



Department for Transport

Connectivity travel time indicators: England, 2013 (experimental)

About this release

Connectivity statistics are an experimental series of small area statistics for England, which have been developed to aid the study of transport access to economically significant destinations - in the first instance transport hubs.

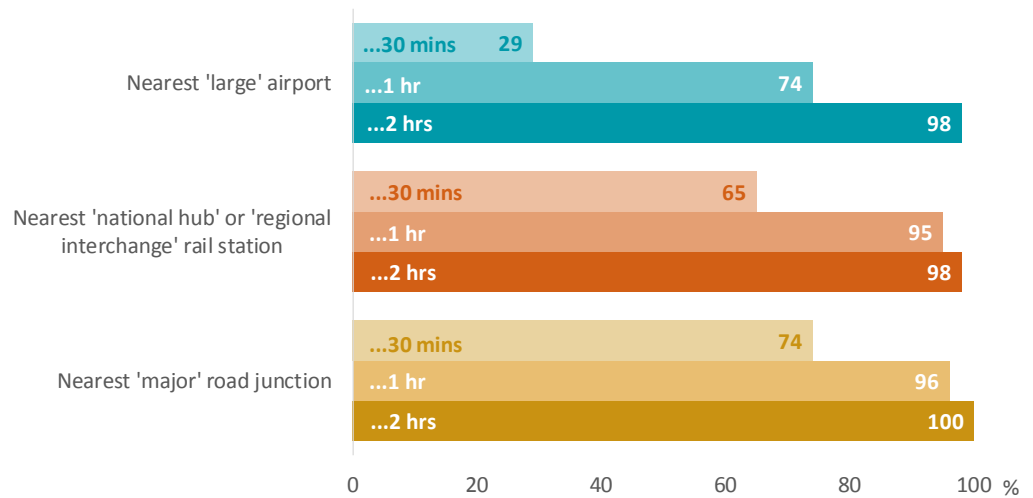
This release presents updated travel time data and indicators to measure connectivity by car from each local neighbourhood in England to transport destinations - major airports, stations and road junctions.

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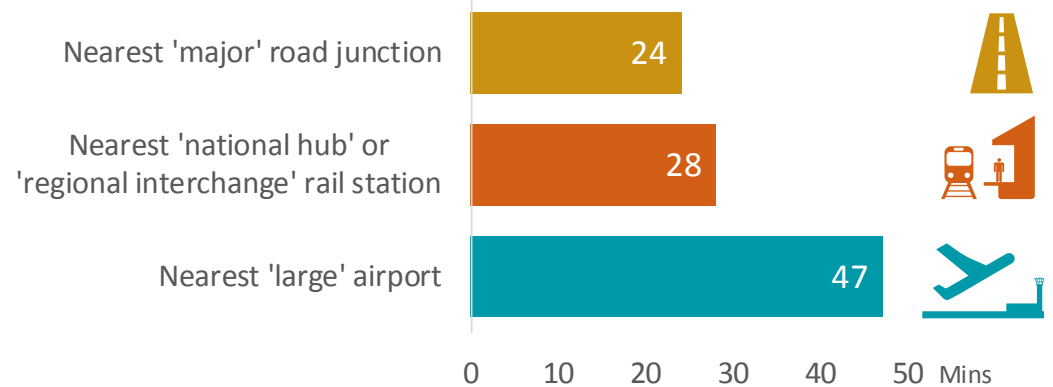
In England in 2013, around 74% of people lived within 1 hour by car of a large airport, about 95% within an hour of a national hub or regional interchange railway station, and about 96% within an hour of a major road junction.

Proportion of the England population who could reach selected transport destinations by car within...



The average travel time to the nearest large airport was 47 minutes, to the nearest major station was 28 minutes, and to the nearest major road junction was 24 minutes.

England average travel times by car to selected transport destinations during the morning peak, 2013



This document accompanies the release of a further travel time dataset (similar to a large set of journey planner results), which can be used for the analysis of travel time patterns at national and local level.

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Introduction

In June 2014 the Department for Transport published a set of experimental connectivity statistics for the first time. These modelled journey times to a range of key transport network locations, and were based on methods used for some years to produce the Department's Accessibility Statistics.

This release provides an updated set of car journey time statistics, based on 2013 traffic speed data, and using 2011 Census geography. Consideration was also given to producing 2013 public transport journey time statistics, but testing suggested the available model was producing results for 2013 which were less consistent nationally than those already published for 2011, so it was decided not to produce estimates for 2013.

