

Sub-national road transport fuel consumption statistics for 2010 and analysis of national trends in diesel and petrol use

Introduction

This article presents the latest estimates of road transport fuel consumption at both Regional and Local Authority level. The dataset has been produced for DECC by AEA, and was calculated using the same methodology used to estimate total UK emissions for the road transport sector in the National Atmospheric Emission's Inventory (NAEI) / Greenhouse Gas Inventory. The data in this article relate to 2010; however to provide a comparable time series, data for years 2005 to 2009 have been revised to incorporate the latest methodological developments.

This work forms part of a wider project that started in 2003 to improve local area energy data, to meet increasing user needs. This information on the consumption of road transport fuels in 2010 complements three other regional and local data sets of energy use for the same year. These data sets include gas and electricity consumption data, which were published in December 2011 and March 2012 respectively, along with estimates for consumption of residual fuels¹, which will be released later this year.

Key points

- Between 2009 and 2010, fossil fuel use for road transport has decreased by two per cent from 36,200 thousand tonnes of fuel to 35,393 thousand tonnes of fuel in the United Kingdom. This is set in the context of a continuing decline since 2007. Fossil fuel use for road transport has fallen by six per cent over this period.
- The change in consumption for cars between 2009 and 2010 saw the largest annual fall since comparable records began in 2005, of 913 thousand tonnes of fuel (four per cent).

All DECC's sub-national energy datasets are available at:

www.decc.gov.uk/en/content/cms/statistics/regional/regional.aspx

Methodology

To produce these 2010 estimates, the NAEI Road Transport Inventory methodology was used. This methodology combines traffic activity data (from the Department for Transport's (DfT) national traffic census) with fleet composition data (vehicle mix by engine size, vehicle size, age, engine and exhaust treatment technology, Euro emission standards and fuel type as observed on different road types), based on licensing data from DfT and fuel consumption/emission factors produced by the Transport Research Laboratory.

The resulting estimates are based on the location at which the fuel was consumed rather than the place where the fuel was purchased. On this basis, AEA have estimated road transport consumption at Local Authority level based on the traffic and road type data and point measurements from traffic counters. Data are then aggregated and published by vehicle type within each Local Authority.

Due to the NAEI continuous improvement programme, AEA have further developed the methodology since the previous publication.

The major changes to the methodology since the last publication are:

- Re-allocation of more petrol and DERV to off-road and inland waterways sectors across all years after a major review;
- Revised 2009 vehicle km activity data for Northern Ireland;
- Use of Automatic Number Plate Recognition (ANPR) data and Regional Vehicle Licensing Statistics (DVLA) to define the petrol and diesel car mix by road type and by Devolved Administrations;
- Assumptions on the split in vehicle weight class have been updated;

¹ These are defined as non-gas, non-electricity and non-road transport use but exclude fuel used for aviation and national navigation.

Special feature – Sub-national road transport consumption statistics for 2010

- Revised figures on average MPG fuel efficiency of different sizes of HGVs;
- Time series revision of DfT's Bus Services, to take account of the fuel consumption for journeys to and from the start and end of a bus route.

A report containing a more detailed description of the methodology behind these estimates is available from the 'Related Documents' section at:

www.decc.gov.uk/en/content/cms/statistics/regional/road_transport/road_transport.aspx

Limitations and definitions

As the data are modelled, there are a number of uncertainties affecting the accuracy of these estimates at Local Authority level. These uncertainties mainly reflect the uncertainties in the vehicle kilometre data (traffic census, DfT) and fleet composition data, affecting the consumption factors calculated for each vehicle type.

The uncertainties in allocating consumption to individual Local Authorities are mainly due to local variations in the national fleet in terms of the vehicle age and fuel mix. For example, traffic in some areas can be made by higher proportion of diesel or older cars than in other areas. However, the use of DVLA's Regional Vehicle Licensing Statistics has reduced this uncertainty.

Areas where there is frequently congested urban traffic and those with high levels of heavy duty vehicle traffic (HGVs and buses) are considered to be more uncertain, in comparison to areas where traffic is normally free-flowing. Rural areas dominated by smaller towns are considered to have the lowest levels of uncertainty.

