



**TRANSPORT  
SCOTLAND**  
CÒMHDHAIL ALBA

# Scottish Transport Statistics 2022

## Notes and Definitions

## Contents

User guide - Road Transport Vehicles .....	3
User guide – Bus and Coach Travel .....	11
User guide – Road freight.....	16
User guide – Road network.....	21
User guide – Road traffic.....	26
User guide – Injury road accidents.....	35
User guide – Rail .....	37
User guide - Aviation statistics .....	45
User guide – Water transport .....	50
User guide – Finance .....	56
User guide – Personal and crossmodal travel.....	57
User guide – International comparisons .....	66
User guide – Environment.....	70

# User guide - Road Transport Vehicles

## Notes and definitions

### Motor Vehicles

There are three types of classification of motor vehicles:

- Taxation Group: based on the level of tax placed on a motor vehicle according to its vehicle type (e.g. Private & light goods, Public transport, Goods etc);
- Body Type: based on the look of a vehicle (e.g. cars).
- Method of propulsion: based on type of fuel used.
- 

### Private and Light Goods Vehicles

The bulk of this group consists of private cars (whether owned by individuals or companies) and vans and light goods vehicles (goods vehicles which do not exceed 3,500 kgs gross weight). The group also contains a number of other types of vehicle including private buses and coaches.

### Motorcycles

No distinction is made between motorcycles, scooters and mopeds for taxation purposes, and therefore motorcycles includes all two wheeled vehicles.

### Public Transport

All vehicles classified for taxation in class 34 - Bus (introduced 1 July 1995). These are vehicles used for public conveyance, with more than 8 seats. Prior to 1 July 1995 public transport vehicles were taxed in class 35 Hackney, used similarly for public transportation but with no lower limit on seating capacity. Buses and coaches not licensed for public conveyance, and operated and used privately, are excluded and are classified for excise licensing with private and light goods. Taxis and private hire cars are now included in the private and light goods group.

### Goods Vehicles

The totals for this group (goods vehicles which exceed 3,500 kgs gross weight) for the earlier years include the now-discontinued formerly separate Farmers Goods, General Goods and some vehicles which before 1 July 1995 were taxed in a specialised taxation class but which now fall into the Goods Vehicle class groups, which were shown separately in some of the previous editions of *Scottish Transport Statistics*. Goods vehicles that are used un-laden, privately or for driver training purposes are licensed in the Private HGV taxation class.

### Crown and Exempt Vehicles

The 'exempt' vehicles include a number of distinct sub-groups and classes, of which the most important are: 'Emergency vehicles', 'Disabled driver and disabled passenger carrying vehicles', 'All vehicles, except buses and goods vehicles used commercially if they were constructed before 1 January 1973', and 'Personal export and direct export vehicles', and vehicles formerly in the 'Special Concessions' class

i.e. agricultural tractors, combine harvesters, and mowing machines, electric vehicles, gritting vehicles and snow ploughs, and steam powered vehicles.

### Special Vehicles

This group consists of vehicles over 3,500 kgs which do not pay Vehicle Excise Duty as heavy goods vehicles nor qualify for taxation in the special concessionary group. Vehicles in this group include road rollers, work trucks, digging machines and mobile cranes.

### Average ages of vehicles

With effect from the estimates for 2008, the Department for Transport [DfT] improved its method of estimating the age of the vehicle fleet. The estimated ages are slightly higher than previously, although the pattern from year to year is unchanged.

### Goods vehicles licensed by operator size

To operate a goods vehicle (over 3,500 kgs gross weight) in GB (England, Scotland and Wales) in connection with a trade or business or for hire or reward you need to hold a goods vehicle operator's license. The aims of operator licensing are basically road safety and fair competition. All operators undertake to keep their vehicles in a fit and serviceable condition and to ensure their drivers meet the statutory requirements regarding drivers' hours and records legislation. Operator licensing is the responsibility of the Traffic Commissioners. Each is responsible for a Traffic Area, of which there are 8 in GB. Where an operator has an operating centre(s) (i.e. the place(s) where vehicles are normally kept) in a Traffic Area, a license must be held in that Traffic Area. Some of the larger operators will have more than one license. Some operators have licenses with no vehicles specified, relying solely on short term hire instead.

### Reported CO2 emissions

The reported CO2 emissions for a car in the UK are determined using a laboratory test. The test changed from the New European Driving Cycle (NEDC) to the Worldwide harmonised Light vehicles Test Procedure (WLTP) in late 2018, although the WLTP figure was translated into an equivalent NEDC (e-NEDC) figure to maintain consistency in the transition period. The figure reported when first registering the car moved from e-NEDC to WLTP from April 2020 onwards, which caused a discontinuity in the reported emissions trend shown here. This topic is complex and care should be taken when considering recent figures – see <https://www.gov.uk/government/publications/vehicles-statistics-guidance>

### Driving tests

The theory test was introduced on 1 July 1996, therefore full year figures are available from 1997. A person who has passed the theory test must sit the practical test within two years. If the person fails the practical during this period then he/she can re-sit the practical without having to take the theory test again.

### Households with cars available for private use

In the Scottish Household Survey (SHS), the term car is used *only* for cars: vans are **not** included in the analysis. The interviewer asks whether any cars are normally available for private use by members of the household. Cars normally kept or owned by someone outside the household are excluded, but company cars available for private use are included.

### Household types

The following categories are used in the analysis of the SHS results:

- A **single pensioner** household consists of just one adult of pensionable age (60+ for women, and 65+ for men) and no children
- A **single parent** household contains an adult of any age and one or more children.
- A **single adult** household consists of an adult of non-pensionable age and no children.
- An **older smaller** household contains *either* (a) an adult of non-pensionable age and an adult of pensionable age and *no* children *or* (b) two adults of pensionable age and *no* children.
- A **large adult** household has three or more adults and *no* children.
- A **small adult** household contains two adults of non-pensionable age and *no* children.
- A **large family** household consists of *either* (a) two adults and three or more children *or* (b) three or more adults and one or more children.
- **Small family** households consist of two adults and one or two children.

### Annual net household income

The *net* income (i.e. after taxation and other deductions) which is brought into the household by the highest income householder and/or his/her spouse or partner, if there is one. It includes any contributions to the household finances made by other members of the household (e.g. dig money). In the case of households for which any of the main components of income were not known (for example, because of refusal to answer a question), the SHS contractors imputed the missing amounts, using information that was obtained from other households that appeared similar.

### SHS urban / rural classification

The urban / rural classification shown in some tables was developed for use in analysing the results of the SHS. It is based on settlement size, and (for the less-populated areas) the estimated time that would be taken to drive to a settlement with a population of 10,000 or more. Each postcode in Scotland was classed as either urban or non-urban, then clumps of adjacent urban postcodes, which together contained more than a certain total number of addresses, were grouped together to form settlements. Six categories were then defined:

- **Large urban areas** - settlements with populations of 125,000 or more. These are around - but not the same as - Aberdeen, Dundee, Edinburgh and Glasgow. This category may (a) include areas outwith the boundaries of these four cities, in cases where a settlement extends into a neighbouring local authority, and (b) exclude some non-urban areas within the boundaries of these four cities.
- **Other urban areas** - other settlements of population 10,000 or more.
- **Accessible small towns** - settlements of between 3,000 and 9,999 people, which are within 30 minutes' drive of a settlement of 10,000+ people.
- **Remote small towns** - settlements of between 3,000 and 9,999 people, which are *not* within 30 minutes' drive of a settlement of 10,000+ people.
- **Accessible rural areas** - settlements of fewer than 3,000 people, which are within 30 minutes' drive of a settlement of 10,000+ people.
- **Remote rural areas** - settlements of fewer than 3,000 people, which are *not* within 30 minutes' drive of a settlement of 10,000+ people.

### Motor Vehicle Offences

Offences classified as motor vehicle offences in the classification of crimes and offences used for police recorded crime statistics. Certain crimes related to motor vehicles, namely causing death by dangerous driving, causing death by careless driving while under the influence of drink or drugs and reckless driving at common law, are excluded primarily because information on these crimes is not collected on the same basis as other motor vehicle offences. In 2019-20, the police recorded 37 crimes of causing death by dangerous driving, 15 crimes of causing death by careless driving, 2 crimes of an illegal driver being involved in a fatal accident and 1 crime of causing death by careless driving when under the influence of drink or drugs. There were no crimes of reckless driving at common law recorded in 2019-20. In 2018-19, there were 9 convictions where the main offence was causing death by dangerous driving, all of which resulted in a custodial sentence. There were 21 convictions where the main offence was causing death by careless driving, of which 14 resulted in a community sentence, 6 resulted in fines and 1 resulted in a custodial sentence. There was also 1 conviction for causing death by careless driving while under the influence of drink or drugs, which resulted in a custodial sentence. There were no proceedings in 2018-19 with reckless driving at common law as the main offence.

However, the statistics dealing with recorded crime and court proceedings are not directly comparable as a person may be proceeded against for more than one crime involving more than one victim and there is the possibility that the crime recorded by the police may be altered in the course of judicial proceedings. Also a crime may be recorded by the police in one year and court proceedings concluded in a subsequent year.

## Sources

### Numbers of vehicles

The source of this information is the Vehicle Information Database (VID) held by the Department for Transport (DfT). The results conform to the same definitions as earlier vehicle censuses, but, for technical reasons, are considered slightly more reliable than earlier estimates. Some vehicles have complicated licensing histories, that may include incidents such as cheques failing to clear, changes of taxation status, late payments, and one or more valid or invalid refund claims. The VID undertakes a more detailed examination of licensing history than earlier vehicle census analyses and is therefore able to provide better estimates of licensed stock. The figures include all vehicles which pay tax and certain vehicles which are exempt. The exempt vehicles are described in section 1.6. The figures exclude vehicles registered by the armed forces, or as personal or direct export and trade licences issued to manufacturers, repairers of and dealers in motor vehicles. In 2010 [DfT revised stock figures from 2006 to 2009](#).

### Number of Vehicles: Taxation class changes in the period covered by the tables

In 1995 there were major reforms of the vehicle taxation system. The bulk of the changes came into operation on 1 July 1995, but some additional changes were introduced on 29 November 1995. The intention was to remove many of the complications in the existing taxation structure, using a strategy to link Vehicle Excise Duty (VED) rates for many directly to the rate for the private and light goods group (PLG), or the basic minimum rate for heavy goods vehicles (HGVs). One measure to help achieve this was the creation of three umbrella taxation groups:

- An emergency vehicles group - exempt from VED
- A special concessionary group, including agricultural machines, snow ploughs, gritting vehicles, electric vehicles and, later, steam powered vehicles, paying VED at one quarter of the annual PLG rate
- A special vehicles group, limited to vehicles over 3500 kgs, including mobile cranes, works trucks, digging machines, showmen's vehicles, etc, paying VED at a rate equivalent to the basic minimum rate for HGVs.

From 1 April 2001, vehicles licensed in the special concessionary group were exempted from the payment of VED.

In addition, the goods vehicle taxation system was itself considerably simplified by the abolition of separate goods vehicle classes for farmers and showmen. All remaining goods vehicle taxation classes were also abolished and vehicles in those groups transferred to an appropriate tax class. At the same time, the basis for calculation of excise duty for goods vehicles was amended to revenue weight. Revenue weight means either confirmed maximum gross weight as determined by plating and testing regulations, or design weight for vehicles not subject to plating and testing (formerly known as Restricted HGVs).



The process also included further simplifications and tidying arrangements. These included cases in which vehicles not over 3,500 kgs gross weight were removed into the private and light goods taxation class rather than remaining in specialised taxation classes and groups, and the re-allocation of some tax classes into more appropriate groups. One key change of a similar type was to abolish the separate taxation of public transport vehicles with eight seats or fewer, and tax all such vehicles in the PLG class. From start of July 1995 bigger public transport vehicles were taxed in a new bus taxation class. The changes were completed by the introduction in the November 1995 budget of a new exempt class for vehicles over 25 years of age previously in the private and light goods or motorcycle groups. In 1998 the exemption for vehicles over 25 years of age was replaced with one applying to all vehicles, except buses and goods vehicles used commercially if they were constructed before 1 January 1973.

In general, the process of implementing these changes was gradual, and vehicles were allowed to remain in their current class until a new tax disk was required, whereupon they were transferred into other groups and classes as appropriate. Since tax disks may run for up to a year, some vehicles remained legitimately taxed in abolished groups at the end of 1995. That process was effectively complete by the end of 1996, but users of taxation and stock statistics for 1995 and later years should take special care to ensure they are aware of the changes and the methods by which vehicles were re-allocated to other groups.

### **Heavy Goods Vehicles**

There is a large increase in the over 38 tonnes category, and a large decrease in the 32.1 to 38 tonnes category, between 1998 and 1999, and continuing in later years. This is due primarily to legislation which came into effect in 2001 allowing 6-axled lorries to run at up to 44 tonnes. This has led to many lorries 'up-plating' i.e. the lorries do not necessarily physically change, but are simply taxed differently so that they may carry greater loads.

A further reform to the tax class structure for vehicles weighing up to 3,500kg was announced in 1998. In 1999 a two banded system based on engine size was introduced for the PLG class. In March 2001 four new tax classes were introduced. The Petrol Car, Diesel Car and Alternative Fuel Car taxation classes were introduced for passenger vehicles weighing up to 3,500kg registered on or after 1 March 2001. The Light Goods Vehicles tax class was introduced for goods vehicles weighing up to 3,500kg registered on or after 1 March 2001.

### **Numbers of vehicles: Analysis by local government areas**

Until 1995 the DVLA used the postcode of the registered keeper (of the vehicle) to allocate vehicles to local government regions. With the 1996 re-organisation of local authorities in Scotland, local government area analyses required major revisions. This was achieved by use of the most recently available postcode directory, which, when used in conjunction with the Vehicle Information Database, allowed vehicle stocks to be estimated for the new local authorities.

### **Numbers of new registrations of vehicles**

The numbers of new registrations of vehicles of various taxation class types have been obtained by DfT from DVLA. In recent years, changes to taxation classes and



local government reorganisation have affected the DVLA computer system used to produce these figures, and it can no longer provide the numbers of new registrations for each taxation class for Scotland. Scottish figures appearing here are estimated by DfT, using post town area data, and are subject to a small margin of error.

### **Taxis licensed**

These figures are based on an annual survey conducted by the Scottish Government and represent the taxi fleet size/driver numbers at the time of replying to the survey.

### **Goods vehicles operators by licence type and number of vehicles specified on the licence**

These figures were produced from information taken from the Traffic Commissioners administrative records.

### **Most popular car sold**

These figures are supplied by Society of Motor Manufacturers and Traders (SMMT). They are based on postcode location derived from form V55 which is completed by the car dealer. The figures do not include sales from non SMMT dealers, such as overseas dealers.

### **MOT tests**

These figures are supplied by VOSA (Vehicle Operator Services Agency) and are based on test results data entered electronically at each privately operated Vehicle Testing Station in Scotland.

### **Driving test receipts**

Figures for both driving licence theory and practical tests are obtained from the Driving Standards Agency (DSA).

### **Scottish Household Survey**

The Scottish Household Survey is a large household level survey run in Scotland. Data is collected on a range of topics including transport and travel. The survey also includes a Travel Diary component. This data is used to analyse travel patterns and choices.

### **Numbers of Blue Badges**

The Scottish Government requested details from Local Authorities on the number of badges awarded under the EU Blue Badge scheme. Blue badges are valid for up to 3 years from the date of issue. Totals (shown in Table 1.21) will include all valid badges on issue in the specified year.

The Blue Badge Improvement Service (BBIS), a central database for all blue badges on issue, was introduced on 1 January 2012. Data accuracy for the total number of blue badges on issue has improved as all blue badges are recorded on BBIS.

### **Motor Vehicle Offences**

The statistical return from which the figures on recorded motor vehicle offences in this publication are taken is a simple count of the numbers of crimes and offences, for each local authority, which the police have recorded and cleared up. Returns of

quarterly data are submitted by Police Scotland and are used to produce a national total. Data from other police forces, such as the British Transport Police, are not included. Each quarterly submission of data to the Scottish Government contains revisions (such as the re-designation of incidents found on investigation not to be criminal) back to quarter 1 of the same financial year. However, amendments which arise after the end of the year are not incorporated.

Most motor vehicle offences are discovered and recorded as a result of police activity rather than by being reported to the police by the public. Hence the numbers of such offences recorded are mainly determined by the level of enforcement or police deployment.

The figures included in the Motor vehicle offences group do not include stationary motor vehicle offences dealt with by the issue of a fixed penalty ticket. However, offences dealt with under the vehicle defect rectification scheme and offences for which the procurator fiscal offers a fixed penalty are included in the figures. In addition to this, moving traffic offences which are the subject of a police conditional offer of a fixed penalty are also included, e.g. speeding, traffic directions offences.

Certain motor vehicle offences are not always recorded in cases where police forces are unable to clear-up the offence (e.g. speeding offences where the driver is untraceable). Clear-up rates for motor vehicle offences in these circumstances are artificial. Thus, clear-up rates for the Motor vehicle offences group are not included.

The number of Vehicle Excise Licence Offences recorded decreased from 3,792 in 2017-18 to 176 in 2018-19. This was largely due to standardisation of practice across Police Scotland divisions in November 2017, whereby the Driver and Vehicle Licensing Agency (rather than the police) took primacy in dealing with these offences. There was a small increase in this crime from 2018-19 to 2019-20 (17 crimes).

## Further information

Within Scottish Transport Statistics:

- Chapter 2 – Bus and coach travel,
- Chapter 5 – Road Traffic (including congestion)
- Chapter 11 – Personal and Cross modal travel
- Chapter 13 – Environment and Emissions

Other Transport Scotland Publications:

[Transport and Travel in Scotland](#) – includes more detailed analysis of SHS data, in particular:

- Table 20 – Frequency of driving

SHS Local Authority Results, publishes as part of Transport and Travel in Scotland – provide breakdowns of SHS data by Local Authority, Regional Transport Partnership and Urban Rural Classification. In particular:

- Table 4 – Car access by Local Authority
- Table 5 – Frequency of driving by Local Authority

Further information on motor vehicle licensing statistics can be found in the DfT publications [Transport Statistics Great Britain](#), and [Vehicle Licensing Statistics](#).

Further information on motor vehicle offences recorded by the Police is available in the Scottish Government's [Criminal Proceedings in Scottish Courts](#).

[Eurostat](#) collate vehicle registration statistics for EU member states.

## User guide – Bus and Coach Travel

### Notes and definitions

#### Local bus service

One which is available to the general public, where passengers pay separate fares and travel a radial distance no greater than 15 miles (24 kms) from the point of boarding.

#### Other services

Include contract, private hire, express journeys, excursions and tours which are not registered as local services.

#### Passenger journeys (boardings)

Statistics are compiled on the basis that each boarding of a vehicle counts as one passenger journey. Therefore, each trip made by a passenger on one vehicle on one route counts as a separate journey. Return tickets therefore count as two passenger journeys. The numbers of passenger journeys using season tickets or travel passes are largely based on button presses by the driver or scaling factors applied to ticket machine data by the operator. Figures from 2004-05 include any adjustments applied by operators to allow for driver under-counting, but where this is not done no adjustment is made by DfT.

#### Vehicle kilometres

Estimates are for live (in service) mileage and exclude empty running of buses (e.g. between garage and terminus), driver instruction and vehicle testing.

