

Transport Statistics Bulletin

Vehicle Speeds in Great Britain: 1999



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Department of the Environment, Transport and the Regions (DETR),
Transport Statistics, Zone 2/17, Great Minster House, 76 Marsham Street, London SW1P 4DR
☎ 020 7944-4847, Fax: 020 7944-2166, E-mail: andrew_smith@detr.gov.uk

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(ii) Metric units are generally used.

Rounding of figures: In tables where figures have been rounded to the nearest final digit, there may be an apparent slight discrepancy between the sum of the constituent items and the total as shown.

Conversion factors: 1 kilometre = 0.6214 mile 1 tonne = 0.9842 ton
1 tonne-km = 0.6116 ton-mile 1 billion = 1,000 million

Symbols: The following symbols have been used throughout.

| | | | |
|----|---|----|---------------------------------|
| .. | = not available | . | = not applicable |
| - | = Negligible (less than half the final digit shown) | 0 | = Nil |
| * | = Sample size too small for reliable estimates. | ow | = of which |
| { | = subsequent data is disaggregated | } | = subsequent data is aggregated |
| | = break in the series | P | = provisional data |

F = forecast expenditure
n.e.s. = not elsewhere specified

e = estimated outturn
TSO = The Stationary Office

VEHICLE SPEEDS IN GREAT BRITAIN

1999

DEPARTMENT OF THE ENVIRONMENT, TRANSPORT AND THE REGIONS
STATISTICS BULLETIN (00)19

**The Department of the Environment, Transport and the Regions
TSR5 Branch
Zone 2/18
Great Minster House
76 Marsham Street
LONDON SW1P 4DR**

**Telephone: 020 7944 6642
Fax: 020 7944 2166
Email: roadacc_stats@detr.gov.uk**

Enquiries about the contents of this bulletin should be made to the Department at the above address.

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SUMMARY OF KEY POINTS FROM ANALYSIS OF 1999 SPEED SURVEY

NON-URBAN ROADS - 1999 ESTIMATES (Chart 1 and Section 1: Table 1)

- Cars were the vehicles most likely to be speeding on motorways with 56 per cent of those surveyed exceeding 70 mph and 19 per cent travelling in excess of 80 mph.
- On non-urban dual carriageways 53 per cent of cars exceeded 70 mph and 14 per cent by 80 mph and on non-urban single carriageway roads 10 per cent of cars exceeded the 60 mph limit, 2 per cent travelling at 70 mph.
- On dual carriageways 90 per cent of articulated heavy goods vehicles (HGVs) surveyed exceeded their 50 mph limit. On single carriageways levels of speeding were generally considerably lower although HGVs, are still high with 76 per cent of articulated HGVs exceeding their 40 mph limit.

URBAN ROADS - 1999 ESTIMATES (Chart 2 and Section 2: Table 5)

- On urban roads with a 30 mph speed limit 67 per cent of cars exceeded the speed, 31 per cent travelling faster than 35 mph. On 40 mph roads 26 per cent of cars exceeded the limit, with 8 per cent exceeding 45 mph.
- Motorcycles were the vehicles most likely to be speeding on 40 mph roads, with 38 per cent exceeding the speed limit and 22 per cent doing so by more than 5 mph, on 30 mph roads 38 per cent exceeded 35 mph.
- On urban 30 mph roads, 45 per cent of articulated HGVs exceeded the speed limit, 13 per cent by more than 5 mph.

Chart 1: Speeding on non-urban roads

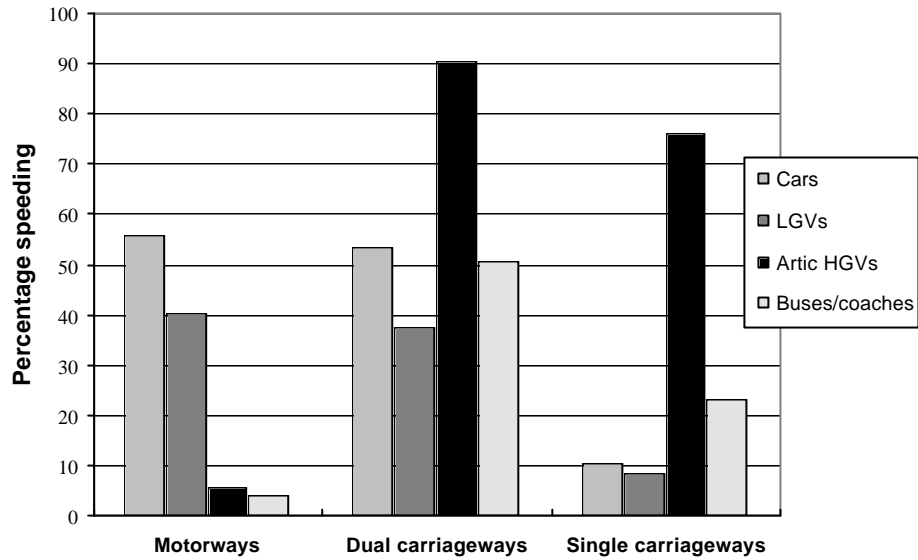
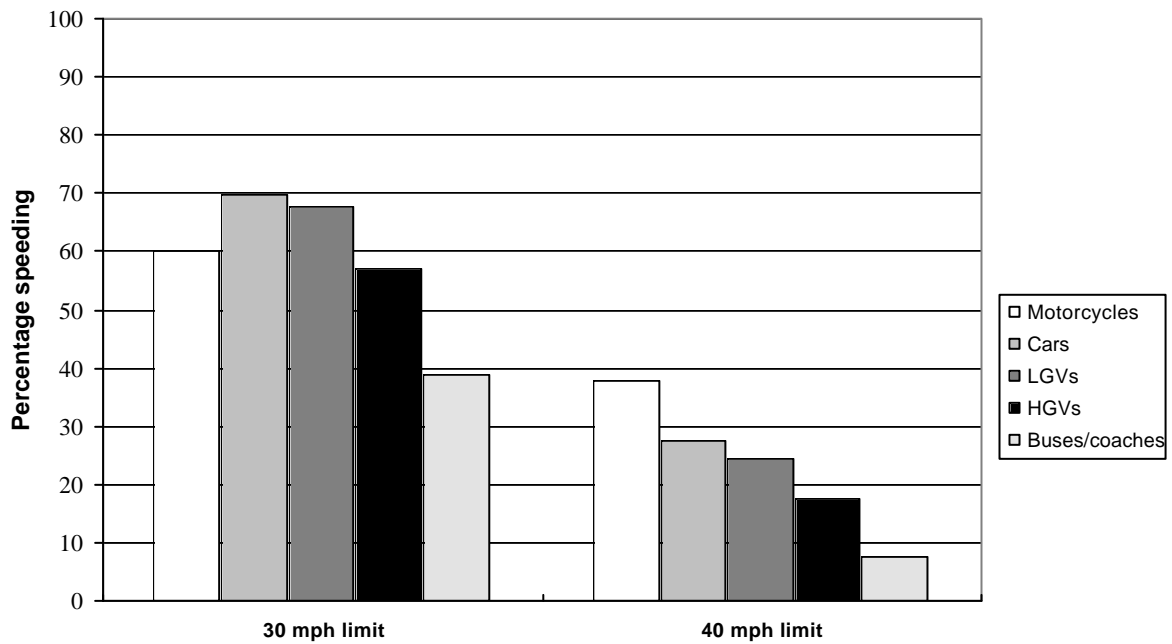


