Estimates of station usage 2020-21

25 November 2021

Background:

This annual statistical release contains estimates of the total number of people:

- travelling from or to each station in Great Britain (**entries and exits**); and

- changing trains at each station (**interchanges**)

Estimates of station usage are derived from LENNON, the rail industry's ticketing and revenue system, together with some local ticketing data. A number of adjustments are made to the source data to make the estimates as accurate as possible.

Source: LENNON and local ticketing data

Latest year: 2020-21 (April 2020 to March 2021)

Contents:
Introduction – p2
Entries and exits – p3
Interchanges – p10
Annexes – p11

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Next publication:
November 2022

In Great Britain, **2,569 stations** were served by mainline rail services as at 31 March 2021.

Passenger rail usage in 2020-21 (1 April 2020 to 31 March 2021) was affected by the coronavirus (COVID-19) pandemic. Rail passenger journeys decreased significantly in 2020-21, down 78% on the previous year (2019-20). This represented the lowest level of annual passenger usage since before the time series began in 1872.

Most and least used stations

The most used station in 2020-21 was **Stratford (London)** with an estimated **14.0 million entries and exits**. This was 27.9 million (67%) lower than the previous year due to the pandemic.

Top five most used stations in Great Britain, 2020-21

Rank	Station	Entries and exits	Last year's rank
1	Stratford (London)	13,985,162	8
2	London Victoria	13,791,322	2
3	London Bridge	13,763,890	4
4	London Waterloo	12,214,626	1
5	London Liverpool Street	11,212,008	3

London Waterloo, the most used station in each of the last 16 years, was the fourth most used station in 2020-21 with 12.2 million entries and exits (86% lower than the previous year).

There were six stations in 2020-21 with no recorded entries and exits. Services were temporarily suspended at the majority of these stations during the year due to the pandemic.

Further information on the most and least used stations can be found on pages 3 to 5.

All data tables, a quality and methodology report, frequently asked questions, infographics and an interactive dashboard associated with this release are published on the Estimates of station usage page of the data portal.

1. Introduction

Why estimates?

These statistics on station usage are estimates based primarily on ticket sales. The data sources and methodology used is the best approach possible given Great Britain does not have a fully gated rail network or comprehensive and robust count data at every station.

There are a number of limitations using this approach which users should be aware of:

- Some ticket sales and ticketless travel are not included, which may mean that usage at some stations is underestimated. It should be noted that levels of ticketless travel may have changed during the pandemic and those changes may vary substantially by station.
- Ticket sales data does not always specify precise journey origins and/or destinations, so these are estimated using alternative data sources.
- Methodology improvements e.g. inclusion of ticket sales previously not available means that estimates are not always comparable over time.

Further information on the methodology underlying these statistics and their limitations can be found in Annex 1.

Methodology changes made for 2020-21 estimates

Key methodology changes made this year and their impact on station usage estimates are listed below. These changes should be considered when comparing estimates with previous years. Further information is provided in Table 1410 (column K) and the Quality and methodology report.

- An additional 320,000 entries and exits have been added to stations across the West Yorkshire area as a result of additional tickets being included in the dataset for the first time. This increased usage estimates across the West Yorkshire area by around 1.9%.
- An update methodology was used to estimate journeys using local tickets across the West Midlands and South Yorkshire areas, adding 177,000 (0.6%) and 21,000 (0.5%) entries and exits across each of these areas respectively.
- Around 100,000 entries and exits were added across 25 stations served by Caledonian Sleeper services.
- Adjustments were made to estimates at 8 stations in Wales for the first time to account for season ticket journeys likely to have been made to or from a different station to that specified on the ticket.

2. Station entries and exits

Stations with the most entries and exits

The most used station in 2020-21 was **Stratford (London)** with **14.0 million entries and exits**, 27.9 million (67%) lower than the 41.9 million entries and exits in 2019-20. Stratford (London) was the eighth most used station in 2019-20.

This TfL Rail managed station in London Travelcard Area (LTA) Zones 2/3 is served by c2c, Greater Anglia, London Overground and TfL Rail mainline services. It also has connections to the Central and Jubilee lines on the London Underground network and Docklands Light Railway (DLR) services.