#### Local bus fare indices

Information about the size of each fares change is supplied by a representative sample of around 100 operators. Indices are obtained by averaging the reported

changes using weights based on receipts from passengers (excluding concessionary fare reimbursement from local authorities). In theory, therefore, the index measures the change in the average charge to the fare-paying passenger. The implementation of free concessionary fares is, though, included once, in the quarter within which it was introduced.

### Commercial services

Those that run without direct financial support from a local transport authority. They are still eligible for central Government subsidy in the form of the Bus Service Operators Grant (BSOG) (formerly known as the fuel duty rebate) and (where applicable) for concessionary fare reimbursement.

### Subsidised services

Those considered socially necessary and run under contract to local transport authorities with some direct subsidy. They include a few services subsidised without competitive tendering, under Section 91 of the Transport Act 1985 ('de minimis' arrangements) in England and Wales or in accordance with the duty of best value in Scotland.

### Concessionary fare reimbursement

A National Concessionary Travel schemes for groups such as elderly people and disabled people was rolled out in early 2006. Prior to that local authorities ran their own schemes. Bus operators are reimbursed for revenue lost as a result of their participation in the schemes, after taking into account a portion of the income from the extra travel generated, i.e. it is supposed to be profit-neutral. Journeys made under these schemes can be found in Table 11.29. These schemes should not be confused with the reductions offered to children, for example, by many operators on commercial grounds.

### Staff employed

**Platform staff** comprise drivers, conductors and any other on-vehicle staff; **maintenance staff** include all employees engaged on cleaning, repair, service or maintenance of vehicles, while **other staff** include administrative staff. There may be some duplication of functions, particularly amongst the smaller operators.

### Walking time to nearest bus stop

The Scottish Household Survey (SHS) interviewer asks how long it would take him/her to walk to the nearest bus stop (or place where one could get a bus).

### Frequency of bus service

The SHS interviewer asks about the frequency of service at the nearest bus stop (or place one could get on a bus). If the householder says that the frequency of service varies, the interviewer asks for the week-day off-peak frequency.

### SHS urban / rural classification

The urban / rural classification shown in some tables was developed for use in analysing the results of the SHS. It is based on settlement size, and (for the less-populated areas) the estimated time that would be taken to drive to a settlement with a population of 10,000 or more. Each postcode in Scotland was classed as either

urban or non-urban, then clumps of adjacent urban postcodes, which together contained more than a certain total number of addresses, were grouped together to form settlements. Six categories were then defined:

- **Large urban areas** - settlements with populations of 125,000 or more. These are around - but not the same as - Aberdeen, Dundee, Edinburgh and Glasgow. This category may (a) include areas outwith the boundaries of these four cities, in cases where a settlement extends into a neighbouring local authority, and (b) exclude some non-urban areas within the boundaries of these four cities.
- **Other urban areas** - other settlements of population 10,000 or more.
- **Accessible small towns** - settlements of between 3,000 and 9,999 people, which are within 30 minutes' drive of a settlement of 10,000+ people.
- **Remote small towns** - settlements of between 3,000 and 9,999 people, which are *not* within 30 minutes' drive of a settlement of 10,000+ people.
- **Accessible rural areas** - settlements of fewer than 3,000 people, which are within 30 minutes' drive of a settlement of 10,000+ people.
- **Remote rural areas** - settlements of fewer than 3,000 people, which are *not* within 30 minutes' drive of a settlement of 10,000+ people.

## Sources

### DfT survey of Public Service Vehicle Operators

The basis for most of the statistics in this chapter is the annual returns which a sample of Public Service Vehicle operators makes to the Department for Transport (DfT).

The sample includes all operators who are licensed with 21 or more licence discs (which normally, but not always, equate to the number of vehicles), plus a random sample of smaller operators. Until 2010-11, the sample included both local and other operators, but from 2011-12 only local operators have been surveyed. Local operators are identified from the list of operators who receive BSOG and other sources. Sampling is stratified and based upon the size of the operator's fleet (in terms of the number of licence discs), though some operators are selected with certainty where this is necessary to ensure sufficient coverage in each geographical area.

Proxy data are generated for all local operators, and imputation is used for data which are missing either because the operator was not sampled or did not respond. Imputation is based either on previous returns from the operator or using other methods such as using other data the operator has supplied.

The figures for Scotland are primarily based on returns for operators with an address in Scotland, even though some operators may do work in England and vice versa. However, important information relating to local operators (mainly passenger boardings, vehicle kilometres and passenger receipts) is obtained at local authority

level and so these estimates will exclude data relating to England, even though other variables such as staff numbers are all allocated to just one of an operator's local authorities – the one with the highest number of passenger boardings. (NB: a large group, such as Stagecoach, is not treated as a single operator: there will be a separate statistical return for each of its subsidiary companies.)

In September 2006, DfT revised the passenger numbers for each year from 1985/86 onwards in order to adjust for driver under-recording of the numbers of passengers who did not pay cash (e.g. those using season tickets, concessionary fare passes, return halves of tickets etc). A further survey showed that the allowance was not affected by the introduction of free concessionary fares.

In October 2012, the DfT revised passenger numbers, vehicle kms and passenger revenue relating to 2004-05 onwards. Although previous figures are presented these are not strictly comparable with the later years. The methodology used by DfT means that figures back to 2004-05 are subject to minor revisions each year (for example as new data is used to improve imputation of previous year's figures) though the broad trends shown are rarely affected.

### **Scottish Government and Transport Scotland finance data**

This data is taken from Local Authority Finance returns and Transport Scotland finance records relating to grant payments and the administration of the National Concessionary Travel scheme.

In Summer 2011, Transport Scotland reviewed the Government Support for bus figures published in Bus and Coach Statistics 2011. This led to a revision of the figures to exclude support for non-bus transport. Figures have been revised back to 2006-07 when the National Concessionary Travel Scheme was introduced.

### **Transport Scotland National Concessionary Travel scheme data**

Transport Scotland is responsible for reimbursing bus operators for carrying passengers under the National Concessionary Travel scheme. The application process for an NCT pass is managed by a third party contractor but summary numbers are provided to Transport Scotland which have been used to populate the card holder numbers used in this chapter.

### **Scottish Household Survey**

The Scottish Household Survey is a large household level survey run in Scotland. Data is collected on a range of topics including transport and travel. The survey also includes a Travel Diary component. This data is used to analyse travel patterns and choices.

## **Further information**

Within Scottish Transport Statistics:

- Chapter 1 – Road vehicles,
- Chapter 5 – Road Traffic (including congestion)
- Chapter 6 – Road casualties
- Chapter 11 – Personal Travel chapter (including travel to work)

Other Transport Scotland Publications:

[Transport and Travel in Scotland](#) – includes more detailed analysis of SHS data, in particular:

- Table 4 – satisfaction with public transport
- Table 5 – concessionary pass possession
- Table 21 – Park and ride
- Table 28 – Frequency of bus and train use
- Tables 29 and 30 – Views on local buses and trains



- Tables 31 and 32 – Concessionary pass use

Scottish Household Survey Travel Diary, published as part of Transport and Travel in Scotland – includes detailed tables using the Travel Diary dataset, in particular:

- Table 2 – journeys by mode of transport
- Table 2a – journey distance by mode of transport
- Table 2b – stages by mode of transport
- Table 4a – mode of transport by journey distance
- Table 5a – distance summary statistics by mode of transport

SHS Local Authority Results, published as part of Transport and Travel in Scotland – provide breakdowns of SHS data by Local Authority, Regional Transport Partnership and Urban Rural Classification. In particular:

- Table 1 - Travel to work by mode of transport
- Table 2 - Travel to school by mode of transport
- Table 11 - Frequency of bus and train use
- Table 12 – Convenience of public transport
- Table 13 – Satisfaction with public transport
- Table 14a – Views on bus services
- Table 15 – Concessionary pass use
- Table 16 – journeys by mode of transport

The Department for Transport produces a number of related publications, including:

- [Road traffic statistics](#)
- [Vehicles statistics](#)
- [Bus statistics](#)

Other sources:

Office of the Traffic Commissioner – [Traffic Commissioners' Annual report](#)

Confederation of Passenger Transport – [Cost Index](#)

## **User guide – Road freight**

### **Notes and definitions**

#### **Origin and destination**

These refer to the origins and destinations of the trips that were recorded in the surveys. These are *not* necessarily the ultimate origins and destinations of the goods (a trip on a surveyed vehicle may represent only one stage in the journey of a consignment: goods may have been trans-shipped on a number of occasions). Individual origins and destinations are standardised by the Department for Transport to NUTS3 regions (an EU wide geography based on existing local administrative boundaries), with all published outputs based on these regions.

### **Entering Scotland and leaving Scotland**

Trips with a destination in Scotland and an origin outwith Scotland are classed as 'entering Scotland', whilst trips with an origin in Scotland and a destination outwith Scotland are classed as 'leaving Scotland' - where a trip is defined as a vehicle moving from an origin to a destination to either load and/or unload goods.

### **Remaining in Scotland**

Goods for which both the origin and the destination of the trip are within Scotland.

### **Length of haul**

Tonne kilometres moved divided by tonnes lifted. This information relates to individual vehicle trips, and not to the total distance that the goods may have travelled.

### **Goods lifted**

The total weight of goods carried, measured in tonnes.

### **Goods moved**

The weight of the goods carried multiplied by the distance hauled, measured in tonne kilometres.

### **Groupage**

When, for mixed consignments, no single commodity makes up 75% or more of the consignment weight.

### **Road Freight Intensity Index**

This indicates how the volume of road freight (measured in tonne-kilometres) has been changing relative to the Scottish economy as a whole. The road freight intensity index is an index of the ratio of (i) the index of road freight tonne-kilometres moved by UK HGVs on journeys originating in Scotland to (ii) the index of Scottish

Gross Domestic Product (measured in terms of the Gross Value Added for all industries).

### Road freight data revisions

Road freight data from 2011 to 2016 have been revised since the DfT publication *Road Freight Statistics: 2016*. Revisions on the domestic road freight series were made after a review of part of the methodology used to produce these estimates, where more information can be found [here](#). There were also slight revisions on the international road freight series after corrections were made to the number of roll-on roll-off vehicles reported, where more information can be found [here](#).

### Sources

Statistics of freight lifted and moved by road were provided by the Department for Transport, (DfT) from three sample surveys.

#### Continuing Survey of Roads Goods Transport Great Britain (CSRG T GB)

Information about domestic road freight activity by GB registered HGVs is obtained from the DfT's Continuing Survey of Roads Goods Transport Great Britain (CSRG T GB). This collects details of the journeys that were made by a sample of heavy goods vehicles (HGVs: vehicles with a gross vehicle weight (weight of vehicle plus carrying capacity) of 3.5 tonnes or more).

Each week, a stratified sample of HGVs are randomly selected from the Driver and Vehicle Licensing Authority (DVLA) licensing records. The sample is stratified by region and type and weight of vehicle, in order that the sample surveyed is representative of the population of HGVs in GB. A questionnaire is sent to each selected vehicle's registered keeper, asking for information about the vehicle, and about every trip that it made in a sample week. The sample weeks are spread evenly across the year.

The origins and destinations are reported in the survey as the names of towns, or postcodes (where known). DfT standardises these origins/destinations to NUTS3 regions (an EU wide geography based on existing local administrative boundaries) using a computerised gazetteer, and validates these origins and destinations against other metrics such as the lengths of the routes between these places. These NUTS3 regions are then aggregated to the appropriate Region or Island Area for each Scottish origin and destination. DfT did not record origins and destinations in terms of the new Council areas before 2004. Following the completion of local government reorganisation across Britain, DfT has coded to NUTS3 regions that are used to produce statistics for the European Union. There are 23 of these areas in Scotland.

The results of the survey are grossed-up to produce estimates which represent the total road freight activity during the year, by all GB registered HGVs. This is done quarterly, in two stages. First, the sample vehicles' results are grossed up to the whole HGV population using the ratio of the average number of HGVs in each

stratum (from DVLA licensing records) to the achieved sample for each stratum. The average number of HGVs in each stratum is calculated as the average of the numbers at the start and the end of the quarter). Then the results are multiplied by 13, to raise the activity in the sampled week to an estimate for the whole of the quarter.

As with any sample based statistics there will be a degree of sample error. The annual sample for Scottish vehicles is too small for detailed yearly analysis of the estimates, and so the table which shows the estimated flows of freight to and from the former Regions of Scotland was produced by combining the results from several years' surveys.

### **International Road Haulage Survey (IRHS)**

Statistics on international road freight activity are derived from DfT's International Road Haulage Survey (IRHS) which covers a sample of GB-registered heavy goods vehicles (HGVs with a gross vehicle weight (weight of vehicle plus carrying capacity) of 3.5 tonnes or more). Work by foreign-registered vehicles, and the transport of goods in unaccompanied trailers, is not within the scope of the survey. Other EU countries are responsible for monitoring the international movements of their own vehicles.

The survey covers trips using roll-on/roll-off ferries and the Channel Tunnel to serve origins and destinations located outside of the UK, where the driver accompanies the vehicle throughout the journey. Trailers, when unaccompanied on a ferry crossing, are treated as domestic traffic when hauled to or from a UK port. If the trailer is subsequently picked up by a foreign vehicle, that leg of the journey will be recorded in the statistics of the country in which the vehicle is registered. These statistics therefore exclude traffic which is carried in unaccompanied trailers, or in foreign-registered vehicles.

GB hauliers with an International Operators Licence are asked to provide details of all international trips by its HGVs across a predetermined set of sample periods. Details of each trip are required, in those cases where a vehicle starts two (or more) international trips within the specified period.

The results of the survey – combined with international legs from the CSRGT NI survey - are grossed-up to produce estimates which represent the total road international freight activity by UK-registered HGVs during the year as a whole. The results are grossed to the total number of UK HGVs leaving the country collected by the Department for Transport's Roll-on Roll-off (Ro-Ro) survey, stratified by groups of ports.

### **Continuing Survey of Roads Goods Transport Northern Ireland (CSRGT NI)**

Information about domestic **and** international road freight activity by HGVs registered in Northern Ireland is obtained from the Continuing Survey of Roads Goods Transport Northern Ireland (CSRGT NI).

Due to the unique situation in relation to Northern Ireland and the Republic of Ireland, there is a higher prevalence for HGVs in Northern Ireland to perform international work (predominantly in the Republic of Ireland). As such the CSRGT is administered through a separate survey for NI registered vehicles, which records international activity as well as domestic activity.

Results from the CSRGT NI are grossed in the same way as the CSRGT GB described above. Domestic and international journey totals are added to the CSRGT GB and the IRHS respectively to produce estimates of domestic and international activity by UK-registered vehicles.

### **Other Sources**

Gross Domestic Product: The index used is an updated version of the index of Gross Value Added for all industries, published in Table 1.1 of *Scottish Economic Statistics 2008*.

Sources for data on rail, air and water freight can be found in the relevant chapters in this publication. Rail (Chapter 7), air (Chapter 8), water (Chapter 9), and international comparisons. (Chapter 12)

## **Further information**

Within Scottish Transport Statistics, further information on freight can be found in:

- Chapter 7 – Rail,
- Chapter 8 – Aviation
- Chapter 9 – Water
- Chapter 12 – International comparisons.

The Department for Transport produces a number of related publications:

- [Maritime and shipping statistics](#)

Civil Aviation Authority:

- [UK Airlines – Annual Operating and Traffic Statistics](#)

Office of Rail and Road:

- [Freight Rail Usage and Performance](#)

# User guide – Road network

## Notes and definitions

### Trunk road network

The trunk road network is the responsibility of Scottish Ministers, and comprises all motorways and some of the main A roads (local councils are responsible for non-trunk roads). The Government's view, when it reviewed the trunk road network in 1994, was that the trunk road network should:

- provide the road user with a coherent and continuous system of routes which serve destinations of importance to industry, commerce, agriculture and tourism;
- define nationally important routes which will be developed in line with strategic national transport demands; and
- ensure that those roads which are of predominately local importance are managed locally.

On 1 April 1996, local government was reorganised, and the 32 present Councils replaced the former Regions, Districts and Island Areas. At the same time, changes were made to the trunk road network: about 580 km of former non-trunk roads became trunk roads, and over 340 km of former trunk roads ceased to be trunk roads.

### Major roads

Motorways and A roads.

### Changes in road lengths

Where there has been a change to the use of a Geographical Information System (GIS) as the basis of the road lengths figures, they may differ significantly from those for the previous year: see section 4.8.4. In 2012 the Trunk road figures were recalculated to include A road slip roads which had been excluded from the totals in previous publications. The time series has been updated to include this data resulting in an increase of 3-4% in Trunk road length and an increase in overall road length of 0.2%. The methodology for calculating the trunk road totals from the database has also changed resulting in some small changes to road lengths from those previously published.

### Operating Units

Since 2001-02, the management and maintenance of the trunk road network has been performed by 4 Operating Companies (South West, North East, South East & North West). Details of the areas covered by these Units can be found in the Annex.

### Trunk road constructed, resurfaced

Figures up to 1995/96 (which appeared in previous editions) were estimates based on the area that was treated, and an assumed standard lane width of 3.5 metres. From 1996/97 actual figures are produced from the **Transport Scotland Trunk Roads Network Management**.

### Local authority road network condition

The statutory performance indicator for the condition of the local authority road network is defined as the percentage of the road network, derived from a combination of established condition parameters measured at network level, which should be considered for maintenance treatment, i.e. have reached a condition where more detailed monitoring or investigation is required to establish if and when remedial measures are required.

In 2007-08, the indicator changed from the former Scottish SPI, which included data on longitudinal profile, rutting and texture, to the new UK Standard Road Condition Indicator (RCI), which in addition includes data on carriageway cracking and takes account of the severity of each defect and its relative importance to road users. Further information about the collection of RCI data can be found at:

<http://www.ukroadsliaisongroup.org/en/asset-condition/road-condition-information/data-collection/scanner/SCANNER-Road-Condition-Index.cfm>

Information on the condition of local authority roads is collected in the Scottish Road Maintenance Condition Survey, which is co-ordinated by the Society of Chief Officers of Transportation in Scotland (SCOTS), on behalf of Scottish Local Authorities. The survey is described briefly in section 4.9.4. As with any survey, the nature of the methods used could lead to apparent minor year-to-year variations.

Where previously, a breach of any single parameter threshold would result in a 10 m-section being classified as amber or red; from 2007/08 onwards the new RCI each defect is assigned a score, dependent on its severity and relative importance, and the summation of the individual parameter scores is used to define the section category.

In order to present its results graphically and on maps, the following colour coding has been adopted:

- Green - a score less than 40 – the road is considered to be in an acceptable condition;
- Amber - a score of 40 or greater but less than 100 - further investigation should be taken to establish if treatment is required;
- Red - a score of 100 or greater - the road has deteriorated to the point at which repairs are likely to be required to prolong its future life.

The performance indicator covers the amber and red categories, taken together. It represents the percentage of the road network for which some kind of maintenance *may* be required. It does not take account of the difference in the costs of the treatments which may be required to restore the carriageway to an acceptable standard. The indicator does not currently cover edge deterioration, although it is the intention, subject to further research, to include this.



SCOTS notes that, when examining the results for individual local authorities, it is important to remember that local road networks vary in character, carry different volumes of traffic and serve widely disparate communities. In SCOTS' view, authorities should not be judged on the absolute values of their amber or red proportions in any given year, but on their performance to improve the condition of their road networks.