Chart 2: Speeding on urban roads



INTRODUCTION: AUTOMATIC SPEED DATA

National administrations in England, Scotland and Wales are responsible for setting speed limits on motorways and trunk roads. Local authorities have the power to impose or vary speed limits on principal roads and on all other local roads. In order to monitor the compliance of drivers with these speed limits the Department collects speed data from traffic counting sites around Great Britain.

The Department captures these data on a regular basis as a by-product of the core traffic census. This is a continuous survey of traffic at about 130 sites throughout Great Britain, mainly used to estimate changes in the level of traffic.

The automatic traffic counters operate most efficiently in uncongested conditions and whenever possible are not placed near junctions, hills or sharp bends. In principle they provide estimates of the speeds at which drivers choose to travel when their behaviour is not constrained by congestion or other road conditions. In practice congested traffic conditions at any site, due for example to dense traffic flow or a road accident, may have an influence upon the estimates and, in consequence, distort the speed distributions for specific types of vehicle. Long term road works do not affect the figures as these sites are eliminated before data analysis. The extent to which drivers' speeding behaviour at these sites reflects behaviour in unconstrained conditions nationally is not certain, and the results should be treated with care. Users are advised to draw broad conclusions rather than specific results from these data.

This bulletin contains speed data collected from sites on both urban and non-urban roads. The non-urban results in the bulletin are from 26 motorway sites, 4 dual carriageway non built-up sites and 24 single carriageway non built-up sites during 1999. For the urban roads, data were collected from 30 sites with a 30 mph speed limit and 8 sites with a 40 mph limit. The number of vehicle speeds measured daily at the sites varies widely from a few hundred at the smallest site to many thousands at the motorway sites. Data are collected on a rotating cycle, the cycle being designed to avoid sampling bias, which may be caused by time and day effects.

The counting equipment relies on inductive loop and axle sensors to detect vehicle length, chassis height and the number and position of axles. The equipment is capable of classifying 21 different vehicle types. However, the equipment cannot distinguish between vehicles with the same electronic 'footprint' such as cars and car-based vans (which have an identical chassis to that of a car). In such cases vehicles are classified to the group that the equipment recognises rather than that which would be used in a manual count, in the example above, the car-based vans would be classified as cars. The data on non-urban speeds are collected continuously and stored in 8 pre-set speed bands for 14 groups of vehicles. These have been used for the non-urban speed study in Section 1. The urban speeds in Section 2 are derived from a special survey in which the urban sites were monitored for 15-minute periods in a pre-determined cycle and the speeds of individual vehicles were collected.

The types of vehicle analysed in the non-urban survey are motorcycles, cars, cars towing, LGVs, buses/coaches, rigid 2 axle HGVs, rigid 3 or 4 axle HGVs, articulated HGVs, all 4 axle HGVs and all 5 or more axle HGVs. There are two important points concerning these categories. Firstly, the categories of goods vehicle are not mutually exclusive and therefore in the non-urban survey some vehicles are counted twice. For example, a 4 axle articulated lorry would appear in both the results for all articulated lorries and the results for all 4-axle heavy goods vehicles. In the urban speed survey such vehicles *have* been uniquely allocated to a single category and the 4 or more axle HGVs are not recorded a second time

in the articulated HGV category. Secondly, the automatic counters identify rigid 2 axle lorries but cannot distinguish between vehicles weighing less than 7.5 tonnes gross and those weighing more. The weight of this type of vehicle determines its speed limit on non built-up roads. Consequently, it is impossible to tell how many rigid 2 axle HGVs are speeding. The speed limits for different types of vehicle on different classes of non-built up road are shown in Annex A.

It was discovered in 1996 that the recording of motorcycle speeds by counters at non-urban sites was distorted. As a result there was the potential for bias in the estimates of motorcycle speeds at these sites and they were excluded from the analysis in previous years. Software to correct the discrepancy has been tested and implementation began at the end of 1997 and continued throughout 1998 and into 1999. Only speed data is included for motorcycles from 26 motorway sites in Annex B. Data was collected for 3 dual-carriageway sites (1 site all year, 1 site for 5 months and 1 site for 2 months), and 9 single-carriageway sites (2 sites all year, 5 sites for a minimum of three months, 2 sites for 6 days). Statistics relating to these roads have been omitted from this publication as not enough data has been collected to be representative of these road classes as a whole, so standard errors are high (see Annex C). Data for eighteen motorway sites was obtained. This was collected for the whole year at seven sites and for the last seven or eight months of the year at the others. Motorcycle speeds collected at the urban sites are not affected by the same problem and are included in Section 2.

The accuracy of the average speeds presented in this bulletin depend on the number of sites surveyed and the number of vehicles observed at each site. The higher these numbers are the more accurate estimates of average speed will be. Annex C shows the estimates of average speed for each vehicle type together with their standard errors. Sections 1 & 2 contain discussion of the differences between average vehicle speeds over time. The statistical reasoning behind the variability underlying the estimates of average speed has been presented in previous editions of this bulletin.

SECTION 1: NON-URBAN SPEED DATA

Vehicle speeds by road type and vehicle type (Table 1)

Motorways

1. Speeding at the 26 motorway sites surveyed was widespread, 56 per cent of cars exceeded the 70 mph limit and 19 per cent were travelling at over 80 mph. The speed distribution for light goods vehicles (LGVs) generally indicates lower speeds than for cars. 40 per cent of LGVs exceeded 70 mph and 9 per cent exceeded 80 mph.
2. Only 6 per cent of articulated heavy goods vehicles (HGVs) and 10 per cent of rigid 3/4 axle HGVs exceeded their 60 mph limit. There was little difference between average speeds of the four classes of HGV for which a speed limit could be determined. Only 4 per cent of buses and coaches exceeded 70 mph.
3. The percentage of HGVs, buses and coaches speeding has dropped in recent years as shown in Table 4.
4. Since August 1992 speed limiters have been fitted to all new goods vehicles of over 7.5 tonnes gross weight and since 1994 these have been set to 56 mph. Since 1992 most coaches have been fitted with speed limiters set to 70 mph and the lower limit of 65 mph was imposed for new vehicles from 1994. It is not known whether the residual levels of speeding by buses, coaches and HGVs are due to the combined tolerances of speed limiters and automatic speed detectors, or to vehicles which remain on the roads without limiters (or with devices that are not operating correctly).