It also should be noted that the estimates exclude consumption of LPG and biofuels and all references to petrol and diesel in this article exclude bioethanol and biodiesel respectively.

The total 2010 UK consumption figure for road transport fuels using aggregated LA level data is 35,393 thousand tonnes of fuel. The total is 1.5 per cent lower than the equivalent total of petrol and diesel (DERV) in the Digest of UK Energy Statistics (DUKES) of 35,926 thousand tonnes. The DUKES value also includes a small amount of petrol and diesel consumed by off-road vehicles and machinery (e.g. portable generators, lawn mowers) and consumption in the Crown Dependencies (Jersey, Guernsey and Isle of Man).

Regional and local estimates

Table 1, at the end of this article, presents estimates of road transport fuel consumption for Scotland, Wales, Northern Ireland and the regions of England for 2010. The table also includes four local authorities from each region showing the highest and lowest total consumption. Total consumption is made up of personal (defined as buses, diesel cars, petrol cars and motorcycles) and freight (defined as HGV, diesel LGV and petrol LGV). Consumption is also shown separately for cars, buses, motorcycles, HGVs and LGVs.

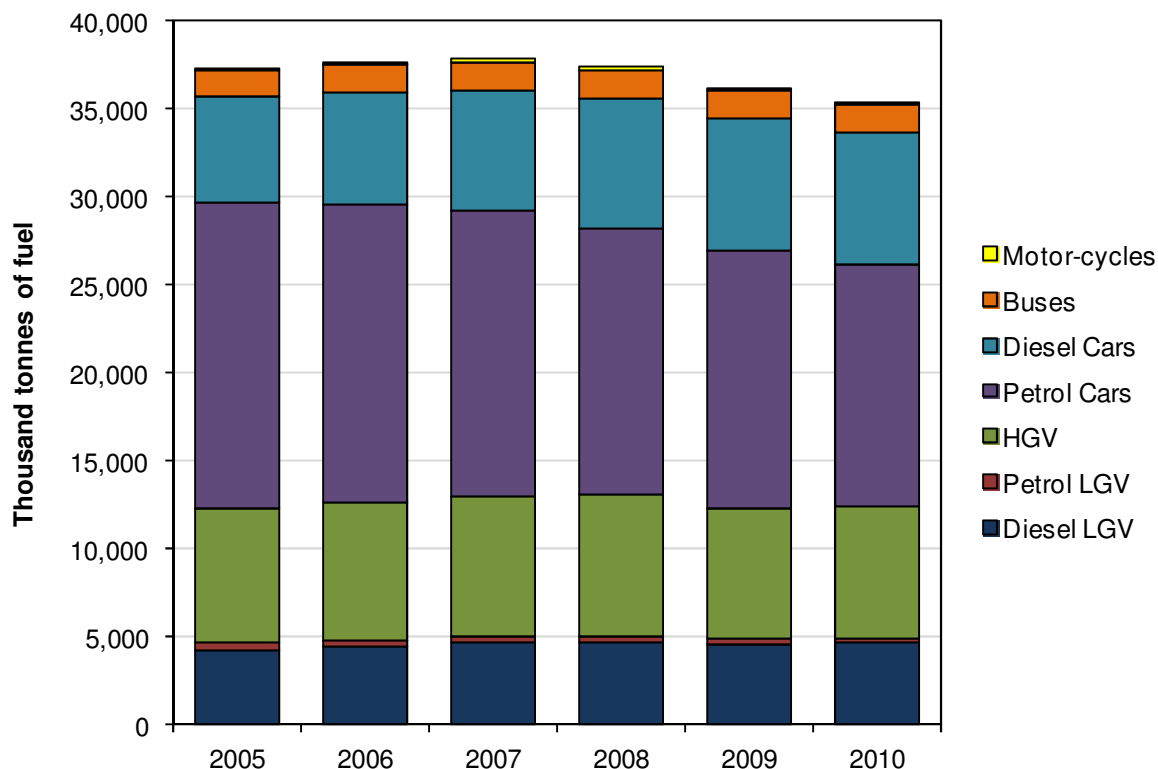
The full tables showing road transport fuel consumption for all LAU1² (formerly NUTS4) areas in the United Kingdom for 2002 to 2010 are available on the DECC Energy Statistics website at: www.decc.gov.uk/en/content/cms/statistics/regional/road_transport/road_transport.aspx. However, the data prior to 2005 are produced using a different methodology, therefore it is not recommended that data for 2002 to 2004 are compared with later data.