## Sources

### Road lengths

Information on road lengths is mainly obtained from annual returns made to the Transport Scotland by Councils and by the trunk road management operators. (The figures for motorways are now prepared by Transport Scotland using a GIS - see section 4.8.3). These returns provide the total lengths of the roads for which the Council or trunk road management operator is responsible. The road lengths are categorised in a number of ways (e.g. by class of road, by type of road and by speed limit).

Because the returns provide only the total lengths of roads of various types (they do not provide any information about any individual roads) they can contain errors which cannot be detected, and, even in cases where an error is suspected, it may not be possible to determine how the figures should be corrected. There are a few cases of apparently unusual changes in the figures between one year and the next, which may be due to errors in the statistical returns (for example, it appears that the figures for dual carriageways may have been affected by the double-counting of some lengths of dual carriageway in some years).

Some councils now calculate their road lengths using GIS, which should reduce the number of errors in the longer term. However, changing to a GIS as the source of the statistics can cause a discontinuity in the figures. They will no longer be affected by any errors inherent in the old method of estimation. There may also be changes in the basis of the figures - for example, in the way in which the lengths of roads at roundabouts are counted. Different methods can give different results: for example, the straight-line distance across a roundabout will differ from the distance around the roundabout; or just half the distance around might be used (to represent the average distance which is travelled on the roundabout).

The effect of a change to a GIS as the source of the data can be seen using the figures for motorways for 2000, which were prepared by the then Scottish Executive using a GIS. The figures for each local authority area (which were published in Table 5.2 of *Scottish Transport Statistics no. 20 / 2001 edition*) could differ from the figures

reported by the trunk road management operators for 1999 (which were published in the previous edition), even in local authority areas where there were no changes to the motorway network between April 1999 and April 2000. The then Scottish Executive derived its figures using particular ways of counting the road lengths for (eg) slip roads and roundabouts. The precise basis of the figures which were reported for earlier years is not known.

The change to the use of a GIS was also the reason why the length of unclassified roads reported by Falkirk Council increased from 400 km in 1999 to 572 km in 2000. In such a case, it must be assumed that the figures produced by the use of the new system are more reliable than those which had been provided previously.

### **Trunk road network - residual life**

The physical condition of Motorways and trunk roads is monitored by annual condition surveys which are undertaken for Transport Scotland by specialist contractors. The surveys are designed to provide information about the structural, surface and safety condition of the road surface (which are referred to as pavements by the engineers). Road condition data is measured by a slow moving vehicle that tests the structural strength by pushing a weight onto the road and measuring how much it deflects. This is then analysed to assess how much life is left in the road pavement. A road network cannot be kept in perfect condition: there will always be some wear and tear, and it is most economic to replace a worn out carriageway at the end of its useful life. When there is no life (which is counted in the residual life <0 column in Table 4.5), the road requires close monitoring to ensure its overall condition does not deteriorate significantly before it is replaced. The data from the surveys is processed annually in a Pavement Management system so as to identify objectively performance and to target the available funds on those areas of greatest need.

The base network includes most motorways and dual carriageway trunk roads. The surveyed network also includes some single carriageway trunk roads. The surveyed network figures are on a cumulative basis – for example, the figure for 2002-03 represents the combination of the condition in 2002-03 of the roads which were surveyed in 2002-03, the condition in 2001-02 of the roads which were surveyed most recently in 2001-02, and so on. Therefore, the surveyed network figures do not represent the current position in each of the specified years: there may have been some improvement or deterioration in the condition of some of the roads since they were surveyed in earlier years. In addition, as the coverage of the surveyed network expands, it includes further roads, whose condition may differ significantly from that of the roads that were already in the surveyed network. Therefore, some of the

apparent changes in the figures between years may be due to the expansion of the surveyed network.

#### Local authority road network condition - the Scottish Road Maintenance Condition Survey

The Scottish Road Maintenance Condition Survey, which is organised by the Society of Chief Officers of Transportation in Scotland (SCOTS) on behalf of Local Authorities, is carried out by a specialist contractor using vehicles accredited annually by the TRL. TRL also undertakes quality assurance checks throughout the year. The vehicles are equipped with lasers and high resolution cameras, to collect data for processing by computer and currently record:-

- The road geometry (gradient and shape);
- Variations in the longitudinal profile (evenness of ride along the road);
- Transverse profile variance (deformation across the road );
- Wheel track rutting / deformation in the wheel path ;
- The presence of cracking within the carriageway;
- Texture (roughness of the surface of the road);
- The extent of edge deterioration (due to over-riding or lack of lateral support).

As indicated previously in section 4.7, the construction of the Scottish road performance indicator was changed in 2007-08 to the new UK Standard Road Condition Indicator (RCI), with each ten metre stretch of road being assigned to one of three categories (Green, Amber or Red) depending on the overall defect score.

The survey currently aims to cover all local authority A roads in both directions every two years, all B and C roads in both directions every four years, and a 10% sample of unclassified roads in one direction each year. In order to minimise the effect of sampling errors on the result, the RCI for unclassified roads is calculated from four years data, as agreed with Audit Scotland and is in effect a rolling four-year indicator. While the survey machines have been calibrated and shown to provide consistent results, variations can occur due to minor differences in machine settings or in the path followed by the survey vehicle (which may well be dictated by, for example, the presence of other vehicles on particular parts of the road).

The SRMCS survey started in the 2002-03 financial year, when it covered all A roads in all local authorities plus a sample of the B, C and unclassified roads in *some* local authority areas. 2003-04 was the first year for which the survey covers a sample of all road categories in all local authority areas, and is therefore the first year for which results can be produced for Scotland as a whole.

## Further information

Within Scottish Transport Statistics:

- Chapter 5 – Road traffic
- Chapter 12 – International comparisons.

The Department for Transport produces a number of related publications:

- [Road traffic statistics](#)

Eurostat:

- [Total length of motorways](#)

## User guide – Road traffic

### Notes and definitions

#### Department for Transport traffic estimates

The methods that have been used to estimate the volume of traffic on major roads (Motorways and A roads) in Scotland have changed over the years. Section 5.1 describes the method which the Department for Transport (DfT) used to produce the estimates for 1993 onwards. The method used prior to this is explained in the Road Traffic chapter of earlier versions of this publication. Estimates of the volume of traffic on minor roads (B roads, C roads and unclassified roads) in Scotland that are suitable for publication are only available from 1993. Section 5.6 describes the methods used.

Please note that the DfT traffic estimates provide only a rough indication of the likely volume of traffic on the roads in each local authority area, and that the DfT traffic estimates for individual Council areas are not National Statistics. DfT provides the estimates that it produces for individual local authority areas as being the best that it can produce from the limited amount of data available to it - rough indications of the likely volumes of traffic on roads in each Council area, for use with caution as no better estimates are available. Therefore:

- it is not possible for DfT to quantify the possible margins of error around the estimates for individual local authority areas;
- they are not classed as National Statistics;
- more detailed breakdowns of the estimates for individual Council areas are not published.

DfT's methodology for estimating traffic volumes distinguishes between Motorways, urban roads (i.e. roads, other than Motorways, which are in urban areas) and rural roads (i.e. roads, other than Motorways, which are in rural areas). It defines an urban road as a road (other than a Motorway) that lies within the boundaries of an urban area which had a population of 10,000 or more in 2001 (using the Population Census boundaries for settlements); a rural road as located in an area with a smaller

population. However, there are exceptions. DfT adjusted the urban/rural classification of stretches of major road which are on the outskirts of urban areas, in some cases where it was not possible to break them at a junction with another major or minor road. E.g. a stretch of road which is part of a trunk road bypass will usually be classified by DfT as rural (even the part of it which runs through an urban area) whereas a relatively short road between two urban areas that are close to each other will normally be classified by DfT as urban (even the stretch which is in a rural area). DfT's estimate these adjustments to have a small impact on the overall traffic estimates.

DfT's urban / rural classification of roads differs from the built-up / non-built-up classification of roads, used for the DfT traffic estimates prior to 2003. The built-up / non-built-up classification was based on speed limits, with roads with a speed limit of 40 mph or less being classed as built-up; those with a higher speed limit being non-built-up. For example, a dual carriageway with a 50 mph speed limit in an urban area is counted as an urban road on the basis of its location, but as a non-built-up road on the basis of its speed limit. In contrast, a road with a 40 mph speed limit in a small town (population under 10,000) is classed as a rural road on the basis of its location, but as a built-up road on the basis of its speed limit. While most roads in urban areas have speed limits of 40 mph or less (so are built-up), there are many roads in small towns and villages in rural areas which also have speed limits of 40 mph or less (so are also built-up). Therefore, urban / rural traffic figures are not comparable to built-up / non-built-up traffic figures: the two could differ noticeably for some local authority areas. It will not be possible to quantify this, because each set of DfT's estimates were produced using only one of the two classifications, so there is no table which cross-tabulates the traffic estimates by both urban / rural and built-up / non-built-up. Also urban boundaries tend to change slowly over time, whilst there has been a trend for more roads in rural areas to be assigned speed limits of 40 mph or less. So, a time series for traffic on urban roads may show a different trend from a time series for built-up roads.

On 1st April 1996, local government was reorganised, and the 32 present Councils replaced the former Regions, Districts and Island Areas. At the same time, changes were made to the trunk road network: some former non-trunk roads became trunk roads, and some former trunk roads ceased to be trunk roads. Section 4.3 of the 2002 edition described how this affected the traffic estimates produced by DfT's previous methodology, and caused discontinuities in the series of figures for traffic volumes on major roads. DfT's traffic estimates are no longer affected by such discontinuities, because they count major roads on the basis of their trunk road status at a recent date, rather than on the basis of their trunk road status in the year in question. As a result, there is no discontinuity in the figures between 1995 and 1996. The new estimation method which DfT introduced in 2003 also removed some other discontinuities from the figures (again, details of these were given in previous editions).

### **Traffic flows at selected sites**

The average daily traffic flows at Automated Traffic Classifier Sites are total past the point figures: traffic is counted in both directions. The estimated traffic flows are based on 7-day averages which include both weekdays and weekends. On

occasion, the ATCS counters are not in operation for enough of the month to provide a reliable estimate: in these cases, .. is used to indicate that no estimate is available.

### **Traffic on specific trunk road routes: average time lost**

Table 5.8 in previous editions of STS provided estimates of the time lost by traffic on particular routes. Due to a number of reasons including major changes to the network which would have required a substantial rework to the methodology, this table is no longer being updated.

### **Estimated consumption of petrol and diesel**

The estimates for the consumption of petrol and diesel of road traffic relate to the areas in which the vehicles travelled rather than where the fuel was purchased or the locations of the registered keepers of the vehicles.

## **Sources**

### **Method of estimating major road traffic volumes for 1993 onwards**

Estimates of traffic volumes on major roads (Motorways and A roads) in Scotland by road type, vehicle type, and area within Scotland are produced by DfT in conjunction with the Transport Scotland Trunk Road Network Management (formerly Scottish Executive Trunk Roads Network Management Division) (TRNM).

The method of estimation has two main stages. First, traffic flows (which represent the numbers of vehicles flowing past particular points in a specified period) are estimated for each of the approximately 2,100 (in 2006) individual road links on Motorway and A roads in Scotland. (A link is normally a section of road between two major intersections). The estimates of the traffic flows on these road links are then combined with information about the lengths of the links, to derive total traffic volume estimates (measured in millions of vehicle kilometres) for major roads by road type, vehicle type and Council area. The type of a road is determined by its class (Motorway or A road), by whether or not it is a trunk road (trunk roads are those roads for whose upkeep Scottish Ministers are responsible), and by whether it is in an urban area or a rural area (see Section 3.1). The steps involved in each of these stages are described in subsequent paragraphs.

The estimates of traffic flows for the individual major road links for each year are derived by a methodology which involves the use of two different types of traffic counts: link and core:

- The road link traffic counts are taken manually, for 12 hours in one day, on a rotating basis (on average about once every four years), at each of the approximately 2,100 (in 2006) road links covering nearly all of the major road network in Scotland. These counts take place in neutral weeks during late March, April, May, June, September and October (the aim is to avoid counting, for example, during school holidays, and so to obtain counts which are representative of the level of traffic on each link). Traditionally, roughly one sixth of all the road links on the major road network were counted each year in Scotland, but the proportion counted each year has risen, and was about 22% in 2005 (compared with around 30% in England and Wales). At one time, the aim was to count each Scottish site once every six years.



However, in 1999, the counting schedule was changed in order to improve the accuracy of the estimates: now, the more important links in Scotland should be counted more often, and the less important should be counted less often. Up to and including 2002, about 300 or so counts were taken each year. However, following a study of possible ways of improving the road traffic estimates for Scotland, the then Scottish Executive (SE) increased the number of counts (in 2006, there were about 480 or so per year). These 12 hours in one day counts must be scaled up to estimate the total flow of traffic for the year as a whole, and in order to reflect changes in traffic levels in the years after each count was taken. The core counters provide the information that is used in the scaling.

- The core counters are automatic traffic classifiers, which are located at selected sites on major roads through Great Britain. These operate, on the whole, continuously: 24 hours per day, throughout the year, and provide information about traffic flows classified by category of vehicle according to their length and number of axles. The locations of the core counters, taken together, cover a good cross-section of types of road. There are around 150 core sites on major roads (including motorways) in Great Britain, of which about 25 are in Scotland.

For the purpose of combining the data from the manual counts and the automatic counters, DfT allocates each road link, and each core counter, to one of 22 groupings of road type. These were based on a detailed analysis of the results from all the individual automatic counter sites, and take into account traffic flow levels, (GB) regional groupings, and the road's category, which is a combination of its class (e.g. Motorway, A road, etc) and its urban/rural classification. The groupings range from lightly-trafficked roads in holiday areas, such as Devon and Cornwall, to major roads in Central London. There are no groupings which consist solely of Scottish roads, because there are not enough core counters on roads in Scotland which are in the same category, and have similar levels of traffic flow, to form any separate Scottish groupings.

The estimated traffic flows for each major road link for the latest year are then derived by a series of calculations of which the following provides only a broad outline. The core traffic counters are used to derive two sets of factors, which are then applied to each of the 2,100 (in 2006) link counts:

- Expansion Factors for road type and vehicle type are used to scale the single day 12 hour link counts to provide estimated traffic flows for the whole year in which the counts were taken.
- Growth Factors for each road and vehicle type are used to scale estimated traffic flows in the previous year forward to the latest year, for those links which were not counted in the latest year.

DfT estimates the total traffic volume (in vehicle-kilometres) on each major road link by multiplying together the estimated traffic flow for the link and the length of the link. DfT obtains the length of each major road link, and identifies the Council(s) in which it is located, using a Geographic Information System (GIS). When a link lies completely within the area of one Council, its estimated traffic volume is counted



wholly against that Council. In a case where a link crosses a boundary between Councils, it is split (for the purposes of the calculations) at the boundary into two separate links. Similar calculations are performed for each new link: the length within the relevant local authority (which DfT obtains from the GIS) is multiplied by the average traffic flow calculated for the original link (regardless of the Council area in which the traffic count was taken - because the original link was a section of road between major intersections, the traffic flow should not vary much along its length).

DfT compared its estimates for some motorway and trunk road links with the information that was available from the volumetric automatic traffic counters which are operated on motorway and trunk road links by TRNM, the Highways Agency in England and the Welsh Assembly Government in Wales. In general, there was a much closer correlation between the two sets of data than for the estimates which DfT had made in 2002 and earlier years. DfT noted that its estimates were slightly lower, and thought that there might be a number of reasons for this (e.g. the manual counters might miss some vehicles, the fact that the DfT core counters cannot be positioned on the most congested roads, etc). DfT therefore adjusted its expansion factors in order to eliminate the apparent slight bias in its overall estimates. DfT did not attempt to make its estimate for each individual link agree exactly with the total from any volumetric counter on that link because, for example, the volumetric counters on some links did not provide information for the whole of the year.

These calculations produce estimates of traffic volumes for each road link (or part of a road link) which is within the area of each Council. The estimated traffic volume for each Council is then obtained by adding up the estimates for the relevant links (or parts of links), and the estimates for Scotland as a whole are then produced by adding up the estimates for each Council. As indicated earlier, DfT produced the figures for trunk roads by counting each major road link on the basis of its trunk road status at a recent date.

DfT's estimates of the total volume of traffic on major roads in each local authority area are based on 12 hours in one day manual counts at an average of under 10 (up to 2002: under 15 for 2003 onwards) sites on major roads per Council per year - so they are clearly not based on much data. And, because the manual traffic counts are taken on a rotating census basis, there may be several years between successive counts at a particular site: in which time, there could be large changes in the volume of traffic there. The estimates therefore provide only a broad indication of the likely volume of traffic on major roads in each Council area. DfT notes that there could be some large percentage errors in its traffic estimates for the major roads in some local authority areas. Therefore, DfT's estimates for individual Council areas are not classed as National Statistics.

### **Method used to estimate traffic on minor roads for 1993 onwards**

Estimates of traffic volumes on minor roads (B roads, C roads and unclassified roads) in Scotland by road type and vehicle type are produced by DfT in conjunction with TRNM.

The method used differs from that used for the major roads, because far fewer data are available for minor roads: up to and including 2002, only 200 or so 12 hours on

one day manual traffic counts per year were taken at Scottish minor road sites. In each of the years up to 1997, a fresh sample of sites was picked by, in effect, taking a series of random points on a map, looking within a circle with a specified radius around each point, and identifying which (if any) minor road was nearest to the selected point. The number of other minor roads within the circle was used, at a later stage, when the results were grossed-up to produce the overall traffic estimates. This method of sampling was suitable for the production of results for GB as a whole, but not for Scotland: the kinds of minor roads in the Scottish sample could vary greatly from one year to the next, and, as a result, the Scottish component of the GB estimates was not sufficiently reliable to be published in its own right.

Over the years, a list of all the minor road sites that had been chosen in this way built up, and became the basis for selecting a panel sample of minor road sites to be counted in 1998 and later years. Taking the counts at the same sites each year should produce a better estimate of the year to year percentage change in the volume of traffic on minor roads. The sample was picked from a list of all the sites at which traffic counts had been taken between 1992 and 1997. Disproportionate stratified sampling was used, with a higher sampling fraction for roads which had had a greater volume of traffic, as this should produce more accurate results than a simple random sample of minor road sites. Sites with average flows of fewer than 200 vehicles per day were excluded altogether. Some of the sites chosen for the panel for 1998 were found to be unsuitable, and were replaced by substitute sites in the panel for 1999. There was little change in the composition of the panel of sites until 2003, when, following a study of possible ways of improving the traffic estimates for Scotland, SE increased the number of minor road traffic counts in Scotland to about 320 or so per year.

As with the major road traffic counts, the minor road 12 hour traffic counts must be expanded to estimate the flows for a whole day, and a whole year. This is done using expansion factors calculated from information recorded by a set of core automatic traffic classifiers located on a sample of roughly 40 minor roads across GB, of which about 5 are in Scotland.

The data from the GB-wide core automatic traffic classifiers were used to calculate growth and expansion factors for minor roads outwith London (with separate sets of factors for urban and rural roads of each class). There are too few core classifiers in Scotland for there to be any separate Scottish groupings.

