## SURVEY OF MOTOR VEHICLE USE

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- For further information about these and related statistics, contact the Manager, Survey of Motor Vehicle Use on Brisbane 073222 6294, or Client Services in any ABS office as shown on the back cover of this publication.


## NOTES

ABOUT THIS PUBLICATION

EFFECTS OF ROUNDING

SYMBOLS AND OTHER USAGES

This publication presents results from the 1998 Survey of Motor Vehicle Use (SMVU). The data were collected in four quarterly sample surveys conducted by the Australian Bureau of Statistics (ABS) over the period 1 August 1997 to 31 July 1998.

The statistics in this publication are the first results produced using a new collection methodology designed to overcome problems with the quality of data reported for previous ABS surveys of motor vehicle use, the last of which was conducted in 1995. The new methodology is described in the Explanatory notes. The change to the methodology means that care should be taken in making direct comparisons between 1998 data and that from previous surveys. Information about historical comparisons is provided in the Appendix. Additional information about the reliability of the estimates is given in the Technical note.

Where figures have been rounded, discrepancies may occur between sums of the component items and totals.
n.a. not available

* relative standard error of between $25 \%$ and less than $50 \%$
** relative standard error of $50 \%$ or more
. . not applicable
- nil or rounded to zero
W. McLennan

Australian Statistician

## SUMMARY OF FINDINGS

FUEL CONSUMPTION

During the period 1 August 1997 to 31 July 1998, vehicles registered in Australia for road use travelled 173,317 million kilometres at an average 14,900 kilometres per vehicle. While freight-carrying vehicles and buses on average travelled greater distances, $80 \%$ of all vehicles on the road were passenger vehicles and these accounted for $77 \%$ ( 134,261 million kilometres) of total distance travelled in Australia. Freight-carrying vehicles contributed $21 \%$ ( 35,893 million kilometres); buses $1 \%$ ( 1,639 million kilometres); motor cycles
1\% (1,350 million kilometres); while non-freight carrying trucks travelled 175 million kilometres.

AVERAGE KLOMETRES TRAVELLED BY TYPE OF VEHICLE


Vehicles registered in the Australian Capital Territory recorded the highest distance travelled per vehicle at 15,900 kilometres, followed by Victoria ( 15,800 kilometres) and New South Wales (15,700 kilometres), while Tasmania ( 13,300 kilometres) recorded the lowest average distance travelled.

The average rate of fuel consumption by all vehicles for all fuel types in the 12 months ended 31 July 1998 was estimated at 13.8 litres per hundred kilometres. For those passenger vehicles using petrol, consumption averaged 11.4 litres per hundred kilometres, comprising an average of 11.3 litres per hundred kilometres for vehicles using unleaded petrol and 12.0 litres per hundred kilometres for passenger vehicles using leaded petrol.

Consumption of diesel fuel in the 12 months ended 31 July 1998 averaged 25.6 litres per hundred kilometres for all vehicles, with articulated trucks averaging 51.0 litres, rigid trucks 28.3 litres, light commercial vehicles 12.0 litres and passenger vehicles 11.9 litres per hundred kilometres. Consumption of LPG/CNG and dual fuels averaged 17.1 litres per hundred kilometres for all vehicles, with passenger vehicles averaging 17.0 litres per hundred kilometres.

FUEL CONSUMPTION continued

Total fuel consumption by all vehicles during the 12 months ended 31 July 1998 was estimated at 23,909 million litres, with passenger vehicles accounting for $66 \%$ ( 15,825 million litres) of total fuel consumed and freight-carrying vehicles for 31\% (7,487 million litres).
MOTOR VEHICLE FUEL CONSUMPTION BY TYPE OF FUEL


Of the total distance travelled by all vehicles in the 12 months ended 31 July 1998, an estimated $96 \%$ ( 165,996 million kilometres) was within the State/Territory of registration of the vehicle. About $57 \%$ ( 99,134 million kilometres) of total kilometres driven by all vehicles was in the capital city area of the State/Territory of registration, although for articulated trucks, only $23 \%$ ( 1,129 million kilometres) of the total distance travelled was within the capital city area of the State/Territory of registration and $26 \%$ ( 1,267 million kilometres) was interstate.

TRAVEL WITHIN CAPITAL CITY(a), STATE/TERRITORY OF REGISTRATION

(a) Travel within the capital city of the State/Territory of registration.

FREIGHT-CARRYING VEHICLE USE

Business use accounted for an estimated $35 \%$ ( 60,923 million kilometres) of the total distance travelled in the 12 months ended 31 July 1998, $31 \%$ ( 18,967 million kilometres) of which involved carrying freight.

About 52\% ( 70,106 million kilometres) of the total distance travelled by passenger vehicles was for private use, $24 \%$ ( 31,995 million kilometres) was for travel to and from work, and $24 \%$ ( 32,160 million kilometres) was for business use.

For those vehicles used partly or wholly for business purposes, the average distance travelled for business purposes was 13,700 kilometres. Articulated trucks averaged 92,600 kilometres, with $73 \%$ of their total business distance being travelled while they were either partly or fully laden with freight. Buses averaged 32,900 kilometres; rigid trucks 20,300 kilometres; light commercial vehicles 17,500 kilometres; passenger vehicles 10,500 kilometres; and motorcycles 5,100 kilometres.

TRAVEL FOR BUSINESS PURPOSES IN STATE/TERRITORY OF REGISTRATION


Of those vehicles used partly or wholly for private purposes, the average distance travelled for this purpose was 8,400 kilometres, with passenger vehicles averaging 8,700 kilometres. Vehicles registered in the Australian Capital Territory and Victoria recorded the highest average vehicle usage for private purposes with averages of 9,800 and 9,200 kilometres respectively.

Of those vehicles used partly or wholly for travel to and from work, the average distance travelled in the 12 months ended 31 July 1998 for this purpose was 6,900 kilometres, with light commercial vehicles recording the highest average with 7,600 kilometres.

Freight-carrying vehicles travelled an estimated 18,967 million laden kilometres for business purposes in the 12 months ended 31 July 1998 and carried 1,277 million tonnes of goods. A total of 112,832 million tonne-kilometres was travelled by these vehicles, with articulated trucks having the largest proportion at $77 \%$ ( 86,892 million tonne-kilometres). Rigid trucks accounted for $19 \%$ ( 21,491 million tonne-kilometres) and light commercial vehicles for $4 \%$ ( 4,449 million tonne-kilometres).

TOTAL TONNE-KLOMETRES TRAVELLED BY ARTICULATED TRUCKS


Of the total tonnes of goods carried in the 12 months ended 31 July 1998, rigid trucks accounted for $47 \%$ ( 604 million tonnes), while articulated trucks accounted for $46 \%$ ( 593 million tonnes).
WEIGHT OF COMMODITIES


Buses used partly or wholly for business travelled
1,577 million kilometres in the 12 months ended 31 July 1998. Route services accounted for $38 \%$ ( 597 million kilometres) of the total distance travelled, dedicated school bus services contributed 21\% ( 324 million kilometres), charter services 14\% (221 million kilometres) and tour services accounted for 6\% (94 million kilometres).

AVERAGE KLOMETRES TRAVELLED BY TYPE OF BUS SERVICE


DRIVER CHARACTERISTICS The average distance travelled by drivers of all vehicles (excluding taxis and buses) in the 12 months ended 31 July 1998 was estimated at 10,300 kilometres, with male drivers averaging 11,200 kilometres and female drivers 8,800 .

(a) All vehicles except taxis and buses.

Passenger vehicles, excluding taxis, were driven an average of 9,700 kilometres by each driver. For other types of vehicles, the averages were: motor cycles 5,600 kilometres; articulated trucks 61,300 kilometres; rigid trucks 13,500 kilometres; and light commercial vehicles 12,200 kilometres.

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1 Total kilometres travelled, average number of vehicles and average kilometres travelled by State/Territory of registration and type of vehicle


| State/Territory of registration | Passenger vehicles | Motor cycles | commercial vehicles | Rigid trucks | Articulated trucks | Nonfreight carrying trucks | Buses | Total |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| TOTAL KILOMETRES TRAVELLED (million) |  |  |  |  |  |  |  |  |
| New South Wales | 43155 | 489 | 7832 | 1985 | 1216 | 51 | 441 | 55169 |
| Victoria | 41047 | *298 | 5138 | 1434 | 1389 | 38 | 274 | 49619 |
| Queensland | 20338 | *339 | 5519 | 1377 | 1022 | 46 | 392 | 29033 |
| South Australia | 10749 | 66 | 1763 | 337 | 561 | 20 | 120 | 13616 |
| Western Australia | 12189 | 101 | 3227 | 646 | 490 | 14 | 254 | 16920 |
| Tasmania | 3281 | 25 | 778 | 129 | 126 | 3 | 50 | 4393 |
| Northern Territory | 890 | 13 | 398 | 59 | 84 | *2 | 75 | 1521 |
| Australian Capital Territory | 2611 | 17 | 303 | 49 | 31 | *1 | 33 | 3045 |
| Australia | 134261 | 1350 | 24958 | 6015 | 4921 | 175 | 1639 | 173317 |
| NUMBER OF VEHICLES(a)(b) |  |  |  |  |  |  |  |  |
| New South Wales | 2866875 | 78654 | 434037 | 99282 | 15205 | 2847 | 15608 | 3512508 |
| Victoria | 2583822 | 77551 | 360037 | 84643 | 16946 | 5390 | 11175 | 3139565 |
| Queensland | 1604424 | 67217 | 339925 | 68885 | 11775 | 3073 | 11003 | 2106302 |
| South Australia | 824684 | 28134 | 109766 | 25610 | 5537 | 2218 | 3558 | 999507 |
| Western Australia | 950776 | 39311 | 189593 | 43468 | 6778 | 2733 | 7022 | 1239681 |
| Tasmania | 253251 | 7079 | 54342 | 10791 | 1457 | 1014 | 1846 | 329779 |
| Northern Territory | 64932 | 3579 | 24622 | 3797 | 822 | 198 | 2167 | 100119 |
| Australian Capital Territory | 166204 | 5806 | 16371 | 2376 | 274 | 124 | 881 | 192036 |
| Australia | 9314969 | 307332 | 1528692 | 338851 | 58794 | 17598 | 53260 | 11619496 |