² Local Administrative Units (LAU) is a hierarchical classification of spatial units that provides a comparable breakdown of the European Union's territory for producing regional statistics. Formerly known as NUTS4, LAU1 refers to the 354 individual London boroughs/metropolitan districts/unitary authorities/local authority districts in England, 22 individual unitary authorities in Wales, 41 individual or groups of whole/part unitary authorities and/or local enterprise company areas in Scotland, and 26 individual district unitary authorities in Northern Ireland, totalling 443 UK LAU1 regions. LAU1 areas in Scotland do not match exactly the Local Authority Areas and there are more LAU1 areas in Scotland than Local Authorities. In the analysis, Scottish Local Authorities are used in place of LAU1 giving 434 local areas in the UK.

Preliminary analysis of road transport fuel consumption

Between 2009 and 2010, fuel use for road transport has decreased from 36,200 thousand tonnes of fuel to 35,393 thousand tonnes of fuel (two per cent) in the United Kingdom. This is set in the context of a decline since 2007. Fossil fuel use for road transport has fallen by five per cent between 2005 and 2010 (chart 1).

Chart 1: Fuel use split by vehicle type, UK, 2005 to 2010



The cause of the steeper fall since 2008 could be attributed to the effects of the economic downturn and increases in the efficiency of vehicles.

It is important to note that, as these figures refer to consumption of petrol and diesel, the trends partly reflect national changes and growth in consumption of bioethanol and biodiesel which has displaced some petrol/DERV in recent years through blending. Replacement rates differ between the fuel types, with biodiesel representing 4.1 per cent of the total DERV delivered in 2010, whilst bioethanol represented 3.1 per cent of the total motor spirit.

Chart 1 shows fuel use split by vehicle type. Petrol cars saw the largest decrease between 2005 and 2010 of 3,786 thousand tonnes of fuel (22 per cent). Whilst, diesel cars saw the largest increase between this period of 1,612 thousand tonnes of fuel (27 per cent). HGVs have seen the smallest change since 2005 with a decrease of 60 thousand tonnes of fuel (1 per cent).

Total fuel consumption by cars decreased by 913 thousand tonnes of fuel (4 per cent) between 2009 and 2010, and have decreased by 2,175 thousand tonnes of fuel (10 per cent) between 2005 and 2010. The annual change in 2010 was the largest to date.

Road transport for freight increased by 2 per cent (194 thousand tonnes of fuel) between 2005 and 2010. However, there was actually an increase of 7 per cent (846 thousand tonnes of fuel) for freight transportation between 2005 and 2008, followed by a decrease of 6 per cent (767 thousand tonnes of fuel) between 2008 and 2009. Between 2009 and 2010, there has been an increase of 1 per cent (116 thousand tonnes of fuel). The large decrease between 2008 and 2009 can mainly be attributed to the impacts of the recession, which saw a fall in the amount of freight being transported around the UK.

