



ABS Transport Statistics: Current Activities and Future Directions

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Abstract:

The paper looks at the current activities and future directions of the ABS's transport statistics program. Broad detail is given for the specific transport collections currently undertaken by the ABS

An outline of several specific ABS developments including a framework of standard concepts, definitions and classifications for transport statistics; possible dissemination media and formats such as compendium publication products; methodology reviews for various collections; and areas of possible additional transport related collections is also given.

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Introduction

Each of us is involved with transport every day and it is one of the more important activities of an advanced economy.

Because of its economic and social importance, there is a need to measure, monitor and undertake research into transport activities; however, the nature and scope of this research is particularly diverse - reflecting the pervasiveness of transport itself.

This paper looks at the ABS' contribution to transport information, including an outline of our current statistical collections and planned future directions.

The ABS role

ABS transport statistics

One of the major inputs to good research is sound statistics, and the ABS offers a number of key sources of data for researchers. The ABS is a major though underutilised source of information on Transport and transport related matters in Australia. We appreciate the opportunity which today's seminar provides to make ABS information better known to an important part of the user community.

In Transport, Tourism, and Energy Section, we conduct a number of Transport collections, including:

- the Survey of Motor Vehicle Use (SMVU);
- the Motor Vehicle Census (MVC);
- New Motor Vehicle Registrations (NMVR); and
- Interstate (Road) Freight Movements.

Other statistics produced by the ABS are also relevant to transport research, including:

- the Census of Population and Housing;
- Australian National Accounts;
- Labour Force Surveys;
- Production of Transport Equipment;
- Interstate Freight Movements (all modes);
- the Consumer and Wholesale Price Indices;
- Private New Capital Expenditure;

- Foreign Investment;
- Overseas Trade;
- Balance of Payments; and
- (Overseas) Shipping and Cargo.

The ABS is presently compiling a directory of Transport Statistics, listing sources of transport data available from the ABS and other organisations.

In the first part of this paper, I want to focus on our current Transport collections, starting with the SMVU.

The Survey of Motor Vehicle Use

This survey is a triennial collection which asks a sample of owners of registered vehicles of all types about details of the vehicle's use over the previous 12 months. (Attached to this paper is an extract from our final publication of results from the 1988 Survey of Motor Vehicle Use containing the bulletin's Summary of Findings.)

This "snapshot" provides information to Commonwealth and State Government agencies responsible for the allocation of road funding, regulation and administration of road transport issues including cost recovery, and other policy analysis and research activities. The data provide information about patterns of vehicle and road use, as well as providing profiles of vehicles and the driving population.

While it has some methodological deficiencies, the SMVU's chief advantage is that it provides data consistently and at a common point in time about vehicle (and road) use across all major vehicle types and all States and Territories

As an indicator of road use, the SMVU provides a benchmark for project evaluation and the measurement of growth rates in road use, mobility and traffic congestion

The data are also used extensively in, for example, the calculation of accident exposure rates and energy use analysis

SMVU's have been conducted periodically since 1961, triennially since 1976, with the 1991 collection about to get underway in October

The survey is based on a mail-out to the registered owners of a small sample of motor vehicles. For 1991, some 42,000 forms will be dispatched in the first week of October.

The population listing from which the sample is drawn is obtained from the various Commonwealth, State and Territory Motor Vehicle Registries in July of the collection year. For the 1991 collection this population is expected to be over 10 million vehicles

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The sample size represents a balance between cost on the one hand and level of disaggregation required by users on the other hand. Generally, detailed results are available at State and National levels, while some broad measures may be available for other geographic classifications just below the State level.

There are two main publications from the SMVU (for the forthcoming survey, these are scheduled for February and June 1992). Considerably more unpublished statistics are available in the form of either standard or tailored cross-classifications of data, and we invite users to contact us about their specific requirements.

Motor Vehicle Census

The Motor Vehicle Census (MVC) is an administrative by-product collection which provides a count of vehicles "on register" at 30 September. In the past, this collection was only seen as an extension to the SMVU, since the ABS needed to obtain the list of vehicles on register from which the sample could be drawn. As a result, these data have also been compiled triennially since 1976, with the next MVC due to be conducted later this month (ie, in September 1991). Depending on user demand, we may investigate the feasibility of obtaining these data annually, in collaboration with the various Motor Vehicle Registration authorities.

Statistics produced by the MVC are available via a publication, special data services (ad hoc table requests), and as part of TRANSTATS - a microcomputer package. In essence, we provide details about the vehicle population including type of vehicle, make, model (for selected vehicles), engine capacity, fuel type, number of cylinders, and tare weight or gross vehicle mass where applicable. Small area information is also available.

New Motor Vehicle Registrations

The New Motor Vehicle Registrations collection is another administrative by-product collection. The collection provides a standard count across Australia of first time registrations of motor vehicles. As a proxy measure of new car sales, NMVR is an important indicator of economic activity in Australia.

Over time, this collection monitors changes in the characteristics of new vehicles being purchased. For example, the increasing trend toward more fuel efficient four cylinder passenger vehicles is readily apparent from the NMVR. A range of variables are covered in this collection to give a comprehensive measure of changes to the vehicle

population, including type of vehicle, make, model, engine size and tare weight or gross vehicle mass. Small area information is also available

Interstate Road Freight Movements

This small quarterly collection provides a measure of road freight moved inter-State. The collection covers businesses that carry more than 20,000 tonnes of freight intertate annually, representing about 84 per cent of all interstate movements

Other ABS information sources

As well as the above transport-specific statistics, the ABS also compiles a number of statistics that would be relevant to transport researchers. The following is a brief summary of some of the more important sources of data

(1) **Census of Population and Housing**

Everyone would be aware of the recent Population Census. The Census provides data about various characteristics of the Australian population including the occupation and industry of the workforce. The Census also obtains information about the mode, origin and destination of journeys to work and school. This information forms much of the basis for detailed studies into the nature of travel movements by Australian residents.