Dual carriageways

1. In general the speed distributions at the four sites on dual carriageways were similar to those on motorways for all vehicle types. Average speeds were only slightly lower. However, since HGVs, buses and coaches have lower speed limits on non-motorway dual carriageways their levels of speeding were much higher. The percentage of HGVs speeding on dual carriageways was around 12 times higher than on motorways; with between 81 and 92 per cent exceeding their 50 mph limit since their speed limit is 10 mph lower than the corresponding limit on motorways. Between 5 and 6 per cent were speeding above 60 mph. For buses and coaches the average speed on dual carriageways was 2 mph lower than on motorways during 1999, and hence the percentage speeding was just over twelve times higher, with half exceeding their 60 mph limit.
2. A slightly higher proportion of cars than buses, 53 per cent, exceeded the 70 mph limit and 14 per cent exceeded 80 mph, which was the highest level of speeding over 10 mph in excess of the speed limit for any vehicle type on dual carriageways. 37 per cent of LGVs exceeded their 70 mph limit.

Single carriageways

1. It is particularly difficult to draw conclusions from sites on these roads due to their greater variation in surface and design quality. Average speeds were lower at the 24 sites and speeding less frequent on these roads than on dual carriageways. However, a high proportion of HGVs, in particular the largest goods vehicles, exceeding their speed limit of 40 mph by more than 10 mph. The incidence of speeding by HGVs ranged from 64 to 80 per cent and 20 to 32 per cent of HGVs were exceeding 50 mph.
2. Only 10 per cent of the cars surveyed exceeded their 60 mph limit compared to 53 per cent exceeding the 70 mph limit on dual carriageways.

Table 1 Vehicle speeds on non-urban roads by road type and vehicle type: 1999

| | miles per hour/percent/number of vehicles | | | | | | | | |
|--------------------------------------|---|-------------|--------------------------|---------------|-----------------------------------|----------|--------------------------|-------------------|----------|
| | | | | | Heavy goods vehicles ⁵ | | | | |
| | Cars | Cars towing | Light goods ⁴ | Buses/coaches | Rigid | | | Rigid/articulated | |
| | | | | | 2 axle ⁶ | 3/4 axle | Articulated ⁷ | 4 axles | 5+ axles |
| Under 50 mph | 4 | 16 | 6 | 5 | 8 | 13 | 8 | 10 | 8 |
| 50-60 mph | 12 | 51 | 19 | 31 | 51 | 77 | 86 | 85 | 86 |
| 60-65 mph | 11 | 17 | 15 | 47 | 15 | 7 | 5 | 4 | 5 |
| 65-70 mph | 17 | 10 | 20 | 13 | 13 | 2 | 1 | 1 | 1 |
| 70-75 mph | 24 | 5 | 22 | 2 | 8 | 1 | 0 | 0 | 0 |
| 75-80 mph | 13 | 1 | 9 | 1 | 2 | 0 | 0 | 0 | 0 |
| 80-90 mph | 18 | 1 | 9 | 1 | 2 | 0 | 0 | 0 | 0 |
| 90 mph and over | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Average speed | 70 | 57 | 66 | 61 | 59 | 55 | 55 | 54 | 55 |
| Speed limit | 70 | 60 | 70 | 70 | n/a | 60 | 60 | 60 | 60 |
| Percent over limit | 56 | 33 | 40 | 4 | n/a | 10 | 6 | 5 | 6 |
| More than 10 mph over limit | 19 | 6 | 9 | 1 | n/a | 2 | 0 | 0 | 0 |
| Number observed (thousands) | 58,329 | 404 | 4,796 | 323 | 3,725 | 553 | 5,627 | 1,820 | 4,551 |
| (a) Motorways ¹ | | | | | | | | | |
| (b) Dual carriageways ² | | | | | | | | | |
| Under 30 mph | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 30-40 mph | 0 | 2 | 0 | 1 | 1 | 2 | 1 | 1 | 1 |
| 40-50 mph | 2 | 15 | 5 | 8 | 11 | 17 | 9 | 13 | 8 |
| 50-60 mph | 14 | 48 | 22 | 40 | 53 | 75 | 85 | 81 | 86 |
| 60-65 mph | 13 | 17 | 17 | 37 | 14 | 4 | 4 | 4 | 4 |
| 65-70 mph | 17 | 11 | 19 | 11 | 10 | 1 | 1 | 1 | 1 |
| 70-80 mph | 40 | 7 | 31 | 2 | 8 | 0 | 0 | 0 | 0 |
| 80 mph and over | 14 | 0 | 7 | 0 | 1 | 0 | 0 | 0 | 0 |
| Average speed | 70 | 57 | 66 | 59 | 58 | 53 | 54 | 54 | 55 |
| Speed limit | 70 | 60 | 70 | 60 | n/a | 50 | 50 | 50 | 50 |
| Percent over limit | 53 | 35 | 37 | 50 | n/a | 81 | 90 | 86 | 92 |
| More than 10 mph over limit | 14 | 7 | 7 | 2 | n/a | 6 | 5 | 5 | 6 |
| Number observed (thousands) | 6,778 | 59 | 507 | 31 | 372 | 77 | 520 | 172 | 400 |
| (c) Single carriageways ³ | | | | | | | | | |
| Under 20 mph | 1 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 0 |
| 20-30 mph | 3 | 4 | 3 | 5 | 4 | 7 | 4 | 5 | 3 |
| 30-40 mph | 24 | 23 | 25 | 34 | 27 | 28 | 19 | 27 | 17 |
| 40-50 mph | 36 | 45 | 37 | 37 | 39 | 44 | 47 | 44 | 48 |
| 50-60 mph | 26 | 24 | 26 | 21 | 24 | 19 | 27 | 21 | 30 |
| 60-65 mph | 5 | 2 | 5 | 2 | 2 | 0 | 1 | 1 | 1 |
| 65-70 mph | 3 | 1 | 3 | 0 | 1 | 0 | 0 | 0 | 0 |
| 70 mph and over | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Average speed | 47 | 45 | 46 | 43 | 45 | 43 | 45 | 43 | 46 |
| Speed limit | 60 | 50 | 60 | 50 | n/a | 40 | 40 | 40 | 40 |
| Percent over limit | 10 | 27 | 9 | 23 | n/a | 64 | 76 | 66 | 80 |
| More than 10 mph over limit | 2 | 3 | 1 | 2 | n/a | 20 | 29 | 22 | 32 |
| Number observed (thousands) | 10,107 | 108 | 846 | 66 | 576 | 115 | 488 | 180 | 361 |