The number of manual counts per year at minor road sites across Scotland represent an average per local authority area per year of only 6-7 (up to 2002) and only 10 (2003 onwards) - clearly, too few to be the basis for reliable estimates of minor road traffic for individual local authority areas calculated solely from the data collected in each year. DfT had therefore to estimate the volume of traffic on minor roads in individual local authority areas in other ways. DfT started by producing estimates of the volume of traffic on minor roads in each local authority area in 1999 (as that is the new base year for its panel of minor road manual traffic count sites). The information base for these estimates was widened to include manual counts taken in other years by uprating them to 1999 using the growth factors produced from the core counters. DfT used different methods for B roads and for other minor roads (C roads and unclassified roads).

**B roads:** DfT looked at the location and traffic levels of all the B road manual traffic count sites, including ones counted in the past that were not included in the panel sample, identified gaps in coverage and initiated extra counts where necessary. Using its knowledge of the variation in B road traffic by type of location, and the length of B roads in each area, DfT produced estimates of B road traffic for each local authority area.

**C and unclassified roads:** Estimating traffic on other minor roads was more difficult, and had to be done in another way. First, DfT estimated the average levels of traffic flow on each type of these roads across GB (e.g. urban C roads, etc), using the information from the minor road manual counts and core counters. Second, DfT compared the average levels of traffic flow on the non-trunk A roads in each local authority area with the GB average traffic flows for such roads. Third, DfT made the assumption that an area which has non-trunk A road flows that are above the GB averages will also have minor road flows that are proportionately greater than the corresponding GB averages, and that an area whose non-trunk A road flows are below the GB averages will have proportionately lower flows on its minor roads. DfT then estimated the flows for each type of minor road in a local authority by applying to the GB average flows for each type of minor road the relevant ratios (of its non-trunk A road flows to the corresponding GB averages). The resulting estimates were multiplied by the length of minor road of each type in that local authority to give the estimated minor road traffic volumes for the area. This produced what DfT considered to be sensible results for many local authorities. However, there were some areas for which DfT felt the results were odd in relation to those for nearby areas or similar areas. For these local authority areas, DfT undertook a more detailed study. This involved looking at the minor road traffic count data for different parts of the local authority, deriving a traffic intensity value for each part, and comparing the results with the traffic intensities of other local authorities for which DfT was confident about the minor road traffic estimates, in order to produce what DfT considered to be more credible estimates for some parts of the local authority. The resulting estimates were then added together to produce totals for the local authority as a whole, and the results for all the local authorities in Scotland were then added together to produce minor road totals for each area and for Scotland as a whole.

DfT used its estimates for 1999 as the basis for the estimates for earlier years and for later years. The minor road traffic volumes for the years prior to 1999 were estimated by applying year to year change factors, which were calculated from the information produced by the panel survey. The estimates for 2000 to 2003, inclusive, were produced by applying year to year change factors which were derived from the data collected by the GB-wide core automatic traffic classifiers. The methodology was changed for the production of the estimates for 2004, when the overall percentage changes in minor road traffic volumes between 2003 and 2004 were calculated using information, from the panel survey, about the percentage changes in traffic flow levels at each of the sites for which comparable results were available from the manual counts taken in the two years. In all cases, the estimates also took account of information about changes in the length of the minor road network.

Given the assumptions that DfT has to make, and the fact that its estimates of the total volume of traffic on minor roads in each local authority area are based on 12

hours in one day manual counts at an average of 6-7 (up to 2002: about 10 for 2003 onwards) sites on minor roads per Council per year, it is clear that these estimates can only provide a broad indication of the likely volume of traffic on minor roads in each local authority area. That is why figures for individual minor road types are not published for local authority area: only the total volume of minor road traffic for each area appears in Table 5.4, with no breakdown by type of minor road within local authority. DfT notes that there could be some large percentage errors in its traffic estimates for the minor roads in some local authority areas. Therefore, DfT's estimates for individual Council areas are not classed as National Statistics.

1993 is the first year for which there are estimates of the volume of traffic on minor roads for individual local authority areas, and also is the first year for which there are estimates for Scotland as a whole. There are no reliable estimates of the total volume of minor road traffic in Scotland for 1992 or any earlier year.

### **Average time lost by traffic on specific trunk road routes**

Table 5.8 in previous editions of STS provided estimates of the time lost by traffic on particular routes. Due to a number of reasons including major changes to the network which would have required a substantial rework to the methodology, this table is no longer being updated.

### **Scottish Household Survey**

The Scottish Household Survey is a large household level survey run in Scotland. Data is collected on a range of topics including transport and travel. The survey also includes a Travel Diary component. This data is used to analyse travel patterns and choices.

### **Estimated consumption of petrol and diesel**

The figures for the petrol and diesel consumption of road traffic are estimated by AEA Energy & Environment, which was commissioned to do this by the Department of Energy and Climate Change. AEA produce the estimates using a range of data, including: (a) information from equipment, located alongside many A roads, which monitors the levels of various substances emitted by vehicles; (b) average fuel consumption factors (expressed in terms of grams of fuel per kilometre driven) for different classes of vehicles; (c) the Department for Transport's information about the traffic flows on each link of the major road network; and (d) the DfT's estimates of the total volume of road traffic on minor roads. AEA estimate the consumption of petrol and diesel separately for each type of vehicle for each Council area, producing more detailed estimates than appear in Table 5.10.

### **Further information**

Within Scottish Transport Statistics, further information can be found in:

- Chapter 1 – Road vehicles,
- Chapter 4 – Road network
- Chapter 6 – Road casualties
- Chapter 11 – Personal Travel chapter (including travel to work)

- Chapter 13 – Environment and Emissions

Other Transport Scotland Publications:

[Transport and Travel in Scotland](#) – includes more detailed analysis of SHS data, in particular:

- Table 8 – Effects of traffic congestion
- Table 5 – concessionary pass possession
- Table 21 – Park and ride
- Table 28 – Frequency of bus and train use
- Tables 29 and 30 – Views on local buses and trains
- Tables 31 and 32 – Concessionary pass use

Scottish Household Survey Travel Diary, published as part of Transport and Travel in Scotland – includes detailed tables using the Travel Diary dataset, in particular:

- Table 2 – journeys by mode of transport
- Table 2a – journey distance by mode of transport
- Table 4a – mode of transport by journey distance
- Table 5a – distance summary statistics by mode of transport

SHS Local Authority Results, published as part of Transport and Travel in Scotland – provide breakdowns of SHS data by Local Authority, Regional Transport Partnership and Urban Rural Classification. In particular:

- Table 6 – Congestion delays
- Table 16 – Proportion of journeys by mode of transport
- Table 18 – Travel day
- Table 19 and 20 – Distance travelled

The Department for Transport produces a number of related publications:

- [Road traffic statistics](#)
- [Road traffic statistics interactive website](#)
- [Vehicles statistics](#)

# User guide – Injury road accidents

## Notes and definitions

### Fatal injury

An injury which causes death fewer than 30 days after the accident;

### Fatal accident

An accident in which at least one person is fatally injured;

### Serious injury

An injury which does not cause death fewer than 30 days after the accident, and which is in one (or more) of the following categories:

- an injury for which a person is detained in hospital as an in-patient
- *or* any of the following injuries (whether or not the person is detained in hospital): fractures, concussion, internal injuries, crushings, severe cuts and lacerations, severe general shock requiring treatment
- *or* any injury causing death 30 or more days after the accident;

### Serious accident

An accident in which at least one person is seriously injured, but no-one suffers a fatal injury;

### Slight injury

An injury which is neither fatal nor serious – for example, a sprain, bruise, or cut which is not judged to be severe, or slight shock requiring roadside attention;

### Slight accident

An accident in which at least one person suffers slight injuries, but no-one is seriously injured, or fatally injured.

It follows that whether some injuries are classified as serious or as slight could depend upon hospitals' admission policies, or upon other administrative practices, and therefore changes in the numbers of injuries of these two types could result from changes in admissions policies or other administrative practices.

### Built-up roads

Accidents which occur on built-up roads are those which occur on roads which have speed limits of up to and including 40 miles per hour (ignoring temporary speed limits on roads for which the normal speed limit is over 40 mph). Therefore, an accident on a motorway in an urban area would not be counted as occurring on a built-up road, because the speed limit on the motorway is 70 mph. An accident on a stretch of motorway with a temporary speed limit of 30 mph would not be counted as occurring on a built-up road, because the normal speed limit is 70 mph.



## Children

People under 16 years old.

## Pedestrians

Includes people riding toy cycles on the footway; people pushing or pulling bicycles or other vehicles or operating pedestrian-controlled vehicles, those leading or herding animals, occupants of prams or wheelchairs, and people who alight from vehicles and are subsequently injured.

## Estimated Accident Costs

These are intended to encompass all aspects of the costs of casualties including both the human cost and the direct economic cost. The human cost covers an amount to reflect the pain, grief and suffering to the casualty, relatives and friends, and, for fatal casualties, the intrinsic loss of enjoyment of life over and above the consumption of goods and services. The economic cost covers loss of output due to injury and medical costs. The cost of an accident also includes:

1. the cost of damage to vehicles and property; and
2. the cost of police and insurance administration.

Also estimated are the number of damage only accidents (around 14 times the number of injury accidents) and their average costs.

## Sources

The statistics were compiled from returns made by Police Scotland, which cover all accidents in which a vehicle is involved that occur on roads (including footways) and result in personal injury, if they become known to the police. The vehicle need not be moving, and need not be in collision - for example, the returns include accidents involving people alighting from buses. Very few, if any, fatal accidents do not become known to the police. However, there will be non-fatal injury accidents which are not reported by the public to the police, and so are not counted in these statistics. *Reported Road Casualties Scotland* provides more information on this matter.

Damage only accidents are not included in the above definition, and so the road accident statistical returns do not cover damage only accidents. It is thought that the number of damage only accidents is about fourteen times the number of reported injury road accidents.

## Further information

Within Scottish Transport Statistics, further information can be found in:

- Chapter 1 – Road transport vehicles
- Chapter 4 – Road network
- Chapter 5 – Road traffic



Other Transport Scotland Publications:

- [Key Reported Road Casualties Scotland](#)
- [Reported Road Casualties Scotland](#)

These publications contain more detailed statistics of injury road accidents and a full description of the terms used. The figures they contain may differ slightly from those published here due to late returns and amendments made to the database in the periods between the finalisation of the statistics for the purpose of the publications.

Analysis of alternative data sources for road casualties statistics in Scotland were included in an Article 3 of Reported Road Casualties 2011. An article on undercounting of road casualties was also included.

The Department for Transport produces a number of related publications:

- [Road accident and safety statistics](#)

## User guide – Rail

### Notes and definitions

#### Ticket sail statistics

All the statistics are based on the sales of tickets, with the rail industry's central ticketing system (formerly called CAPRI - Computer Analysis of Passenger Revenue Information, now replaced and renamed LENNON - Latest Earnings Nationally Networked Over Night) being the source of most of the figures. LENNON holds information on all national rail tickets purchased in Great Britain. LENNON does not include journeys made by people without tickets, by railway staff using special passes, and by blind people under a free concessionary travel scheme. A single ticket is counted as one passenger journey, a return ticket is counted as two passenger journeys (one in each direction), and the number of journeys made by holders of season tickets is estimated from the sales of such tickets, using the standard factors for season tickets of various lengths which are adopted for the production of National Rail passenger statistics. There is multiple counting when a passenger uses more than one ticket to make a journey (e.g. a journey from A to B, and then on to C, using a separate single ticket for each of the journey stages would be counted as *two* passenger journeys)

Lennon does *not* record directly sales of certain products, including:

- some operator-specific tickets;

- some types of promotional fares (such as two for the price of one) and combined rail plus add-on tickets (e.g. covering a journey by rail and admission to an attraction).

Figures for Scotland are produced on two different bases (due to differences in the available information). In ascending order of size, they are:

- ScotRail passenger train journey stages - used for Table 7.1
- ORR passenger journeys - used for Tables 7.2 – 7.8.

### ORR Passenger journeys

These figures are produced by adding together:

- the numbers of passenger journeys made using national rail tickets - produced from LENNON information about national rail ticket sales, as described in the previous paragraph; and
- estimates of the numbers of certain types of passenger journey that are not recorded directly by LENNON, such as those which are made using some types of promotional fares, combined rail plus add-on tickets, and multi-modal travelcard type tickets, such as the SPT Zonocard.

ORR figures include estimates of zonocard trips using a slightly different basis to ScotRail estimates and therefore figures are not comparable.

### ScotRail passenger train journey stages

These figures are produced from:

- data which have been subject to the ORCATS process (Operational Research Computer Allocation of Tickets to Services). This uses the national rail ticket sales information from LENNON to allocate the revenue from a passenger's ticket to the Train Operating Companies (TOCs) which provide the services on the route or routes which were used for the passenger's journey. In the ORCATS process, *a passenger journey that would involve a change of train is counted against each of the trains that would be used in the course of that journey.*

For example, a journey made using a through single ticket from North Berwick to Carlisle would be counted twice, to reflect the fact that the passenger would use one train from North Berwick to Edinburgh, and then change at Edinburgh to another train to Carlisle. This is done in order that the revenue relating to the ticket can be allocated pro rata to the operators of the different trains used in the course of the journey. Therefore, figures in Table 7.1 represent the numbers of different trains used in the course of journeys on ScotRail services, *not* the actual numbers of journeys made (hence differs from the ORR).

- Estimates of the numbers of journeys (or parts of journeys) made using tickets (such as Zonecards) whose sales are *not* recorded directly by LENNON (some of these estimates are added after the allocation process).
- ScotRail revised its methodology to better estimate Strathclyde Zonecard journeys from 2009/10. To allow meaningful year on year comparisons to be made passenger figures from 2003/04 onwards present the impact on previously published figures. Note that Office of Rail and Road figures are compiled on a different basis and do not adjust for this.

### **Journeys originating in Scotland, and cross-border journeys**

Statistics are compiled on the basis of where each journey starts. For example, someone who used a Zonecard to travel from a suburban station to, say, Glasgow Central, and then bought a single to (say) Manchester, would be counted as making one internal (within Scotland) journey and one cross-border originating in Scotland journey.

### **Ticket types**

The following are identified:

- Full fare - e.g. first class, standard single and standard open return;
- Reduced fare - e.g. saver, supersaver, cheap day return, special promotional fares, such as two for the price of one and combined rail plus add-on tickets (see below);
- Season tickets - includes Zonecards.

### **Journeys datasets in LENNON**

LENNON contains two datasets - pre-allocation (sales) and post-allocation (earnings). Allocations are created for each ticket group, dependant on sales levels, by ORCATS (Operational Research Computer Allocation of Tickets to Services). These allocations are principally used to apportion journeys between TOCs. ORCATS is a mathematical model, which was introduced in the 1980s, which uses a similar logic to journey planning systems and identifies passenger 'opportunities to travel' from an origin station to a destination station using timetable information. An opportunity to travel may include one or more changes of train and one journey will be generated for each train used during an opportunity to travel. This will result in the number of journeys being inflated by around 5%, compared to the pre-allocation dataset which does not assign journeys between TOCs.

### **Revenue**

Includes all ticket revenue and miscellaneous charges associated with passenger travel, such as car park charges earned by the Train Operators. In the case of combined rail plus add-on tickets (e.g. a ticket which covers both a journey by rail and admission to an attraction, or a ticket which covers both a journey by rail and a bus, taxi or ferry journey from the destination station) the figures held in the database for revenue from the sales of such tickets do not indicate how much relates to the rail travel. Therefore, *all* the revenue from the sales of such tickets is counted in these statistics.

## Concessionary fares

The figures for revenue include payments made by passengers for concessionary fares, but *not* the additional payments made by local authorities and the Strathclyde Partnership for Transport to reimburse the train operator for the difference between the concessionary fare and the normal fare for the journey (because these are not recorded in the database).

## Passenger journeys by local authority

Table 7.6a and Table 7.6b are taken from the ORR National Rail Statistics Regional Usage Chapter. Table 7.6c is calculated on a similar basis and replaces versions of the table included in earlier versions of STS as the new methodology corrects the allocation of multi-trip tickets between Edinburgh and Glasgow.

## Passenger journeys, using national rail tickets, to and from particular stations

The figures in Tables 7.7 and 7.8 are produced from information about through tickets sold for journeys between different destinations, and are subject to the same points as were made in the earlier paragraph on passenger journeys made using national rail tickets. However, there are differences, because the figures in these tables aim to represent the numbers of people using each individual station (but not counting those who change trains there, unless they buy another ticket: these figures are of entries and exits to/from the national rail system, not counting interchanges). Normally, a single journey between two stations within Scotland will be counted *twice* (once against the origin station and once against the destination station) and a single journey between Scotland and England will be counted only once (against only the station in Scotland). However, when the contractor working for the Office of Rail Regulation (Now called the Office of Rail and Road - ORR) produced the figures, there were two complications, the second of which caused some journeys to be counted less than this:

- in the case of some places with more than one station, it is possible to buy a ticket which allows travel to and from any of the stations at that place. Such tickets are recorded in the database as being to/from a group station (e.g. Glasgow stations) rather than being to/from any particular station (e.g. Central or Queen Street). When the ORR's contractor produced statistics of the numbers of passengers using each station (like those in Table 7.7), it split the numbers of journeys made using tickets which specified origins/destinations as places (e.g. Glasgow) between the relevant stations. This could be based on information about services and passenger numbers for the places concerned, or could simply count them all against the major stations within the group
- it is possible to purchase national rail tickets for travel between a particular station (or place) and an SPT zone in Glasgow - the ticket allows the traveller to use *any* of the stations in that SPT zone. Such tickets are recorded in the database as being between the specified place and the SPT zone. Prior to 2008 - 09, when producing the station usage statistics, the ORR's contractor counted journeys against origins/destinations outwith Glasgow as described above. They were unable to count any origins/destinations recorded as SPT zones to specific Glasgow stations as it had no basis on which to split the

journeys made using such tickets between the stations in the zones. This resulted in an underestimation of the number of passengers using Glasgow stations (in addition to the exclusions, mentioned earlier, such as journeys made using SPT zonecards).

However, from 2008–09, ORR’s contractor has assigned the previously unknown origin/destinations. Information provided by the PTEs has been used to estimate the number of journeys made on national rail services on PTE sold tickets that are not captured in the rail industry’s LENNON system.

Station usage figures were produced on this basis for every station in Great Britain, and made available on the ORR Web site, as described in section 5. The ORR station usage data consist of separate estimates of the total numbers of people entering, exiting and interchanging at stations. The station usage information from which Table 7.7 was produced is based on ticket sales covering all National Rail stations throughout England, Scotland and Wales. (It does not include those stations that are owned by London Underground. The ticketing system does not record certain journeys made using TfL bought travelcards, TfL Freedom Passes, staff travel passes and certain other PTE specific products. However, from 2008 – 09 the data now includes estimates of journeys and revenue made on zonal products sold outside of the main ticketing database.

The calculation of station usage levels uses sales recorded in the railway ticketing system prior to their allocation to individual operators, and so does not take into account any changes of train during the course of a journey. The figures which appear in Table 7.7 are estimates of the numbers of entries and exits, and do not include the estimated numbers of people who change trains at the specified stations (unless they buy another ticket there).

### **Rail punctuality - Public Performance Measure**

The Public Performance Measure (PPM) combines punctuality and reliability into a single measure of the performance of individual trains against the planned timetable for the day, which may differ from the published timetable (e.g. due to engineering works, speed restrictions, flooding, etc).