Stratford (London) station: sourced from a Network Rail article on planned improvements to the station

Table 2.1: Top 10 most used stations in Great Britain and outside London, 2020-21

Rank	All stations in Great Britain	Entries and exits	Rank	Stations outside London only	Entries and exits
1	Stratford (London)	13,985,162	1	Birmingham New Street	7,350,942
2	London Victoria	13,791,322	2	Leeds	5,853,754
3	London Bridge	13,763,890	3	Glasgow Central	5,325,090
4	London Waterloo	12,214,626	4	Manchester Piccadilly	5,188,066
5	London Liverpool Street	11,212,008	5	Brighton	4,149,082
6	Highbury & Islington	8,660,736	6	Liverpool Central	3,605,780
7	Clapham Junction	8,370,706	7	Liverpool Lime Street	3,510,892
8	Birmingham New Street	7,350,942	8	Reading	2,963,110
9	Barking	6,742,918	9	Edinburgh	2,957,732
10	East Croydon	6,695,420	10	Cambridge	2,300,528

London Waterloo, the fourth most used station in 2020-21 with 12.2 million entries and exits, was the most used station in each of the previous 16 years. This station had the biggest annual absolute decrease in entries and exits in 2020-21 compared with the previous year, 74.7 million (86%) lower than the 86.9 million entries and exits in 2019-20.

The top 10 most used stations in 2020-21 included Highbury & Islington, Clapham Junction, Barking and East Croydon. These London stations (all outside LTA Zone 1), which were not in the top 10 most used stations in 2019-20, replaced London Paddington, London Euston, London St Pancras International and London Kings Cross (all LTA Zone 1 London termini stations).

Outside of London, Birmingham New Street was again the most used station with 7.4 million entries and exits in 2020-21 (84% lower than 2019-20). Liverpool Lime Street and Cambridge were the only stations included in the top 10 most used in 2020-21 that were not in the top 10 most used stations in 2019-20. These two stations replaced Gatwick Airport and Glasgow Queen Street which did feature in the 2019-20 top 10.

Stations with the least entries and exits

There were six stations in 2020-21 with no recorded entries and exits. These were Abererch (Gwynedd, Wales), Beasdale (Highland, Scotland), Llanbedr (Gwynedd, Wales), Sampford Courtenay (Devon, England), Stanlow & Thornton (Cheshire West and Chester, England) and Sugar Loaf (Powys, Wales). Services were temporarily suspended at the majority of these stations during the year due to the pandemic. These stations typically had very low passenger usage before the pandemic.

Abererch Station by Reading Tom, is licenced under CC BY 2.0. Photo taken in 2016.

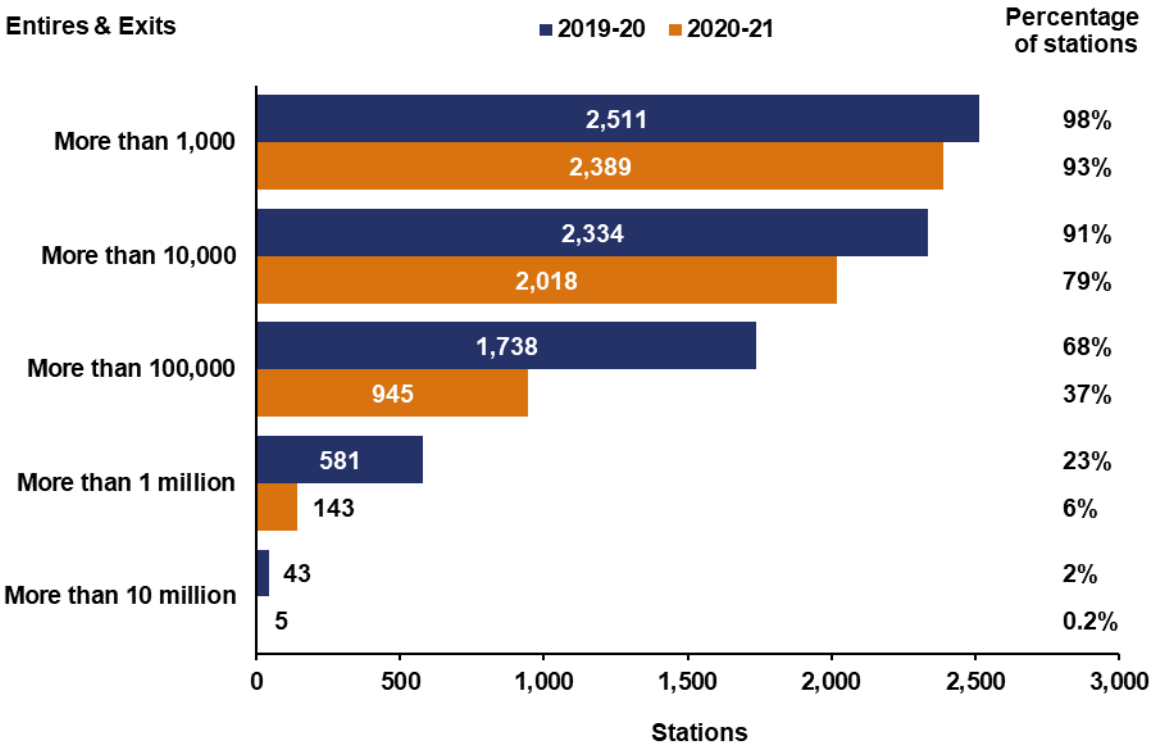
It should be noted that whilst there were no recorded entries and exits at these six stations in 2020-21 (i.e. the source data for these statistics did not include any tickets purchased to or from these stations) it is feasible that some journeys were made to or from these stations during the year without a ticket (and so would not be recorded in our source data). Similarly, there were 14 stations with between 1 and 20 recorded entries in 2020-21. It's possible that not all these journeys were made, despite tickets to or from these stations being purchased. One example of this is Okehampton (Devon, England), with six recorded entries and exits in 2020-21. However, we understand that no mainline services called at this station during the entire year.

