	0.119	0.420	0.105	0 114	0.141	0.036	0 001
NOWRA AND JERVIS BAY	417	0.007	0.079	0.227	0.156	0 402	0 079	0.050	0 000
ORANGE	182	0.085	0.108	0.261	0.040	0 218	0 240	0.048	0.000
PERTH	1674	0.029	0 180	0.263	0.120	0.161	0.198	0.039	0.010
PORT MACQUARIE	254	0.000	0.102	0.147	0.128	0.589	0.018	0 013	0 002

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ANALYSIS OF TRAVEL BY DESTINATION REGION

TABLE III.3 (CONT). TRIP PROPORTIONS BY DESTINATION REGION AND PURPOSE

DESTINATION REGION	NUMBER OF PERSON-TRIPS ('000)	PURPOSE							
		DELIVER FREIGHT	OTHER BUSINESS	VISITING FRIENDS	RECREATION	HOLIDAY	PERSONAL AFFAIRS	OTHER	NOT STATED
PROSERPINE AND NEARBY ISLANDS	109	0.097	0.145	0.162	0 284	0.252	0 051	0 009	0.000
ROCKHAMPTON, YEPPOON, GREAT KEPPEL ISLAND	253	0.020	0.164	0.228	0.095	0.187	0.204	0.099	0.004
RUTHERGLEN AND YARRAWONGA	229	0 036	0.063	0.171	0 376	0.299	0.042	0 011	0 002
SHEPPARTON-MOOROOPNA	369	0.011	0.197	0.362	0 067	0.095	0.185	0 075	0 008
SNOWY MOUNTAINS	312	0 000	0.015	0.064	0 484	0.419	0.003	0.013	0 002
SUNSHINE COAST	827	0.002	0 066	0.135	0.365	0.346	0.057	0.026	0 003
SWAN HILL	225	0.004	0.116	0.167	0 364	0.203	0.115	0.029	0 002
SYDNEY	4546	0.045	0.172	0.325	0 101	0.119	0.162	0 071	0 005
TAMWORTH	221	0.044	0 191	0 280	0.140	0.087	0 206	0.042	0 009
TOOWOOMBA	424	0.005	0.197	0.337	0 151	0.042	0.157	0.064	0.047
TOWNSVILLE AND MAGNETIC ISLAND	341	0.006	0 219	0.245	0.063	0 110	0 246	0.101	0 012
VICTOR HARBOR	136	0.021	0 059	0.287	0.298	0.220	0.004	0.101	0 010
VICTORIAN SNOWFIELDS	360	0.015	0.038	0.075	0.505	0.328	0.022	0.011	0 004
WAGGA WAGGA	445	0.039	0 176	0.313	0.127	0.030	0.255	0.052	0 007
WARRNAMBOOL	267	0.023	0.062	0.255	0.222	0.264	0.123	0.026	0.025
WHYALLA	80	0.005	0.170	0.279	0.163	0.061	0.247	0.070	0.004
WOLLONGONG	431	0.032	0 085	0.434	0.245	0.030	0 144	0.022	0 007
YORKE PENINSULA	222	0.007	0.080	0.179	0.173	0.469	0.070	0.021	0.002

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ANALYSIS OF TRAVEL BY DESTINATION REGION