|  | 15.1 | 6.2 | 18.0 | 20.0 | 80.0 | 17.8 | 28.2 |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: | ---: |
| New South Wales | 15.9 | $* 3.8$ | 14.3 | 16.9 | 82.0 | 7.1 | 24.6 |
| Victoria | 12.7 | $* 5.0$ | 16.2 | 20.0 | 86.8 | 15.1 | 35.6 |
| Queensland | 13.0 | 2.4 | 16.1 | 13.2 | 101.3 | 9.0 | 33.7 |
| South Australia | 12.8 | 2.6 | 17.0 | 14.9 | 72.4 | 5.1 | 36.1 |
| Western Australia | 13.0 | 3.6 | 14.3 | 12.0 | 86.6 | 2.7 | 27.2 |
| Tasmania | 13.7 | 3.8 | 16.1 | 15.5 | 102.7 | $* 9.3$ | 34.7 |
| Northern Territory | 15.7 | $* 3.0$ | 18.5 | 20.4 | 114.4 | $* 10.2$ | 37.5 |
| Australian Capital Territory | 14.4 | 4.4 | 16.3 | 17.7 | 83.7 | 9.9 | 30.8 |
| Australia |  |  |  |  | 13.3 |  |  |

[^0]|  | Passenger <br> vehicles | Motor <br> cycles | Light <br> commercial <br> vehicles | Rigid <br> trucks | Articulated <br> trucks | Non-freight <br> carying <br> trucks | Buses |
| :--- | ---: | :---: | :---: | :---: | ---: | ---: | ---: | ---: |


|  | AVERAGE RATE OF FUEL CONSUMPTION(a) | (litres per 100 kilometres) |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Petrol |  |  |  |  |  |  |  |
| $\quad$ Leaded | 12.0 | 6.3 | 13.7 | 27.4 | 43.3 | 25.9 | 22.3 |
| $\quad$ Unleaded | 11.3 | 5.7 | 12.7 | $* * 16.3$ | 51.3 | 23.5 | 16.5 |
| $\quad$ Total | 11.4 | 5.9 | 13.0 | 24.9 | 50.6 | 24.3 | 17.5 |
| Diesel | 11.9 | n.a. | 12.0 | 28.3 | 51.0 | 30.3 | 29.1 |
| LPG/CNG/dual fuel | 17.0 | n.a. | 16.5 | 30.4 | 23.9 | 36.8 | 42.5 |
| Total | 11.8 | 5.9 | 13.2 | 28.1 | 51.0 | 29.1 | 28.5 |
| (a) Calculated using the total fuel consumption divided by the total kilometres travelled for each type of fuel by type of vehicle. See Explanatory notes. |  |  |  |  |  |  |  |

## 3

area of operation, by type of vehicle

| Vehicle type | Within State/Territory of registration |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Capital city | Other urban areas | Other areas | Total | Interstate | Australia |
| TOTAL KILOMETRES TRAVELLED (million) |  |  |  |  |  |  |
| Passenger vehicles | 80752 | 15350 | 33357 | 129459 | 4802 | 134261 |
| Motor cycles | 686 | *278 | 266 | 1231 | *119 | 1350 |
| Light commercial vehicles | 12408 | 2887 | 8840 | 24136 | 822 | 24958 |
| Rigid trucks | 3240 | 903 | 1681 | 5823 | 191 | 6015 |
| Articulated trucks | 1129 | 368 | 2157 | 3654 | 1267 | 4921 |
| Non-freight carrying trucks | 95 | 23 | 52 | 170 | *5 | 175 |
| Buses | 824 | 199 | 502 | 1525 | 114 | 1639 |
| Total | 99134 | 20008 | 46854 | 165996 | 7321 | 173317 |


|  | AVERAGE KILOMETRES | TRAVELLED PER VEHICLE(a) ('OOO) |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| Passenger vehicles | 12.1 | 7.1 | 9.8 | 14.5 | 4.1 | 14.9 |
| Motor cycles | 5.4 | $* 5.4$ | 3.2 | 5.5 | $* 4.8$ |  |
| Light commercial vehicles | 15.9 | 9.4 | 13.3 | 16.9 | 5.1 | 17.4 |
| Rigid trucks | 21.4 | 14.6 | 12.0 | 19.3 | 7.2 | 19.7 |
| Articulated trucks | 36.2 | 23.8 | 57.7 | 70.4 | 79.1 | 92.1 |
| Non-freight carrying trucks | 14.3 | 8.1 | 6.8 | 10.7 | 10.9 |  |
| Buses | 28.0 | 16.9 | 22.5 | 29.9 | 19.8 | 31.8 |
| Total | 12.7 | 7.6 | 10.7 | 15.1 | 5.2 | 15.6 |

(a) Calculated using the total kilometres travelled divided by the number of vehicles that travelled kilometres for each type of vehicle by area of operation. See Explanatory notes.

| State/Territory of registration | Capital city | Other urban areas | Other areas | Total | Interstate | Australia |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| TOTAL KILOMETRES TRAVELLED (million) |  |  |  |  |  |  |
| New South Wales | 31225 | 7442 | 15116 | 53783 | 1386 | 55169 |
| Victoria | 30782 | 4809 | 11537 | 47128 | 2491 | 49619 |
| Queensland | 13335 | 6312 | 8235 | 27881 | 1153 | 29033 |
| South Australia | 8663 |  | 4136 | 12799 | 817 | 13616 |
| Western Australia | 10603 | . $\cdot$ | 5944 | 16547 | *373 | 16920 |
| Tasmania | 1465 | 1445 | 1304 | 4215 | *178 | 4393 |
| Northern Territory | 793 | . . | 582 | 1375 | 146 | 1521 |
| Australian Capital Territory | 2269 | . | . | 2269 | 777 | 3045 |
| Australia | 99134 | 20008 | 46854 | 165996 | 7321 | 173317 |

AVERAGE KILOMETRES TRAVELLED PER VEHICLE(a) ('000)

| New South Wales | 13.7 | 8.2 | 10.7 | 15.8 | 3.0 | 16.1 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Victoria | 13.1 | 6.4 | 10.0 | 15.9 | 5.7 | 16.5 |
| Queensland | 11.8 | 7.7 | 10.5 | 14.2 | 6.0 | 14.6 |
| South Australia | 11.4 | . | 11.2 | 13.5 | 7.8 | 14.3 |
| Western Australia | 11.7 |  | 12.2 | 14.8 | *4.6 | 14.9 |
| Tasmania | 9.8 | 9.9 | 10.3 | 13.7 | *13.7 | 14.0 |
| Northern Territory | 13.1 |  | 14.6 | 15.6 | 16.8 | 16.6 |
| Australian Capital Territory | 12.5 | $\cdots$ | . | 12.5 | 7.8 | 16.6 |
| Australia | 12.7 | 7.6 | 10.7 | 15.1 | 5.2 | 15.6 |

(a) Calculated using total kilometres travelled divided by the number of vehicles that travelled kilometres for each State/Territory of registration by area of operation. See Explanatory notes.

5
BUSINESS AND PRIVATE VEHICLE USE, BY TYPE OF VEHICLE

| Business |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Type of vehicle | Laden | Unladen | All business use(a) | To and from work | Personal and other | Total |
| TOTAL KILOMETRES TRAVELLED (million) |  |  |  |  |  |  |
| Passenger vehicles | . |  | 32160 | 31995 | 70106 | 134261 |
| Motor cycles | . |  | *241 | 491 | 618 | 1350 |
| Light commercial vehicles | 11280 | 4766 | 16046 | 4032 | 4879 | 24958 |
| Rigid trucks | 4109 | 1726 | 5835 | 90 | 90 | 6015 |
| Articulated trucks | 3579 | 1336 | 4914 | 6 | *1 | 4921 |
| Non-freight carrying trucks | . | $\ldots$ | 173 | *1 | **1 | 175 |
| Buses | . | . | 1554 | *29 | 56 | 1639 |
| Total | 18967 | 7828 | 60923 | 36644 | 75750 | 173317 |


| Passenger vehicles |  | . | 10.5 | 6.9 | 8.7 | 14.9 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Motor cycles |  |  | *5.1 | 5.7 | 3.5 | 5.9 |
| Light commercial vehicles | 13.2 | 8.1 | 17.5 | 7.6 | 6.6 | 17.4 |
| Rigid trucks | 14.5 | 7.5 | 20.3 | 3.5 | 3.2 | 19.7 |
| Articulated trucks | 68.2 | 29.1 | 92.6 | 3.5 | 0.9 | 92.1 |
| Non-freight carrying trucks |  | . | 10.9 | *1.3 | **2.4 | 10.9 |
| Buses | . | . | 32.9 | 7.5 | 8.7 | 31.8 |
| Total | 16.0 | 9.1 | 13.7 | 6.9 | 8.4 | 15.6 |

(a) Including the business travel of non-freight carrying vehicles.
(b) Calculated using the total kilometres travelled divided by the number of vehicles that travelled kilometres for each type of vehicle by purpose. See Explanatory notes.