1 Average vehicle speeds from 26 motorway sites.

2 Average vehicle speeds from 4 dual carriageway sites

3 Average traffic speeds from 24 single carriageway sites

4 Goods vehicles under 3.5 tonnes gross weight

5 Goods vehicles over 3.5 tonnes gross weight

6 Speed limit depends on loading which cannot be determined

7 Includes 4 and 5+ axle types

Average car speeds by time of day (Table 2)

1. On motorways the average car speed varied at different times of the day between 66 mph and 73 mph. The lowest speeds, occurring during the morning and evening peaks, may be attributed to denser and slower moving traffic.
2. For dual carriageways the range in average speeds was from 68 mph to 71 mph with no evidence of lower average speeds during the peaks.
3. On single carriageways the range in average speeds was from 45 mph to 51 mph and the highest speeds occurred at night.
4. Although some congestion may have occurred during the survey periods, the evidence in Table 2 indicates that this is unlikely to have dramatically affected the overall results because of the relatively small variation in average speeds between peak and off-peak periods.

Weekday and weekend comparisons (Table 3)

1. The number of observations at weekends is small for some vehicle classes on dual carriageways because there is less traffic, so care should be taken in drawing anything but the broadest conclusions from these data.
2. There is evidence that speeds increase slightly at the weekend when traffic flows are lower and the proportion of heavy vehicles is much smaller. The proportion of vehicles speeding also generally shows an increase at weekends. For cars and LGVs this was most marked on motorways.

Table 2 Average car speeds by time of day: 1999

| miles per hour | | | |
|----------------|-----------|------------------|--------------------|
| Time of day | Motorways | Dual carriageway | Single carriageway |
| 0000-0400 | 72 | 68 | 51 |
| 0400-0600 | 73 | 70 | 51 |
| 0600-0700 | 71 | 71 | 50 |
| 0700-0800 | 67 | 70 | 47 |
| 0800-0900 | 68 | 71 | 46 |
| 0900-1000 | 71 | 70 | 47 |
| 1000-1100 | 71 | 70 | 46 |
| 1100-1600 | 71 | 70 | 46 |
| 1600-1700 | 68 | 70 | 46 |
| 1700-1800 | 66 | 70 | 45 |
| 1800-1900 | 68 | 71 | 46 |
| 1900-2200 | 72 | 71 | 48 |
| 2200-2400 | 72 | 68 | 49 |
| 0000-2400 | 70 | 70 | 47 |

Table 3 Weekday and weekend comparisons:

| miles per hour/percent | | | | | |
|------------------------|------------|---------------|------------------|---------------|------------------|
| Vehicle type | Road type | Weekday | | Weekend | |
| | | Average speed | Percent speeding | Average speed | Percent speeding |
| Cars | Motorway | 0.3 | 0.3 | 0.7 | -0.4 |
| | Dual `A' | 0.0 | 0.1 | 0.2 | -0.3 |
| | Single `A' | 0.4 | -0.4 | 0.7 | 0.2 |
| LGVs | Motorway | 0.1 | 0.0 | 0.5 | -0.1 |
| | Dual `A' | 0.0 | 0.1 | 0.5 | 0.3 |
| | Single `A' | 0.0 | -0.2 | 0.6 | 0.0 |
| Buses/coaches | Motorway | -0.1 | -0.2 | 0.7 | -0.1 |
| | Dual `A' | -0.6 | 0.1 | 1.0 | -0.2 |
| | Single `A' | 0.6 | 0.4 | 0.6 | 0.1 |
| Rigid 3/4 axle | Motorway | 0.4 | 0.4 | 1.6 | 0.0 |
| | Dual `A' | 0.4 | 0.4 | 0.1 | 0.1 |
| | Single `A' | 0.5 | 0.1 | 1.6 | -0.1 |
| Articulated | Motorway | -0.5 | 0.1 | 0.0 | -0.5 |
| | Dual `A' | -0.5 | 0.2 | -0.4 | -0.4 |
| | Single `A' | 0.2 | -0.2 | 1.6 | 0.0 |

Comparisons with earlier speed surveys (Table 4)

1. The method of analysis was changed in 1998 to eliminate the double counting. The change was found to have negligible effect on the average speeds, speed distributions and standard errors for this and previous year's data.
2. Annex C shows the standard errors of the average speeds for each vehicle type and road class. Using these estimates of standard error together with those from previous years it is possible to perform a significance test on the changes in average speed between two periods.
3. Table 4 shows that the level of speeding by cars on motorways has remained broadly the same. Speeding by buses and coaches and the larger HGVs on motorways has reduced and the average speed of buses and coaches has decreased significantly since 1995. Possible reasons for these changes were given at the start of Section 1.
5. In contrast there has been an increase in speeding on dual-carriageways for cars and buses and coaches. In 1999 there was a slight reduction in average speed of HGVs for the first time in 5 years, although the change in average speeds is not statistically significant.
6. There appears to be an upward trend in speeding of articulated HGVs with the percentage speeding rising from 70 per cent in 1997 to 76 per cent in 1999. For other vehicles speeding at single-carriageway sites remains largely unchanged, the percentage of buses and coaches recorded as speeding has fluctuated from year to year.
7. Changes in average vehicle speeds between 1998 and 1999 were not statistically significant at the 95 per cent level for any types of vehicle on any of the three classes of non-urban road.