For long-distance operators (such as GNER, Virgin CrossCountry and Virgin West Coast) the PPM is the percentage of trains arriving within *ten* minutes of timetable at the final destination; for regional operators (such as ScotRail) the PPM is the percentage arriving within *five* minutes of timetable. (The definitions differ because, in general, long-distance operators' trains run further than regional operators' trains.) The figures relate to *all* the services which are provided by the operator, so (for example) the PPM for GNER is an overall measure for all its trains, *not* just for those which run to, from or within Scotland.

Trains which complete their journey are measured for punctuality at the final destination. When a train fails to run its entire planned route, calling at all timetabled stations, it is either shown as cancelled (if it runs less than half of its planned mileage) or counted in the 20 or more minutes late band. Therefore, such a train would *not* be counted as arriving at the final destination within the number of minutes specified in the PPM.

### Passengers in excess of capacity

From 2001 to 2003, the former Strategic Rail Authority monitored overcrowding on Edinburgh commuter services across the Forth Bridge. Passengers in excess of capacity (PIXC) was calculated for weekday commuter trains which arrived in Edinburgh between 07:00 and 09:59, or which departed between 16:00 and 18:59.

PIXC was calculated as the number of passengers travelling in excess of capacity on *all* of the specified services divided by the total number of passengers travelling on those services, and expressed as a percentage. For journeys of more than 20 minutes, capacity was deemed to be the number of standard class seats on the train; for journeys of 20 minutes or fewer, there was also an allowance for standing room (which varies with the type of rolling stock - e.g. for modern sliding door stock, it was typically of the order of 35% of the number of seats).

The SRA set limits on the level of PIXC at 4.5% on one peak, and 3.0% across both peaks. However, there is no requirement to monitor passengers in excess of capacity under the current Scottish passenger rail franchise, which applies from 17 October 2004 (the date when First Group took over the operation of the ScotRail franchise) - and therefore such information is no longer collected.

### Rail passenger satisfaction: National Rail Passenger Survey

Passengers' ratings of their train journeys are shown in three groups: those which are regarded as generic; those which relate to the station; and those which relate to the journey.

The table shows the percentages who said that they were satisfied / very satisfied with each factor, or who rated it as good / very good. The difference between the percentage shown for a factor and 100% is made up of *both*

- those who said that they were dissatisfied / very dissatisfied, or who rated it poor / very poor; *and*
- those who said that they were neither satisfied nor dissatisfied, or who rated it neither good / very good nor poor / very poor.

A passenger who changes trains later in the course of a journey is asked for his/her views of the *first* station and the *first* train that was used of the journey after they were given a questionnaire. In all analyses, such a person's answers are counted against the operator of the first train.

ScotRail is classified as a regional operator by the Office of Rail and Road, therefore results for ScotRail should be compared with those for all GB regional operators that appear in the table. 'Others whose journey started in Scotland' is made up of long distance routes and these results should be compared with all GB long distance operators.

### Freight traffic

Freight traffic: the figures for 1996-97 onwards were prepared from information supplied by the rail freight companies. The numbers of tonne-kilometres in those years relate to the whole distance that the freight is carried on the companies' trains, *not* just to that part of the journey which is within Scotland.



## Origins and destinations of freight traffic

Three points should be noted about the figures which have been provided by the rail companies for 1996-97 onwards:

1. lifted within Scotland includes freight from abroad which arrives at a Scottish port (e.g. Hunterston) and is lifted from there by rail;
2. lifted outwith UK includes freight from abroad which was imported via ports in England and Wales (eg Teesside) and was then brought from there into Scotland by rail;
3. lifted within Scotland, delivered outwith UK includes freight which is delivered to a Scottish port (eg Leith) or to an English port (eg Southampton) for export

It follows that the figures in the tables for freight lifted or delivered outwith the UK cover much more than just rail traffic which goes through the Channel Tunnel.

There are no statistics available for freight lifted or delivered outwith UK in the years prior to 1996-97. In the figures that were produced for those years, traffic delivered by rail to ports for export was counted on the basis of the location of the port, and so was counted under either Scotland or elsewhere in the UK. Similarly, freight which was imported, and picked up by rail at a port, was counted on the basis of the location of the port. However, the figures that were produced for those years excluded any international freight traffic through the Channel Tunnel (for which freight services commenced in June 1994).

## Railway Accidents

The statistics are of railway incidents statutorily reported under *The Reporting of Incidents, Diseases and Dangerous Occurrences Regulations 1995 (RIDDOR)*. These regulations came into force on the 1 April 1996 and brought railway accident reporting in line with other industry accident reporting. The fatalities are classified by the former Region because those are the areas which are shown in the Rail Atlas which HM Railway Inspectorate uses to identify the locations of the fatalities. Due to an EU safety directive which came into force in 2006, railway accident statistics in table 7.19 and 7.20 have been changed from a financial year basis to a calendar year basis with effect from 2003.

## Sources

Tables 7.1, 7.2, 7.3 (ScotRail figures) and 7.4 to 7.8 were supplied by the Office of Rail and Road, which produced the numbers of passenger journeys, and the associated revenue, from information held in the LENNON database. This records the number of tickets, and the associated revenue, for journeys between every pair of railway stations in Great Britain, and other information, such as estimates (which are sent to it by ScotRail) of the numbers of rail journeys which were made by holders of SPT's multi-modal Zonocard - for further details, please see the notes and definitions in Section 3. As indicated earlier, the ORR provided revised figures for 2003-04 and earlier years for Tables 7.1, 7.2 and H1. Some of the other tables include figures for 2003-04 and earlier years which appeared in previous editions, having been supplied by the former Strategic Rail Authority, which derived them in a similar way. Table 7.6 in the 2012 publication is taken from the ORR National Rail



Statistics, regional usage chapter. *Note that the table showing travel between Local Authorities included in previous versions of STS has not been included in this publication as the methodology used to allocate journeys is being investigated. An updated version of the table will be included on the website in due course.*

The SPT figures in Table 7.17, were compiled from information provided by the Strathclyde Partnership for Transport.

The rail punctuality (Public Performance Measure) figures in Table 7.9 and 7.10 were provided by the ORR. The punctuality of trains is generally recorded using automated monitoring systems, which log performance using the signalling equipment.

The rail passenger satisfaction survey figures in Table 7.11 were provided by Transport Focus. The survey is conducted by distributing self-completion questionnaires, with reply-paid envelopes, to about 700 stations across GB, which are selected to be representative of the entire network, including about 50 stations in Scotland. A few shifts are also conducted on train. The questionnaires are distributed at different times of the day and across different days of the week. There are two survey periods per year: Spring and Autumn. The overall response rate is about 31%. The data are weighted to represent the passengers using each operator's services. Data is weighted by journey purpose, station size and by weekend/weekday. Transport Focus publishes the results of the Spring and Autumn surveys separately, but has combined them for publication here, in order to provide annual figures.

Tables 7.12 and 7.13: the figures for 1996-97 and later years were prepared from information supplied by the rail freight companies.

Tables 7.14, 7.15 and 7.16 were compiled from information supplied by Network Rail.

Tables 7.18 and 7.19: figures for these tables were previously obtained from Office of Rail and Road. We have now changed the source to the RSSB to improve consistency with other official statistics.

## Further information

Within Scottish Transport Statistics, further information can be found in:

- Chapter 11 – Personal Travel chapter (including travel to work)

Other Transport Scotland Publications:

[Transport and Travel in Scotland](#) – includes more detailed analysis of SHS data, in particular:

- Table 28 - Frequency of bus and train use
- Tables 29 and 30 - Views on local buses and trains

Scottish Household Survey Travel Diary, published as part of Transport and Travel in Scotland – includes detailed tables using the Travel Diary dataset, in particular:

- Table 2 – journeys by mode of transport
- Table 2a – journey distance by mode of transport
- Table 4a – mode of transport by journey distance
- Table 5a – distance summary statistics by mode of transport

SHS Local Authority Results, published as part of Transport and Travel in Scotland – provide breakdowns of SHS data by Local Authority, Regional Transport Partnership and Urban Rural Classification. In particular:

- Table 16 – Proportion of journeys by mode of transport

The Department for Transport produces a number of related publications:

- [National Rail Travel Survey](#)
- [Rail Statistics](#)

The Office of Rail and Road also produce a number of related publications:

- [ORR Data Portal](#)

## User guide - Aviation statistics

### Notes and definitions

#### Aircraft Movement

An aircraft take-off or landing at an airport: one arrival and one departure are counted as two movements. Air transport movements are landings or take-offs of aircraft engaged in the transport of passengers or cargo on commercial terms. All scheduled service movements, whether loaded, empty or positioning; and charter movements transporting passengers or cargo and air taxi movements are included.

#### Types of passengers

A terminal passenger is one who joins or leaves an aircraft at the reporting airport, excluding passengers carried on air taxi charter services. A passenger travelling between two reporting airports is counted twice, once at each airport. There are two types of terminal passenger: terminating passengers, who arrive or depart at the airport by a surface means of transport; and transfer passengers, who change aircraft at the airport. A transit passenger is one who arrives at and departs from a reporting airport on the same aircraft which is transiting the airport. Each transit passenger is counted once only.

## Freight

The weight of property carried out on an aircraft including, for example the weight of vehicles, excess baggage, and diplomatic bags, but excluding mail and passengers' and crews' permitted luggage. Freight carried on air taxi services and in transit through the airport on the same aircraft is excluded.

## International Services

Services to and from Scotland from places outside the UK, Isle of Man and Channel Islands.

## International and Domestic Destinations

The figures in Tables 8.2 to 8.7 are based on the origin and destination of passengers as reported to UK airport authorities by the airport handling agent. Operators are required to report in respect of each service operated, the point of uplift and discharge of each passenger. The figures may not reflect a passenger's entire air journey: the point at which a passenger disembarks from a particular service may not represent his ultimate destination. In some cases the actual point of uplift or discharge is not recorded. In such cases all passengers are allocated to the end point of the service, i.e. the aircraft's origin or ultimate destination. The figures include all passengers carried on scheduled and chartered services excluding those charter passengers carried on air taxi service and passengers carried on aircraft chartered by Government Departments. In Tables 8.3 and 8.4, international traffic figures are given for each country for which scheduled traffic was reported until and including 2004 data. In cases where charter only routes carried fewer than 5,000 passengers, the countries concerned may not appear separately in Table 8.3, and may be shown under "Other international traffic" in Table 8.4. All non-air taxi is recorded individually.

## Air punctuality statistics

These statistics cover both arrivals and departures. They relate solely to punctuality at the specified airport. For example, the information which is used about flights from Edinburgh relates only to the punctuality of their departure, so the statistics take no account of any subsequent delays before landing at, say, London. Similarly, the information which is used about arrivals at Edinburgh relates only to the time of arrival (no allowance is made for whether or not the flight departed on time from the airport of origin).

The calculations cover those flights for which information about the planned and the actual times of operation has been matched - for example, cancelled flights, and flights which are diverted to or from another airport, are excluded (the numbers of such flights are included in the figures which are given for unmatched flights).

The percentages early to 15 minutes late would probably be lower, and the average delays would probably be higher, if these statistics were calculated in the same way as the rail punctuality statistics (the latter are based on the time of arrival at the destination, and take account of cancellations).

All cargo and air taxi services are excluded.

### Unmatched actual flights

Air transport movements which actually took place at the airport, but for which no corresponding planned flight was found. There may be a number of reasons for this, such as:

- the flight was a diversion from another airport;
- the flight was a short-haul flight more than one hour before the planned time;
- the flight was planned to take place in the previous month;
- errors in, or omissions from, the records of Airport Coordination Ltd (ACL) or the airport.

### Unmatched planned flights

Flights which were reported in data supplied by ACL, but for which no corresponding air transport movement return has been found. There may be a number of reasons for this, such as:

- the flight was diverted to another airport;
- the flight was cancelled;
- the planned time was for a short-haul flight more than one hour after the flight;
- the flight took place in the following month;
- errors in, or omissions from, the records of ACL or the airport.

### Average delays

The averages relate to all flights – not just to the ones which were delayed. With effect from January 2000, flights which are early are counted as zero delay; prior to that they were counted as a negative delay. As a result, the average delays for 2000 onwards are not directly comparable with the figures for 1999 and earlier years. This accounts for the whole of the apparent increase in the averages for Glasgow for 2000: when the Civil Aviation Authority (CAA) recalculated the averages for 1999 on the current basis, it found that they would be two minutes more than when calculated on the original basis. A similar recalculation using the data for Edinburgh for 1999 suggested that the change had no effect on its averages, when these were rounded to the nearest whole minute.

### Taxi-ing time

The CAA changed its assumption for the taxi-ing time for Edinburgh airport departures from 5 minutes to 10 minutes with effect from the start of 2001. As a result, the punctuality and average delay figures for Edinburgh for 2001 onwards are not on the same basis as the figures for 2000 and earlier years. However, when the CAA recalculated the figures for Edinburgh for 2000 on the current basis, it appeared that this change did not affect the averages or the percentage early or within 15 minutes, when these were rounded to the nearest whole number.

### Route Development Fund

The Route Development Fund (RDF) formally ended on 31 May 2007 and has not been replaced. It has not proved possible to introduce a replacement route

development scheme within the constraints imposed by the European Commission. However, the Scottish Government continues to work with airlines and airport operators on the development of new international air routes which improve business connectivity, encourage inward investment and make Scotland more accessible for inbound tourism. As Table 8.16 that was included in previous publications can no longer be updated it has been removed. Versions of the table and information about the RDF can be found in previous editions including STS 2011.

### **International and domestic passengers**

A passenger is classified as domestic if his/her flight is between two points which are within the UK or the Channel Islands).

### **Business and leisure journeys**

The business category includes purposes such as meetings with customers, conferences, trade fares, armed services and airline staff, studies paid for by an employer, overseas employment, etc. The leisure category includes holidays, visiting friends or relatives, migration, culture, sport, study (not paid for by an employer), etc.

### **UK and Foreign passengers**

A passenger is classified as a UK resident if the UK is the country in which he/she has lived for most of the last twelve months.

### **Mode of transport**

The mode of surface transport that was used to arrive at the airport. In cases where the journey involved the use of more than one mode of transport, it may not be the mode used for the majority of the journey.

### **Origins and destinations of terminating passengers**

When analysing the results of the survey, the CAA used the former Regions for Scottish origins and destinations. The interviewer asks: "where did you start your journey to catch this flight?" In cases where the answer is not the person's home, the interviewer asks whether it was a transit stop - i.e. somewhere the traveller chose to break the journey to the airport (e.g. an airport hotel prior to an early morning flight, calling in on or staying with relatives, stopping somewhere to rest or for a meal, etc) - and, if it was a transit stop, asks for the proper origin of the journey.

## **Sources**

Tables 8.1 to 8.13 are compiled from information supplied by the Civil Aviation Authority (CAA).

The punctuality statistics in Tables 8.8 are prepared by the CAA with the co-operation of the airport operators and Airport Coordination Ltd (ACL). They are produced for Edinburgh, Glasgow and some other UK airports. The first year for which information is available varies from airport to airport: for example, figures for Edinburgh are only available from April 1996, so it is not possible to provide figures

for Edinburgh for 1996 as a whole, or for any earlier years. The actual times of flights' wheels on/off the runway are derived from flight air transport movement returns made by airports to the CAA. The planned times, which relate to arrival/departure from the stand, and include changes made up to 24 hours beforehand, are supplied by ACL. The CAA also uses assumptions about taxi-ing time - currently these are: arrivals - 5 minutes; departures - 10 minutes, for both Edinburgh and Glasgow.

The CAA matches the two sets of data and resolves any obvious mismatches. For example, if an airline appears to operate a series of flights significantly off slot, the CAA will substitute information from published timetables, where these are available, in place of the ACL slot. The statistics are then calculated from the information for those flights for which the data have been matched - so cancelled flights, and flights which are diverted to or from another airport, are excluded from the calculations.

Tables 8.14 to 8.16 were prepared using figures from the Civil Aviation Authority's Passenger Survey reports.

The survey only includes Scottish airports in some years: most recently 2013, and prior to that 2009. Only departing passengers are interviewed, as previous surveys found no significant differences between the characteristics of arriving and departing passengers. The information collected includes: the purpose, origin, destination and type of ticket used for the journey; the age-group, income band, job title and other details needed to determine the socio-economic group of the passenger; the number of people in the party, whether the traveller was accompanied to the airport, and whether the person has flown before; etc.

Each month's sample is weighted, using information on routes and destinations, to gross up the results to the actual level of traffic. The weighting factors therefore vary, but generally, a single survey interview will be weighted in such a way as to represent around 1,000 actual passengers.

## Further information

Within Scottish Transport Statistics:

- Chapter 3 - Freight includes comparison across freight modes.
- Chapter 11 - Personal Travel chapter includes data on visits abroad

The [Department for Transport](#) also produce aviation statistics.

The [Civil Aviation Authority](#) produce most the statistics used in this publication.



## User guide – Water transport

### Notes and definitions

#### Change in the Department for Transport's method of compiling statistics of port traffic from 2000

A new data collection system for maritime traffic was introduced with effect from 2000. As a result, some data for 2000 onwards are not directly comparable with previous years. The reason for the change was to comply with a new EC Maritime Statistics Directive (Council Directive 95/64/EC on statistical returns in respect of the carriage of goods and passengers by sea).

One of the effects of this change is that some data for 2000, principally coastwise and one-port crude oil traffic, and the inland waters penetration of such traffic, are not directly comparable with information for previous years. However, the overall totals are unaffected.

Previously, all freight information was collected from ports annually. Major ports (generally those with cargo volumes of at least 2 million tonnes a year) were asked for detailed information on weight of traffic in and out of their ports, identifying cargo categories (eg liquid bulks, dry bulks, containers, Roll-on-Roll-off etc), and whether they were foreign, coastwise or one port cargoes. Other (minor) ports were required to provide only total weight of cargo inwards and outwards.

In the new collection system, most of the detailed freight information is collected from shipping lines, operators or shipping agents, which are required to supply detailed returns of their inwards and outwards traffic at each major port for each ship, on each route. Major ports (now defined as those with at least 1 million tonnes of cargo a year) are only required to supply summary information (for use as control totals) while other (minor) ports continue to provide just the total weight of cargo inwards and outwards.

One difference between the data from 2000 and previous years affects both coastwise and one-port crude oil estimates from 2000. The new collection arrangements produce much more reliable data on origins and destinations and (when aggregated) coastwise, one-port and foreign traffic summaries. Previously, this information was estimated by ports, with varying degrees of accuracy, particularly for crude oil traffic, which means that origins and destinations for crude oil data in 1999 and earlier years are approximate only, e.g. ports or refinery operators would not necessarily have been able to tell if crude oil was shipped directly from the UK offshore installation, or piped to a land terminal such as Sullom Voe and then shipped out from the land terminal, or if it was imported from a North Sea country or another foreign crude oil producer. As a consequence, it is likely that pre-2000, coastwise crude oil estimates were overestimated and one-port traffic correspondingly underestimated. This leads to the figures for coastwise traffic lifted in Scotland falling substantially in 2000 compared with 1999.