This document gives a brief outline of the new data. For a fuller discussion of potential uses of these data sets, with examples, please refer to the 2011 release:

<https://www.gov.uk/government/statistics/transport-connectivity-statistics-england-2011-data>

Calculation

These statistics are the result of journey time modelling which uses information on the road network and real traffic speeds to calculate representative travel times between over 32,000 origins across England (representing residential neighbourhoods) and each set of destinations (representing important access points to the national transport network).

Travel times have been calculated for journeys during the morning peak (defined as the period 7am to 10am).

A range of summary statistics, or indicators, derived from these raw travel times are published in the data tables accompanying this release. These indicators fall into three main types, which are described in the following sections of this release.

The same three destinations are covered as in the 2011 statistics; airports, rail stations and junctions, as follows:

Experimental statistics

The connectivity statistics are experimental statistics, published for the purposes of user consultation, to assess the potential value of producing further statistics.

We would welcome any comments to:

subnational.stats@dft.gsi.gov.uk

Further information

Technical guidance and a full list of destinations are available in the [technical documentation](#).

Open Data

The raw travel time data calculated for 2013 are publicly available at www.data.gov.uk/dataset/transport_connectivity_statistics-england

Data tables

Data tables accompanying this release:

Airport destinations:

Tables [CON0121-31](#)

Rail destinations:

Tables [CON0221-31](#)

Road destinations:

Tables [CON0321-31](#)

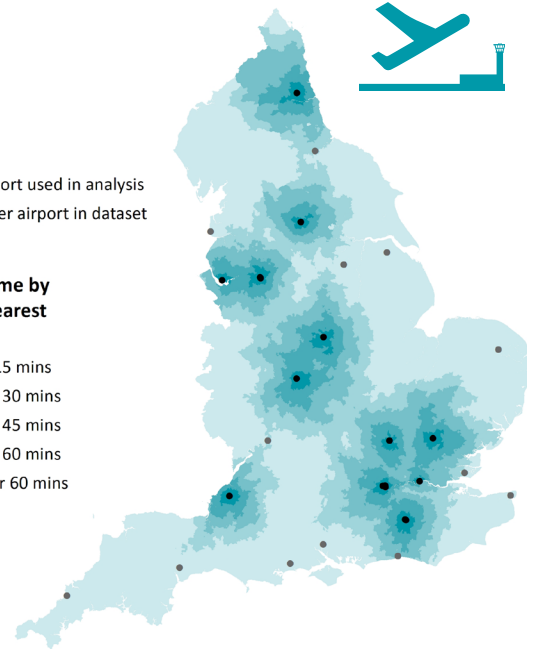
Airports

- 33 British airports. Cambridge was added for 2013, due to an increase in services.
- In some data tables, the focus is on the 15 largest airports (by terminal passenger numbers), but all 33 are included in the underlying data set.
- For larger airports (Heathrow, Gatwick and Manchester) different terminals are included as separate destinations, though for some analyses these are aggregated.

- Airport used in analysis
- Other airport in dataset

Travel time by car to nearest airport

- 0 - 15 mins
- 16 - 30 mins
- 31 - 45 mins
- 46 - 60 mins
- Over 60 mins



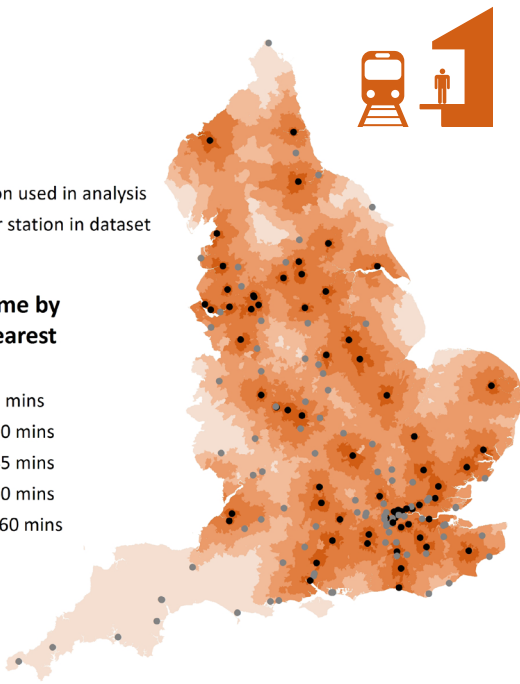
Rail stations

- 183 stations, in categories A (national hubs), B (regional interchanges) and C (important feeder stations) as defined by Network Rail. Unchanged from 2011.
- Data tables sometimes focus on the 88 category A and B stations.
- The major London terminals are sometimes considered as a single station for analysis purposes.