Table 4 Non-urban speed surveys: 1995 - 1999

| | | number/ miles per hour/ per cent | | | | |
|------------------------|----------------------------------|----------------------------------|--------|--------|--------|--------|
| | | 1995 | 1996 | 1997 | 1998 | 1999 |
| Motorways | Sites | 25 | 25 | 26 | 26 | 26 |
| | Observations (thousands) | 59,961 | 60,831 | 65,444 | 72,414 | 80,129 |
| | Average car speed | 70 | 70 | 70 | 69 | 70 |
| | Percent exceeding limit | 55 | 57 | 54 | 55 | 56 |
| | Average artic ¹ speed | 56 | 55 | 55 | 55 | 55 |
| | Percent exceeding limit | 23 | 11 | 8 | 7 | 6 |
| | Average bus/coach speed | 62 | 61 | 61 | 60 | 61 |
| | Percent exceeding limit | 11 | 3 | 3 | 3 | 4 |
| Dual carriageways | Sites | 5 | 5 | 5 | 4 | 4 |
| | Observations (thousands) | 9,122 | 9,397 | 7,840 | 8,409 | 8,916 |
| | Average car speed | 68 | 69 | 70 | 70 | 70 |
| | Percent exceeding limit | 47 | 49 | 53 | 54 | 53 |
| | Average artic ¹ speed | 55 | 55 | 55 | 55 | 54 |
| | Percent exceeding limit | 89 | 89 | 91 | 91 | 90 |
| | Average bus/coach speed | 57 | 59 | 59 | 59 | 59 |
| | Percent exceeding limit | 44 | 50 | 53 | 49 | 50 |
| Single carriageways | Sites | 24 | 23 | 24 | 24 | 24 |
| | Observations (thousands) | 10,576 | 10,463 | 9,756 | 9,751 | 12,847 |
| | Average car speed | 47 | 47 | 46 | 46 | 47 |
| | Percent exceeding limit | 10 | 10 | 9 | 10 | 10 |
| | Average artic ¹ speed | 45 | 45 | 44 | 45 | 45 |
| | Percent exceeding limit | 73 | 72 | 70 | 72 | 76 |
| | Average bus/coach speed | 43 | 44 | 42 | 42 | 43 |
| | Percent exceeding limit | 21 | 22 | 16 | 19 | 23 |

1 artic = articulated heavy goods vehicles

SECTION 2: URBAN SPEED DATA

Vehicle speeds by speed limit and vehicle type (Table 5)

30 mph roads

1. Speeding on 30 mph limit roads was common among drivers of all types of vehicle at the 30 sites surveyed. The worst offenders were drivers of cars and LGVs, of which 67 per cent and 66 per cent respectively exceeded the speed limit. Just over 30 per cent were travelling at more than 5 mph above the limit.
2. 62 per cent of the motorcycles surveyed were speeding. However, a higher proportion of motorcycles - 38 per cent - were travelling at over 35 mph than any other vehicle on these roads.
3. Well over half of the heavy goods vehicles observed were speeding. However, slightly less than one fifth of HGVs exceeded the limit by more than 5 mph.
4. Although the speed distribution for buses and coaches indicates lower speeds than for other vehicles, 38 per cent of buses and coaches still exceeded the speed limit, 11 per cent did so by more than 5 mph.

40 mph roads

1. Average speeds on 40 mph limit roads were slightly higher for all vehicle types although speeding was far less common than on 30 mph roads. Motorcyclists were the worst offenders at the 8 sites surveyed with 38 per cent travelling in excess of the speed limit and 22 per cent doing so by more than 5 mph. Around a quarter of the cars travelled in excess of the speed limit, with 8 per cent travelling at over 45 mph.
2. 15 per cent of 2 axle HGVs were speeding and speeding by larger HGVs ranged from 10 per cent to 12 per cent. Just over 3 per cent of goods vehicles were found to be speeding by more than 5 mph.

Average car speeds by time of day (Table 6)

1. Vehicle speeds on urban roads were collected between 6 am and midnight. Some sites may have been affected by congestion during part of the day. In general, car speeds and the percentage speeding were slightly lower during the morning and evening peak periods when the traffic flow was heaviest, and highest in early morning or late evening when traffic was lightest. On 30 mph roads car speeds varied at different times of the day between 30 mph and 36 mph and on 40 mph roads between 34 mph and 40 mph. At both speed limits the lowest and highest average speeds occurred between 0600-0700 and 0800-0900 respectively.
2. Average speeds showed more variation by time of day than at the non-urban sites as shown in Table 2. The pattern of this variation on 30 mph and 40 mph roads was similar.

Table 5: Vehicle speeds on urban roads by speed limit and vehicle type: 1999

(a) 30 mph speed limit roads¹ miles per hour/ per cent/ number of vehicles

| | Motorcycles ³ | Cars | Cars towing | Light goods ⁴ | Buses/coaches | Heavy goods vehicles ⁵ | | | | |
|--------------------------------|--------------------------|-------|-------------|--------------------------|---------------|-----------------------------------|-------------|-------------------|---------|----------|
| | | | | | | Rigid | Articulated | Rigid/articulated | | |
| | | | | | | 2 axle | 3 axle | 3 axle | 4 axles | 5+ axles |
| Under 20 mph | 16 | 5 | 7 | 6 | 8 | 8 | 9 | 13 | 10 | 11 |
| 20 - 30 mph | 23 | 28 | 40 | 28 | 54 | 36 | 38 | 42 | 39 | 47 |
| 30 - 35 mph | 24 | 36 | 36 | 36 | 26 | 35 | 36 | 32 | 35 | 31 |
| 35 - 40 mph | 18 | 22 | 14 | 22 | 9 | 15 | 15 | 11 | 13 | 9 |
| 40 - 45 mph | 9 | 7 | 3 | 6 | 2 | 4 | 2 | 2 | 2 | 1 |
| 45 50 mph | 5 | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 50 mph and over | 6 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| Average speed | 33 | 32 | 30 | 32 | 28 | 31 | 30 | 28 | 29 | 28 |
| Percent over 30 mph | 62 | 67 | 54 | 66 | 38 | 55 | 53 | 45 | 50 | 42 |
| Percent over 35 mph | 38 | 31 | 18 | 30 | 11 | 20 | 17 | 13 | 16 | 11 |
| Number observed (thousands) | 7 | 1,835 | 6 | 121 | 17 | 56 | 4 | 1 | 7 | 6 |