Chart 2: Fuel use by vehicle type, UK, 2010

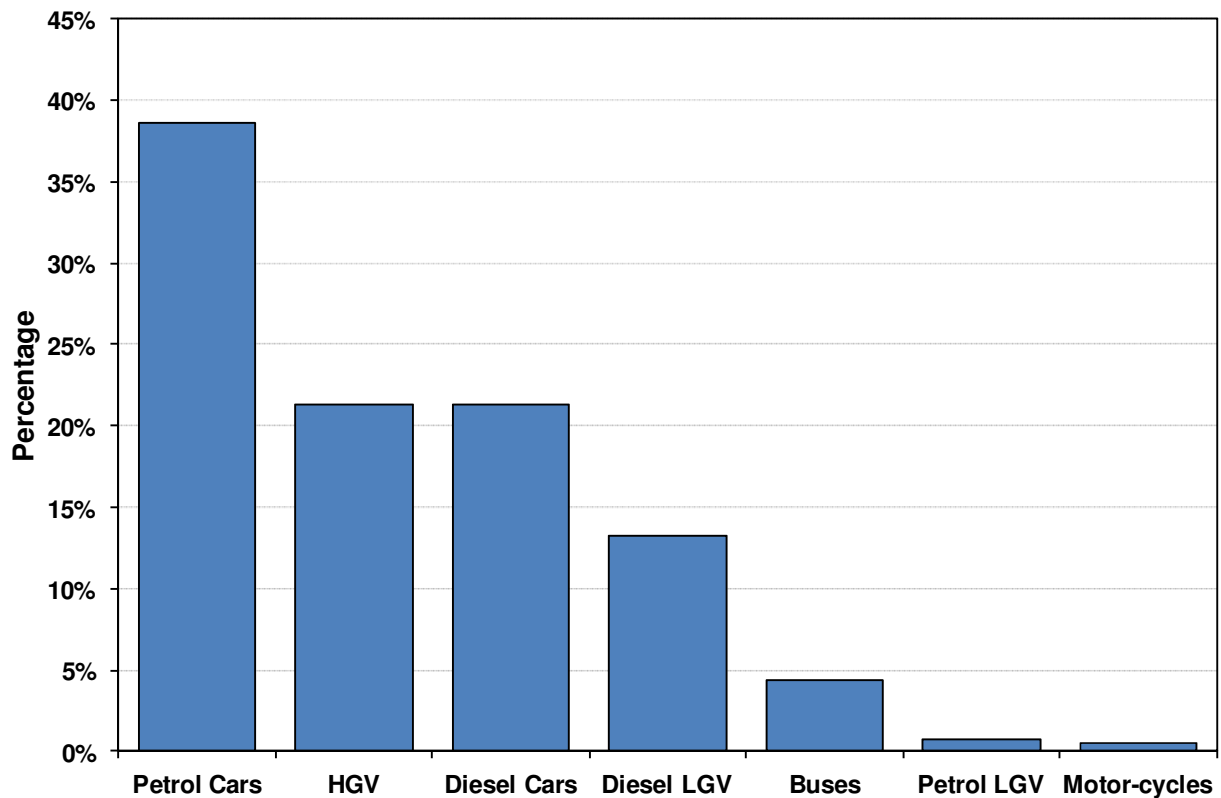
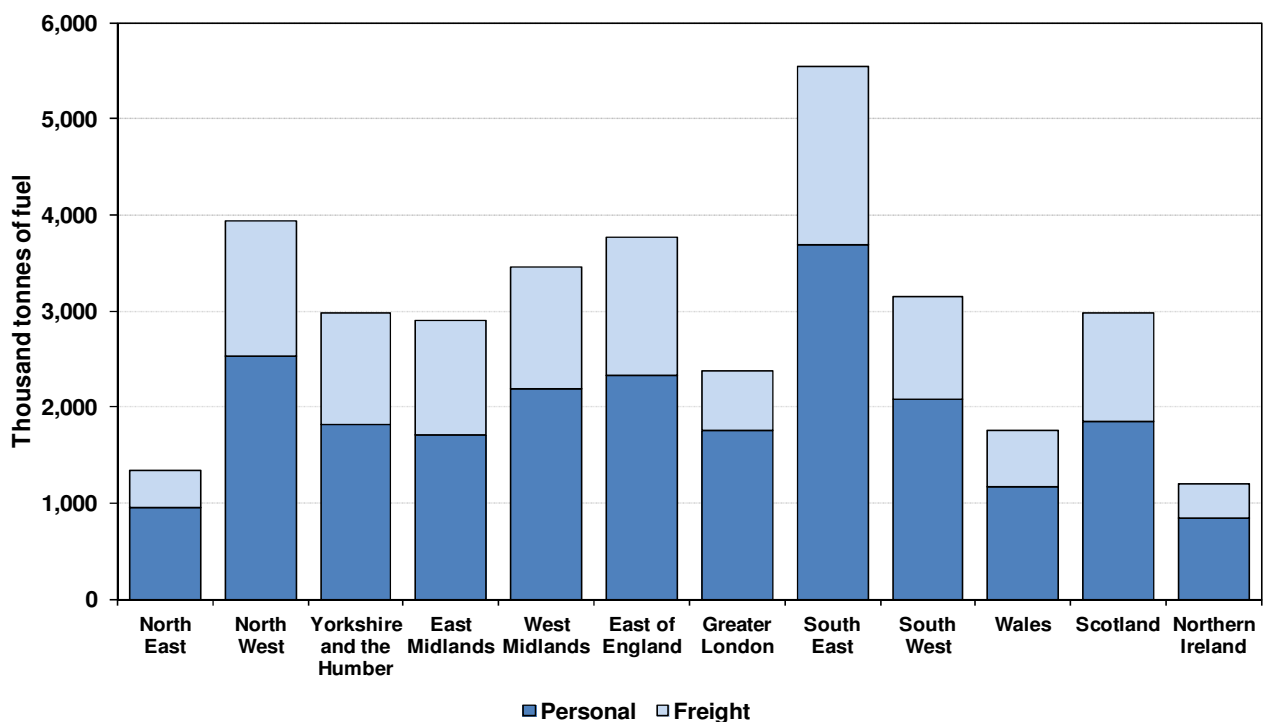