| State/Territory of registration | Business |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Laden | Unladen | All business use(a) | To and from work | Personal and other | Total |
| TOTAL KILOMETRES TRAVELLED (million) |  |  |  |  |  |  |
| New South Wales | 5841 | 2510 | 19641 | 12178 | 23351 | 55169 |
| Victoria | 4280 | 1528 | 17630 | 9666 | 22324 | 49619 |
| Queensland | 4305 | 1553 | 10068 | 5953 | 13013 | 29033 |
| South Australia | 1563 | 686 | 4252 | 2813 | 6551 | 13616 |
| Western Australia | 2065 | 1055 | 6507 | 4134 | 6279 | 16920 |
| Tasmania | 442 | 279 | 1438 | 794 | 2161 | 4393 |
| Northern Territory | 271 | 136 | 698 | 317 | 506 | 1521 |
| Australian Capital Territory | 200 | 82 | 689 | 790 | 1566 | 3045 |
| Australia | 18967 | 7828 | 60923 | 36644 | 75750 | 173317 |
| AVERAGE KILOMETRES TRAVELLED PER VEHICLE(b) ('000) |  |  |  |  |  |  |
| New South Wales | 16.2 | 9.2 | 14.1 | 7.2 | 8.4 | 16.1 |
| Victoria | 15.4 | 7.9 | 13.8 | 7.1 | 9.2 | 16.5 |
| Queensland | 16.5 | 8.7 | 13.1 | 6.2 | 8.1 | 14.6 |
| South Australia | 15.6 | 9.1 | 12.1 | 6.4 | 8.3 | 14.3 |
| Western Australia | 16.3 | 11.2 | 15.0 | 7.5 | 7.0 | 14.9 |
| Tasmania | 12.8 | 9.9 | 13.4 | 5.5 | 8.2 | 14.0 |
| Northern Territory | 17.1 | 11.4 | 17.1 | 6.6 | 7.8 | 16.6 |
| Australian Capital Territory | 16.6 | 10.6 | 10.5 | 7.2 | 9.8 | 16.6 |
| Australia | 16.0 | 9.1 | 13.7 | 6.9 | 8.4 | 15.6 |
| (a) Including the business travel <br> (b) Calculated using the total kil purpose. See Explanatory no | carrying led divid | he number | hicles that trav | kilometres for | State/Territory | tion by |


| State/Territory of registration | Passenger vehicles | Motor cycles | Light commercial vehicles | Rigid trucks | Articulated trucks | Non-freight carrying trucks | Buses | Total |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| TOTAL BUSINESS KILOMETRES TRAVELLED (million) |  |  |  |  |  |  |  |  |
| New South Wales | 10772 | *54 | 5203 | 1935 | 1213 | 50 | 414 | 19641 |
| Victoria | 11401 | **128 | 3042 | 1377 | 1389 | 37 | 256 | 17630 |
| Queensland | 3779 | **13 | 3492 | 1345 | 1021 | 46 | 370 | 10068 |
| South Australia | 1859 | *7 | 1356 | 332 | 561 | 20 | 118 | 4252 |
| Western Australia | 3101 | *27 | 2002 | 629 | 490 | 13 | 245 | 6507 |
| Tasmania | 661 | *6 | 481 | 114 | 126 | 3 | 48 | 1438 |
| Northern Territory | 213 | **5 | 266 | 57 | 84 | *2 | 71 | 698 |
| Australian Capital Territory | 372 | **2 | 203 | 48 | 31 | *1 | 32 | 689 |
| Australia | 32160 | *241 | 16046 | 5835 | 4914 | 173 | 1554 | 60923 |
| AVERAGE BUSINESS KILOMETRES TRAVELLED PER VEHICLE(a) ('000) |  |  |  |  |  |  |  |  |
| New South Wales | 11.0 | *4.2 | 18.2 | 21.6 | 88.2 | 18.6 | 29.7 | 14.1 |
| Victoria | 11.9 | **9.1 | 14.8 | 20.1 | 92.8 | 8.0 | 26.8 | 13.8 |
| Queensland | 7.9 | **2.6 | 17.4 | 22.3 | 92.7 | 16.6 | 38.3 | 13.1 |
| South Australia | 7.9 | *1.0 | 17.4 | 15.9 | 111.3 | 9.1 | 34.6 | 12.1 |
| Western Australia | 11.0 | *4.9 | 20.9 | 18.0 | 81.4 | 6.1 | 39.7 | 15.0 |
| Tasmania | 9.8 | *4.4 | 17.8 | 14.7 | 96.1 | 2.7 | 28.2 | 13.4 |
| Northern Territory | 10.5 | **5.3 | 19.7 | 16.9 | 117.2 | *10.5 | 35.6 | 17.1 |
| Australian Capital Territory | 7.3 | *2.0 | 19.9 | 22.0 | 123.3 | *12.2 | 40.0 | 10.5 |
| Australia | 10.5 | *5.1 | 17.5 | 20.3 | 92.6 | 10.9 | 32.9 | 13.7 |
| (a) Calculated using the total business kilometres travelled divided by the number of vehicles that travelled business kilometres for each State/Territory of registration by type of vehicle. See Explanatory notes. |  |  |  |  |  |  |  |  |


| State/Territory of registration | Light commercial vehicles | Rigid trucks | Articulated trucks | Total |
| :---: | :---: | :---: | :---: | :---: |
| TOTAL LADEN BUSINESS KILOMETRES TRAVELLED (million) |  |  |  |  |
| New South Wales | 3645 | 1335 | 861 | 5841 |
| Victoria | 2242 | 979 | 1060 | 4280 |
| Queensland | 2607 | 954 | 745 | 4305 |
| South Australia | 881 | 241 | 441 | 1563 |
| Western Australia | 1308 | 447 | 311 | 2065 |
| Tasmania | 288 | 76 | 77 | 442 |
| Northern Territory | 171 | 42 | 58 | 271 |
| Australian Capital Territory | 139 | 36 | 26 | 200 |
| Australia | 11280 | 4109 | 3579 | 18967 |
| AVERAGE LADEN BUSINESS KILOMETRES TRAVELLED PER VEHICLE(a) ('000) |  |  |  |  |
| New South Wales | 14.1 | 15.0 | 62.8 | 16.2 |
| Victoria | 11.5 | 14.4 | 71.8 | 15.4 |
| Queensland | 13.6 | 16.2 | 68.8 | 16.5 |
| South Australia | 11.9 | 11.7 | 87.8 | 15.6 |
| Western Australia | 15.1 | 13.0 | 53.0 | 16.3 |
| Tasmania | 11.2 | 9.9 | 59.6 | 12.8 |
| Northern Territory | 14.4 | 12.7 | 82.4 | 17.1 |
| Australian Capital Territory | 14.4 | 16.7 | 102.3 | 16.6 |
| Australia | 13.2 | 14.5 | 68.2 | 16.0 |

[^1] State/Territory of registration by type of vehicle. See Explanatory notes.

## 9

TONNE-KILOMETRES, BY STATE/TERRITORY OF REGISTRATION AND TYPE OF VEHICLE

| State/Territory of registration | Light commercial vehicles | Rigid trucks | Articulated trucks | Total |
| :---: | :---: | :---: | :---: | :---: |
| TOTAL TONNE-KILOMETRES (million) |  |  |  |  |
| New South Wales | 1467 | 6962 | 18444 | 26874 |
| Victoria | 905 | 5591 | 22560 | 29056 |
| Queensland | 953 | 4626 | 17047 | 22625 |
| South Australia | 439 | 1222 | 11793 | 13454 |
| Western Australia | 467 | 2390 | 11605 | 14462 |
| Tasmania | 102 | 385 | 1747 | 2234 |
| Northern Territory | 68 | 164 | 3156 | 3388 |
| Australian Capital Territory | 48 | 151 | 540 | 738 |
| Australia | 4449 | 21491 | 86892 | 112832 |
| AVERAGE TONNE-KILOMETRES PER VEHICLE(a) ('000) |  |  |  |  |
| New South Wales | 5.7 | 78.2 | 1346.4 | 74.5 |
| Victoria | 4.6 | 82.3 | 1527.9 | 104.5 |
| Queensland | 5.0 | 78.6 | 1574.2 | 86.6 |
| South Australia | 6.1 | 59.5 | 2346.6 | 137.9 |
| Western Australia | 5.4 | 69.6 | 1977.2 | 114.3 |
| Tasmania | 4.0 | 50.4 | 1347.8 | 64.6 |
| Northern Territory | 5.7 | 49.3 | 4453.0 | 213.0 |
| Australian Capital Territory | 5.0 | 70.0 | 2158.1 | 61.4 |
| Australia | 5.2 | 75.7 | 1656.9 | 95.1 |

(a) Calculated using the total tonne-kilometres travelled divided by the number of vehicles that travelled tonne-kilometres for each State/territory of registration by type of vehicle. See Explanatory notes.

| State/Territory of operation | Light commercial vehicles | Rigid trucks | Articulated trucks | Total |
| :---: | :---: | :---: | :---: | :---: |
| TOTAL TONNE-KILOMETRES (million) |  |  |  |  |
| New South Wales | 1454 | 7173 | 28274 | 36902 |
| Victoria | 912 | 5260 | 18488 | 24660 |
| Queensland | 965 | 4656 | 14184 | 19805 |
| South Australia | 428 | 1322 | 8594 | 10344 |
| Western Australia | 468 | 2405 | 12764 | 15637 |
| Tasmania | 102 | 392 | 1809 | 2302 |
| Northern Territory | 66 | 162 | 2637 | 2865 |
| Australian Capital Territory | 54 | 122 | *141 | 317 |
| Australia | 4449 | 21491 | 86892 | 112832 |
| AVERAGE TONNE-KILOMETRES PER VEHICLE(a) ('000) |  |  |  |  |
| New South Wales | 5.1 | 74.6 | 1259.6 | 91.6 |
| Victoria | 4.4 | 75.6 | 945.8 | 82.9 |
| Queensland | 4.8 | 76.8 | 937.0 | 71.1 |
| South Australia | 5.5 | 61.4 | 1085.1 | 96.3 |
| Western Australia | 5.5 | 69.2 | 1814.5 | 122.8 |
| Tasmania | 4.0 | 49.5 | 1335.0 | 66.2 |
| Northern Territory | 5.6 | 47.0 | 2141.8 | 175.1 |
| Australian Capital Territory | 3.1 | 29.4 | *88.8 | 13.6 |
| Australia | 5.2 | 75.7 | 1656.9 | 95.1 |
| (a) Calculated using the total tonne-kilometres travelled divided by the number of vehicles that travelled tonne-kilometres for each State/Territory of operation by type of vehicle. See Explanatory notes. |  |  |  |  |

11 RIGID TRUCKS, TONNE-KILOMETRES, BY NUMBER OF AXLES AND GVM/GCM


AVERAGE TONNE-KILOMETRES PER VEHICLE(a) ('OOO)

| 2 axles | 20.2 | 51.5 | 36.6 |  |
| :--- | ---: | ---: | ---: | ---: |
| 3 axles | 39.9 | 53.8 | 104.2 | 269.1 |
| 4 or more axles | n.a. | 46.0 | 326.3 | 316.8 |
| Total rigid trucks | 20.5 | 51.6 | 312.1 | 75.7 |

(a) Calculated using the total tonne-kilometres travelled divided by the number of vehicles that travelled tonne-kilometres for each number of axles by GVM/GCM. See Explanatory notes.