(b) 40 mph speed limit roads² miles per hour/ percent/ number of vehicles

| | Motorcycles ³ | Cars | Cars towing | Light goods ⁴ | Buses/coaches | Heavy goods vehicles ⁵ | | | | |
|--------------------------------|--------------------------|------|-------------|--------------------------|---------------|-----------------------------------|-------------|-------------------|---------|----------|
| | | | | | | Rigid | Articulated | Rigid/articulated | | |
| | | | | | | 2 axle | 3 axle | 3 axle | 4 axles | 5+ axles |
| Under 20 mph | 10 | 3 | 4 | 3 | 5 | 4 | 4 | 7 | 5 | 5 |
| 20 - 30 mph | 15 | 11 | 15 | 14 | 36 | 19 | 20 | 25 | 20 | 23 |
| 30 - 35 mph | 15 | 26 | 32 | 29 | 31 | 31 | 32 | 31 | 34 | 33 |
| 35 - 40 mph | 22 | 34 | 33 | 32 | 21 | 31 | 33 | 28 | 31 | 30 |
| 40 - 45 mph | 16 | 18 | 14 | 15 | 6 | 11 | 10 | 8 | 8 | 9 |
| 45 - 50 mph | 10 | 6 | 2 | 4 | 1 | 3 | 2 | 1 | 1 | 1 |
| 50 - 60 mph | 8 | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 60 mph and over | 5 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Average speed | 37 | 36 | 34 | 35 | 31 | 34 | 34 | 32 | 33 | 33 |
| Percent over 40 mph | 38 | 26 | 16 | 21 | 7 | 15 | 12 | 10 | 10 | 10 |
| Percent over 45 mph | 22 | 8 | 3 | 6 | 1 | 4 | 2 | 2 | 2 | 1 |
| Number observed (thousands) | 5 | 805 | 3 | 61 | 6 | 30 | 3 | 1 | 5 | 6 |

1 Speed measurements taken from 30 sites.

2 Speed measurements taken from 8 sites.

3 Motorcycles includes mopeds and other types of powered two wheeled vehicles.

4 Goods vehicles up to 3.5 tonnes gross weight.

5 Goods vehicles over 3.5 tonnes gross weight.

Table 6: Average car speeds by time of day: 1999

| miles per hour/ percent | | | | |
|-------------------------|---------------|------------------|---------------|------------------|
| Time of day | 30 mph limit | | 40 mph limit | |
| | Average speed | Percent speeding | Average speed | Percent speeding |
| 0600-0700 | 36 | 86 | 40 | 45 |
| 0700-0800 | 33 | 73 | 37 | 31 |
| 0800-0900 | 30 | 58 | 34 | 20 |
| 0900-1000 | 32 | 66 | 36 | 23 |
| 1000-1100 | 32 | 67 | 36 | 24 |
| 1100-1200 | 32 | 66 | 36 | 23 |
| 1200-1300 | 32 | 67 | 36 | 24 |
| 1300-1400 | 32 | 67 | 36 | 23 |
| 1400-1500 | 32 | 67 | 36 | 24 |
| 1500-1600 | 32 | 64 | 36 | 23 |
| 1600-1700 | 31 | 62 | 35 | 23 |
| 1700-1800 | 31 | 60 | 35 | 24 |
| 1800-1900 | 33 | 69 | 36 | 26 |
| 1900-2000 | 33 | 72 | 38 | 30 |
| 2000-2100 | 34 | 75 | 38 | 33 |
| 2100-2200 | 34 | 74 | 38 | 32 |
| 2200-2300 | 34 | 76 | 38 | 33 |
| 2300-2400 | 34 | 78 | 38 | 33 |
| 0600-2400 | 32 | 67 | 36 | 26 |

Table 7: Weekday and weekend comparisons: 1999

| miles per hour/ percent | | | | | |
|-------------------------|-------------|---------------|------------------|---------------|------------------|
| Vehicle type | Speed limit | Weekday | | Weekend | |
| | | Average speed | Percent speeding | Average speed | Percent speeding |
| Cars | 30mph | 32 | 65 | 33 | 72 |
| | 40mph | 36 | 24 | 37 | 29 |
| LGVs | 30mph | 32 | 65 | 33 | 70 |
| | 40mph | 35 | 20 | 36 | 25 |
| Motorcycle | 30mph | 32 | 59 | 35 | 67 |
| | 40mph | 36 | 35 | 39 | 43 |
| Rigid 2 axle | 30mph | 30 | 55 | 31 | 60 |
| | 40mph | 34 | 14 | 35 | 20 |

Weekday and weekend comparisons (Table 7)

1. Average speeds were slightly higher at the weekend and speeding was more commonplace. This confirms the evidence, from non-urban speed data, that less dense weekend traffic slightly increases average speed and speeding. Motorcycles, on both 30 mph and 40 mph roads, were observed to have an average speed at weekends which was more than 2 mph higher than the average weekday speed.

Average speeds on urban roads by time of year (Charts 3 and 4)

1. Due to the small number of sites surveyed and the small changes seen throughout the year none of the differences in quarterly average speeds observed in 1999 were significant. However, Chart 3 illustrates that motorcycle speeds on 30 mph roads are, generally, higher in the summer and lower in winter, probably because motorcycles are the vehicles most affected by adverse weather conditions and possibly because of seasonal differences in motorcycle usage. There is some evidence, as shown in Chart 4, that this occurs on 40 mph roads, although the changes are also not statistically significant and the number of sites surveyed is lower.

2. Average speeds for most other vehicle types showed little variation throughout the year. For example, average car speeds remained between 32 and 33 mph on 30 mph roads throughout 1999 and between 35 and 37 mph on 40 mph roads. Charts 3 and 4 show the average quarterly speeds for cars, generally the fastest vehicles on urban roads and for buses and coaches, generally the slowest vehicles on urban roads.

3. None of the quarterly average speeds in 1999 differed significantly from the average speeds in the corresponding quarter of 1998.

Comparisons with earlier speed surveys (Table 8)

1. The first urban speed survey was carried out in 1994 and has been operating continuously since then. Detailed results are shown in earlier editions of this bulletin. Although the survey method has not changed and the selection of sites has remained fairly constant the comparisons should be treated as indicative only.

2. The standard errors of the average speeds for each vehicle type and road class in 1999 are shown in Annex C. Using these estimates of standard error together with those from 1998 there was found to be no significant change in average vehicle speeds between the two years for any vehicle type.

3. Table 8 shows that average car speeds on urban roads have reduced slightly over the past five years. Speeding by motorcycles has increased on 30 mph limit roads during this period although the change in average motorcycle speeds is not statistically significant at the 95% level.