Chart 2 shows the distribution of total UK road transport fuels (35,393 thousand tonnes) by vehicle type in 2010. Petrol and diesel cars combined, were estimated to be responsible for the largest proportion (60 per cent) of total road transport fuel consumption in 2010. HGVs were the second largest consumers of fuel, accounting for 21 per cent of overall fuel consumption followed by LGVs at 14 per cent and the remaining 5 per cent is attributed to buses and motorcycles.

Chart 3: Fuel used for freight and personal road transport by region, 2010



Special feature – Sub-national road transport consumption statistics for 2010

Chart 3 illustrates fuel consumption at a regional level, split by personal and freight road transport. The North East of England and Northern Ireland had the lowest consumption of road transport fuel for both freight and personal travel, with consumption totalling 1,343 and 1,205 thousand tonnes of fuel respectively. The South East of England experienced the largest consumption of all regions, 16 per cent of overall road transport consumption (5,552 thousand tonnes of fuel). Fuel consumption for personal travel in the South East was higher than total consumption in all regions with the exception of the North West and the East of England. At a local authority level, the two areas with the highest total consumption were Leeds (437 thousand tonnes of fuel) and Birmingham (406 thousand tonnes of fuel), this is due to major motorways located within these areas and the relative sizes of these regions.

In the UK personal travel accounted for 65 per cent of the fuel consumed. Between regions, the percentage of fuel consumed for personal travel varied. The East Midlands had the lowest personal travel proportion of 59 per cent, whilst Greater London had the highest proportion of 74 per cent. The variation between the proportion of personal and freight road transport consumption in regions provide an indication on the categorisation of roads within a region.

Acknowledgements

DECC would like to thank Ioannis Tsagatakis and his team at AEA for their work on improving and producing this dataset.

User feedback

We welcome all feedback from the users of this data, therefore if you would like to comment on these or on the content of this article, please contact Sabena Khan using the details below.