The 1991 Census will also obtain details about the number of vehicles garaged at home.

(2) **Australian National Accounts**

Australia's National Accounts show, among other things, the contribution to Gross Domestic Product (GDP), wages and salaries, and net capital stock held, classified by Industry. Published data are at the very broad Industry level (Transport, Storage and Communications), but more detailed breakdowns of industry (eg, road freight) are available on request.

GDP in particular provides a measure of the importance of each industry to the Australian economy. In 1989-90, these data indicated that Transport accounted for \$27.5b or 7.4% of Australia's GDP. This does not include industries and activities that commonly relate to transport, such as automotive manufacture and sale; and road/infrastructure construction.

(3) **Labour Force Surveys**

The data available from these surveys include the number of persons employed in transport industries, classified by whether they are employers, self employed, or wage and salary earners

The Labour Force Surveys also show the relative importance in employment terms of the transport sector. As at May 1991, over 404,000 people were classified as being employed in the Transport and Storage Industry, accounting for 5.2% of Australia's total employment. And once again these figures do not include industries and activities commonly related to Transport.

(4) **Production of Transport Equipment**

The ABS collects monthly production statistics for assembled, complete motor vehicles; motor bodies; semi-trailers; and selected other transport equipment.

(5) **Consumer and Wholesale Price Indices**

These collections monitor movements in the prices of various transportation components such as motor vehicle purchase prices, and automotive fuel and vehicle servicing costs

(6) **Private New Capital Expenditure**

This survey obtains estimates of actual and expected new capital expenditure by type of asset and by selected industries and includes information on equipment purchases by the Transport Industry.

(7) **Foreign Investment**

Details of foreign investment transactions are available for the Transport and Storage Industry. These include both Australian investment abroad and foreign investment in Australia, classified by type and level of investment

(8) **Overseas Trade**

Monthly information is available on the volume and value of transport equipment either imported into or exported out of Australia.

(9) **Balance of Payments**

Key components of the monthly Balance of Payments series include details of the value of transport services and major items of merchandise trade including aircraft purchases.

(10) **(Overseas) Shipping and Cargo**

Data are available on the quantity of overseas cargo loaded and discharged, classified by mode of transport (sea and air); Australian State of loading or discharge; commodity; etc

These and other data sources are readily available from the ABS and users are invited to discuss their requirements at any of our Bookshops or Information Consultancy offices located in all capital cities.

Future ABS activities in transport statistics

Framework of transport statistics

The collection of statistics is all too often the result of historical factors that see isolated surveys developed and conducted to meet specific requirements and objectives. The result of this piecemeal approach to statistics is a range of disparate collections, sometimes involving duplication but more often leaving important gaps; providing conflicting conclusions due to the different objectives of the collections; and incompatibility of concepts, definitions and classification systems across the collections.

To overcome this, the ABS is currently attempting to develop a framework for transport statistics as a means of logically ordering the scope of potential statistics and to provide a basis for introducing a set of standard concepts, definitions and classification systems. The objectives are to ensure that statistical (and research) activities achieve maximum relevance and compatibility; to improve the chances of obtaining the most appropriate level of support for these activities; and to ensure we provide value for money.

Other benefits of a statistical framework include:

providing a "map" of relationships and interrelationships between various components;

users more easily identifying significant gaps and deficiencies in the available statistics (i.e. it provides a checklist of important variables); and

- understanding the nature of the transport sector, by providing a context, within which the choice of appropriate statistical (and research) methodologies can be assessed

A preliminary view of the framework involves a series of 11 elements.

1) mode the device/means by which physical movement is achieved. At the broad level this element includes a classification structured as follows:

Land
road
rail
other
Sea
Air
Other

2) consignors the people/organisation for whom the transport activity is undertaken;

3) transporters the people/organisation who undertook the activity;

4) origin/destination the location of start/finish of transport activity;

5) corridor the route taken between the origin and destination;

6) payload persons or goods that are moved;

7) purpose the reason for undertaking the transport activity;

8) duration the time and/or distance of the transport activity;

9) cost of transport activity;

10) support industries industries which supply components or services used in transport activity - eg, automotive manufactures, fuel suppliers and booking agencies; and

11) infrastructure physical features that facilitate transport activity - eg, roads, warehouses and port facilities.

By cross classifying various of the above elements, major areas of statistical and methodological interest in the transport field can be identified. More importantly, adoption of a common framework fosters the use of a common (or at least a compatible) set of standards across levels of government, agencies and suppliers

Further development of this framework is a major short-term priority within the ABS, as it is seen as being fundamental to ABS' future activities in this field. An important part of this development includes seeking comments from the user community to ensure that the framework is relevant. Our intention is to finalise a draft framework document and to canvass comments on its content and usefulness from as wide an audience as possible.

Directory of Transport Statistics

As a complementary task to this framework development, the ABS is also compiling a Directory of Transport Statistics. The directory is aiming to list various major, publicly available holdings of statistical data both within the ABS and amongst other agencies. At this stage it is planned that the first issue of the directory will be available late in 1991. Potential suppliers of data are being presently canvassed for submitting entries to the Directory.