Chart 3: Average speed trends for selected vehicle types on 30 mph roads

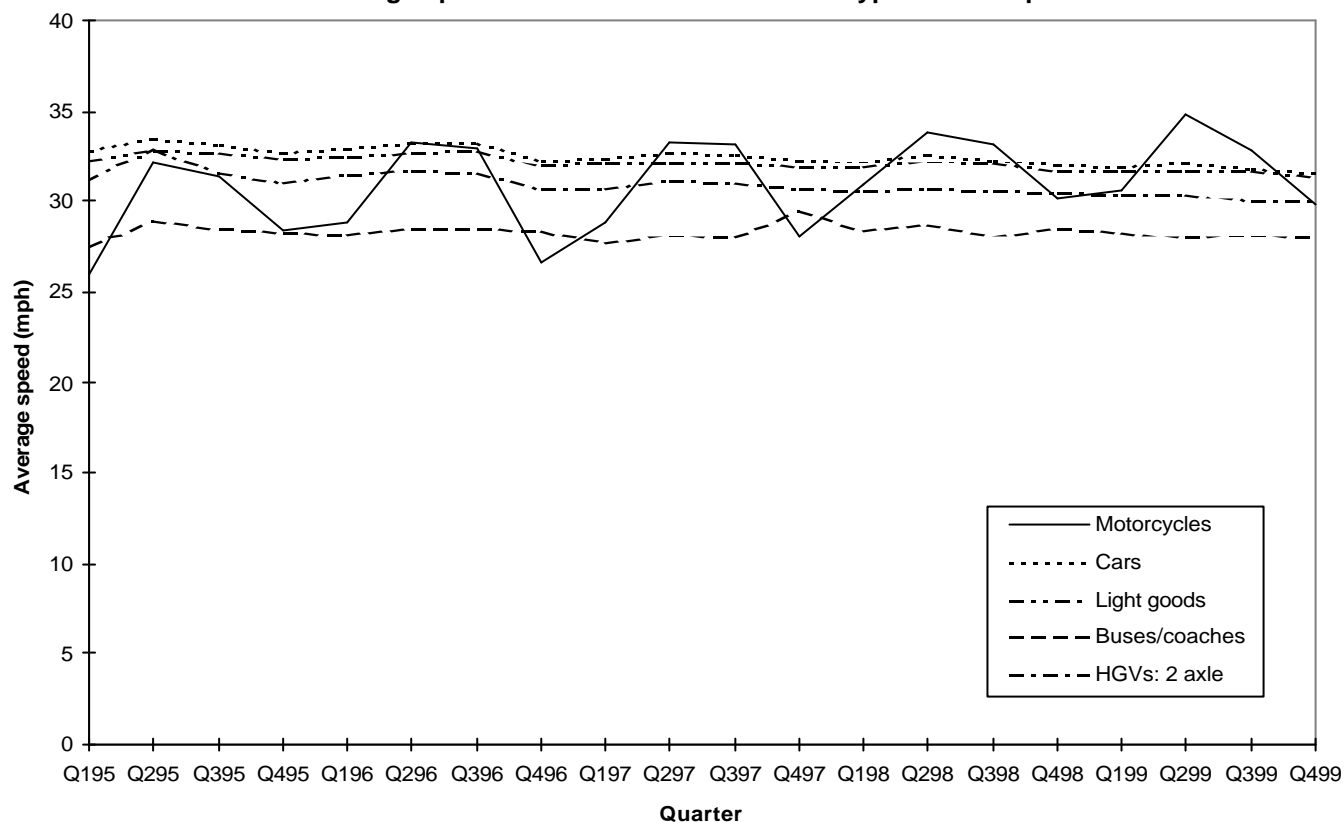


Chart 4: Average speed trends for selected vehicle types on 40 mph roads

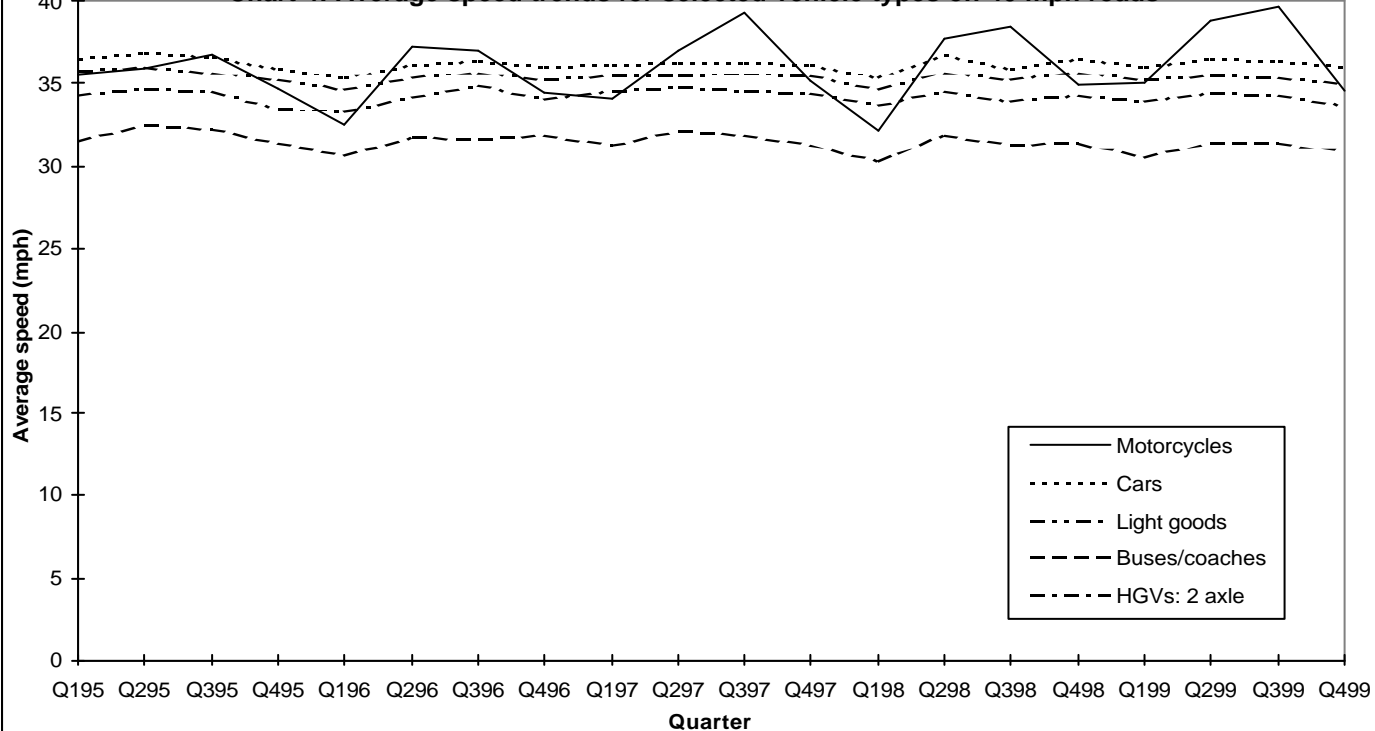


Table 8 Urban speed surveys: 1995 - 1999

| | | number/ miles per hour/ per cent | | | | |
|--------------|--------------------------|----------------------------------|-------|-------|-------|-------|
| | | 1995 | 1996 | 1997 | 1998 | 1999 |
| 30 mph limit | Sites | 31 | 30 | 30 | 30 | 30 |
| | Observations (thousands) | 2,793 | 2,047 | 2,109 | 2,218 | 2,060 |
| | Average motorcycle speed | 30 | 31 | 32 | 32 | 33 |
| | Percent exceeding limit | 52 | 56 | 60 | 63 | 62 |
| | Average car speed | 33 | 33 | 33 | 32 | 32 |
| | Percent exceeding limit | 72 | 72 | 70 | 69 | 67 |
| | Rigid 2-axle HGV speed | 32 | 31 | 31 | 31 | 31 |
| | Percent exceeding limit | 61 | 61 | 58 | 57 | 55 |
| | Average bus/coach speed | 28 | 28 | 28 | 28 | 28 |
| | Percent exceeding limit | 38 | 39 | 39 | 41 | 38 |
| 40 mph limit | Sites | 8 | 8 | 8 | 8 | 8 |
| | Observations (thousands) | 1,425 | 1,068 | 1,121 | 921 | 924 |
| | Average motorcycle speed | 36 | 35 | 37 | 36 | 37 |
| | Percent exceeding limit | 36 | 34 | 38 | 35 | 38 |
| | Average car speed | 37 | 36 | 36 | 36 | 36 |
| | Percent exceeding limit | 28 | 25 | 27 | 26 | 26 |
| | Rigid 2-axle HGV speed | 34 | 34 | 35 | 34 | 34 |
| | Percent exceeding limit | 18 | 16 | 19 | 16 | 15 |
| | Average bus/coach speed | 32 | 31 | 32 | 31 | 31 |
| | Percent exceeding limit | 8 | 6 | 7 | 7 | 7 |

1 Comparisons are indicative only. see commentarv.

Annex A: UK Maximum speed limits on non built up roads

| | | miles per hour | | |
|--------------------------------|---------------------------|----------------|------------------|--------------------|
| Vehicle type | | Motorway | Dual carriageway | Single carriageway |
| Cars /motorcycles ¹ | | 70 | 70 | 60 |
| Cars towing | 1 trailer | 60 | 60 | 50 |
| | 2 or more trailers | 40 | 20 | 20 |
| Buses /coaches | < 12 metres | 70 | 60 | 50 |
| | > 12 metres | 60 | 60 | 50 |
| Goods vehicle | < 7.5 tonnes ² | 70 | 60 | 50 |
| | artic < 7.5 tonnes | 60 | 60 | 50 |
| | > 7.5 tonnes ³ | 60 | 50 | 40 |
| Goods vehicle towing | 2 or more trailers | 40 | 20 | 20 |

1 Not more than 3.5 tonnes. Includes car-derived vans.

2 Maximum laden weight. Not an artic, trailer puller or car-derived van.

3 Maximum laden weight of cab and trailer

Annex B: Non-urban motorcycle speed data: 1999

| miles per hour/percent/number of vehicles | |
|---|-------------|
| Motorways ¹ | Motorcycles |