- Station used in analysis
- Other station in dataset

Travel time by car to nearest station

- 1 - 15 mins
- 16 - 30 mins
- 31 - 45 mins
- 46 - 60 mins
- Over 60 mins



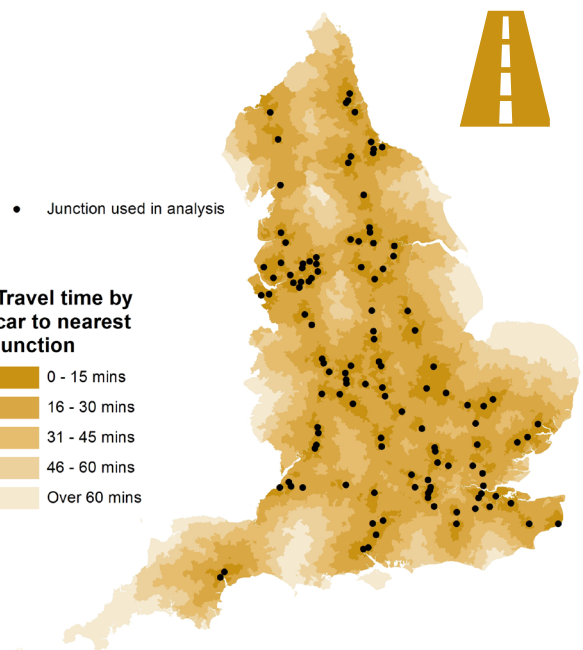
Road junctions

- Nearly 500 junctions on the 'Strategic National Corridors' (SNCs), where these intersect with the Primary Route Network. Unchanged from 2011.
- Data tables sometimes focus on 122 SNC junctions which intersect with the Strategic Road Network.

- Junction used in analysis

Travel time by car to nearest junction

- 0 - 15 mins
- 16 - 30 mins
- 31 - 45 mins
- 46 - 60 mins
- Over 60 mins

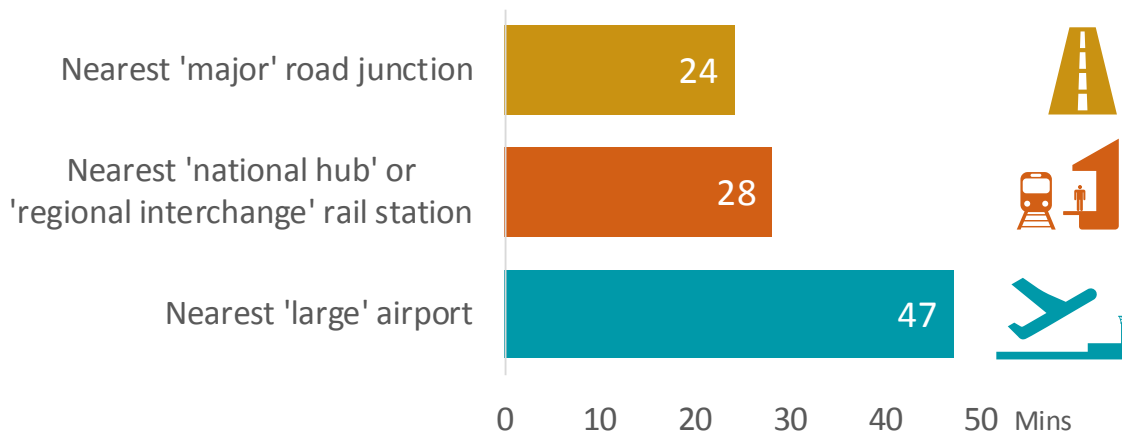


1 Travel time indicators

These are the simplest representations of the data, based directly on the raw travel time data. The summary tables show travel times to the nearest destination of each type for each origin.

Averages of the shortest travel times can be calculated across higher levels of geography by weighting together results for each LSOA in proportion to the LSOA population. Results for both LSOA and local authorities are shown in the data tables. Averages for England as a whole are shown in the chart below.

England average travel times by car to selected transport destinations during the morning peak, 2013



Related data tables:

Airports:
CON0121 (local authority level)
CON0131 (LSOA level)

Stations:
CON0221 and **CON0231**

Junctions:
CON0321 and **CON0331**

2 Access to destination indicators

These indicators include a number of different measures relating to the number or percentage of people able to access particular destinations (e.g. Heathrow airport) or types of destination (e.g. any airport) within a given time.