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Table 1: Selected regional and local road transport consumption statistics: 2010

Thousands tonnes of fuel

English Regions and Devolved Administration Regions and selected Local Authorities	Buses	Diesel Cars	Petrol Cars	Motor-cycles	HGV	Diesel LGV	Petrol LGV	Personal ⁽¹⁾	Freight ⁽²⁾	Total
Gateshead	11.0	28.4	56.0	0.5	18.2	17.0	1.0	95.8	36.2	132.0
Newcastle upon Tyne	11.2	29.2	58.2	0.4	12.6	15.2	0.9	99.0	28.7	127.8
Alnwick	0.9	3.9	7.8	0.1	4.8	3.2	0.2	12.8	8.1	20.9
Wansbeck	2.0	4.3	8.7	0.1	1.8	2.5	0.1	15.0	4.4	19.4
TOTAL NORTH EAST	101.3	284.3	561.5	4.4	204.0	177.0	10.0	951.6	391.0	1,342.6
Warrington	5.2	36.9	63.9	0.5	61.4	19.7	1.1	106.5	82.2	188.7
Manchester	13.6	42.8	80.9	0.7	25.3	20.9	1.2	137.9	47.4	185.3
Copeland	1.6	4.9	9.9	0.1	3.2	3.2	0.2	16.5	6.6	23.2
Barrow-in-Furness	1.4	3.0	6.0	0.1	1.6	1.8	0.1	10.5	3.5	13.9
TOTAL NORTH WEST	176.7	825.7	1,519.5	14.0	912.7	465.7	26.0	2,535.8	1,404.3	3,940.1
Leeds	18.1	91.6	170.1	1.5	93.6	58.0	3.3	281.3	154.8	436.1
Doncaster	8.8	41.8	76.1	0.8	86.8	27.8	1.6	127.5	116.1	243.6
Scarborough	3.0	10.3	20.7	0.3	5.5	7.0	0.4	34.3	12.9	47.2
Craven	1.7	8.2	16.4	0.2	8.5	5.6	0.3	26.6	14.4	41.0
TOTAL YORKSHIRE AND THE HUMBER	123.4	580.2	1,097.5	11.9	754.2	394.7	22.0	1,813.0	1,170.9	2,983.9
Daventry	2.5	26.0	45.0	0.4	63.9	19.2	1.0	73.8	84.1	157.9
South Northamptonshire	2.6	27.5	47.4	0.4	58.6	19.8	1.0	77.9	79.3	157.2
Lincoln	1.4	3.6	7.3	0.1	2.7	2.3	0.1	12.5	5.1	17.6
Oadby and Wigston	1.1	3.0	5.9	0.1	1.2	1.5	0.1	10.1	2.8	12.9
TOTAL EAST MIDLANDS	95.6	550.9	1,049.2	11.4	795.8	382.1	20.4	1,707.1	1,198.3	2,905.4
Birmingham	29.6	93.0	180.1	1.6	48.3	50.2	3.0	304.2	101.5	405.7
North Warwickshire	3.0	33.6	53.7	0.4	74.5	23.6	1.1	90.7	99.3	190.0
Oswestry	1.2	3.9	7.7	0.1	5.2	3.3	0.2	12.9	8.6	21.5
Tamworth	1.6	4.7	9.5	0.1	2.5	2.6	0.2	15.9	5.2	21.1
TOTAL WEST MIDLANDS	158.7	706.0	1,310.1	12.3	790.2	450.3	24.7	2,187.1	1,265.3	3,452.4
Huntingdonshire	3.7	33.2	61.9	0.7	75.0	26.0	1.3	99.5	102.4	201.9
South Cambridgeshire	3.0	31.5	59.4	0.6	55.5	23.7	1.2	94.6	80.4	175.0
Harlow	1.7	6.1	11.7	0.1	4.6	3.3	0.2	19.6	8.2	27.8
Watford	1.6	6.5	12.9	0.1	2.7	3.4	0.2	21.2	6.3	27.4
TOTAL EAST OF ENGLAND	128.1	752.0	1,431.3	17.4	876.0	539.1	28.8	2,328.9	1,443.9	3,772.7