Other specific tasks

The ABS is also looking at three specific new thrusts towards improving the range of transport statistics in the next few years. These are:

1. Re-examination of the SMVU methodology;
2. Investigations into the collection of national freight movement statistics; and
3. Development of a collection of statistics about the structure and operations of businesses involved in transport

Review of the Survey of Motor Vehicle Use

The main problem with the SMVU at the moment is that we ask respondents to provide information relating to a 12-month period. The problem arises because, generally speaking, few records are kept by the population at large about their vehicle use patterns. To overcome this problem, we will be looking at various options including:

- (a) A combined Odometer and Motor Vehicle Use Survey - where we could ask for an initial odometer reading and then re-approach the same vehicle owners 12 months later to provide a second odometer reading and to obtain other motor vehicle use information for that period. This methodology was used in a limited way in 1988.
- (b) A diary/log book approach - in which we would ask respondents to keep a daily record of their use of the selected vehicle. This approach may need to break the sample down to say 12 separate monthly sub-samples, to minimise and spread respondent load, and also to provide reliable measures of seasonal differences. However, this methodology is considerably more expensive than our current mail enumerated collection, and may require some sample size trade-offs.

National Freight Movement Statistics

A major area of unmet demand in Australia relates to information about freight movements. I mentioned earlier that the ABS currently conducts a quarterly Interstate Road Freight Movements collection. However, this survey only covers perhaps 5 per cent of total road freight movements throughout the country (as measured in tonne-kilometres moved) since most of the freight moved is intra-state. While some regional studies of freight movements are conducted from time to time, we are not aware of any regular, detailed measures of road-freight movements.

The ABS proposes to investigate the feasibility of collecting intra-state data. The difficulties we anticipate finding relate to concerns about the amount of record keeping. We will need to look at whether the best source of data is the business wanting to move the freight (ie, the consignor), or the business that ultimately transports the freight. This in turn will depend on the amount of detail we want them to report - for example, commodity by region.

Survey of Transport Activity

There is also a requirement to provide information about the structure, composition and operations of businesses engaged in transport activities. The ABS last conducted a Transport Industry Survey in respect of 1983-84 and since then little data have been obtained about these businesses. There is provision in our Forward Work Program to conduct a major survey in the Transport field in 1994. In conjunction with the Bureau's recently introduced annual, economy-wide Economic Activity Survey, this provides an opportunity to address these needs. (In essence, the Economic Activity Survey provides information about the structure and financial performance of businesses classified by industry including those in the Transport industry.) By using the transport framework, we also intend to assess options for obtaining further information about the nature of the transport activities and services undertaken by various businesses.

As our thinking on this collection begins to firm up, we will be canvassing user comments and requirements widely.

Conclusion

I would like to congratulate the organisers on the provocative framing of the theme for this Conference. I hope that the transport research community will be better informed about the nature of ABS activities in this field as a result of the invitation to participate, that we may be able to make a greater contribution in future, and that greater use will be made by researchers of our many services and data sources.

It is my belief that the ABS has an important role to play in the transport field.

The ABS currently has an array of data relevant to many transport issues, including the key measures of vehicle stock and usage. To date, however, these data sources have been seriously underutilised. As a result, we would argue that not only do researchers not know what they want, they also don't know what is available. Our current interest is to increase user awareness of these data sources, and for this I am grateful to the organisers of the Conference for this opportunity to address key transport researchers.

Our work on the statistical framework is aimed at identifying the various components and issues relevant to Transport research and policy. This work will also, we trust, encourage researchers to adopt more uniform concepts and standards, as well as foster greater coordination of statistical (and research) effort. Finally, we hope that

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this framework will also help to focus on major gaps and deficiencies in our information base and therefore aid in setting the direction for future initiatives

If this conference leads to clearer statements of research information needs and their priorities, we will try to respond within the limits of given resources. I should also mention that the ABS is also willing to conduct statistical collections on a user funded basis, while we also offer consultancy services to meet specific requirements

The ABS is looking towards the improvement of existing, and development of new, statistical collections in transport. We invite users to make their views known to the ABS in this regard

AUSTRALIAN BUREAU OF STATISTICS
Canberra ACT

SUMMARY OF FINDINGS

SECTION 1: NUMBER OF VEHICLES

Results of the 1988 Survey of Motor Vehicle Use relate to an estimated 9.4 million vehicles across Australia. There were 7.4 million cars and station wagons, representing nearly 80 per cent of all road using vehicles. Utilities and panel vans accounted for a further 12.6 per cent of vehicles; rigid trucks for 4.3 per cent; motor cycles for 3.1 per cent; articulated trucks for 0.5 per cent; and buses for 0.4 per cent.

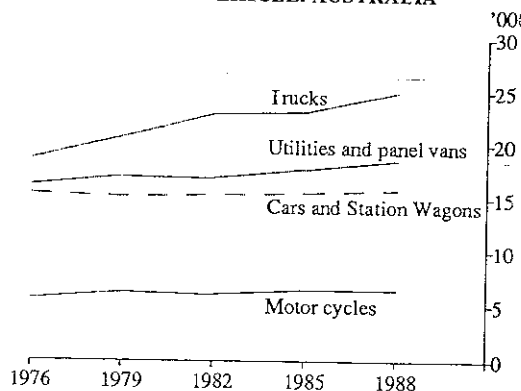
Since 1976, the total number of road using vehicles has increased by nearly 43 per cent. The proportion of vehicles classified by vehicle type has remained relatively stable over that period although utilities and panel vans showed a rise of almost 63 per cent. In contrast, the number of non-freight carrying trucks declined by almost 21 per cent. Motor cycle numbers have shown an overall increase of 2.9 per cent since 1976 but declined by almost 17 per cent between 1985 and 1988.