For example, the following chart shows the proportion of the population who could reach selected destinations in a given time. The published tables show similar statistics for each local authority.

Related data tables:

Indicators comparing destinations:

Airport: **CON0122**
Stations: **CON0222**
Junctions: **CON0322**

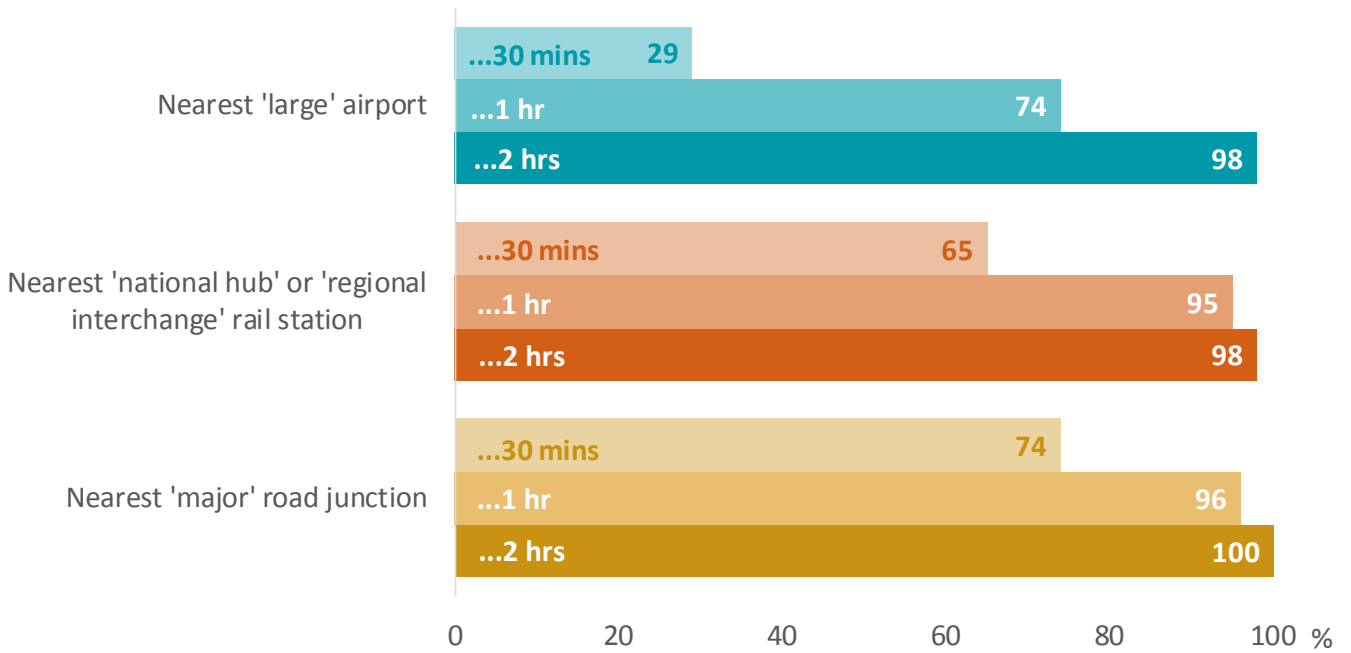
Indicators comparing areas based on specific times:

Airport: **CON0123**
Stations: **CON0223**
Junctions: **CON0323**

Indicators based on weighted travel times:

Airport: **CON0124**
Stations: **CON0224**
Junctions: **CON0324**

Proportion of the England population who could reach selected transport destinations by car within...