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## 13

LOAD CARRIED, BY STATE/TERRITORY OF REGISTRATION AND TYPE OF VEHICLE

| State/Territory of registration | Light commercial vehicles | Rigid trucks | Articulated trucks | Total |
| :---: | :---: | :---: | :---: | :---: |
| TOTAL TONNES CARRIED (million) |  |  |  |  |
| New South Wales | 25 | 186 | 182 | 393 |
| Victoria | 18 | 127 | 142 | 287 |
| Queensland | 18 | 165 | 101 | 284 |
| South Australia | 7 | 39 | 47 | 92 |
| Western Australia | 9 | 63 | 88 | 160 |
| Tasmania | 2 | 14 | 19 | 36 |
| Northern Territory | 1 | 7 | 11 | 18 |
| Australian Capital Territory | 1 | 4 | 3 | 7 |
| Australia | 81 | 604 | 593 | 1277 |
| AVERAGE LOAD CARRIED PER TRIP(a) (kilograms) |  |  |  |  |
| New South Wales | 335 | 5226 | 22474 | 3304 |
| Victoria | 359 | 4901 | 20011 | 3483 |
| Queensland | 338 | 6003 | 22691 | 3293 |
| South Australia | 304 | 5473 | 21903 | 2939 |
| Western Australia | 297 | 5308 | 29075 | 3569 |
| Tasmania | 325 | 5733 | 22618 | 3434 |
| Northern Territory | 328 | 4397 | 38029 | 3617 |
| Australian Capital Territory | 306 | 4712 | 23093 | 1865 |
| Australia | 332 | 5361 | 22737 | 3334 |

(a) Calculated using the total load carried divided by the total number of laden trips by vehicles for each State/Territory of registration by type of vehicle. See Explanatory notes.

| Commodity carried | Light commercial vehicles million tonnes | Rigid trucks <br> million tonnes | Articulated trucks million tonnes | Total <br> million tonnes |
| :---: | :---: | :---: | :---: | :---: |
| Food and live animals | 6 | 77 | 145 | 227 |
| Beverages and tobacco | **- | 4 | 8 | 12 |
| Crude materials, inedible, except fuels | 5 | 278 | 167 | 450 |
| Mineral fuels, lubricants and related materials | *1 | 21 | 87 | 109 |
| Animal and vegetable oils, fats and waxes | **- | *1 | *1 | 2 |
| Chemicals and related products, not elsewhere specified | *3 | 7 | 12 | 22 |
| Manufactured goods | 9 | 81 | 63 | 153 |
| Machinery, transport equipment | 5 | 25 | 31 | 61 |
| Miscellaneous manufactured articles | *3 | 8 | *6 | 17 |
| Tools of trade | 37 | 24 | *5 | 66 |
| Other commodities, not elsewhere specified | 8 | 72 | 58 | 138 |
| Unspecified(a) | 3 | 7 | 9 | 20 |
| Total | 81 | 604 | 593 | 1277 |
| (a) Represents loads carried where type of commodity could not | obtained. |  |  |  |

15
BUS USE(a), BY TYPE OF BUS AND TYPE OF SERVICE

| Type of bus |  |  |  |  |  | pe of service |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Route service | Dedicated school bus service | Charter service | Tour service | Other | Not specified(b) | Total |
| TOTAL KILOMETRES TRAVELLED (million) |  |  |  |  |  |  |  |
| Buses with fewer than 20 seats | *18 | 45 | 67 | *34 | 251 | *19 | 434 |
| Buses with 20 or more seats | 580 | 279 | 155 | 60 | 60 | *10 | 1144 |
| Total | 597 | 324 | 221 | 94 | 311 | *29 | 1577 |
| AVERAGE KILOMETRES TRAVELLED PER VEHICLE(c) ('000) |  |  |  |  |  |  |  |
| Buses with fewer than 20 seats | *24.6 | 14.0 | 30.7 | *26.2 | 18.8 | *18.5 | 23.6 |
| Buses with 20 or more seats | 51.1 | 17.7 | 17.2 | 43.3 | 15.0 | *17.3 | 39.6 |
| Total | 49.6 | 17.1 | 19.8 | 35.1 | 17.9 | 18.1 | 33.4 |
| (a) Excluding distance travelled by buses used exclusively for private purposes. |  |  |  |  |  |  |  |
| (b) Represents travel by buses where type of service could not be obtained. |  |  |  |  |  |  |  |
| (c) Calculated using the total kilometres travelled divided by the number of vehicles that travelled kilometres for each type of bus by type of service. See Explanatory notes. |  |  |  |  |  |  |  |

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| State/Territory of registration |  |  |  |  | e of service |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Route senvice | Dedicated school bus service | Charter service | Other(b) | $\begin{array}{r} \text { Not } \\ \text { specified(c) } \end{array}$ | Total |
| TOTAL KILOMETRES TRAVELLED (million) |  |  |  |  |  |  |
| New South Wales | 157 | 123 | 51 | 80 | *8 | 419 |
| Victoria | 99 | 56 | 45 | 59 | **2 | 261 |
| Queensland | 140 | 72 | 60 | 98 | **7 | 377 |
| South Australia | 62 | 16 | 19 | 21 | **1 | 119 |
| Western Australia | 91 | *40 | *22 | 90 | **5 | 248 |
| Tasmania | 21 | 12 | *4 | 10 | **1 | 48 |
| Northern Territory | *6 | *4 | *18 | 43 | **2 | 74 |
| Australian Capital Territory | 21 | *2 | *3 | *4 | *3 | 32 |
| Australia | 597 | 324 | 221 | 405 | *29 | 1577 |
| AVERAGE KILOMETRES TRAVELLED PER VEHICLE(d) ('000) |  |  |  |  |  |  |
| New South Wales | 38.3 | 16.2 | 13.3 | 14.9 | *11.5 | 30.0 |
| Victoria | 43.9 | 16.3 | 18.6 | 16.3 | *17.3 | 27.3 |
| Queensland | 70.2 | 16.9 | 24.1 | 23.3 | **34.6 | 39.0 |
| South Australia | 62.1 | 14.9 | 25.0 | 16.6 | **15.0 | 34.8 |
| Western Australia | 54.8 | 26.0 | 25.2 | 31.9 | **21.3 | 40.1 |
| Tasmania | 41.8 | 14.6 | 8.1 | 17.5 | **12.4 | 28.4 |
| Northern Territory | *52.4 | *18.6 | *60.4 | 27.9 | *22.0 | 36.7 |
| Australian Capital Territory | 50.3 | 26.3 | *24.2 | *20.2 | *28.5 | 40.4 |
| Australia | 49.6 | 17.1 | 19.8 | 20.7 | 18.0 | 33.4 |
| (a) Excluding distance travelled by buses used exclusively for private purposes. <br> (b) Includes tour senvice operations. |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| (c) Represents travel by buses where type of service could not be obtained. |  |  |  |  |  |  |
| (d) Calculated using the total kilometres travelled divided by the number of vehicles that travelled kilometres for each State/Territory of registration by type of service. See Explanatory notes. |  |  |  |  |  |  |

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| Type of vehicle(b) | Age group of driver (years) |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  | 15-24 | 25-54 | 55 and over | Total(c) |
| MALES |  |  |  |  |
| Passenger vehicles | 8.0 | 10.8 | 9.1 | 10.2 |
| Motor cycles | *4.1 | 6.7 | *1.9 | 5.8 |
| Light commercial vehicles | 10.9 | 14.5 | 10.6 | 13.3 |
| Rigid trucks | 9.7 | 14.7 | 11.0 | 13.7 |
| Articulated trucks | 36.9 | 63.2 | 51.6 | 61.3 |
| Non-freight carrying vehicles | *3.7 | 5.1 | *2.7 | 5.0 |
| Total | 8.6 | 12.0 | 9.4 | 11.2 |
| FEMALES |  |  |  |  |
| Passenger vehicles | 7.4 | 9.7 | 6.9 | 9.0 |
| Motor cycles | **2.6 | *3.8 | **0.3 | *3.6 |
| Light commercial vehicles | *7.6 | 6.6 | 4.1 | 6.1 |
| Rigid trucks | *0.9 | 7.6 | **0.2 | 5.9 |
| Articulated trucks | 13.0 | *45.3 | n.a. | *43.8 |
| Non-freight carrying vehicles | **3.5 | *1.9 | n.a. | *2.4 |
| Total | 7.4 | 9.5 | 6.7 | 8.8 |
| PERSONS |  |  |  |  |
| Passenger vehicles | 7.7 | 10.3 | 8.2 | 9.7 |
| Motor cycles | *4.1 | 6.4 | *1.8 | 5.6 |
| Light commercial vehicles | 10.5 | 13.2 | 9.6 | 12.2 |
| Rigid trucks | 9.6 | 14.4 | 10.6 | 13.5 |
| Articulated trucks | 36.7 | 62.9 | 51.3 | 61.3 |
| Non-freight carrying vehicles | *3.6 | 4.8 | *2.7 | 5.2 |
| Total | 8.1 | 11.0 | 8.5 | 10.3 |
| (a) These estimates include details reported for up to five drivers who drove the selected vehicle; but they do not take into account the possibility of a driver driving more than one vehicle during the survey period. It is therefore likely this survey underestimates the average distance driven by an individual who drove two or more vehicles during the survey period. <br> (b) Taxis and buses are excluded from the calculation for average kilometres in this table. <br> (c) Includes drivers whose age was not stated. |  |  |  |  |
|  |  |  |  |  |

INTRODUCTION

SCOPE

METHODOLOGY

1 This publication presents annual estimates of patterns of motor vehicle use for all major vehicle types (cars, trucks, buses etc.) in Australia based on results from the 1998 Survey of Motor Vehicle Use (SMVU). The data were collected in four quarterly sample surveys conducted over the period 1 August 1997 to 31 July 1998.