Estimated numbers of vehicles and average kilometres travelled, by category are shown in the following table.

	Estimated number of vehicles ('000)	Average kilometres travelled ('000)
Cars and station wagons	7,375.6	15.8
Motor cycles	293.9	6.5
Utilities and panel vans	1,178.9	18.6
Rigid trucks	404.7	19.4
Articulated trucks	48.7	78.7
Other truck types	23.1	11.3
Buses	40.5	35.3
Total	9,365.4	16.4

trucks was the only vehicle type to show a decline over the period from 14,400 kilometres to 11,300 kilometres; fall of more than 21 per cent.

AVERAGE KILOMETRES TRAVELLED BY TYPE OF VEHICLE: AUSTRALIA



The total distance travelled by all vehicles rose by almost 10 per cent over the corresponding figure for 1985: 153,914.9 million kilometres.

While trucks on average travel the greatest distance, there are far more cars and station wagons on the road (see Table 1) and consequently this category shows the greatest total distance travelled.

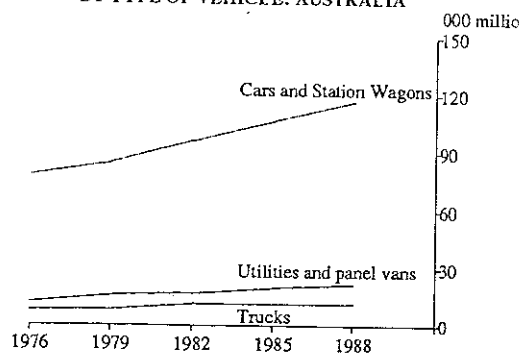
Cars and station wagons travelled a total of 116,640 million kilometres, an increase of more than 9 per cent over the corresponding 1985 figure. While all other vehicle types showed increases over the 1985 estimates for total distance travelled, motor cycles fell slightly to 1,924 million kilometres.

SECTION 2: DISTANCE TRAVELLED

The average distance travelled by motor vehicles in the twelve months to 30 September 1988 was 16,400 kilometres, an increase of almost 4 per cent over the corresponding period in 1985 (15,800 kilometres). All vehicle types except non-freight-carrying trucks and motor cycles showed increases on 1985 with articulated and rigid trucks rising 8.9 per cent and 8.4 per cent respectively, and cars and station wagons by nearly 2 per cent to 15,800 kilometres.

Since 1976 the average distance travelled by motor vehicles has increased from 15,400 to 16,400 kilometres, an increase of more than 6 per cent. The average distance travelled by articulated and rigid trucks rose by 56 per cent and 24 per cent respectively, while cars and station wagons rose by nearly 3 per cent. Non-freight-carrying

TOTAL KILOMETRES TRAVELLED BY TYPE OF VEHICLE: AUSTRALIA

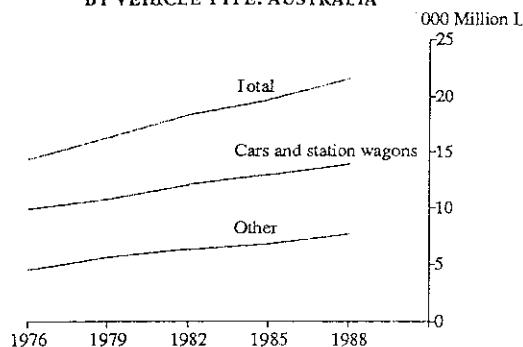


SECTION 3. FUEL CONSUMPTION

Total fuel consumption by all vehicles for the year ended 30 September 1988 was estimated at 21,577.2 million litres. Cars and station wagons accounted for nearly 65 per cent (13,893.8 million litres) of this total, followed by trucks with over 19 per cent (4,194.0 million litres) and utilities and panel vans with almost 14 per cent (2,946.0 million litres).

Petrol, both leaded and unleaded, accounted for over 75 per cent (16,228.4 million litres) of total fuel consumption in 1988.

TOTAL FUEL CONSUMPTION BY VEHICLE TYPE: AUSTRALIA



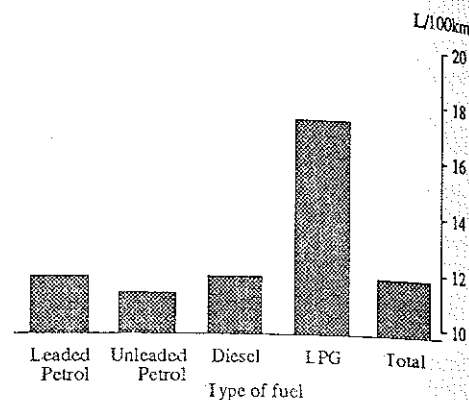
The average rate of fuel consumption for cars and station wagons over the year ended 30 September 1988 was estimated at 11.9 litres per 100 kilometres, a fall of about 2 per cent over the corresponding period in 1985. For those cars and station wagons using unleaded petrol, consumption averaged 11.3 litres per 100 kilometres in 1988 while leaded petrol consumption averaged 11.9 litres per 100 kilometres. Since 1976 the average fuel consumption of cars and station wagons has fallen by 0.7 litres per 100 kilometres or about 6 per cent.