Thousands tonnes of fuel

English Regions and Devolved Administration Regions and selected Local Authorities	Buses	Diesel Cars	Petrol Cars	Motor-cycles	HGV	Diesel LGV	Petrol LGV	Personal ⁽¹⁾	Freight ⁽²⁾	Total
Hillingdon	9.3	35.4	66.9	1.1	23.1	17.7	1.0	112.8	41.8	154.6
Enfield	6.0	24.0	45.0	0.6	30.2	12.2	0.7	75.6	43.2	118.8
Islington	5.3	7.3	15.4	0.9	3.7	5.6	0.4	29.0	9.8	38.8
City of London	2.2	3.1	6.7	0.5	1.6	2.4	0.2	12.5	4.2	16.7
TOTAL GREATER LONDON	207.6	504.5	1,022.5	28.7	301.2	288.4	18.0	1,763.3	607.6	2,370.9
West Berkshire	4.4	46.5	78.6	0.8	62.9	26.1	1.3	130.2	90.3	220.5
Cherwell	3.4	35.9	62.7	0.6	51.4	21.8	1.1	102.6	74.4	177.0
Hastings	1.6	5.0	10.1	0.2	1.6	2.8	0.2	16.9	4.5	21.5
Gosport	1.1	4.1	8.2	0.2	1.1	2.3	0.1	13.6	3.5	17.1
TOTAL SOUTH EAST	168.0	1,227.8	2,262.7	29.2	1,035.2	787.1	41.9	3,687.7	1,864.2	5,551.9
South Gloucestershire	7.5	55.6	94.0	1.4	66.6	32.3	1.7	158.5	100.6	259.0
North Somerset	4.9	33.6	58.0	0.8	31.1	19.5	1.0	97.2	51.6	148.8
Weymouth and Portland	1.8	4.2	8.5	0.2	1.5	2.5	0.1	14.7	4.1	18.9
Isles of Scilly	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2
TOTAL SOUTH WEST	120.6	674.0	1,268.0	19.2	590.0	448.1	24.2	2,081.8	1,062.2	3,144.0
Cardiff	8.3	48.8	75.1	0.6	23.9	21.6	1.2	132.8	46.8	179.6
Rhondda, Cynon, Taff	5.5	32.1	49.7	0.4	18.4	18.5	1.0	87.7	37.9	125.6
Merthyr Tydfil	1.0	6.3	10.1	0.1	3.9	3.9	0.2	17.4	8.0	25.4
Blaenau Gwent	0.9	5.6	9.0	0.1	3.5	3.2	0.2	15.5	6.9	22.4
TOTAL WALES	75.5	424.4	656.6	7.5	309.4	264.5	14.2	1,164.0	588.1	1,752.1
Glasgow City	16.1	54.5	87.3	0.6	41.2	30.1	1.7	158.5	73.1	231.6
North Lanarkshire	13.1	44.4	75.9	0.5	49.7	28.8	1.6	133.9	80.1	214.0
Shetland Islands	0.8	2.4	4.2	0.0	2.0	2.4	0.1	7.5	4.6	12.1
Orkney Islands	0.7	1.8	3.1	0.0	1.5	1.6	0.1	5.7	3.2	8.9
TOTAL SCOTLAND	181.3	617.6	1,047.7	10.1	686.3	406.6	22.3	1,856.8	1,115.2	2,972.0
Belfast	1.7	30.5	34.6	0.6	21.4	3.2	0.1	67.4	24.7	92.1
Lisburn	0.9	26.8	30.6	0.4	20.2	4.5	0.1	58.7	24.7	83.4
Moyle	0.2	6.6	7.4	0.1	3.5	1.1	0.0	14.2	4.6	18.8
Carrickfergus	0.1	4.2	4.6	0.1	1.8	0.6	0.0	9.0	2.4	11.5
TOTAL NORTHERN IRELAND	11.2	389.4	440.5	4.6	283.6	73.8	1.6	845.7	359.1	1,204.7
Great Britain Total	1,536.8	7,147.3	13,226.7	166.1	7,254.8	4,603.5	252.6	22,077.0	12,110.9	34,187.9
UK	1,548.0	7,536.6	13,667.2	170.8	7,538.4	4,677.3	254.3	22,922.6	12,470.0	35,392.7

(1) Personal travel includes buses, diesel cars, petrol cars and motor cycles

(2) Freight includes HGV, diesel LGV and petrol LGV