2 The statistics in this publication are the first results produced from a new collection methodology introduced to overcome concerns about the quality of data reported by vehicle owners on SMVU questionnaires in previous surveys, the last of which was conducted in 1995. More information about the new collection methodology and quality of estimates is provided in the Technical note: Data quality. Because significant changes have been introduced, users are cautioned against making detailed direct comparisons between 1998 survey results and those produced from previous surveys (see Appendix: Historical comparisons for more information).

3 The scope of the survey is all vehicles that were registered with a motor vehicle authority for road use at some stage during the 12 months ended 31 July 1998, except caravans, trailers, tractors, plant and equipment, vehicles belonging to the defence services and vehicles with diplomatic or consular plates. Where they were registered as such, vintage and veteran cars were also excluded from the survey. The population was identified using information obtained from the State and Territory motor vehicle registration authorities.

4 For the 1998 SMVU, a sample of approximately 20,000 vehicles was selected to report on vehicle use over a three month period within the reference year 1 August 1997 to 31 July 1998. This equated to a sample of 5,000 selections in each quarter. Of these, $22 \%$ were passenger vehicles and motor cycles, $61 \%$ were freight-carrying vehicles, $13 \%$ were buses and $4 \%$ were other non-freight carrying vehicles. The sample size was chosen to give a suitable level of precision for total distance travelled at the State/Territory of registration level for each vehicle type category.

5 Selections were made from a vehicle population (of 11.4 million vehicles at 31 October 1996) which was stratified within each State or Territory according to the vehicle description recorded by the registration authority. Each vehicle type category was further stratified by other characteristics to take account of different usage patterns. These were:

- passenger vehicles were stratified into taxis and other passenger vehicles, with other passenger vehicles for most states further stratified by area of registration (capital city or rest of state);
- motor cycles were stratified according to their age;
- buses according to vehicle size;
- light commercials and articulated trucks were stratified according to age and for most states, according to area of registration; and
- rigid trucks were stratified by age and size and for most states area of registration.

6 This stratification method broadly followed that of the previous survey conducted in 1995; however, area of registration was introduced in 1998, size was no longer included for some vehicle types and age was excluded for passenger vehicles.

7 The new survey methodology adopted is described as 'pre-advice', to reflect the fact that survey selections now received early advice about their inclusion in order to encourage record keeping and minimise reliance on recall. Owners of selected vehicles completed two mail questionnaires tailored to their vehicle types i.e. passenger vehicles (cars, station wagons, passenger vans and motor cycles); freight vehicles (light commercials, rigid and articulated trucks) or buses (passenger vehicles with 10 or more seats including the driver's). At the beginning of each quarterly survey period, owners of vehicles selected in the survey were asked to return a questionnaire reporting selected vehicle characteristics and the vehicle's odometer reading. The owners were also advised that they would receive a follow up questionnaire at the end of the quarter seeking details about the use of the vehicle over the quarter and a second odometer reading. Examples of the main items requested in the second questionnaire were included with the first questionnaire, together with an optional, simple worksheet to help compile the data during the period.

8 When the questionnaires were returned to the ABS they were checked for completeness and accuracy and, where possible, follow-up contact was made with owners to resolve reporting problems. Missing items on incomplete questionnaires were filled by imputing average data from like vehicles for which data were obtained.

9 Where the selected vehicle owner had not owned the vehicle for the whole quarterly survey period, the details provided for the period of ownership were adjusted to give a three-month equivalent, except where the vehicle was deregistered, in which case only the use up to deregistration was included.

10 In addition, adjustments were made in the estimation process to account for the use of new motor vehicles registered after 31 October 1996 (the survey population identification date) and up to July 1998, as well as the re-registration of other vehicles during this time. More information about these adjustments is provided in the Technical note: Data quality.

11 Estimates from information reported in each quarterly collection period were produced and these were then aggregated into annual estimates relating to the use of vehicles during the period 1 August 1997 to 31 July 1998. The size of the sample is insufficient to produce reliable quarterly results.

12 Since estimates of motor vehicle use are based on a sample survey, rather than a complete enumeration, the data are subject to sampling variability. That is, they may differ from results that would have been obtained had all vehicles been included. For more information on sampling error, see the Technical note: Data quality.

13 Sampling error is not the only type of inaccuracy which affects the reliability of the data. Other types of error, referred to as non-sampling error, can be present in any type of collection, whether it be a complete enumeration or a sample survey. For example, non-sampling error can occur because of non-response to the survey, imperfections in reporting by providers, definition or classification difficulties, or errors in transcribing and processing data. While the effects of non-sampling error are not quantifiable, every effort is made to minimise the impact through the design and testing of questionnaires and the use of efficient operating procedures. Non-sampling error is discussed further in the Technical note: Data quality.

14 Survey estimates of the numbers of vehicles, by vehicle type, are not fully comparable with ABS Motor Vehicle Census data (see Motor Vebicle Census Australia, 31 October 1997 (Cat. no. 9309.0)). The main reasons for differences are:

- survey estimates of the numbers of vehicles relate to the average number of vehicles registered for road use for the period 1 August 1997 to 31 July 1998, not to the number of vehicles registered at a specific date, as is the case for the Motor Vehicle Census;
- the classification of vehicles in the survey to the vehicle type identified from the survey information, which may differ from the type of vehicle recorded by the motor registries;
- the exclusion from the survey of vehicles on the register which fall outside the survey's scope e.g. consular and diplomatic vehicles and vintage and veteran cars where they could be identified.

15 Many tables in this publication present data as averages. For all average distance tables except table 1 and all average tonne-kilometres tables, the denominator used in calculating these averages is the estimated number of vehicles that contributed to a particular cell.

CONCEPTS OF AVERAGES continued

UNPUBLISHED STATISTICS

RELATED PUBLICATIONS AND PRODUCTS

16 For table 1, all vehicles in the appropriate category are included in the denominator regardless of distance travelled. This includes vehicles which travelled zero kilometres as they are representative of unused vehicles that are likely to occur across the vehicle population. However, in most other tables, the average relates to actual vehicle use. For example, in table 7 the average kilometres travelled for business purposes in Australia by passenger vehicles was derived by dividing the number of kilometres travelled for business purposes by passenger vehicles by the number of passenger vehicles which reported business travel.

17 In table 2, the average rate of fuel consumption for each vehicle type and fuel type is calculated by dividing the total fuel consumption by total kilometres.

18 In table 13, the average load weight represents the average weight carried per laden trip and is calculated by dividing the total weight of loads carried by the number of trips made while carrying a load.

19 As the denominators used to calculate the cells of a table are different, the averages along a row cannot be used to derive the total column entry for that row.

20 As well as the statistics included in this publication, the ABS has unpublished data available for a charge. Inquiries should be directed to the contact officer named in the inquiries box at the front of this publication.

21 Users may also wish to refer to the following publications and products which contain information relating to motor vehicles in Australia:

Motor Vehicle Census, Australia, 31 October 1998
(Cat. no. 9309.0)-issued annually from 1995. Small area motor vehicle census data are available on CD-ROM in TranStats (Cat. no. 9312.0.30.001)

Registrations of New Motor Vehicles, Australia, Preliminary (Cat. no. 9301.0)—issued monthly

Motor Vehicles in Australia (Cat. no. 9311.0)—released in June 1997
Directory of Transport Statistics, 1998 (Cat. no. 1132.0)—released in January 1999

Transport Theme page on ABS internet site (http://www.abs.gov.au)

## APPENDIX: HISTORICAL COMPARISONS

1 Significant changes in the collection and estimation methodologies were introduced for the 1998 Survey of Motor Vehicle Use (SMVU). These were mainly designed to reduce recall bias, i.e. the error that occurs when people cannot remember whether or when events of a given type occurred, resulting in omitting events, incorrectly placing events in time or reporting events that never took place. For further information on the effect of recall bias in the SMVU, see the Technical note: Data quality-Non-sampling error.

2 Due to changes to the methodology, results may differ from those produced from earlier surveys. Users are cautioned against making detailed direct comparisons between the 1998 survey results and those produced from previous surveys.

3 Factors were produced which may be applied to the 1995 statistics on total distance travelled by type of vehicle to remove the estimated recall bias from those data. The factors were first published in the Information Paper: Motor Vehicle Use, Australia (Cat. no. 9219.0) and were based on estimated total distance travelled obtained from special surveys conducted for the 12 months ended 30 September 1996.