Consumption of diesel or distillate fuel averaged 11.9 litres per 100 kilometres for cars and station wagons, 54.2 litres per 100 kilometres for articulated trucks and 28.3 litres per 100 kilometres for all vehicles. All vehicle types showed small increases in average fuel consumption on 1985 with articulated and rigid trucks increasing by 1.1 per cent and 1.5 per cent respectively, and cars and station wagons by nearly 4.4 per cent.

Average consumption for LPG/Dual fuel vehicles ranged from a high of 62.7 litres per 100 kilometres for articulated trucks to 17.4 litres per 100 kilometres for cars and station wagons. In comparison, articulated trucks consumed an average of 54.5 litres per 100 kilometres for the corresponding period in 1985 with cars and station wagons consuming 18.0 litres per 100 kilometres.

The average rate of LPG consumption across all vehicle types declined from a high of 23.6 litres per 100 kilometres in 1979 (when it was recorded separately for the first time) to 18.6 litres per 100 kilometres in 1988.

CARS AND STATION WAGONS, AVERAGE RATE OF FUEL CONSUMPTION BY FUEL TYPE: AUSTRALIA

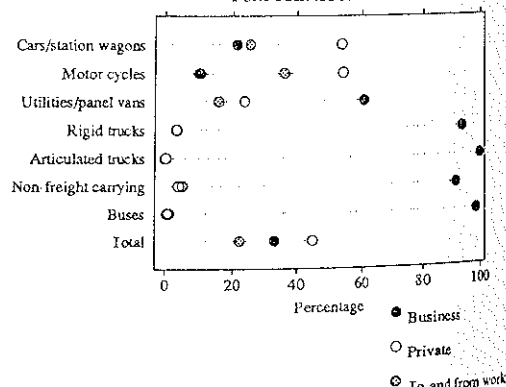


SECTION 4 PRIVATE AND BUSINESS VEHICLE USAGE

Business usage accounted for nearly one third (51,061 million kilometres) of the total distance travelled in the twelve months ended 30 September 1988, almost 36 per cent (18,168 million kilometres) of which involved carrying loads.

Over 21 per cent (24,761.9 million kilometres) of the total distance travelled by cars and station wagons was for business use while more than 25 per cent (29,743.4 million kilometres) was for travel to and from work.

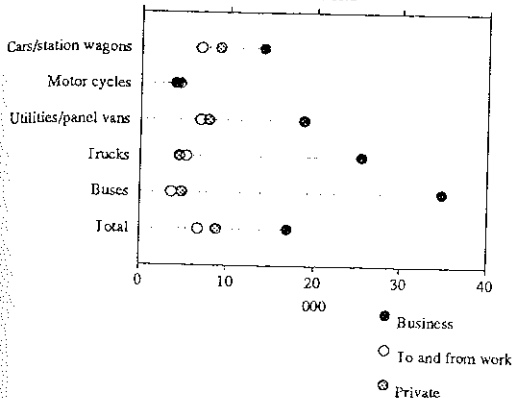
PROPORTION OF TOTAL KILOMETRES TRAVELLED BY TYPE OF VEHICLE AND PURPOSE: AUSTRALIA



The average distance travelled for business purposes by all motor vehicles was 17,000 kilometres in 1988 compared with 14,900 kilometres in 1985, an increase of over 14 per cent. Articulated trucks averaged 78,600 kilometres in 1988, about 76 per cent (59,600 kilometres) of which was while laden. This compares with an average of 71,700 kilometres in 1985, 74 per cent of which was while laden.

After the Australian Capital Territory Western Australia recorded the highest proportion (about 66 per cent) of total distance travelled within the capital city area, which was unchanged from 1985. Western Australia and Tasmania showed the highest proportion (both about 98 per cent) of total distance travelled within the State of registration, again unchanged from 1985.

AVERAGE KILOMETRES TRAVELLED BY TYPE OF VEHICLE AND PURPOSE: AUSTRALIA



Vehicles registered in the Northern Territory recorded the highest average distance travelled per vehicle at 17,800 kilometres, followed by Victoria (17,000 kilometres) and New South Wales (16,800 kilometres) while South Australia (14,900 kilometres) and Tasmania (14,200 kilometres) recorded the lowest.

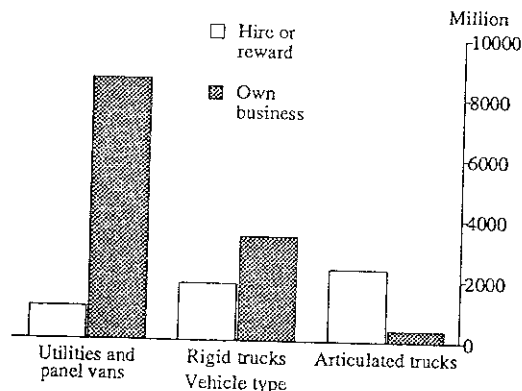
Northern Territory registered vehicles recorded the highest average *business* kilometres travelled in the survey period (21,500 kilometres) followed by New South Wales with 18,100 kilometres. The Australian Capital Territory recorded the lowest average (13,700 kilometres).

SECTION 5. LOAD CARRYING VEHICLE USAGE

Load carrying vehicles recorded a total of 18,167.9 million laden kilometres for business purposes in the twelve months ended 30 September 1988. Of this total, almost 70 per cent (12,637.9 million) was attributable to vehicles used in own business while the remainder (5,530.0 million) was by vehicles used for hire and reward.