TABLE III.4. TRIP PROPORTIONS BY DESTINATION REGION AND ACCOMMODATION

DESTINATION REGION	NUMBER OF PERSON-TRIPS ('000)	ACCOMMODATION					
		HOTEL OR MOTEL	FRIENDS HOME	CARAVAN OR TENT	OTHER	NOT STATED	NOT APPLICABLE
ADELAIDE	1647	0.227	0.445	0.063	0.049	0.014	0.202
ALBANY	189	0.190	0 161	0.123	0.026	0.051	0.448
ALBURY-WODONGA	505	0.246	0.207	0.063	0.062	0.020	0.403
ALICE SPRINGS & CENTRAL AUSTRALIA	127	0.346	0.105	0.243	0 092	0 041	0 174
ARMIDALE	172	0.334	0.326	0.047	0.059	0 034	0.201
AUSTRALIAN CAPITAL TERRITORY	1052	0 249	0.354	0.085	0.047	0.008	0.257
BALLARAT AND ENVIRONS	761	0.068	0.247	0.029	0.024	0.016	0.615
BAROSSA VALLEY	70	0 143	0.170	0.123	0.000	0.005	0.560
BENDIGO	657	0 118	0.393	0.041	0.015	0.014	0.418
BLUE MOUNTAINS	576	0.120	0.219	0.021	0.050	0.024	0 566
BRISBANE	2078	0 180	0.371	0 027	0.046	0.019	0 357
BROKEN HILL	82	0 447	0.318	0.111	0 043	0.009	0.071
BUNDABERG	156	0.241	0.401	0 048	0.000	0 004	0.305
CAIRNS AND GREEN ISLAND	275	0 340	0.187	0.192	0 161	0.052	0.068
COFFS HARBOUR	245	0.333	0 200	0.159	0 125	0.004	0.178
DARWIN	116	0.394	0.287	0.078	0.066	0.015	0.160
EILDON- MOUNT BULLER AREA	300	0.138	0 181	0.092	0.325	0.037	0.226
GEELONG AND BELLARINE PENINSULA	895	0.031	0.283	0 158	0.084	0.034	0 411
GERALDTON	172	0.293	0.309	0.042	0 038	0 047	0.272
GOLD COAST	1571	0.189	0.236	0.091	0.174	0 016	0.295
GOSFORD-WOY WOY, THE ENTRANCE	1301	0 061	0.327	0.117	0.127	0.020	0.349
GOULBURN	149	0.118	0 255	0.003	0.086	0.028	0.509
HOBART	649	0.357	0 323	0.089	0.037	0.004	0 190
LAUNCESTON	465	0.189	0.177	0 005	0.035	0.015	0 579
LISMORE	189	0.126	0.314	0.009	0.011	0 020	0.519
MACKAY AND BRAMPTON ISLAND	216	0.266	0.391	0.054	0.033	0.012	0.245
MARYBOROUGH	133	0 181	0.496	0.067	0.022	0.000	0.234
MELBOURNE	6247	0.124	0 371	0.046	0.081	0 019	0 359
MOUNT GAMBIER	152	0.226	0.256	0 274	0.014	0.003	0 226
MOUNT ISA	76	0.319	0.312	0.065	0 016	0.005	0.283
NEWCASTLE	1103	0 085	0.524	0.028	0.054	0.023	0.286
NOWRA AND JERVIS BAY	417	0 079	0 278	0.279	0.083	0.025	0.256
ORANGE	182	0.157	0.329	0.007	0.185	0.023	0.298
PERTH	1674	0.181	0.438	0.055	0.067	0 021	0.239
PORT MACQUARIE	254	0.356	0.140	0.070	0.309	0 004	0.121

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ANALYSIS OF TRAVEL BY DESTINATION REGION

TABLE III.4 (CONT). TRIP PROPORTIONS BY DESTINATION REGION AND ACCOMMODATION

DESTINATION REGION	NUMBER OF PERSON-TRIPS ('000)	ACCOMMODATION					
		HOTEL OR MOTEL	FRIENDS HOME	CARAVAN OR TENT	OTHER	NOT STATED	NOT APPLICABLE
PROSERPINE AND NEARBY ISLANDS	109	0.211	0.125	0.186	0.141	0.005	0.332
ROCKHAMPTON, YEPPOON, GREAT KEPPEL ISLAND	253	0.226	0.383	0.086	0.059	0.000	0.246
RUTHERGLEN AND YARRAWONGA	229	0.282	0.318	0.202	0 060	0.003	0.135
SHEPPARTON-MOOROOPNA	369	0.177	0.294	0.050	0.001	0.009	0.469
SNOWY MOUNTAINS	312	0.348	0.118	0.126	0 292	0 000	0.116
SUNSHINE COAST	827	0.125	0.235	0.231	0 198	0.012	0.198
SWAN HILL	225	0 271	0.172	0.245	0.004	0.008	0 300
SYDNEY	4546	0.163	0.404	0.026	0.049	0 015	0.342
TAMWORTH	221	0.331	0.323	0.014	0.002	0.026	0.304
TOOWOOMBA	424	0.167	0.276	0.015	0.034	0.016	0 492
TOWNSVILLE AND MAGNETIC ISLAND	341	0.188	0.345	0.022	0.099	0.017	0 329
VICTOR HARBOR	136	0.097	0.139	0.047	0.068	0.023	0.626
VICTORIAN SNOWFIELDS	360	0.333	0.073	0.201	0.205	0.030	0.158
WAGGA WAGGA	445	0.136	0.251	0.066	0.007	0.018	0.523
WARRNAMBOOL	267	0.203	0.294	0.186	0.008	0.007	0.302
WHYALLA	80	0.175	0.491	0.089	0.018	0.012	0.215
WOLLONGONG	431	0.050	0.300	0.047	0.008	0.019	0.577
YORKE PENINSULA	222	0.070	0.166	0.371	0.171	0.018	0.204