| Under 50 mph | 4 |
| 50-60 mph | 14 |
| 60-65 mph | 13 |
| 65-70 mph | 15 |
| 70-75 mph | 21 |
| 75-80 mph | 14 |
| 80-90 mph | 17 |
| 90 mph and over | 1 |
| Average speed | 70 |
| Speed limit | 70 |
| Percent over limit | 53 |
| More than 10 mph over limit | 18 |
| Number observed (thousands) | 71 |

1. Data was collected for 18 motorway sites in 1999; 7 were surveyed throughout the year, 5 for 6 or 7 months and 6 were surveyed for the last 2 months of the year. The results should be regarded with caution until a more complete survey is available from 2000. Data for one dual-carriageway site and two single-carriageway sites were also collected but are not shown here as they may not be representative of these road classes as a whole.

Annex C: Average vehicle speeds and their standard errors: 1999

| miles per hour | | | | | | | | | | | |
|---------------------------------|----------------|-----------------------------------|------|-------------|--------------------------|--------------------|--------|--------------------------------|-------------|---------|----------|
| | | ³ Heavy goods vehicles | | | | | | | | | |
| | | | | | | ⁴ Rigid | | ⁵ Rigid/articulated | | | |
| | | ¹ Motorcycles | Cars | Cars towing | ² Light goods | Buses/coaches | 2 axle | 3/4 axle | Articulated | 4 axles | 5+ axles |
| Non-urban sites | | | | | | | | | | | |
| Motorways ⁶ | Average speed | 70.0 | 69.9 | 57.1 | 66.5 | 60.5 | 59.3 | 54.6 | 54.6 | 54.3 | 54.7 |
| | Standard error | 1.6 | 0.8 | 0.5 | 0.7 | 0.5 | 0.6 | 0.6 | 0.3 | 0.3 | 0.3 |
| Dual carriageways ⁶ | Average speed | 70.0 | 70.1 | 57.4 | 66.3 | 58.9 | 57.8 | 53.5 | 54.5 | 53.9 | 54.7 |
| | Standard error | 6.9 | 2.3 | 1.8 | 2.4 | 1.6 | 1.8 | 1.0 | 1.5 | 1.1 | 1.5 |
| Single carriageway ⁶ | Average speed | 47.3 | 46.8 | 44.6 | 46.3 | 43.0 | 44.5 | 42.6 | 45.3 | 43.3 | 46.1 |
| | Standard error | 5.3 | 1.8 | 1.2 | 1.7 | 1.8 | 1.5 | 1.4 | 1.7 | 1.4 | 1.9 |
| Urban sites | | | | | | | | | | | |
| 30mph ⁶ | Average speed | 32.9 | 32.1 | 30.1 | 31.8 | 28.3 | 30.5 | 29.7 | 28.4 | 29.1 | 28.0 |
| | Standard error | 1.6 | 0.9 | 1.2 | 0.7 | 1.2 | 1.1 | 1.1 | 1.2 | 1.2 | 2.4 |
| 40mph ⁶ | Average speed | 37.5 | 36.3 | 34.4 | 35.3 | 31.1 | 34.1 | 33.6 | 32.3 | 33.2 | 32.9 |
| | Standard error | 2.4 | 1.3 | 1.3 | 1.3 | 1.2 | 1.2 | 1.4 | 1.6 | 1.5 | 1.5 |

1 Motorcycles includes mopeds and other types of powered two wheeled vehicles

2 Goods vehicles up to 3.5 tonnes gross weight

3 Goods vehicles over 3.5 tonnes gross weight

4 Does not include 4 axle types on urban roads

5 Includes 4 and 5+ axle types

6 Number of sites given in table 4 or table 8