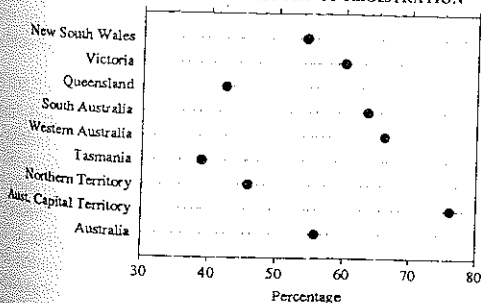
More than 95 per cent (146,559 million) of total kilometres travelled by all vehicles were attributed to travel within the State of registration, the same proportion as for 1985. Nearly 56 per cent (85,836.6 million) of total kilometres were driven in a capital city area, an increase of 3 per cent over 1985. For articulated trucks, however, only about 20 per cent (759.3 million kilometres) of the total distance travelled was estimated to be within a capital city area, while over 25 per cent (960 million kilometres) was interstate.

TOTAL LADEN BUSINESS KILOMETRES TRAVELLED BY TYPE OF VEHICLE AND VEHICLE USAGE: AUSTRALIA

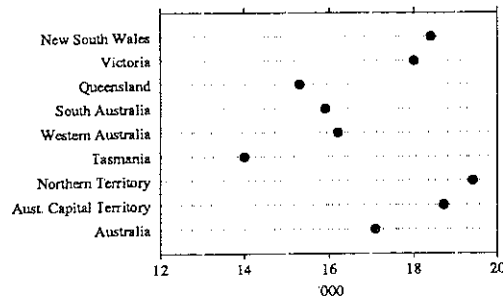


Vehicles used for load carrying purposes averaged 17,100 laden business kilometres, up from 15,200 in 1985. Vehicles registered in the Northern Territory, Australian Capital Territory and New South Wales recorded the highest average laden business distance travelled with 19,400, 18,700 and 18,400 kilometres respectively.

PROPORTION OF TOTAL KILOMETRES TRAVELLED WITHIN CAPITAL CITY AREA, ALL VEHICLES: STATE/TERRITORY OF REGISTRATION



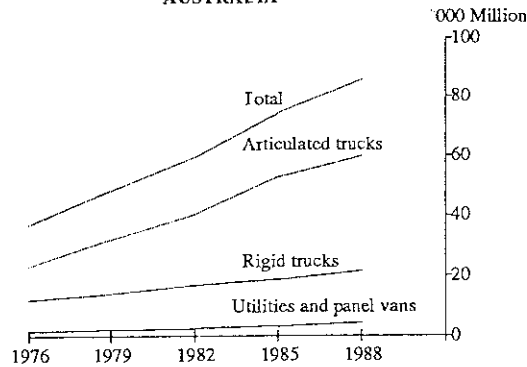
AVERAGE LADEN BUSINESS KILOMETRES TRAVELLED BY STATE/TERRITORY OF REGISTRATION



Total tonne-kilometres by load carrying vehicles was estimated to be 85,529 million tonne-kilometres, an increase of more than 15 per cent over the corresponding 12 month period to 30 September 1985 (74,300 million tonne-kilometres).

Almost 80 percent of total tonne-kilometres was travelled within the State of registration, the remainder (17,490 1 million kilometres) was recorded as interstate travel, about 96 per cent of which was by articulated trucks.

TOTAL TONNE-KILOMETRES TRAVELLED BY LOAD CARRYING VEHICLES: AUSTRALIA



Articulated trucks showed an increase of almost 16 per cent between the 1985 and 1988 surveys in average tonne-kilometres travelled (from 1,065,500 to 1,231,400 tonne-kilometres). Northern Territory registered articulated trucks recorded the highest average in 1988 with 1,365,900 tonne-kilometres, down from 3,175,300 in 1985, and Tasmania the lowest with 1,003,400 tonne-kilometres, up from 786,100 tonne-kilometres in 1985.

The total tonnes carried in the survey period was 990 2 million tonnes, an apparent decrease of more than 4 per cent over the corresponding 1985 period (1,031 8 million tonnes). However, care should be exercised when making

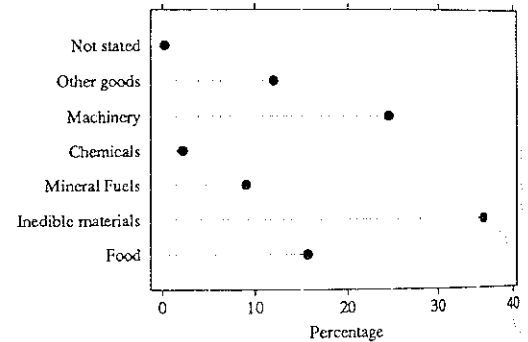
comparisons with previous periods as respondents had particular difficulty in providing these data (See Explanatory Notes, paras 31 to 33).

Almost 60 per cent of total tonnes carried was by vehicles registered in New South Wales and Victoria, an increase of 5 per cent over 1985. The average load carried by utilities and panel vans was 391 kilograms, 3,432 kilograms by rigid trucks and 18,189 kilograms for articulated trucks.

SECTION 6. COMMODITY/INDUSTRY USAGE

The commodity group 'inedible crude materials except fuels', accounted for almost 36 per cent (355.4 million tonnes) of total tonnes carried, but only about 18 per cent (15,148 3 million) of total tonne-kilometres. This was a fall of almost 11 per cent and a rise of over 11 per cent respectively on 1985. In contrast, 155.1 million tonnes of 'food and live animals' were carried (nearly 16 per cent of total tonnes) accounting for about 28 per cent of total tonne-kilometres (23,815.4 million), a decline of almost 15 per cent and an increase of about 14 per cent respectively on 1985.