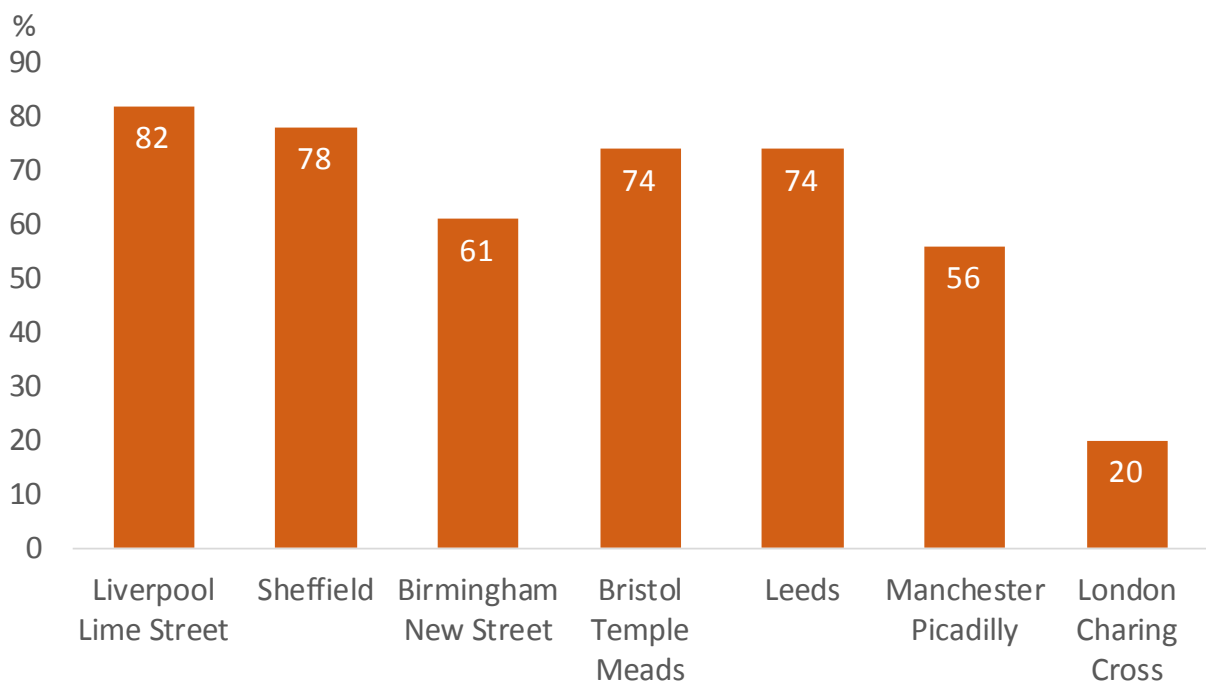


For journeys during the morning peak, 2013. From tables CON0123, CON0223, CON0323

Similar indicators can also be produced for specific destinations, for example, 4.9 million people live within an hour of Birmingham New Street station by car. *Table CON0222.*

Local area connectivity measures can also be defined, for example the proportion of people living within a given distance of a destination who can reach it in a given time, In the example below, also extracted from table CON0222, 61% of people living within 20km of Birmingham New Street station can get there in half an hour by car.

Percentage of 20km catchment population able to reach selected stations within 30 minutes during the morning peak, 2013



The above indicators implicitly assume each destination is of equal importance, and are also very sensitive to the specific time 'cut-offs' chosen. An alternative approach which avoids these issues is to weight the destinations according to some measure of their relative 'importance'.

For example, in Table CON0124 are indicators which weight airports by the number of destinations served per week (i.e. a measure of size) and display, for each origin, a value which reflects both size of airport and travel time, with bigger airports and shorter travel time given a bigger weighting. The disadvantage of such measures is that the results are relative measures which lack the direct 'real world' interpretation of numbers of destinations accessible in a given time.

3 'Number of available destinations' indicators

These measure the number of destinations of a particular type (e.g. airports) available to the resident population within a given travel time. For example:

Related data tables:

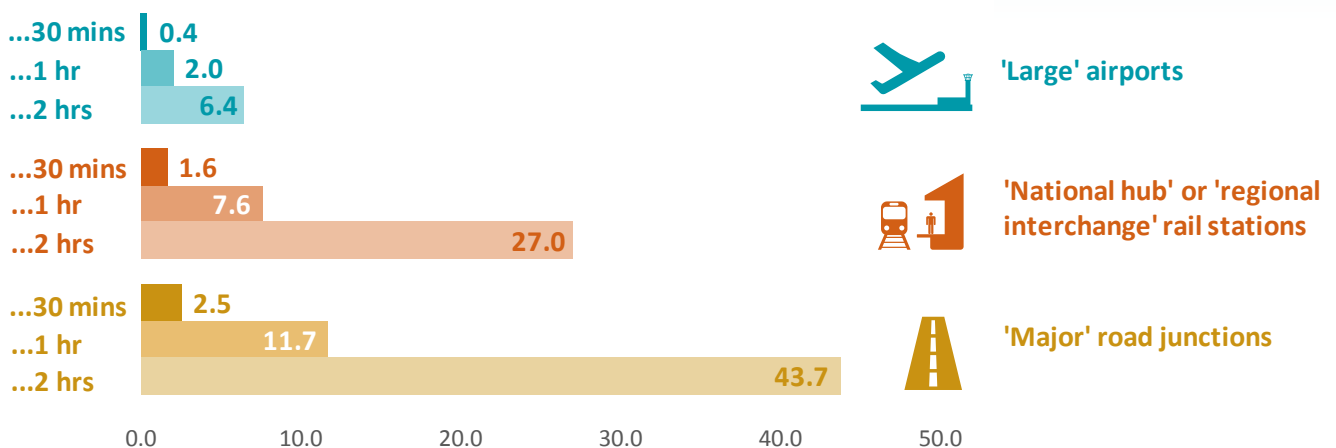
'Number of Destination' indicators:

Airports: **CON0125**

Airports: **CON0225**

Airports: **CON0325**

England average number of destinations accessible within...



The number of destinations accessible will obviously depend in part on the number of such destinations available, which is why people can typically access far more major road junctions in a given time than airports.

Further information

Further information on the data sources, calculation methodology and strengths and weaknesses of these statistics can be found in the separate [technical documentation](#).

Potential uses of these statistics

These experimental statistics have been published to help assess the potential value of producing further statistics of this nature, and we welcome any feedback. Possible uses might include:

- As a high level measure of access to the strategic transport network in England.
- Use in commercial applications, for example in websites showing characteristics of different areas.
- Use in operational planning e.g. assessing where to locate services based on transport connections.
- As an explanatory variable in economic analyses, e.g. of factors affecting local economic growth.
- In developing the strategic case for transport projects, or assessing bids for funding.
- As a source of information on travel times for validating other transport models and analyses.

Methodology

A fuller description of the methodology used to produce the statistics is available in the [technical documentation](#).

Data sources

Origins:	Population-weighted centroids of English 2011 Lower Layer Census Output Areas
Destinations:	As described above
Road network:	Ordnance Survey Integrated Transport Network (ITN) of roads and footpaths as at June 2012
Traffic Speeds:	Road link level averages from DfT TrafficMaster data set for weekdays 0700-0959 for the period September 2012 to August 2013, or default speeds by road type where no real averages available

More details in the [technical documentation](#).

Strengths and weaknesses of these statistics

These statistics readily provide a large dataset of travel times from small area origins to a range of destinations, based on a nationally consistent method and covering the whole of England.

A wide range of different indicators can be constructed from the underlying data, and the structure of the data allows small area analysis.

Journey times are based on a detailed road network map and real traffic speeds, so will reflect the effects of congestion.

The resulting travel times will be affected by a number of factors - the number and location of destinations included; journey factors such as road layout and congestion; the model assumptions and the quality of input data.

Possibly the most important of these factors will be the destinations chosen for the analysis - and therefore the ultimately subjective judgement of what constitutes a 'major' airport, station or road junction.

These statistics represent the outcomes of algorithms which rely on the quality of the input data, and involve a number of assumptions to identify and construct routes to the destination. For car journeys the input data is thought to be quite robust. The modelling assumptions are likely to have more impact for shorter journeys and are less likely to invalidate the broad patterns of connectivity by car shown here.

For car journeys, the methods used in 2011 and 2013 are fairly consistent. However, the underlying geography on which the origins are based has been updated from the 2001 to the 2011 Census geography, so the small area results are not always directly comparable. There was also a very slight change for the calculation of 'catchment' populations: for 2013 all LSOAs with a population-weighted centroid within 20km of the destination were included, whereas in 2011 the corresponding analysis only included LSOAs entirely within 20km of the destination.

These figures provide estimates of 'actual' travel times and indicate possible connections - they do not provide any measure of how likely it is that people would be able to achieve the minimum times in practice, and how many people would choose to make the connection in that way. Other factors relevant to that choice, notably cost, are not captured by these results. These statistics should therefore be considered as most useful in supplementing other evidence in building up a picture of relative levels of connectivity across an area of interest, and possibly highlighting features of interest for further study.

National Statistics

These figures are outside the scope of National Statistics. However, as experimental official statistics they are produced in line with the Code of Practice for Official Statistics.

For details of ministers and officials who receive pre-release access to these statistics up to 24 hours before release: <https://www.gov.uk/government/publications/transport-accessibility-statistics-pre-release-access-list>

Feedback

Any feedback you are able to provide will be used to help plan the future production of related statistics, making the best use of resources available. Please email subnational.stats@dft.gsi.gov.uk with any comments or queries.