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ANALYSIS OF TRAVEL BY DESTINATION REGION

TABLE III.5. TRIP PROPORTIONS BY DESTINATION REGION AND DURATION AT DESTINATION

DESTINATION REGION	NUMBER OF PERSON-TRIPS ('000)	DURATION AT DESTINATION (NIGHTS) 0	1	2	3-7	8-14	15-28	29-56	OVER 56	NOT STATED
ADELAIDE	1647	0.202	0.101	0 164	0.343	0.123	0.030	0.005	0 007	0.026
ALBANY	189	0.448	0.113	0.184	0.188	0.023	0.000	0.000	0.000	0.043
ALBURY-WODONGA	505	0.403	0.221	0.134	0.156	0.041	0.009	0.003	0.000	0.032
ALICE SPRINGS & CENTRAL AUSTRALIA	127	0.174	0 146	0.252	0.272	0.063	0.075	0 007	0.003	0.008
ARMIDALE	172	0 201	0.314	0.222	0 200	0.032	0.000	0.007	0.000	0.024
AUSTRALIAN CAPITAL TERRITORY	1052	0.257	0.162	0.234	0.273	0 056	0.010	0 002	0.000	0 007
BALLARAT AND ENVIRONS	761	0.615	0.112	0 104	0.123	0.023	0 000	0.003	0 000	0.019
BAROSSA VALLEY	70	0.560	0.079	0 058	0.274	0 000	0 026	0.000	0.000	0 002
BENDIGO	657	0.418	0 308	0.160	0.085	0 016	0.001	0.000	0 000	0 012
BLUE MOUNTAINS	576	0.566	0.103	0.128	0.184	0.015	0 003	0.000	0 000	0.002
BRISBANE	2078	0.357	0 118	0.126	0.222	0 092	0.045	0.003	0 007	0.032
BROKEN HILL	82	0 071	0 233	0.149	0.437	0 098	0.000	0 000	0.000	0.012
BUNDABERG	156	0 305	0.205	0.165	0 184	0.112	0.017	0.003	0 000	0.009
CAIRNS AND GREEN ISLAND	275	0.068	0.109	0.087	0.285	0.235	0.103	0 023	0.018	0.071
COFFS HARBOUR	245	0.178	0.182	0.124	0.200	0.158	0.126	0.003	0.000	0.028
DARWIN	116	0.160	0.036	0 093	0.389	0.154	0.091	0.065	0.010	0 001
EILDON- MOUNT BULLER AREA	300	0.226	0.192	0.258	0.254	0.038	0 000	0.000	0 000	0.031
GEELONG AND BELLARINE PENINSULA	895	0.411	0 134	0.158	0.149	0 086	0.017	0.003	0.000	0 042
GERALDTON	172	0 272	0.086	0.133	0 366	0.079	0.014	0.000	0 002	0.047
GOLD COAST	1571	0.295	0.136	0.141	0.145	0.188	0 070	0.009	0 003	0.013
GOSFORD-WOY WOY, THE ENTRANCE	1301	0 349	0.104	0.224	0 230	0.041	0 015	0 002	0.000	0.034
GOULBURN	149	0.509	0.093	0.202	0.097	0.054	0 003	0.017	0.000	0.024
HOBART	649	0.190	0.107	0.200	0 375	0 087	0.030	0 004	0.000	0.006
LAUNCESTON	465	0.579	0 078	0.131	0.135	0.034	0.005	0 000	0.000	0 039
LISMORE	189	0.519	0 174	0 067	0.145	0.051	0.035	0.000	0.000	0.009
MACKAY AND BRAMPTON ISLAND	216	0 245	0.227	0.138	0.186	0.142	0.057	0 001	0.005	0 000
MARYBOROUGH	133	0.234	0.145	0 358	0.176	0.033	0.027	0.000	0.000	0.026
MELBOURNE	6247	0.359	0 159	0.162	0.198	0.058	0.026	0.009	0.001	0.030
MOUNT GAMBIER	152	0 226	0.095	0.183	0.413	0.038	0.010	0.000	0 002	0 032
MOUNT ISA	76	0.283	0.214	0 103	0.125	0.221	0 022	0.011	0 000	0.021
NEWCASTLE	1103	0.286	0.174	0.233	0.188	0 076	0.017	0.011	0 002	0.013
NOWRA AND JERVIS BAY	417	0 256	0.070	0.254	0.280	0 079	0.036	0.000	0.000	0.025
ORANGE	182	0 298	0.060	0.172	0.407	0.004	0 034	0.014	0.000	0.011
PERTH	1674	0.239	0.141	0.172	0.241	0 104	0 046	0.018	0 003	0.035
PORT MACQUARIE	254	0 121	0.041	0.124	0 349	0.277	0.077	0 003	0.000	0.007