## Ports which are part of selected major Scottish ports

### a.) Clyde Port

Port	Port Locode
Arran	GB085
Cumbræ	GB086
Port Glasgow	GBPGG
Ardrossan	GBARD
Bowling	GBBOW
Clydebank	GBCLY
Clyde	GBCYP
Dunoon	GBDNU
Faslane	GBFAS
Finnart	GBFNT
Glasgow	GBGLW
Greenock	GBGRK
Gourock	GBGUR
Hunterston	GBHST
Rothesay	GBRAY
Renfrew	GBREN
Largs	GBLGS
Tarbert	GBTAB
Wemyss Bay	GBWMB

### b.) Forth

Port	Port Locode
Leith	GBLEI
Rosyth	GBROY
Kirkcaldy	GBKKD
Hound Point	GBHPT
Methil	GBMTH
Granton	GBGRN
Grangemouth	GBGRG
Forth	GBFOR
Edinburgh	GBEDI
Burntisland	GBBTL
Braefoot Bay	GBBFB

### c.) Orkney

Port	Port Locode
Eday	GBEOI
Rousay	GB170
Egilsay	GB175
Wyre	GB176
Shapinsay	GB226
St Margarets Hope	GB232
Burray Pier	GB234
Graemsay	GBGAE
Flotta Terminal	GBFLH
Sanday	GBNDY
North Ronaldsay	GBNRO
Papa Westray	GBPPW
Orkney	GBKWL
Scapa Flow	GBSFW
Stromness	GBSNS
Stronsay	GBSOY
Shapinsay	GBSPY
Tingwall	GBTWL
Longhope	GBLHP
Lyness	GBLYS
Westray	GBWRY

Lerwick is all ports on Shetland except for Scalloway and Sullom Voe, and Port Askaig is all ports on Islay.

### Coastwise traffic

Traffic between ports of the United Kingdom, excluding traffic between a UK port and either the sea bed or an off-shore installation. It should be noted that Table 9.1(a) covers only freight lifted in Scotland, and therefore its figures for coastwise traffic exclude cargoes arriving from other UK ports; Table 9.1(b) covers freight discharged in Scotland, so includes cargoes arriving from other UK ports (including those elsewhere in Scotland).

### One port traffic

Traffic between the sea bed or an offshore installation and a UK port. For example, it includes traffic to and from offshore installations, materials shipped for dumping at sea, and dredged sand and gravel etc landed at a port for commercial purposes. The disappearance of the sea dumped traffic is due to the end of sewage dumping at sea. It should be noted that Table 9.1(a) covers only freight lifted in Scotland: Table 9.1(b) contains figures for the one port traffic arriving from offshore installations and any incoming sea dredged aggregates. The reason for the increase in one-port oil

traffic is due to increased number of crude oil shipments into Sullom Voe and Flotta, particularly from the newer Atlantic fields west of the Shetlands, Schiehallion and Foinaven.

### **Domestic traffic**

In the statistics of traffic through the ports, domestic traffic comprises coastwise traffic plus one port traffic.

### **Foreign traffic**

Traffic between ports in the United Kingdom and other countries.

### **Inland waterways**

In general, waterways bounded by the furthest point downstream which is fewer than both 3 km wide at low tide and 5 km wide at high tide (spring). However, this definition is not applied strictly: for example, the definition is relaxed, where necessary, in order not to count, as inland waterway traffic, short-haul shipping movements of foreign and coastwise traffic, such as all sea-going traffic to or from major seaboard ports.

### **Inland waters traffic**

Subdivides into coastwise, one port and foreign (in each case, that part of the traffic that is carried upstream of the inland waters boundary, excluding short haul inland movements of sea-going traffic) and internal (i.e. not sea-going) traffic. All passenger and passenger vehicle ferry services are excluded, such as crossing movements (e.g. Gourock-Dunoon) and coastwise ferries entering sheltered waters (e.g. Loch Ryan, on services between Stranraer or Cairnryan and Northern Ireland).

### **Tonne-kilometres**

Where part of a voyage is on an inland waters and part is at sea, account is taken of the inland waterway boundary, so that, in the case of traffic involving inland ports, there is no double-counting of tonne-kilometres between the figures for inland waters and the figures for coastwise, one port and foreign traffic. (This is in contrast to the double-counting of some of the figures for tonnage - for example, if a voyage to another UK port starts on a Scottish inland waterway in Scotland, the tonnage would be counted in the figures for both inland waters and coastwise traffic.)

### **Container and roll-on traffic**

Includes all traffic carried on special container and roll-on vessels, as well as the container traffic carried on conventional services.

Main Freight Units comprise containers, road goods vehicles, unaccompanied trailers, rail wagons, shipborne port to port trailers and shipborne barges only.

### **Ferry Routes within Scotland**

**The Scottish Government subsidises the principal operators of the Clyde and Hebrides ferry services (operated by CalMac Ferries Ltd), the Gourock – Dunoon passenger ferry service (operated by Argyll Ferries Ltd) and the**

**Northern Isles (Orkney and Shetland) ferry services (operated by Serco NorthLink Ferries and Shetland Line 1984 Ltd).** The companies providing most of the services, CalMac Ferries Ltd and Argyll Ferries Ltd, are part of the David MacBrayne Limited group. **The following Local Authorities fund a number of ferry services: Orkney Islands Council, Shetland Islands Council, Highland Council and Argyll & Bute Council.** Other services are privately operated.

### Road Equivalent Tariff (RET)

The Road Equivalent Tariff (RET) scheme involves setting ferry fares on the basis of the cost of travelling an equivalent distance by road - Ministers have announced the Scottish Government's intention to:

- continue RET as a permanent feature on the Western Isles, Coll and Tiree for passengers and cars, including small commercial vehicles and coaches
- replace RET for larger commercial vehicles on the Western Isles, Coll and Tiree, with an enhanced pre-RET discount scheme
- roll out a further RET pilot for passenger and cars including small commercial vehicles and coaches to Colonsay, Islay and Gigha from October 2012
- roll out a further RET pilot for passenger and cars including small commercial vehicles and coaches to Arran from October 2014
- roll out RET to other West Coast and Clyde islands within the term of this Parliament.

RET was introduced in the following routes in 2008: Oban-Castlebay-Lochboisdale; Oban-Coll/Tiree; Oban-Coll/Tiree/Castlebay; Uig-Tarbert-Lochmaddy; and Ullapool-Stornaway. RET was introduced to the following routes in 2012: Kennacraig-Islay, Kennacraig- Islay/Colonsay/Oban; Oban-Colonsay; and Tayinloan-Gigha.

### Persons assisted

Coastguard statistics relating to persons given assistance do not include people who are rescued.

### Sources

Most of this data is supplied by the Department for Transport (DfT). The Scottish Government obtains shipping service information from Caledonian MacBrayne, Western Ferries, Northlink Ferries, Orkney Ferries, Shetland Island Council and some of the other operators of shipping and ferry services.

### Waterborne Freight Lifted in Scotland (Table 9.1)

Statistics of waterborne freight (coastwise traffic, one port traffic and inland waters traffic) are compiled by MDS-Transmodal Ltd under contract to the Department for Transport.

A number of data sources are used to determine the level of *coastwise* traffic, including the tonnage of goods reported in the port traffic statistics, (see below) and other surveys, and information about vessel movements. (The vessel movement data include the Northern Ireland, Orkney and Shetland ferry services, but exclude

ferries operated by Caledonian MacBrayne and others in and around the Western Isles.) The pattern of coastwise shipping flows, by port and commodity group, is represented by origin and destination matrices, and combined with Admiralty information about the distances between ports. Where appropriate, account is taken of the inland waters boundary, so that there is no double-counting of tonne-kilometres between inland waters and coastwise shipping, in the case of traffic involving inland ports. The method which is used to derive the statistics of coastwise shipping involves some adjustments and reclassifications. As a result, the totals that it produces do not match the port traffic statistics for reasons which are described in the DfT Statistical Bulletin *Waterborne Freight in the United Kingdom*.

The principal sources for the statistics of *one-port* traffic are the port statistics (see section 9.16 below) and information about the distances between the ports and the at sea origins and destinations of the traffic, such as offshore installations and dumping grounds.

The sources of the *inland waterway* statistics are described below.

### **Traffic at Scottish Ports (Tables 9.2 to 9.9)**

A new system for collecting detailed port traffic statistics was introduced in 2000 to comply with the requirements of an EC Maritime Statistics Directive. Annual traffic returns are made by shipping lines or their agents and port authorities. This information has been used to derive data on coastal and one-port traffic, and on the inland waters penetration of such traffic. From 1 January 2000, shipping lines or their agents are required to supply detailed statistics of foreign, coastwise and one-port traffic for all cargoes loaded or unloaded at major UK ports. Major ports are now defined as those ports with cargo volumes of at least one million tonnes in the previous year, plus a few smaller ports. The major ports handled 97 per cent of total port traffic in 2000. In addition, port authorities at the major ports are required to supply inwards and outwards control totals for each cargo category. For all other ports, the port authorities are required to supply just two figures: total inwards and total outwards traffic. The lack of detailed statistics for these minor ports means that a degree of approximation is required in the statistics for their traffic. For more details about the new data collection system, see DfT's publication '*Maritime Statistics*'

For 1999 and earlier years, the port traffic statistics were produced, for the most part, from the records made by each port authority of the dues levied on goods passing through the port (supplemented, in some cases, by figures supplied by others).

From 1995 to 1999, the smaller ports (then defined as, generally, those with fewer than 2 million tonnes of traffic per year) were not required to supply detailed statistics - they provided only two figures, their inwards and outwards traffic. Full details of freight traffic were collected only for those ports with at least 2 million tonnes of cargo in the previous year (and for a few ports with less traffic): these were called the 'major' ports. In the 1995 and 1996 surveys, there were seven 'major' ports in Scotland: Aberdeen, Clyde, Cromarty Firth, Forth, Glensanda (on Loch Linnhe, south-west of Fort William, which exports crushed granite, which is classified in the statistics as crude minerals), Orkney, and Sullom Voe. In the 1997 and 1998 surveys, there were eight: these seven plus Cairnryan, which was counted as a

major port because its 1996 return of its inwards and outwards totals had shown that its traffic exceeded 2 million tonnes in 1996. In 1999 the number of 'major' ports increased from eight to nine, since total traffic at Peterhead had exceeded 2 million tonnes in 1998. In 2000, with the introduction of the new definition of a major port (at least 1 million tonnes), Stranraer and Dundee became major ports, bringing the total in Scotland to 11.

### **Inland Waterways (Tables 9.10 and 9.11)**

Statistics for internal traffic (ie traffic which is wholly within inland waters) are collected directly by DfT's contractor, MDS-Transmodal, from all known operators using personal interviews and postal questionnaires, supplemented by statistics from British Waterways collected primarily for toll levying purposes. Some information is also drawn from Maritime Statistics Directive returns where traffic is classified as internal movements and these traffic movements are then excluded from other traffic estimates to avoid duplication. For traffic moving to and from the open sea, the figures for inland waterway tonne-kilometres are calculated using information about the distances from each inland waterway boundary to the ports and wharves which are upstream of the boundary.

### **Shipping Services (Tables 9.12 to 9.17)**

Transport Scotland obtains shipping service information from DfT (in respect of the services between Scotland and Northern Ireland, the Rosyth/Zeebrugge and Lerwick/Europe routes). Transport Scotland writes directly to Caledonian MacBrayne, Western Ferries, Northlink Ferries, Orkney Ferries, Shetland Island Council and the other major ferry operators in Scotland for the required information.

### **HM Coastguard Statistics (Table 9.18)**

Statistics on search and rescue operations are obtained from the Maritime and Coastguard Agency.

## **Further information**

Within Scottish Transport Statistics, further information can be found in:

- Chapter 3 – Road freight,
- Chapter 13 – International Comparisons (including water freight)

Other Transport Scotland Publications:

A relatively small number of ferry journeys compared to other modes means little data is available from the SHS.

The Department for Transport produces a number of related publications:

- [Maritime and Shipping statistics](#)

Transport Scotland:

[Scottish Ferry Services: Ferries Plan \(2013-2022\)](#)

## User guide – Finance

### Notes and definitions

Following local government reorganisation on 1 April 1996, the management and maintenance of motorways and other trunk roads was sub-divided into 8 operating units. These applied for the years from 1996-97 to 2000-01 inclusive. New arrangements were introduced with effect from 2001-02 which resulted in 4 Operating Companies maintaining the trunk road network. The introduction of 3<sup>rd</sup> Generation Contracts for Trunk Road Maintenance in April 2006 and 2007 means there are now 3 Operating Companies. Details of the areas covered by each of these companies can be found in the Annex.

#### Local authority trading services

Those services of a commercial nature which are, or could be, substantially financed by charges made to recipients of the services.

In a few cases, negative figures are shown in the net expenditure tables. This is due to income/receipts exceeding the expenditure in a particular category.

#### Retail Prices Index

Rail fares are 5 parts per 1,000 (or 0.5%) of the Retail Prices Index. Bus and coach fares are also 5 parts per 1,000 (or 0.5%). 'Motoring costs' accounts for 14.6% of the Retail Prices Index. This breaks down into:

- 6.2% Purchase of vehicles (CHBK)
- 2.2% Maintenance of motor vehicles (DOCT)
- 3.8% Petrol and Oil (DOCU)
- 2.4% Tax and Insurance.(DOCV)

Car parking charges are included under 'Maintenance of motor vehicles'.

#### Resource Accounting and Budgeting (also known as Accruals)

Under resource accounting income is shown when it is earned, and costs are shown when they are incurred, the timing of the cash movement is irrelevant. The costs of a capital asset are spread ('depreciated') evenly over its useful life. A capital charge was also made against the value of capital assets until 2009-10.

#### Cash Accounting

Income is shown when money is received, and costs are shown when payment is made. All receipts and payments made in a financial year are included in the cash accounts for that period. The whole cost of a capital asset is recorded when it is bought.

### Sources



Table 10.1 (upper half) - *Building a Better Scotland: Spending Proposals 2003-2006* and Scotland's *Budget Documents 2006-07: Budget (Scotland) (No.3) Bill Supporting Document*

Tables 10.1 (lower), 10.3 to 10.5 - from returns by Councils and boards to the Scottish Government

Tables 10.2 - Transport Scotland Trunk Roads Network Management.

Tables 10.6 - The Department of Energy and Climate Change.

Table 10.7 – [Consumer Price Indices](#), Table 42.

Table 10.8 – [Family Spending in the UK](#)

## Further information

Office for National Statistics:

- [Public spending](#)

# User guide – Personal and crossmodal travel

## Notes and definitions

### Annual net household income

This is the *net* income (i.e. after taxation and other deductions) which is brought into the household by the highest income householder and/or his/her spouse or partner, if there is one. It includes any contributions to the household finances made by other members of the household (e.g. dig money). In the case of households for which any of the main components of income were not known (for example, because of refusal to answer a question), the SHS contractors imputed the missing amounts, using information that was obtained from other households that appeared similar.

### SHS urban / rural classification

The urban / rural classification shown in some tables was developed for use in analysing the results of the SHS. It is based on settlement size, and (for the less-populated areas) the estimated time that would be taken to drive to a settlement with a population of 10,000 or more. Each postcode in Scotland was classed as either urban or non-urban, then clumps of adjacent urban postcodes, which together contained more than a certain total number of addresses, were grouped together to form settlements. Six categories were then defined:

- **Large urban areas** - settlements with populations of 125,000 or more. These are around - but not the same as - Aberdeen, Dundee, Edinburgh and Glasgow. This category may (a) include areas outwith the boundaries of these four cities, in cases where a settlement extends into a neighbouring local authority, and (b) exclude some non-urban areas within the boundaries of these four cities.



- **Other urban areas** - other settlements of population 10,000 or more.
- **Accessible small towns** - settlements of between 3,000 and 9,999 people, which are within 30 minutes' drive of a settlement of 10,000+ people.
- **Remote small towns** - settlements of between 3,000 and 9,999 people, which are *not* within 30 minutes' drive of a settlement of 10,000+ people.
- **Accessible rural areas** - settlements of fewer than 3,000 people, which are within 30 minutes' drive of a settlement of 10,000+ people.
- **Remote rural areas** - settlements of fewer than 3,000 people, which are *not* within 30 minutes' drive of a settlement of 10,000+ people.

### Full driving licence and frequency of driving

The SHS asks whether the person currently holds a full driving licence (car or motorcycle). For those who are said to hold a licence, the SHS asks how often the person drives nowadays. The interviewer records whichever of the categories shown in the table is the most appropriate, in the light of the answer. Prior to April 2003, these questions were asked of the head of the household, or his or her spouse/partner, about each adult member of the household. Since April 2003, these questions have been asked of a randomly-selected adult member of the household about themselves. Hence, results for previous years may not be entirely comparable with results for 2003 onwards.

### Frequency of walking

The SHS asks on how many of the last seven days the person made a trip of more than quarter of a mile by foot. The interviewer asks about walking for the purpose of going somewhere, such as work, shopping or to visit friends. The interviewer then asks about walking just for the pleasure of walking or to keep fit or to walk the dog.

### Frequency of cycling

The SHS asks on how many of the last seven days the person made a trip of more than quarter of a mile by bicycle. The interviewer asks about cycling for the purpose of going somewhere, such as work, shopping or to visit friends. The interviewer then asks about cycling just for the pleasure or to keep fit.

### Sampling variability

As with the NTS, the SHS is a sample survey so results will be subject to sampling variability. More information including a look up table to calculate confidence intervals can be found in the background section of the Transport and Travel in Scotland or SHS: Travel Diary publications.

### International Passenger Survey

The International Passenger Survey is designed to be representative of all people travelling in and out of the UK in terms of: the usage of air, sea and tunnel; UK residents going abroad and foreign residents coming to the UK; different types of traveller (e.g. holiday, business, etc); and travel to and from different parts of the world. However, it is not designed to produce results which are representative for different regions of residence within the UK. While the survey's procedures should not lead to any major bias in the estimates for Scottish residents, the sample-based

nature of the survey may result in their being over-represented in the survey in some years, and under-represented in other years.

### Visits abroad

The figures include all tourists who make trips which last no more than a year, those travelling to Eire have been included in the IPS since 1999.

### Miscellaneous and other purposes

Includes visits for study, to attend sporting events, for shopping, health, religious or other purposes, and multi-purpose visits for which no one purpose predominates.

### Area visited

In cases where two or more countries are visited, a person is counted on the basis of the one country in which he or she stayed for the longest time.

### Inter-zonal trips made on an average weekday - the Transport Model for Scotland (TMfS)

These are the estimated annual average numbers of trips made per weekday between or within the areas shown, using the specified modes of transport (for example, they do not include trips made by foot, by bicycle, or by motorcycle). The figures represent the estimated total flows over the whole 24 hours of an average weekday. A return journey, from A to B and back again, on the same day, would be counted as two trips: one from A to B and one from B to A.

The figures are estimates of the numbers of inter-zonal trips - i.e. trips which cross the boundary of at least one of the zones used in the Transport Model for Scotland (TMfS). The zones used in the model are constructed by amalgamating Population Census output areas. The model's zones vary in size from area to area, depending on factors such as the size and density of the population and the nature of the transport network that the model must represent. As a result, there is no simple definition of a zone. Some Council areas have many zones (e.g. there are 180 in Edinburgh, and 239 in Glasgow); others have only a few (e.g. there are 10 in East Lothian, 11 in Midlothian and 21 in West Lothian). It follows that a trip of a particular length will be more likely to be counted as an inter-zonal trip if it is in (say) Edinburgh than if it is in (say) East Lothian.