4 The factors could only be reliably estimated for total distance travelled by main vehicle types at the Australian level and will not be appropriate to lower level detail, if recall biases vary at this more detailed level. Care should also be taken in applying factors to data from surveys conducted prior to 1995 because while it is recognised that the recall problem was inherent in all previous surveys, there is no reliable measure of how recall biases have varied over time.

5 The estimated recall bias factors for total kilometres travelled by vehicle type are as follows:

A1 ESTIMATED FACTORS FOR TOTAL KILOMETRES TRAVELLED-12 MONTHS ENDED 30 SEPTEMBER 1996

| Type of vehicle | Estimated factor | RSE $\%$ |
| :--- | ---: | ---: |
| Passenger vehicles(a) | 0.91 | 5 |
| Motor cycles(b) | 0.71 | 11 |
| Light commercial vehicles | 1.01 | 7 |
| Rigid trucks | 1.01 | 5 |
| Articulated trucks | 0.95 | 5 |
| Non-freight carrying trucks | 0.82 | 1.12 |
| Buses(a) | 0.94 | 6 |
| Total(a) |  | 6 |
| (a) The estimated factor is statistically significant at the 10\% level. |  |  |
| (b) The estimated factor is statistically significant at the 5\% level. |  |  |

6 The factors shown above were applied to the preliminary estimates of total distance travelled by type of vehicle for the 12 months ended 30 September 1995. Table A2 shows adjusted statistics with the estimated recall bias removed.

|  | Preliminary estimate | Preliminary estimate |  | Adjusted estimate | Adjusted estimate |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Type of vehicle | million kms | RSE \% | Estimated factor | million kms | RSE \% |
| Passenger vehicles | 123691 | 3 | (a)0.91 | 113054 | 6 |
| Motor cycles | 1526 | 7 | (b) 0.71 | 1076 | 13 |
| Light commercial vehicles | 27751 | 3 | 1.01 | 28056 | 7 |
| Rigid trucks | 6725 | 2 | 1.01 | 6772 | 6 |
| Articulated trucks | 5094 | 2 | 0.95 | 4860 | 6 |
| Non-freight carrying trucks | 249 | 9 | 0.82 | 204 | 22 |
| Buses | 1479 | 2 | (a)1.12 | 1661 | 6 |
| Total | 166514 | 2 | (a)0.94 | 155683 | 5 |

(a) The estimated factor is statistically significant at the $10 \%$ level.
(b) The estimated factor is statistically significant at the $5 \%$ level.

A3
TOTAL KILOMETRES TRAVELLED BY TYPE OF VEHICLE(a)

|  | 1979 | 1982 | 1985 | 1988 | 1991 | 1995(b) | 1995(c) | 1998 |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: |
| Type of vehicle | million | million | million | million | million | million | million | million |
| Passenger vehicles | 84872 | 96109 | 106574 | 116640 | 114286 | 123691 | 113054 | 134261 |
| Motor cycles | 1768 | 2152 | 2276 | 1924 | 1615 | 1526 | 1076 | 1350 |
| Light commercial vehicles | 15928 | 16951 | 20121 | 21982 | 22814 | 27751 | 28056 | 24958 |
| Rigid trucks | 5837 | 8417 | 7627 | 7840 | 6114 | 6725 | 6772 | 6015 |
| Articulated trucks | 2607 | 3000 | 3588 | 3836 | 3959 | 5094 | 4860 | 4921 |
| Non-freight carrying trucks | 457 | 237 | 242 | 261 | 201 | 249 | 204 | 175 |
| Buses | n.a. | n.a. | n.a. | 1433 | 1401 | 1479 | 1661 | 1639 |
| Total | 111469 | 126866 | 140427 | 153915 | 150389 | 166514 | 155683 | 173317 |

(a) All data except 1998 are for the year ended 30 September. 1998 data are for the year ended 31 July.
(b) Preliminary estimates.
(c) Adjusted to remove estimated recall bias.

8 When the factors are applied to 1995 survey data collected using the old recall methodology, the estimated total distance travelled by all motor vehicles is revised from 166,514 million kilometres to 155,683 million kilometres, a reduction of $7 \%$. This decrease is mainly caused by passenger vehicles, where the total distance travelled is revised from 123,691 million kilometres to 113,054 million kilometres.

9 It is not possible to obtain similar adjustments for data prior to 1995 . As noted in paragraph 4 , it should be recognised that the recall problem which the ABS has attempted to overcome by its new collection methodology for the 1998 survey was inherent in all surveys conducted up to 1995 , however there is no reliable measure of how recall biases have varied over time. Taking into account earlier studies, it is reasonable to conclude that estimates of total and average distance travelled for passenger vehicles and total vehicles are also likely to have been overstated in surveys before 1995. Similar generalisations cannot be made for other vehicle types. In particular, for commercial vehicles, record keeping practices appear to have improved over time, with a consequent reduction in recall bias.

10 An historical comparison for total kilometres travelled by passenger vehicles and all vehicles, with the break in series at 1995, is shown in the following graph.
TOTAL KLOMETRES TRAVELLED BY TYPE OF VEHICLE

(a) To 1995 , as originally published.
(b) From 1995, estimated recall bias excluded.

11 The following table provides estimates of the average distances travelled by type of vehicle in Australia. These have been derived by dividing the total distances travelled shown in table A3 by the number of vehicles estimated to have been registered for use during the relevant year.

A4
AVERAGE KILOMETRES TRAVELLED BY TYPE OF VEHICLE(a)

|  | 1979 | 1982 | 1985 | 1988 | 1991 | $1995(b)$ | $1995(c)$ | 1998 |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: |
| Type of vehicle | $\prime 000$ | $\prime 000$ | $\prime 000$ | $\prime 000$ | $\prime 000$ | '000 | '000 | '000 |
| Passenger vehicles | 15.1 | 15.3 | 15.5 | 15.8 | 14.3 | 14.4 | 13.1 | 14.4 |
| Motor cycles | 6.3 | 6.1 | 6.5 | 6.5 | 5.7 | 5.2 | 3.7 | 4.4 |
| Light commercial vehicles | 17.0 | 16.9 | 17.7 | 18.6 | 16.9 | 17.7 | 17.9 | 16.3 |
| Rigid trucks | 16.7 | 19.0 | 17.9 | 19.4 | 18.5 | 20.0 | 20.2 | 17.7 |
| Articulated trucks | 59.3 | 64.4 | 72.3 | 78.7 | 76.0 | 87.9 | 83.9 | 83.7 |
| Non-freight carrying trucks | 12.9 | 12.8 | 11.5 | 11.3 | 14.2 | 15.9 | 13.0 | 9.9 |
| Buses | n.a. | n.a. | n.a. | 35.3 | 33.3 | 32.5 | 36.5 | 30.8 |
| Total | 15.3 | 15.6 | 15.8 | 16.4 | 14.9 | 15.2 | 14.3 | 14.9 |

(a) All data except 1998 are for the year ended 30 September. 1998 data are for the year ended 31 July.
(b) Preliminary estimates.
(c) Adjusted to remove estimated recall bias.

12 When the factors are applied to 1995 total kilometres data, the estimated average kilometres travelled by all motor vehicles in 1995 falls from 15,200 kilometres to 14,300 kilometres, a reduction of $6 \%$. Again, the decrease is mainly caused by passenger vehicles, where the average kilometres travelled is revised from 14,400 kilometres to 13,100 kilometres.

13 An historical comparison for average kilometres travelled by passenger vehicles and all vehicles, with the break in series at 1995, is shown in the following graph.

AVERAGE KLOMETRES TRAVELLED BY TYPE OF VEHICLE

(a) To 1995, as originally published.
(b) From 1995, estimated recall bias excluded.

14 Besides average distances based on all registered vehicles referred to above, this publication also contains a number of more detailed average distance travelled tables where estimates relate only to vehicles with a particular use. As stated previously, recall bias adjustment factors are unavailable at the more detailed level. Users are cautioned against applying the same recall bias adjustments to the more detailed tables in order to make historical comparisons.

15 Furthermore, users should be aware of an additional complication affecting the comparability with previous surveys of the averages per vehicle in tables 3 to 12 and 15 to 17 . Because vehicle use throughout the year is not constant, having a shorter reporting period of three months means that the proportion of vehicles which report a particular type of usage will be lower than if the reporting period had been 12 months. Therefore, the estimate of the number of vehicles having a particular type of use in the 12 months will be lower and since the denominator is lower, the average distance travelled for vehicles for the 12 months will be slightly higher than under the old method.

## TECHNICAL NOTE: DATA QUALITY

INTRODUCTION

SAMPLING ERROR

1 When interpreting the results of a survey it is important to take into account factors that may affect the reliability of estimates. Such factors can be classified as either sampling error or non-sampling error, as defined below.

2 Estimates in this publication are based on information collected from a sample of registered motor vehicles, rather than a full enumeration, and are therefore subject to sampling error. They may differ from the figures that would have been produced if the information had been obtained for all registered motor vehicles. Examples of the sampling error for selected estimates from the 1998 Survey of Motor Vehicle Use (SMVU) for the 12 months ended 31 July 1998 are included below.

3 Other inaccuracies may occur because of imperfections in reporting by vehicle owners or in processing by the ABS. These are collectively referred to as non-sampling error and may occur in any statistical collection whether it is based on full enumeration or a sample. Concerns about non-sampling error in previous surveys, most notably recall bias, led to the introduction of a new collection methodology for the 1998 SMVU. While the new collection methodology has resulted in an overall improvement in SMVU estimates, some data quality issues remained with the 1998 survey and these are described below.

4 The sampling error associated with any estimate can be calculated from the sample results. One measure of sampling error is given by the standard error, which indicates the extent to which an estimate might have varied by chance because only a sample of vehicles was included. There are about two chances in three that a sample estimate will differ by less than one standard error from the figure that would have been obtained if all vehicles had been included, and about 19 chances in 20 that the difference will be less than two standard errors.