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TABLE III 5 (CONT). TRIP PROPORTIONS BY DESTINATION REGION AND DURATION AT DESTINATION

DESTINATION REGION	NUMBER OF PERSON-TRIPS ('000)	DURATION AT DESTINATION (NIGHTS) 0	1	2	3-7	8-14	15-28	29-56	OVER 56	NOT STATED
PROSERPINE AND NEARBY ISLANDS	109	0.332	0.092	0.134	0.236	0.125	0.077	0.000	0.000	0.005
ROCKHAMPTON, YEPPOON, GREAT KEPPEL ISLAND	253	0.246	0.118	0.194	0.246	0.180	0.003	0.005	0.000	0.008
RUTHERGLEN AND YARRAWONGA	229	0.135	0.136	0 182	0.424	0.106	0.000	0.000	0.000	0.017
SHEPPARTON-MOOROOPNA	369	0.469	0.171	0.145	0.151	0.050	0.005	0.001	0 000	0.008
SNOWY MOUNTAINS	312	0.116	0.122	0.191	0.409	0.161	0.002	0.000	0.000	0 000
SUNSHINE COAST	827	0.198	0.144	0.245	0.176	0.157	0.065	0.002	0.006	0.006
SWAN HILL	225	0.300	0.108	0.282	0.250	0.052	0.000	0.000	0.000	0.008
SYDNEY	4546	0.342	0.110	0.150	0.249	0.092	0.025	0.007	0.002	0.022
TAMWORTH	221	0 304	0.162	0.202	0.209	0.089	0.002	0.008	0.000	0.024
TOOWOOMBA	424	0.492	0.172	0.105	0.173	0.026	0.011	0.000	0.000	0.020
TOWNSVILLE AND MAGNETIC ISLAND	341	0.329	0.117	0 129	0.190	0.139	0.071	0.012	0.000	0.013
VICTOR HARBOR	136	0.626	0.094	0 114	0 102	0.030	0.031	0 000	0.000	0.003
VICTORIAN SNOWFIELDS	360	0.158	0.101	0.256	0.325	0.149	0.007	0.000	0.001	0.002
WAGGA WAGGA	445	0.523	0.156	0.119	0.166	0.010	0.011	0.005	0.000	0.011
WARRNAMBOOL	267	0.302	0.146	0.125	0.237	0 088	0.048	0.022	0.006	0.027
WHYALLA	80	0.215	0.157	0.230	0.274	0.108	0.004	0.000	0.000	0.012
WOLLONGONG	431	0 577	0.083	0.147	0 132	0.035	0.006	0 001	0.000	0.019
YORKE PENINSULA	222	0.204	0.166	0.148	0.367	0.049	0.033	0.014	0.006	0.012

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ABBREVIATIONS

ABS	Australian Bureau of Statistics
A.C.T.	Australian Capital Territory
AGPS	Australian Government Publishing Service
AGR	Australian Government Region
ARRB	Australian Road Research Board
ATRC	Australian Travel Research Conference
BTE	*Bureau of Transport Economics*
DURD	Department of Urban and Regional Development
LGA	Local Government Area
N.S.W.	New South Wales
N.T.	Northern Territory
NTS	National Travel Survey
O-D	Origin-destination
Qld	Queensland
S.A.	South Australia
Tas.	Tasmania
U.S.A.	United States of America
Vic.	Victoria
W.A.	Western Australia
km	kilometre