PROPORTION OF TOTAL TONNES CARRIED, BY COMMODITY: AUSTRALIA

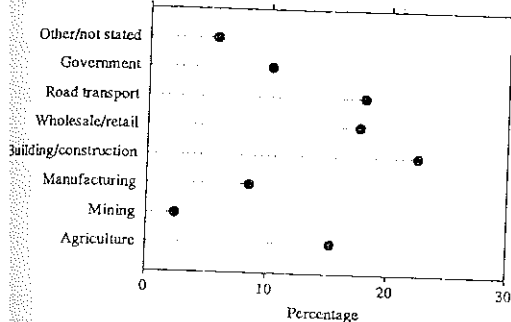


The industry to which business distance travelled is classified, largely reflects respondents' perceptions of the industry in which the main client is predominantly engaged (see Explanatory Notes, paragraph 16).

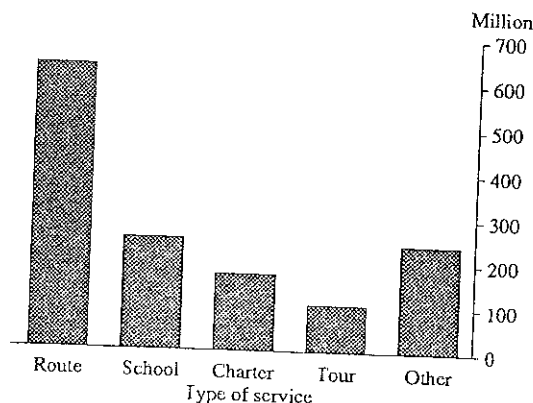
In terms of total business kilometres travelled, the wholesale and retail trade industry was the major industry served, accounting for around 23 per cent (11,552 1 million kilometres). With a total of 7,384 million kilometres (about 15 per cent of the total) the building and construction industry was the next most significant contributor. In 1985, the wholesale and retail trade industry accounted for almost 24 per cent of total business kilometres travelled (10,611 2 million) followed by the agriculture, forestry, fishing and hunting industry with 6,709 2 million kilometres (about 15 per cent of the total).

Assessed in terms of total *laden* business kilometres travelled, the building and construction industry (4,088 million kilometres) was the largest contributor with the road transport (3,269 million kilometres) and wholesale and retail trade industries (3,189 million kilometres) also being significant contributors. In contrast, for the corresponding 1985 period the wholesale and retail trade, building and construction and road transport industries were the largest contributors to total laden business kilometres with 2,886.3, 2,877.6 and 2,791.6 million kilometres respectively.

PROPORTION OF TOTAL LADEN BUSINESS KILOMETRES BY INDUSTRY SERVED: AUSTRALIA



TOTAL BUS KILOMETRES TRAVELLED BY TYPE OF SERVICE: AUSTRALIA

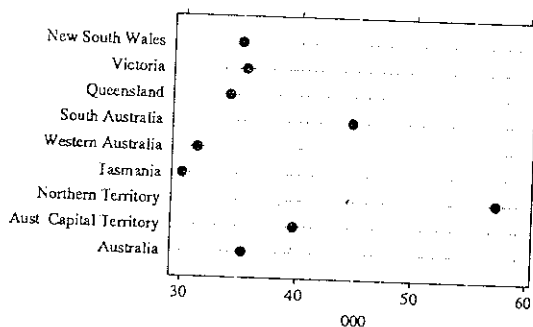


The average distance travelled by all buses was 35,300 kilometres, with tour service buses averaging 69,700 kilometres and route service buses averaging 57,500 kilometres. Buses registered in the Northern Territory, with 57,300 kilometres per bus, had the highest average distance travelled, followed by South Australia with 44,700 kilometres per bus and Tasmania the lowest with 30,000 kilometres per bus.

The road transport industry itself recorded by far the highest average business kilometres (42,200 kilometres), average laden business kilometres (37,800 kilometres), average tonne-kilometres (456,100 tonne-kilometres), average load (6,544 kilograms) and was the most significant contributor to both total tonne-kilometres (50 per cent) and total tonnes carried (over 25 per cent).

Agriculture, forestry, fishing and hunting industry recorded the lowest average business kilometres (11,700 kilometres), average laden business kilometres (8,200 kilometres) and average tonne-kilometres (28,000 tonne-kilometres).

AVERAGE KILOMETRES TRAVELLED (BUSES) BY STATE/TERRITORY OF REGISTRATION

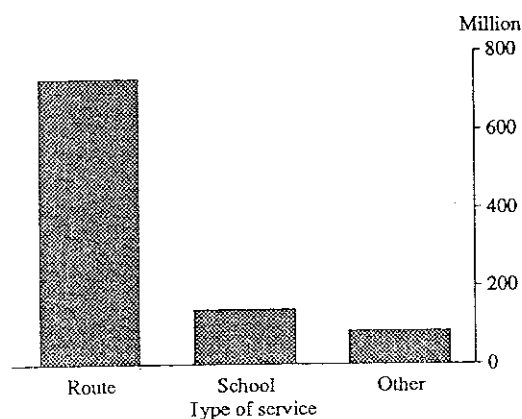


SECTION 7. BUS USAGE CHARACTERISTICS

The 1,432.8 million kilometres travelled by buses in the months to 30 September 1988, route services accounted for about 45 per cent (640.1 million kilometres), dedicated school services for 18 per cent (257.5 million kilometres), charter services for over 12 per cent (178.3 million kilometres) and tour services for almost 8 per cent (116 million kilometres).