**Person trips** relate to the number of people travelling by the specified modes of transport, and vehicle trips to the numbers of vehicles going between the specified areas. Thus, for example, if a car containing two people goes from A to B, it is counted as two person trips and one vehicle trip.

The areas identified in the table are sectors within TMfS. These correspond broadly (but not necessarily exactly) to the Strategic Development Planning areas or current Councils. Some of these sectors do not contain many TMfS zones - for example, the Borders sector contains 11 zones, and the Perth & Kinross sector contains 23 zones. All else being equal, the larger the zones are within a sector, the smaller the proportion of the trips within the sector that will be treated as inter-zonal trips - and, hence, the smaller the proportion that will be represented within the model.

**Elsewhere in Scotland** refers to those parts of Scotland not identified in other sectors: broadly, Argyll & Bute, Eilean Siar, Highland, Moray, Orkney Islands, and Shetland Islands.

The estimated average number of trips originating in an area usually differs from the estimated number with a destination in that area - for example, compare the estimates of 111,000 person trips with a destination in Dumfries & Galloway and 112,000 trips originating in Dumfries and Galloway. This is because the estimation process (which is described in section 11.8) is mainly based upon survey data covering the 7 a.m. to 7 p.m. period, and cannot take full account of trips which involve returning later in the evening. Therefore, the TMfS-based estimates indicate broadly the levels of flows within Scotland, but do not provide precise measures.

The model's estimates of the number of cross-border trips by bus and train may not be particularly reliable, because of the way that they are produced.

## Sources

**Scottish Household Survey - Frequencies of driving, walking and cycling; and usual main methods of travel to school and travel to work (Tables 11.10 to 11.13 and 11.17 to 11.19 and 11.21 to 11.23)**

Information on these and some other transport-related topics is collected by the Scottish Household Survey, which started in February 1999. The SHS collects information on a wide range of topics, to allow exploration of the relationships between different sets of variables. Interviewing takes place throughout the year.

The SHS is a survey of private households. For the purposes of the survey, a household is defined as one person or a group of people living in accommodation as their only or main residence and either sharing at least one meal a day or sharing the living accommodation. A student's term-time address is taken as his/her main residence, in order that he/she is counted where he/she lives for most of the year. The sample was drawn from the Small User file of the Postcode Address File (PAF) which does not include many nurses' homes, student halls of residence, hostels for the homeless, other communal establishments, mobile homes, and sites for travelling people.

Each year, SHS interviews are conducted with a randomly-chosen sample of (on average) over 15,000 households across Scotland. Within each Council area, the sample is stratified using a geo-demographic indicator in order that it will be representative across that Council's area. A higher sampling fraction is used in the areas of the Councils with the smallest populations, in order that (in each two-year period) there is a minimum of 550 household interviews per Council. The results are then reweighted so that they will be representative of Scotland as a whole.

The SHS interview is conducted in two parts. The first part is with the highest income householder, or his/her spouse/partner (if any), who answers questions about the household and its members. This provides household members' age and gender, and the annual net household income. Prior to April 2003, it included questions about the type of driving licence (if any) held by each adult member of the household, and the frequency of driving. Main method of travel to school was also

collected (for one randomly-chosen schoolchild member of the household). As the information is collected for one schoolchild per household, proportionately greater weight is given to cases with greater numbers of schoolchildren in the household.

The second part of the SHS aims to obtain results which are representative of Scottish adults by interviewing a randomly-chosen adult (aged 16+) member of the household (who may happen to be the person who answered the questions in the first part of the interview - for example, this is always the case for single pensioner households). This part has fewer respondents as not all randomly-chosen adults are available. Information on the frequency of walking, place of work, usual method of travel to work etc are collected. Questions are also asked about journeys made on the previous day (the Travel Diary). These include the start and end times of each stage of the journey, the mode of transport used, the purpose of the journey, and experiences of congestion. As one adult is interviewed per household, proportionately greater weight is given to cases with greater numbers of adults in the household. For the Travel Diary questions, further weighting is given according to the day of the week and the economic status of the adult.

Although the SHS's sample is chosen at random, respondents will not necessarily be a representative cross-section of the people of Scotland. E.g. the sample could include disproportionate numbers of certain types of people, in which case the survey's results would be affected. In general, the smaller the sample from which an estimate is produced, the greater the likelihood that the estimate could be misleading. SHS publications (see sections 11.10 and 11.11) provide examples of the 95% confidence limits for estimates of a range of percentages calculated from sub-samples of a range of sizes.

The above information relates only to sampling variability. The survey's results could also be affected by non-contact / non-response bias: the characteristics of the (roughly) one-third of households who should have been in the survey but who could not be contacted, or who refused to take part, could differ markedly from those of the people who were interviewed. If that is the case, the SHS's results will not be representative of the whole population. Without knowing the true values (for the population as a whole) of some quantities, one cannot be sure about the extent of any such biases in the SHS. However, comparison of SHS results with information from other sources suggests that they are broadly representative of the overall Scottish population, and therefore that any non-contact or non-response biases are not large overall. Of course, such biases could be more significant for certain sub-groups of the population. In addition, because it is a survey of private households, the SHS does not cover some sections of the population - for example, it does not collect information about many students in halls of residence. The SHS technical reports provide more information on these matters.

### **Travel to work (Tables 11.14 to 11.16)**

The information about the usual means of travel to work and the time taken to travel to the usual place of work shown in tables 11.14 and 11.15 is obtained from the Labour Force Survey using questions which have been included in those survey interviews which have been conducted in the Autumn each year since 1992. The tables include the self-employed, those on Government training schemes and unpaid family workers as well as employees, but exclude those working at home, and those

whose workplace or mode of transport to work was not known. The LFS is a household survey covering 60,000 households each quarter in GB, and about 6,000 households per quarter in Scotland.

Scotland's Census took place on Sunday 27 March 2011 with the chief purpose of providing an accurate population count as well as collecting data on key characteristics of individuals in Scotland, including their travel to work. Some individuals are missed in the Census, and this under-counting does not usually occur uniformly across all geographical areas or across other sub-groups (for example, by age and sex) of the population.

To fill the gap, the National Records for Scotland (NRS) implemented a coverage assessment process to estimate the population that was missed, also identifying and adjusting for the people who were counted more than once or who were counted in the wrong place. Carrying out this work allowed a census estimate of the entire population to be obtained.

The methods were largely based on those developed by the Office for National Statistics (ONS). The ONS systems were also implemented although adapted as necessary to cope with Scotland specific data. ONS have produced a full suite of methodology papers detailing the statistical theory and practical application of the methodology. They can be found here: <http://www.ons.gov.uk/ons/guide-method/census/2011/census-data/2011-census-user-guide/quality-and-methods/methods/coverage-assessment-and-adjustment-methods/index.html>

It was not always practical or appropriate to replicate exactly what was done for the rest of the UK due to differences in fieldwork processes, data capture and processing and also the availability of comparator data sources. The ONS documentation should be read bearing in mind there were small differences between Scotland and the rest of the UK.

Table 11.16 provides some Census of Population information about travel to work. Information about travel to work has been collected in population censuses since 1966. There have been some changes in the categories used – for example, the 1966 Census had a category described as none which was included in the 1971 Census under its On foot and none category; the 1971 Census had a category described as Public Transport which was separate from the categories for Train and Bus; and the 1966 and 1971 Census travel to work figures did not identify separately those who were working at home, so they are included in the figures for those years. However, the effect of such differences on the statistics will be small compared to the scale of the changes in the shares of the main modes of travel .

Information about travel to work is also collected by the SHS, which is the source for tables 11.17 and 11.18.

### **Hands Up Scotland Survey (Table 11.23a)**

Established in 2008, the Hands Up Scotland Survey is the largest national dataset to look at travel to school across Scotland. The project is funded by Transport Scotland and is a joint survey between Sustrans and Scottish local authorities.



Schools across Scotland complete the survey by asking their pupils 'How do you normally travel to school?' The responses are then sent to local authority officers who collate the data and return it to Sustrans' Research and Monitoring Unit for overall collation, analysis and reporting.

A Parliamentary Order was passed designating Sustrans as Official Statistics Providers in the production of Hands Up Scotland on 1st June 2012. Sustrans is currently looking to acquire National Statistics status for the survey.

### **International Passenger Survey - Scottish residents' visits abroad (Tables 11.24 to 11.26)**

This information is collected by the International Passenger Survey (IPS), from a sample of passengers returning to the UK by the principal air, sea and tunnel routes (excluding some routes which are too small in volume or which are too expensive to be covered). Travellers passing through passport control during the day are randomly selected for interview (interviewing is suspended at night). A weighting procedure takes account of the non-sampled routes and time periods. For example, the figures for certain airports are uplifted to take account of the passenger numbers at the other UK airports which are not covered by the survey. Prior to 2005, Edinburgh and Glasgow were the only Scottish airports at which interviewing took place. Prestwick airport was added to the survey in 2005 and Aberdeen has been collected since 2009. These are uplifted to take account of the non sampled airports. Rosyth was included in quarters 2, 3 and 4 of 2007 and quarters 2 & 3 of 2008.

The figures in the tables are based on interviews with Scottish residents who returned to the UK. This is the Office for National Statistics' standard practice for producing such estimates, as it can then also analyse other information that is collected in the interviews (such as the amount that people say that they spent while on holiday).

The survey covers both adults and children, and is voluntary - for example, the response rate was 80% in 2003, and the results reported in these tables for that year are based upon interviews with about 2,000 Scottish residents.

The IPS data used in the tables are adjusted to take account of the fact that not all people respond to questions regarding area of residence. This means that tables produced by area of residence will not always exactly match other published data regarding trips abroad by UK residents.

### **Transport Model for Scotland - Trips made on an average weekday (Table 11.27)**

These figures were provided using the Transport Model for Scotland 2012. This model covers the Scottish Strategic Mainland Transport Network, and also includes representation of travel patterns between Scotland and England.

The area covered by the model is divided into 720 zones. The model uses planning data for each zone (e.g. population, number of households, car ownership, employment, number of employed residents) to calculate the number of trips that would be expected to be generated. It also uses information collected by traffic counts, roadside interviews and surveys of passengers on public transport. The information collected and used to develop the model started in 2002 and continued

through to 2012, which is the base year. TMfS also uses information from other sources, such as 'donor' models (such as the Strathclyde Integrated Transport Model), the 2001 Census of Population and the Scottish Household Survey (which has been conducted continuously since February 1999). Data collected in other years were factored to represent the base year. The quality and coverage of the data that are held within the TMfS vary between different areas and different parts of the transport network. This is the result of the historical interest in the movement of people and goods between various points on the transport network, and the resultant availability of data. However, the base information used to develop TMfS12 is more robust and comprehensive than that used in former versions of the national model.

The pattern of travel movements is held in a series of trip matrices covering the morning peak period, the evening peak period and the intervening off-peak period. Taken together, these matrices can be combined to provide a matrix reflecting trip movements during the period 7 a.m. to 7 p.m. on a typical weekday. Daily, monthly and annual averages can then be derived by grossing-up these figures using time series data sources. The resulting expected flows around the transport network are then calibrated and validated for each modelled time period using information about the actual numbers of trips that were made on particular routes.

Applying the calibration and validation process to the expected numbers of generated trips calculated by the model produces estimates of the numbers of trips which are consistent with the observed traffic counts and the results of surveys and interviews. The estimated numbers of trips for the areas shown in the table were then produced by aggregating the estimated numbers of trips for the relevant zones.

The model's estimates of the numbers of people travelling by bus and train across the border with England are less reliable because it uses its standard set of public transport factors to gross up the cross-border passenger numbers obtained (e.g.) from surveys and passenger counts which were carried out at certain times on certain days. Because local bus services account for the vast majority of public transport in Scotland, the model's standard public transport grossing-up factors mainly reflect the pattern of local bus passenger usage - so applying these factors to the data for cross-border bus and train traffic may not take proper account of the different patterns of such traffic.

### **Passenger journeys made under concessionary fare schemes (Table 11.29)**

The figures for the Strathclyde Concessionary Travel scheme were supplied by Strathclyde Partnership for Transport (SPT); the figures for other schemes were collected from Transport Scotland (national schemes) and from local authorities using the Local Financial Returns form LFR5.

The National Concessionary Travel bus scheme was introduced on 1st April 2006, which allows elderly and disabled free travel on all scheduled bus services in Scotland. This is administered by Transport Scotland and replaced any local bus schemes. The Young People's Concessionary bus Travel Scheme started in 8 January 2007, aimed at 16 to 18 year olds (inclusive) and full time volunteers (aged under 26).



Local authorities were asked to provide numbers of passenger journeys on the same basis as the expenditure on concessionary fares that they report in the LFR5. This relates to concessionary fares for elderly people, for people with visual or other disabilities, and for children (but exclude school transport).

SPT was able to provide passenger numbers from its records for the Strathclyde Concessionary Travel scheme for several years; figures for the passenger numbers for other schemes are only available for 2000-01 onwards because that was the first year for which that information was requested from local authorities using the LFR forms.

## Further information

Within Scottish Transport Statistics:

- Chapter 1 – Road vehicles,
- Chapter 5 – Road Traffic (including congestion)
- Chapter 12 – International comparisons

Other Transport Scotland Publications:

[Transport and Travel in Scotland](#) – includes more detailed analysis of SHS data, in particular:

- Table 11 – car sharing
- Table 16 and 17 – Reasons for choice of travel to school mode
- Table 18a – bicycle access
- Table 21 – Park and ride
- Table 28 – Frequency of bus and train use
- Tables 31 and 32 – Concessionary pass use

Scottish Household Survey Travel Diary, published as part of Transport and Travel in Scotland – includes detailed tables using the Travel Diary dataset, in particular:

Table 2 – journeys by mode of transport

- Table 2a&b – journey and stage distance by mode of transport
- Table 3 – Purpose of travel
- Table 4a & 5a – mode of transport by journey distance

SHS Local Authority Results, published as part of Transport and Travel in Scotland – provide breakdowns of SHS data by Local Authority, Regional Transport Partnership and Urban Rural Classification. In particular:

- Table 2 – journeys by mode of transport
- Table 2a&b – journey and stage distance by mode of transport
- Table 3 – Purpose of travel
- Table 4a & 5a – mode of transport by journey distance

## User guide – International comparisons

### Notes and definitions

#### Scotland, UK & GB

In general, notes on and definitions of the figures for Scotland (and, by implication, the figures on the same basis for the UK or GB as a whole) appear in the relevant chapters. Therefore, this section covers only matters which are not dealt with there.

#### Population, area and population density:

The population figures for GB and UK are mid-2019 estimates (NB: the EU publication's figures are for 1 January 2019) based on Office for National Statistics release (published in June 2020), available at <https://bit.ly/2KXOxkd> Scottish figures are taken directly from the General Registry Office of Scotland.

Areas figures relate to 2008 (no year is specified for the EU publication's figures) taken from Table 1.1 of the 2010 edition of the Annual Abstract of Statistics. Population densities were calculated by the Scottish Government using these area estimates.

#### Motorways

The figures for Scotland and for GB are for 2018 (the same year as most of the EU figures). They were taken from Table RDL0201 of DfT's road lengths statistics publication. The DfT's figure for Scotland was used in this table. As explained in paragraph 5.5 below the methodology used by DfT means that the figure for the length of motorways in Scotland (excluding slip roads) differs slightly from Table 12.5.1).

#### All roads

The figures for Scotland and for GB relate to 2018 (the same year as most of the EU figures), taken from Table RDL0201 of DfT's road lengths statistics. The DfT's figure for Scotland was used in this table which differs from the road length figure in Table 4.1, due to the DfT using a Geographical Information System (GIS) and Ordnance Survey data to produce estimates. Whereas (as explained in the notes to Chapter 4), most of the figures in Table 4.1 are produced from annual returns made by local authorities.

Some countries (Bulgaria, Denmark, Germany, Italy, Luxembourg, Portugal and Romania) did not have information for 'other roads' in the latest EU publication.

Therefore the total road length figure for all countries excludes 'other roads'. In the case of Scotland and the UK, 'Unclassified roads' have been excluded.

### **Railways**

The figures are for the route length at the end of the financial year 2018/19 (the EU figures are for 2018). The figure for Scotland is from Table 7.14 of this publication; the GB figure was taken from Table TSGB0601 of TSGB 2019.

### **Passenger cars**

Passenger cars figures for Scotland and GB are for 2018 (most EU figures are for 2018). They are taken from Table TSGB0903 of DfT's Transport Statistics Great Britain 2019 edition.

### **Powered two wheelers**

The figures for Scotland and GB are for 2018 (the same year as most of the EU figures). They are taken from Table TSGB0903 of DfT's Transport Statistics Great Britain 2019 edition, which includes figures for motorcycles, scooters and mopeds and based on numbers of vehicles licensed at 31st December. The EU publication's figure (for the UK) is lower than the DfT figure for GB due to different methodologies. EU figures are based on national sources and definitions may vary.

### **Goods vehicles**

The figures for Scotland and GB are for 2018 (the same year as most of the EU figures). The Scottish figure is taken from Table 1.2 of this publication, and the GB figure is taken from Table TSGB0903 of DfT's Transport Statistics Great Britain 2019 edition. They are the totals of the figures for the body types light goods and goods (the latter being heavy goods vehicles). The result of using the body type figures is slightly different from that which would have been obtained had taxation group figures been used.

### **New registrations of passenger cars**

The GB and Scotland figures are for new registrations of all vehicles and are for 2019 (the same year as most of the EU figures). They are taken from Table VEH0152 of DfT's Vehicle Licensing Statistics.

### **Passenger transport - distance travelled and modal shares**

The figures for Scotland and GB are for the two year period 2011/2012 (the EU figures are for 2018). Following the increase in its sample size with effect from 2002, the National Travel Survey can provide some figures for a single year for Scotland, but figures for the two year period should be less susceptible to sampling fluctuations. The figures for Scotland are taken from STS 2013 Table 11.2 and converted from miles into kilometres. The GB figures for 2011/2012 were calculated by simply averaging the figures from 2011 and 2012 for each relevant mode of transport shown in Table NTS0305 of DfT's National Travel Survey: 2012 bulletin, and converting the result from miles into kilometres.

The NTS figures relate to the mode of travel, not to the main mode that is used in some other analyses of NTS figures and use detailed mode breakdowns of NTS results as opposed to aggregate groupings. Also passenger cars category consists

of car only - driver, car only - passenger and taxi / minicab; the buses and coaches category covers private hire bus, bus in London, local bus and non-local bus; and the tram / metro category relates only to the London Underground (the Glasgow Underground is not identified in the results of the NTS).

The NTS average for the total distance travelled per person in GB (covering all modes of transport) is 6,826 miles, or 10,985 kilometres in 2011/12. For the modes of transport shown in the table (which excludes, for example, air and ferry) the NTS average is 10,556 kilometres. This difference between the UK and GB figures arises because the two sets of figures are on different bases:

- the NTS figures relate only to personal travel within GB, and are produced from the results of a survey of households across GB;
- the EU publication's figures have been derived by dividing estimates of the total volume of travel (passenger-kilometres) within the country by the total population of the country.
- The kinds of travel which would be counted using the latter approach (but not by the NTS) include
  - travel within GB by foreign tourists and other non-residents;
  - travel for business purposes (e.g. to and from meetings);
  - and, possibly, some travel in the course of their work by the likes of lorry drivers, postmen and bus drivers.