5 Another measure of sampling variability is the relative standard error (RSE) which is obtained by expressing the standard error as a percentage of the estimate to which it refers. The RSE is a useful measure in that it provides an immediate indication of the percentage error likely to have occurred due to sampling.

6 The SMVU was designed primarily to minimize relative standard errors for estimates of total kilometres travelled at the State/Territory level for the main vehicle types.

7 The RSEs achieved in the 1998 survey relating to estimates contained in Table 1 are shown in the following table.

| State/Territory of registration | Passenger vehicles | Motor cycles | Light commercial vehicles | Rigid trucks | Articulated trucks | Non-freight carrying trucks | Buses | Total |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| TOTAL KILOMETRES TRAVELLED (\%) |  |  |  |  |  |  |  |  |
| New South Wales | 6 | 16 | 5 | 4 | 5 | 20 | 6 | 4 |
| Victoria | 5 | 33 | 7 | 6 | 7 | 18 | 7 | 4 |
| Queensland | 6 | 30 | 5 | 6 | 7 | 19 | 8 | 4 |
| South Australia | 8 | 21 | 9 | 7 | 7 | 24 | 8 | 6 |
| Western Australia | 7 | 16 | 10 | 8 | 7 | 20 | 9 | 5 |
| Tasmania | 7 | 19 | 7 | 8 | 7 | 23 | 9 | 5 |
| Northern Territory | 9 | 24 | 10 | 13 | 11 | 31 | 12 | 6 |
| Australian Capital Territory | 6 | 22 | 10 | 7 | 11 | 37 | 7 | 5 |
| Australia | 3 | 12 | 3 | 3 | 3 | 9 | 3 | 2 |
| NUMBER OF VEHICLES(a)(b) (\%) |  |  |  |  |  |  |  |  |
| New South Wales | 3 | 5 | 3 | 1 | 3 | 11 | 9 | 2 |
| Victoria | 3 | 7 | 4 | 3 | 3 | 8 | 5 | 2 |
| Queensland | 3 | 4 | 2 | 4 | 3 | 11 | 4 | 2 |
| South Australia | 3 | 5 | 4 | 4 | 3 | 15 | 4 | 2 |
| Western Australia | 3 | 4 | 4 | 5 | 4 | 9 | 6 | 2 |
| Tasmania | 2 | 4 | 3 | 4 | 4 | 11 | 4 | 2 |
| Northern Territory | 4 | 6 | 6 | 8 | 6 | 13 | 6 | 3 |
| Australian Capital Territory | 3 | 22 | 6 | 8 | 10 | 19 | 7 | 3 |
| Australia | 1 | 3 | 1 | 1 | 1 | 4 | 3 | 1 |
| AVERAGE KILOMETRES TRAVELLED(c) (\%) |  |  |  |  |  |  |  |  |
| New South Wales | 5 | 16 | 5 | 4 | 5 | 16 | 7 | 4 |
| Victoria | 5 | 32 | 6 | 6 | 5 | 17 | 6 | 4 |
| Queensland | 6 | 30 | 5 | 6 | 5 | 17 | 7 | 4 |
| South Australia | 7 | 21 | 8 | 7 | 6 | 22 | 8 | 6 |
| Western Australia | 7 | 16 | 8 | 7 | 7 | 18 | 7 | 5 |
| Tasmania | 7 | 18 | 7 | 7 | 7 | 23 | 8 | 5 |
| Northern Territory | 9 | 23 | 9 | 8 | 10 | 31 | 11 | 6 |
| Australian Capital Territory | 6 | 30 | 6 | 9 | 9 | 28 | 6 | 5 |
| Australia | 2 | 12 | 2 | 2 | 2 | 8 | 3 | 2 |

(a) The average number of vehicles registered for the 12 months ended 31 July 1998. See Explanatory notes.
(b) Includes registered vehicles that did not travel during the reference period.
(c) Registered vehicles that did not travel during the reference period are included in this calculation. See Explanatory notes.

8 As an example of the use of an RSE, the estimate of 134,261 million kilometres for total kilometres travelled for all passenger vehicles registered in Australia from Table 1 of the publication has a RSE of $3 \%$ as shown above i.e. the standard error is 4,028 million kilometres. There are about two chances in three that the figure that would have been obtained if all vehicles had been included, would have been in the range 130,233 million kilometres to 138,289 million kilometres and about 19 chances in 20 that it would have been in the range 126,205 million kilometres to 142,317 million kilometres.

9 It is important to note that estimates at more detailed levels than the above are subject to higher RSE and are less reliable. In this publication, only estimates with a RSE of less than $25 \%$ are considered sufficiently reliable for most purposes. Estimates with a RSE from $25 \%$ to less than $50 \%$ are preceded by a single asterisk (*) while those with a RSE of $50 \%$ or more are preceded with two asterisks (**).

10 RSEs for other key variables in the collection are shown below. Detailed relative standard errors of other variables can be made available on request.

T2
FUEL CONSUMPTION, BY TYPE OF FUEL AND TYPE OF VEHICLE(a)

| Type of fuel | Passenger vehicles | Motor cycles | Light commercial vehicles | Rigid trucks | Articulated trucks | Non-freight carrying trucks | Buses | Total |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Type of fuel |  |  |  |  |  |  | Buses |  |


| Petrol |  |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: | ---: |
| $\quad$ Leaded | 7 | 17 | 6 | 16 | 47 | 19 | 21 |
| $\quad$ Unleaded | 4 | 16 | 5 | 57 | 95 | 26 | 17 |
| $\quad$ Total | 3 | 12 | 4 | 16 | 88 | 18 | 14 |
| Diesel | 20 | - | 7 | 3 | 3 | 3 |  |
| LPG/CNG/dual fuel | 12 | - | 12 | 26 | 99 | 2 | 2 |
| Total | 3 | 12 | 3 | 3 | 3 | 20 | 10 |

AVERAGE RATE OF FUEL CONSUMPTION RELATIVE STANDARD ERROR (\%)

| Petrol |  |  |  | 12 | 14 | 12 | 2 |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: | ---: |
| $\quad$ Leaded | 2 | 10 | 2 | 8 | 3 | 13 | 11 |
| Unleaded | 3 | 15 | 60 | 4 | 10 | 9 |  |
| Total | 2 | 11 | 3 | 15 | 2 | 3 |  |
| Diesel | 14 | - | 5 | 2 | 1 | 3 |  |
| LPG/CNG/dual fuel | 8 | - | 9 | 15 | 2 | 17 | 13 |
| Total | 2 | 11 | 2 | 2 | 6 | 2 | 2 |

(a) These relative standard errors relate to the estimates in table 2.

|  | TONNE-KILOMETRES, <br> TYPE OF VEHICLE (a) | BY STATE/TERRITORY OF OPERATION AND |
| :--- | :---: | ---: | :--- | ---: | :--- |

(a) These relative standard errors relate to the estimates in table 10.

|  |  | Gross Combin | Mass (G | nnes) |
| :---: | :---: | :---: | :---: | :---: |
| Type of trailer configuration | 30 and under | Over 30 to 40 | Over 40 | Total |
| TOTAL TONNE-KILOMETRES RELATIVE STANDARD ERROR (\%) |  |  |  |  |
| Single axle trailer | 32 | 85 | n.a. | 31 |
| Tandem axle trailer | 25 | 11 | 66 | 10 |
| Triaxle trailer | 61 | 14 | 4 | 4 |
| B-Double | n.a. | n.a. | 15 | 15 |
| Road train | n.a. | n.a. | 11 | 11 |
| Other | 90 | 81 | 35 | 34 |
| Total articulated trucks | 21 | 9 | 4 | 4 |
| AVERAGE TONNE-KILOMETRES RELATIVE STANDARD ERROR (\%) |  |  |  |  |
| Single axle trailer | 29 | 64 | n.a. | 29 |
| Tandem axle trailer | 24 | 10 | 63 | 9 |
| Triaxle trailer | 56 | 12 | 4 | 3 |
| B-Double | n.a. | n.a. | 13 | 13 |
| Road train | n.a. | n.a. | 9 | 9 |
| Other | 103 | 79 | 33 | 33 |
| Total articulated trucks | 20 | 8 | 4 | 3 |

NON-SAMPLING ERROR

11 The ABS was concerned about the extent of non-sampling error in the SMVU prior to 1998 . The previous collection methodology relied on owners of selected vehicles recalling details of vehicle use over the 12 months prior to receiving the survey questionnaire. This dependence on a 'recall methodology' for collecting motor vehicle use information from respondents led to increased non-sampling error where vehicle owners did not keep detailed records. The degree of record keeping by freight vehicle and bus owners was better but, even for these vehicles, not all of the information sought was readily available. This led to two main types of observable deficiencies with the quality of data entered on survey questionnaires; firstly, where respondents failed to provide a figure for particular questions, even after follow-up contact from the ABS; and secondly, where respondents' recall was inaccurate. A particular concern was the extent to which respondents were only able to provide rounded figures for the questions about distance travelled. Studies showed that inaccurate recall by respondents resulted in biased estimates of total distance travelled.

12 In the light of these concerns about data quality, the ABS undertook an extensive review during 1995 and 1996 of the methods employed to obtain vehicle use data, including tests of different methodological options. Following this review, the SMVU was redesigned from the previous triennial survey to an ongoing quarterly survey designed to produce annual estimates. The new quarterly survey was introduced from 1 August 1997.

NON-SAMPLING ERROR continued

OTHER DATA QUALITY ISSUES

13 The ABS is confident that the new 'pre-advice' methodology has improved the quality of its estimates of motor vehicle use. The new methodology in which vehicle owners receive early advice about their inclusion in the survey encouraged a higher degree of record keeping about the use of the vehicle during the survey period, either within owners' systems or by using the worksheet provided. This reduced the reporting errors arising from inaccurate recollection of use identified as a deficiency in the previous collection methodology. In addition, the reporting of odometer readings taken at the start and end of the survey periods provided more reliable estimates of total distance travelled without the recall bias inherent in the previous methodology.