A total of 973.7 million passengers were carried by all buses with more than 75 per cent (736.1 million passengers) by route services and over 15 per cent (146.9 million passengers) by dedicated school bus services. Buses registered in New South Wales carried almost 43 per cent of all passengers (417.2 million) while those registered in the Northern Territory carried less than 1 per cent (5.3 million passengers).

NUMBER OF PASSENGERS CARRIED BY TYPE OF SERVICE: AUSTRALIA

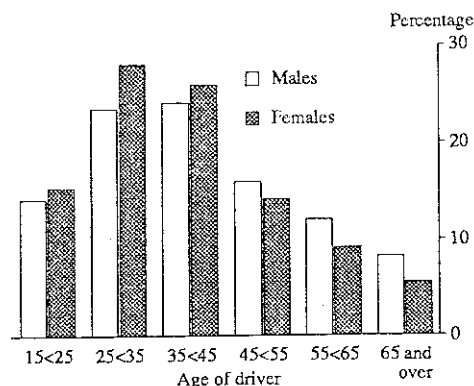


SECTION 8 DRIVER CHARACTERISTICS

This section discusses characteristics of drivers of non-load carrying vehicles such as cars, station wagons, motor cycles and non-freight carrying vans and trucks (see Explanatory Notes, para. 5). The data reflect the incidence of vehicles which may be driven by more than one driver. Details were obtained about the age, sex, driving experience and proportion of total distance travelled (as driver) in the selected vehicle, for each driver. On the other hand, these estimates do not take account of persons who drove more than one vehicle. It is therefore likely that the survey underestimates the total distance driven by an individual to the extent that more than one vehicle may have been driven by that person over a given period.

The average age of drivers of all non-load carrying vehicles was found to be 40 years at 30 September 1988, with 41 years being the average for males and 39 for females. The average age of motor cycle riders was 32 years with more than two thirds being under 35 years of age.

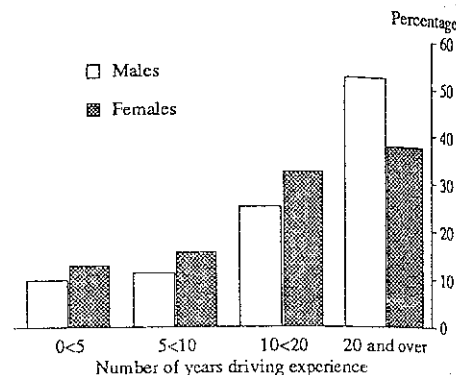
DISTRIBUTION OF DRIVERS OF NON-LOAD CARRYING VEHICLES BY AGE AND SEX OF DRIVER: AUSTRALIA



An estimated 46 per cent of drivers (approximately 5.8m) reported 20 or more years of driving experience whilst about 4 per cent reported less than 5 years.

About 95 per cent of drivers drove less than 30,000 kilometres in the selected vehicle during the 12 months ended 30 September 1988 while almost 63 per cent of drivers drove less than 10,000 kilometres.

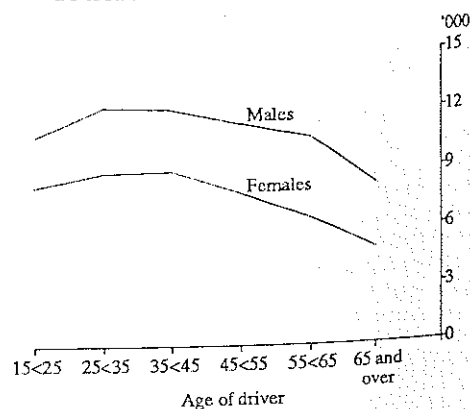
DISTRIBUTION OF DRIVERS OF NON-LOAD CARRYING VEHICLES BY DRIVING EXPERIENCE AND SEX OF DRIVER: AUSTRALIA



The average distance travelled by drivers of non-load carrying vehicles was 9,800 kilometres with male drivers averaging 11,000 kilometres and female drivers 8,100 kilometres. The average distance driven by males exceeded that by females for all vehicles except cars and station wagons with engine capacities less than 1600 cc.

Males accounted for 57 per cent and females for 43 per cent of the 11.6m drivers of cars and station wagons. Almost twice as many males (2.6m) as females (1.5m) drove cars and station wagons with a reported engine capacity of 3,000 cc or more. In contrast, the number of female drivers (1.1m) slightly exceeded males (1.0m) in the less than 1600 cc category.

AVERAGE KILOMETRES TRAVELLED BY DRIVERS OF NON-LOAD CARRYING CARS AND STATION WAGONS, BY AGE AND SEX OF DRIVER: AUSTRALIA





Research into Traffic Models for the Economic Evaluation of Private Sector Toll Roads and Tunnel Proposals in New South Wales

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Abstract:

Government policy in New South Wales has shifted in recent years to allow a greater private-sector participation in the construction and operation of toll roads and tunnels. Examples of proposals include the Sydney Harbour Tunnel (due for completion in 1992), The Bulahdelah Tollway, the F2 and F4 toll roads in metropolitan Sydney, and the Queanbeyan-South Coast tollway. Unisearch Ltd - the University of New South Wales Research and Development company - has given independent advice to both the private and public sectors and to community-based groups on all of the examples mentioned above.

The objective of the paper is to describe the "research and development" aspects of the traffic models used to estimate future traffic assignments to the proposed facilities. Two case studies are included: a model for the temporal distribution of traffic demands over the Sydney Harbour Bridge and tunnel proposal; and a logit model for traffic assignment to a proposed tollway between Queanbeyan and the South Coast. The relationship between toll revenue and construction and operational costs is of crucial importance in determining financial viability.

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