Therefore, estimates produced using the latter approach will be greater than the NTS estimates, which cover only personal travel by residents.

There are no official estimates of the total passenger-kilometres travelled within Scotland: the only Scottish estimates of the average distance travelled per head of population are NTS ones, which cover only personal travel by residents.

Although the two methods produce markedly different average distances, they produce quite similar modal shares - e.g. the modal share for passenger cars is: NTS – 82.3%; shown in EU Energy and Transport in Figures – 85.6% (NB: in both cases, the modal shares are calculated excluding powered two-wheelers, walking and cycling, for consistency with the figures in the relevant table of the EU publication). Therefore, the modal shares for Scotland, calculated from the NTS results, should be comparable to the modal shares for the EU countries.

### **International air passengers (traffic between EU countries)**

The figures for Scotland and the UK are both for 2017 (the same year as the EU figures). The Scottish figure is taken from the Total EU countries in Table 8.3(a) of this publication. It is the number of passengers to and from the EU-28 countries for the main Scottish international airports (Aberdeen, Edinburgh, Glasgow and Glasgow Prestwick). The table shows figures for 21 of the EU member states: these are the countries for which the international air passenger route analysis table on the Civil Aviation Authority's Web site (from which the figures for Table 8.3(a) were obtained) shows passengers to/from Scottish airports (for example, the CAA table does not show any passengers between, say, Luxembourg and any Scottish airport

in 2005). These figures will underestimate slightly the total number of international passengers between Scotland and EU countries because they do not include (a) passengers on charter only routes in cases where fewer than 5,000 passengers were carried between an airport and a particular country, nor (b) any passengers to and from EU countries at other airports in Scotland. The UK figure is taken from Table AVI0105 of DfT's Aviation Statistics publication, using the figures for EU-28.

### Road fatalities

The figures for Scotland and GB are both for 2018 (as are most of the EU figures). The Scottish figure is taken from Table 2 of Reported Road Casualties Scotland 2018, and the GB figure is taken from Table RAS30003 of Reported Road Casualties Great Britain 2018.

### Freight transport - modal shares

Both Scotland and GB relate to 2018 (as do the EU figures). The Scottish figures are derived from the tonne-kilometre figures for each mode of transport which appear in Table H2(b) of this publication. The GB figures are derived from the tonne-kilometre figures for each mode of transport which appear in Table TSGB0403 of TSGB 2019.

The figures for Scotland are based on the tonnage of goods lifted in Scotland and the distance on which they are carried on that journey, be it within Scotland or from Scotland to (say) England. For example, the tonne-kilometres for goods taken from Edinburgh to London would be calculated using the full distance between Edinburgh and London (over 660 kilometres) not just the distance between Edinburgh and the border (under 160 kilometres). Therefore, the figures do not represent the modal shares for freight transport within Scotland: they include tonne-kilometres outwith Scotland on journeys which started in Scotland, and they exclude tonne-kilometres within Scotland on journeys which started elsewhere.

## Sources

Most EU country statistics originate from the [EU Transport in Figures](#), produced annually by the EC Directorate General for Energy and Transport with the assistance of Eurostat. The publication contains a range of detailed statistics and only a summary is presented in this chapter.

## Further information

Eurostat:

- [Transport statistics](#)

United Nations Economic Commission for Europe:

- [Transport statistics](#)

World Health Organization:

- [Road traffic injuries](#)

## User guide – Environment

### Notes and definitions

#### Pollutants

The atmospheric pollutants listed in Table 13.1 have been selected because they are considered to be a threat to human health, and transport is understood to be a significant contributor to emissions of these pollutants. The Air Quality Strategy for England, Scotland, Wales and Northern Ireland contains air quality objectives for nine pollutants (benzene, carbon monoxide, lead, nitrogen dioxide, ozone, particulates (PM<sub>10</sub> and PM<sub>2.5</sub>), sulphur dioxide, 1,3-butadiene and polycyclic aromatic hydrocarbons (PAHs)). The objectives are policy targets expressed as a maximum ambient concentration to be achieved, either without exception or with a permitted number of exceedances, within a specified timescale. The table below sets out the agreed air quality objectives (for pollutants which transport is understood to contribute to significantly). PM<sub>10</sub> are small particulates less than 10 microns in diameter while PM<sub>2.5</sub> are less than 2.5 microns in diameter.

#### Air Quality Objectives for Scotland

Pollutant	Objective		Date to be achieved by
	Concentration	Measured as:	
Benzene	3.25µg/m <sup>3</sup>	running annual mean	31 Dec 2010
Nitrogen dioxide <sup>2</sup>	40µg/m <sup>3</sup>	annual mean	31 Dec 2005
	200µg/m <sup>3</sup>	hourly mean not to be exceeded more than 18 times a year	31 Dec 2005
Particles (PM <sub>10</sub> ) <sup>3</sup>	40µg/m <sup>3</sup>	annual mean	31 Dec 2004
	50µg/m <sup>3</sup>	24-hour mean not to be exceeded more than 35 times a year	31 Dec 2004



	18µg/m <sup>3</sup> 50µg/m <sup>3</sup>	annual mean 24-hour mean not to be exceeded more than 7 times a year	31 Dec 2010 31 Dec 2010
Particles (PM <sub>2.5</sub> )	10µg/m <sup>3</sup>	annual mean	2020
Ozone	100µg/m <sup>3</sup>	daily maximum (measured as an 8 hour running mean) not to be exceeded more than 10 times a year	31 Dec 2005

### Carbon Account for Transport

The Carbon Account for Transport (CAT) is published on an annual cycle and contains:

- Scotland’s annual transport emissions from 1990 to 2017;
- emissions efficiency estimates across different modes of transport;
- emissions efficiency of road vehicles registered in Scotland;
- comparison of Scotland’s emissions to those of the UK as a whole;
- key leading transport emissions indicators.

The Climate Change (Scotland) Act 2009 requires Scottish Ministers to lay a report in Parliament setting out their proposals and policies for meeting annual emissions reduction targets. The Climate Change Plan, published February 2018, is the Scottish Government’s third report on proposals and policies for meeting its climate change targets. It sets out how Scotland can deliver its target of 66% emissions reductions, relative to the baseline, for the period 2018–2032. In April 2019 the First Minister acknowledged that Scotland – like the rest of the world – faces a Climate Emergency and confirmed that the Scottish Government would accept the recommendations of the UK Committee on Climate Change to set a target of net zero greenhouse gas emissions by 2045 with interim reduction targets of 70% by 2030 and 90% by 2040. The Scottish Government has committed to updating the Climate Change Plan within six months of the Climate Change Bill receiving Royal Assent so that it reflects the more ambitious targets being established.

While the UK emissions return to the UN does not include emissions from international aviation and shipping (IAS), the Climate Change Scotland Act 2009 explicitly includes this category of emissions in its calculation of total Scottish emissions and the required reduction in emissions to fulfil the terms of the Act.

International aviation and shipping emissions are shown in the national emissions Inventory as an additional, outside scope, item.

### **Ultra Low Emission Vehicles (ULEV)**

An ULEV emits extremely low levels of carbon dioxide (CO<sub>2</sub>) compared to conventional vehicles fuelled by petrol/diesel. They typically also have much lower or virtually nil emissions of air pollutants and lower noise levels. Since 2009, the Office for Low Emission Vehicles has considered ULEVs as new cars or vans that emit less than 75 grams of CO<sub>2</sub> from the tailpipe per kilometre driven, based on the current European type approval test.

### **Plug in Grant**

Since January 2011, UK motorists purchasing a qualifying ultra-low emission car have been able to receive a grant of 25% towards the cost of the vehicle, up to a maximum of £5,000. The Plug-in Car Grant has been designed to help make the whole-life costs of a qualifying car more comparable with petrol or diesel equivalents. The terms of this scheme were modified in early 2016.<sup>1</sup>

## **Sources**

### **Pollutants and air quality objectives**

The information on air pollutant emissions is taken from the publication [Air Quality Pollutant Inventories for England, Scotland, Wales and Northern Ireland: 2005 – 2019](#), published in September 2021 on the National Atmospheric Emissions Inventory website. Emissions estimates are modelled and revisions may be made to the time series each year where revised figures are available. The most recent report provided revisions from 2005 only. Emissions for 1990-2004 have therefore not been revised and are taken from the previous report [Air Quality Pollutant Inventories for England, Scotland, Wales and Northern Ireland: 1990 – 2018](#) published in October 2020. The year 2005 is now used as the point of reference in response to the new national emission reduction commitments (ERCs) which are applicable from 2020 and 2030 onwards for SO<sub>2</sub>, NO<sub>x</sub>, NMVOC, NH<sub>3</sub>, and PM<sub>2.5</sub> to cut the health impact attributed to air pollution by approximately half when compared to 2005.

<sup>2</sup> A sensitive parameter in the emission calculations for petrol cars is the assumption made about the proportion of the fleet with catalyst systems that have failed, for example due to mechanical damage or failure of the lambda sensor. Following discussions with DfT, it is assumed that the failure rate is 5% per annum for all Euro standards, and that up to 2008 only 20% of failed catalysts were rectified properly, but those that were rectified were done so within a year of failing. The revisions are based on evidence on fitting of replacement catalysts. According to DfT there is evidence that a high proportion of replacement catalysts were not Type Approved and do not restore the emission performance of the vehicle to its original level (DfT 2009). This is being addressed through the Regulations Controlling Sale and Installation of Replacement Catalytic Converters and Particle Filters for Light Duty Vehicles (LDVs) for Euro 3 (or above) LDVs after June 2009. Therefore a change in the repair rate is taken into account for

---

<sup>1</sup> [Revised terms of Plug-in-Grant scheme](#)

Euro 3 and above petrol LDVs from mid-2009, assuming all failed vehicles are rectified properly.

The methodology for estimating emissions from shipping was revised in the *Air Quality Pollutant Inventories for England, Scotland, Wales and Northern Ireland: 1990-2016* ([http://naei.beis.gov.uk/reports/reports?report\\_id=970](http://naei.beis.gov.uk/reports/reports?report_id=970)). Full details of the revision are given in the report. As a result of the revision there has been a large apparent increase in emissions from shipping compared with the previous inventory which particularly affects the NOx figures. The percentage of NOx emissions allocated to transport in 2015 increased from 45% in the 2017 inventory to 53% in the 2018 inventory.

In the inventory *Air Quality Pollutant Inventories for England, Scotland, Wales and Northern Ireland: 1990-2017* ([https://naei.beis.gov.uk/reports/reports?report\\_id=996](https://naei.beis.gov.uk/reports/reports?report_id=996)) there was a major revision to the emission factor for gas oil combustion on locomotive trains for all years after 1998. Additional revisions are due to minor refinements to the shipping methodology which now produces uses pollutant-specific techniques to disaggregate UK emissions, but this is minor compared to changes to the emissions for Railways.

In the inventory *Air Quality Pollutant Inventories for England, Scotland, Wales and Northern Ireland: 1990-2018* ([https://naei.beis.gov.uk/reports/reports?report\\_id=1010](https://naei.beis.gov.uk/reports/reports?report_id=1010)), emission and fuel consumption factors for different train classes have been revised based on newly available data, leading to a reduction in emissions for NFR code 1A3c (Railways: intercity, regional and freight).

Detailed information on all sites in the Scotland Air Quality Database are available from the data section of the “Air Quality in Scotland” website (<http://www.scottishairquality.co.uk>) and the [Scottish Air Quality Database – Annual Report 2020](#). The air quality objectives are taken from *The Air Quality Strategy for England, Scotland, Wales and Northern Ireland: Addendum*. Summary statistics for all sites are available from the “Scottish Environment Statistics Online” website (<http://www.gov.scot/seso/Datasets.aspx?TID=2>). Please note that this website is no longer being updated as of 30 September 2017.

### **Emissions of greenhouse gases from transport allocated to Scotland**

The majority of the Scottish emissions tables shown here are based on emissions estimates reported in *Greenhouse Gas Inventories for England, Scotland, Wales & Northern Ireland 1990-2017*, compiled by Aether/Ricardo-AEA under contract to the Department for Business, Energy and Industrial Strategy, the Scottish Government, the Welsh Government and the Northern Ireland Department of Environment. Data from other sources, such as Scottish Transport Statistics, are also presented in the report. In this inventory:

In line with the methodology used to report against the Climate Change (Scotland) Act 2009, emissions from transport only include those at the point of use, also known as tailpipe emissions. Lifestyle and displaced emissions, such as emissions from generating the electricity to power electric trains, are not included. The all sources figures given in Table 13.2 take account of removals of carbon dioxide as a result of Land Use, Land Use Change and Forestry (LULUCF).

The way in which emissions are allocated to the different countries within the UK are described in the *Greenhouse Gas Inventories* report. In summary, the bases of the different estimates are:

- *road transport* - the estimated volume of traffic on the roads within each country. The estimates for carbon dioxide are constrained so that the total for the four countries agrees with the internationally-reported overall total for the UK as a whole (which was calculated from the total volume of fuel sold within the UK);
- *railways* - emissions from railway locomotives in Great Britain are disaggregated based on diesel oil consumption data for passenger services and National Atmospheric Emissions Inventory (NAEI) estimates for freight services. In addition, emissions associated with the use of coal for steam locomotives are also included within the calculations. The data used in the 2006 inventory was reported for each railway company, whose area of operation can in most cases be allocated to one of the four constituent countries;
- *civil aviation* - estimates of emissions from domestic aviation are calculated based on aircraft movement data from the UK's major airports. The total number of domestic flights from each of the devolved administration areas has been calculated, and based on this, a fraction of the total UK emission has been allocated to each constituent country. This approach is also used to allocate emissions from aircraft support vehicles;
- *national navigation* - the disaggregation of emissions from navigation and coastal shipping has been derived in a similar way to the approach used for aviation, based on port movements in each constituent country.

Road transport carbon dioxide (CO<sub>2</sub>) emissions are estimated using vehicle kilometre data constrained so the sum of the UK areas equate to the total for the UK inventory (where that total is derived from fuel sales data of petrol and DERV within the UK as specified in the reporting guidelines of the Intergovernmental Panel on Climate Change). A criticism of this method is that the presentation of results does not always provide a CO<sub>2</sub> emission trend that is directly consistent with the vehicle kilometre trend data, as the fluctuations in UK fuel data have a more significant impact on the resultant emission trends. As an alternative, road transport CO<sub>2</sub> emissions from the constituent countries of the UK may be estimated solely by vehicle kilometre data unconstrained to the UK total derived from fuel consumption data.

The difference in results between the constrained and unconstrained methods at Devolved Administration level largely reflects the difference in the results at UK level between bottom-up calculated fuel consumption using vehicle km data and fuel consumption factors and the fuel sales data in the Digest of UK Energy Statistics (DUKES). The reason for a disparity has previously been attributed to cross-border fuel sales ("fuel tourism") although model uncertainty was always emphasised as an additional, and probably a major explanation for the differences.

Any change in the methodologies or the factors used to calculate fuel consumption will affect the magnitude of the difference between calculated fuel consumption at

national level and sales figures from DUKES and so, in turn, it will affect the disparity between the Devolved Administration CO<sub>2</sub> emissions from the constrained and unconstrained approaches.

### **Carbon dioxide emissions per passenger-kilometre**

The figures are taken from the new [Greenhouse Gas Conversion Factor Repository](#) created for Defra.

Figures are consistent with the factors used in the compilation of the UK's National Atmospheric Emissions Inventory (NAEI) and in the Greenhouse Gas Emissions Inventory compiled for Scotland and other constituent countries in the UK by Ricardo - AEA.

Figures within the repository are estimated using data for GB/UK as a whole and so do not relate specifically to Scotland. There are no estimates of emissions per passenger-kilometre for Scotland alone. The basis of each estimate is as follows:

### **Road Transport**

The factors used are estimated values for the average petrol and diesel car fleet travelling on average trips in the UK. This has been divided by an average car occupancy rate of 1.50 passengers to calculate average emissions per passenger kilometre.

## Rail

The national rail estimate refers to an average emission factor for diesel, electric and steam trains. The light rail and tram factors are based on an average of the annual electricity consumption and passenger kilometre data provided by network operators, and a CO<sub>2</sub> emission factor for electricity generation on the national grid from the UK Greenhouse Gas Inventory.

## Air

The emission factor is an aggregate representation of typical CO<sub>2</sub> emissions from illustrative types of aircraft for the three types of air services – domestic, short haul and long haul. Broadly speaking the definition of domestic flights, are those within the UK, short-haul are those within Europe and long-haul are outside of Europe. In keeping with evidence from the IPCC, a 8% uplift factor has been applied to allow for sub-optimal routing and stacking at airports during periods of heavy congestion.

## Vehicle Licensing data

Data used in tables 13.6 to 13.10 is provided by the Department for Transport Vehicle Licensing team. More information can be found in Chapter 1 of STS or on the DfT website.

## Further information

Within Scottish Transport Statistics, further information can be found in:

- Chapter 1 – Road transport vehicles
- Chapter 5 – Road Traffic

Other Transport Scotland Publications:

[Transport and Travel in Scotland](#) – includes more detailed analysis of SHS data, in particular:

- Table 2 – Fuel costs
- Table 7 – Mode of transport for travel to work
- Table 11 – Car sharing
- Table 18b – Car Access
- Table 20 – Frequency of driving
- Table 28 – Frequency of train use

Scottish Household Survey Travel Diary, published as part of Transport and Travel in Scotland – includes detailed tables using the Travel Diary dataset, in particular:

- Table 2 – journeys by mode of transport
- Table 2a – journey distance by mode of transport



- Table 4a – mode of transport by journey distance
- Table 5a – distance summary statistics by mode of transport

SHS Local Authority Results, published as part of Transport and Travel in Scotland – provide breakdowns of SHS data by Local Authority, Regional Transport Partnership and Urban Rural Classification. In particular:

- Table 1 – Travel to work by mode of transport
- Table 2 – Travel to school by mode of transport
- Table 16 – Journeys by mode of transport

The Department for Transport produces a number of related publications:

- [Road traffic statistics](#)
- [Vehicles statistics](#)

Department of Business, Energy & Industrial Strategy:

- [Digest of UK Energy Statistics \(DUKES\)](#)

Scottish Government:

- [Environment statistics](#)

Transport Scotland:

- [Carbon Account for Transport](#)



**TRANSPORT  
SCOTLAND**

CÒMHDHAIL ALBA

© Crown copyright 2023

You may re-use this information (excluding logos and images) free of charge in any format or medium, under the terms of the Open Government Licence. To view this licence, visit <http://www.nationalarchives.gov.uk/doc/open-government-licence> or e-mail: [psi@nationalarchives.gsi.gov.uk](mailto:psi@nationalarchives.gsi.gov.uk)

Where we have identified any third party copyright information you will need to obtain permission from the copyright holders concerned.

Further copies of this document are available, on request, in audio and visual formats and in community languages. Any enquiries regarding this document / publication should be sent to us at [info@transport.gov.scot](mailto:info@transport.gov.scot)

This document is also available on the Transport Scotland website: [www.transport.gov.scot](http://www.transport.gov.scot)

Published by Transport Scotland, March 2023

Follow us:

 [transcotland](https://www.facebook.com/transcotland)

 [@transcotland](https://twitter.com/transcotland)

**[transport.gov.scot](http://transport.gov.scot)**