14 In spite of the overall improvement in the collection methodology, it was necessary to make some adjustments to the estimation process for the 1998 survey to account for vehicles not in the population from which the survey samples were selected. This occurred either because they were registered just prior to the commencement of the survey, or because of processing difficulties with information received from some of the motor vehicle registration authorities.

15 As 1998 survey selections were taken from vehicles registered at 31 October 1996, i.e. nine months before the beginning of the 1998 survey reference year, adjustments were made to account for the use of new motor vehicles registered after that date and up to 31 July 1998, as well as the re-registration during this time of other vehicles not registered at 31 October 1996. At the Australian level, the adjustment for vehicles being re-registered after 31 October 1996 accounted for approximately $1 \%$ of total distance travelled for all vehicles. For rigid and articulated trucks the adjustment was slightly higher at $2 \%$. However the impact of the adjustment for new motor vehicles was much more significant and is detailed by type of vehicle in the following table.

16 The following table shows the effect of the adjustment for new motor vehicles registered after 31 October 1996 as a percentage of their contribution to total distance travelled for each type of vehicle.
$T 5$ CONTRIBUTION OF THE ADJUSTMENT FOR NMVR(a) TO TOTAL DISTANCE TRAVELLED

| State/Territory of registration | $\%$ |
| :--- | ---: |
| Passenger vehicles | 11 |
| Motor cycles | 16 |
| Light commercial vehicles | 13 |
| Rigid trucks | 9 |
| Articulated trucks | 15 |
| Non-freight carrying trucks | 11 |
| Buses | 10 |
| Total | 11 |

(a) New motor vehicle registrations.

17 The adjustments made to the estimates to account for the use of new motor vehicles registered after 31 October 1996 were based on average data from the newer vehicles for which data were obtained in the survey. While it is thought that the use for newer vehicles surveyed would be similar, some variance from the actual use of vehicles registered after 31 October 1996 could be expected. It is planned that the methodology for surveys from 2000 will allow for a sample of newly registered vehicles to be included in the survey, thus reducing the need for this adjustment.

18 Other adjustments were required to account for an understatement of the number of registrations in Victoria, and the number of articulated trucks registered in South Australia at 31 October 1996. These data were subsequently amended and included in the following release of motor vehicle census statistics (refer Motor Vehicle Census, Australia, 31 October 1997 (Cat. no. 9309.0)). However, as these vehicles were not available for selection in the 1998 survey, information to account for their use during the 1998 survey period was estimated based on data supplied by types of vehicles which were expected to have had similar usage patterns.

19 In addition, the need for imputation of unfilled items on the questionnaires, as for previous surveys, remained quite high. Of the questionnaires returned, $12 \%$ of those reporting some use needed imputation of one or more items apart from the average rate of fuel consumption; $24 \%$ required the fuel data to be imputed.

20 With the ongoing conduct of the SMVU and the compilation of the next annual set of estimates for the 12 months ended 31 July 1999, it is anticipated that the reliability of the new methodology and of the estimates for the 1998 survey will be further clarified. Users should contact the ABS if they have any queries on the quality and reliability of estimates for particular purposes.

## GLOSSARY

## Articulated trucks

Motor vehicles constructed primarily for load carrying, consisting of a prime mover which has no significant load carrying area, but with a turntable device which can be linked to a semi-trailer.

Average load carried

Average load carried is calculated by dividing the total weight of loads carried by the number of trips made while carrying a load.

## B-Doubles

A B-Double combination consists of a prime mover towing two semi-trailers. The first trailer includes a turntable which links to the second trailer, rather than using a dolly to link the trailers as in road train configurations.

Buses Motor vehicles constructed for the carriage of passengers. Included are all motor vehicles with 10 or more seats, including the driver's seat.

Business kilometres Distance travelled for hire and reward, or charged to a business expense, or for which an allowance was received. All distances travelled for business purposes, irrespective of whether the vehicle was predominantly used for private purposes, and irrespective of vehicle type, are included in 'total business kilometres'. The 'laden-unladen' dissection of distance travelled for business purposes relates only to freight-carrying vehicles, i.e. light commercial vehicles, rigid trucks and articulated trucks.

Capital city These are the capital city Statistical Divisions as defined in the Australian Standard Geographical Classification (ASGC), Edition 2.4.

Sydney-this includes the area bounded by Gosford and Wyong; Hawkesbury and Blue Mountains; Campbelltown, Wollondilly and the Sutherland Local Government Areas.

Melbourne-this includes the area bounded by Werribee, Melton, Sunbury, Craigieburn, Whittlesea, Healesville, Warburton, Berwick, Pakenham and the whole of Mornington Peninsula.

Brisbane-this includes the area bounded by Caboolture, the eastern part of the Pine Rivers Shire, Redcliffe City, Redland Shire, Beenleigh, Logan City and the City of Ipswich.

Adelaide-this includes the area bounded by the Gulf of St. Vincent, the Gawler River and the Mount Lofty Ranges from Gawler to Bridgewater through Kangarilla and Willunga to Sellicks Beach.

Perth-this includes the area bounded by Yanchep and Bullsbrook; Warnbro, Keysbrook and Wooroloo.

Hobart-this includes the area bounded by New Norfolk; Sorell and Carlton Creek; Brighton and Snug.

Darwin-this includes Darwin and suburbs, Palmerston and other areas north of the Howard Springs turn-off.

Canberra-this includes all of the Australian Capital Territory.

| Commodity carriedDolly | The publication of commodities carried is based on the 10 sectional groupings of the Australian Transport Freight Commodity Classification (ATFCC), with the addition of 'Tools of Trade'. |
| :---: | :---: |
|  | A device intended to link two semi-trailers or a rigid truck and a semi-trailer. |
| Freight-carrying vehicles | Consists of light commercial vehicles, rigid trucks and articulated trucks. |
| Fuel consumption | Total fuel consumption is calculated by adding the product of total kilometres travelled and reported average fuel consumption for each vehicle. The average rate of fuel consumption is calculated by dividing the total fuel consumption by total kilometres for each vehicle type. |
| Gross Combination Mass <br> (GCM) | Tare weight (i.e. unladen weight) of the motor vehicle and attached trailers, plus their maximum carrying capacity. In the survey, this was obtained for vehicles operated in combination (e.g. a prime mover/semi-trailer combination, or a rigid truck/trailer combination). |
| Gross Vehicle Mass (GVM) | Tare weight (i.e. unladen weight) of the motor vehicle, plus its maximum carrying capacity. In the survey, this was obtained for buses and rigid trucks not usually towing trailers. |
| Light commercial vehicles | Motor vehicles constructed for the carriage of goods and which are less than or equal to 3.5 tonnes GVM. Included are utilities, panel vans, cab-chassis and goods carrying vans (whether four-wheel drive or not). |
| Non-freight carrying trucks | Specialist motor vehicles or motor vehicles fitted with special purpose equipment, and having little or no goods carrying capacity, e.g. ambulances, cherry pickers, fire trucks and tow trucks. |
| Other Urban Areas | These are defined in the Australian Standard Geographical Classification (ASGC), Edition 2.4 as being either Statistical Districts with a population greater than 40,000 or clusters of collection districts and other urban areas with a population greater than 40,000 , based on the 1991 Population Census. |
|  | New South Wales-within the areas of Newcastle, Wollongong, Bathurst-Orange, Maitland, Albury (excluding Wodonga), Wagga Wagga, Tweed Heads (excluding Gold Coast), Queanbeyan (excluding Canberra ACT), Lismore, Coffs Harbour, Greater Taree, Shellharbour, Cessnock, Nelson Bay, Port Macquarie and Nowra. |
|  | Victoria-within the areas of Geelong, Ballarat, Bendigo, Wodonga (excluding Albury), Shepparton and Mildura. |
|  | Queensland-within the areas of Gold Coast (excluding Tweed Heads), Sunshine Coast, Bundaberg, Rockhampton, Mackay, Townsville, Cairns and Toowoomba. |

$\left.\begin{array}{cl}\begin{array}{rl}\text { Other Urban Areas } \\ \text { continued }\end{array} & \begin{array}{l}\text { Tasmania-within the areas of Launceston, Burnie, Devonport, Penguin, } \\ \text { Ulverstone, Wynyard and Latrobe. }\end{array} \\ & \begin{array}{l}\text { This category is not applicable in South Australia, Western Australia, the } \\ \text { Northern Territory and the Australian Capital Territory. }\end{array} \\ \text { Passenger vehicles } & \begin{array}{l}\text { Motor vehicles constructed primarily for the carriage of persons and } \\ \text { containing up to nine seats (including the driver's seat). Included are } \\ \text { cars, station wagons, four-wheel drive passenger vehicles, passenger vans }\end{array} \\ \text { or mini buses with fewer than 10 seats and campervans. }\end{array}\right\}$

Tonnes carried Total tonnes carried is the total weight of goods and freight carried during the survey period. The estimate of annual tonnes carried relates to goods and freight uplifted by vehicles and therefore will overstate the actual physical quantity of goods and freight moved during the survey period to the extent that transhipment occurs (i.e. the transfer of goods and freight from one vehicle to another).

Travel to and from work The travel between place of residence and place of work at the beginning and end of all working days, including travel to and from train and bus stations.




[^0]:    (a) The average number of vehicles registered for the 12 months ended 31 July 1998. See Explanatory notes.
    (b) Includes registered vehicles that did not travel during the reference period.
    (c) Registered vehicles that did not travel during the reference period are included in this calculation. See Explanatory notes.

[^1]:    (a) Calculated using the total laden business kilometres travelled divided by the number of vehicles that travelled laden business kilometres for each