In previous years, usage at some of the least used stations presented as part of these statistics have greatly increased the following year. We understand that highlighting the least used stations within these statistics can encourage people to visit them. Last year's least used station, Berney Arms (Norfolk, England) had 42 entries and exits. In 2020-21, the number of entries and exits at this station increased to 348 which was the biggest percentage increase of any station compared with the previous year.

Distribution of entries and exits

There were just five stations in Great Britain with more than 10 million entries and exits in 2020-21 compared with 43 stations in 2019-20.

Figure 2.1: Distribution of entries and exits by station, 2019-20 and 2020-21

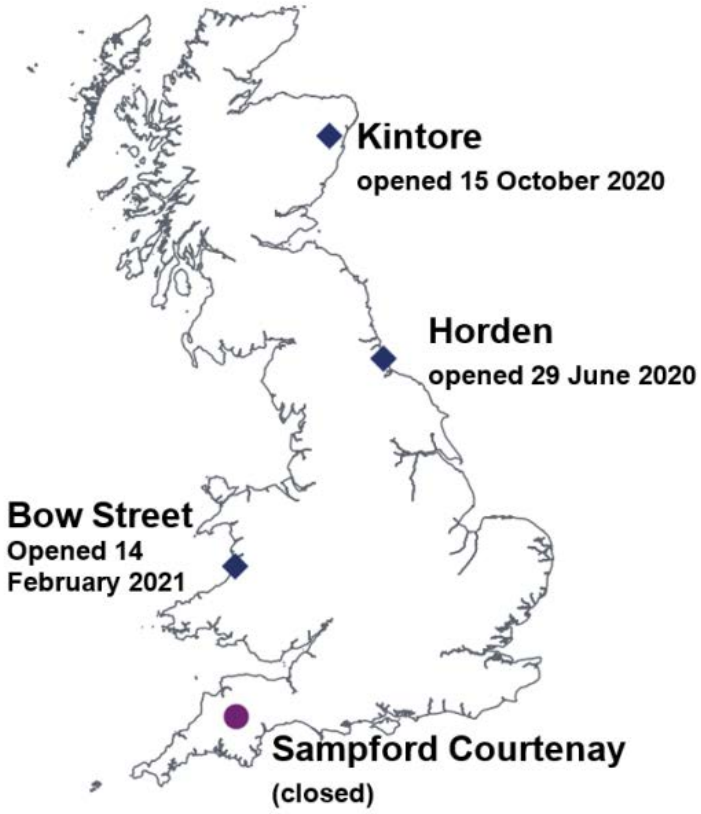


New and closed stations

Three new stations opened in 2020-21, these were: Bow Street (Ceredigion, Wales), Horden (County Durham, England), and Kintore (Aberdeenshire, Scotland).

Sampford Courtenay station (Devon, England) was previously served by Great Western Railway services. These were suspended in September 2019. During 2020-21 it was announced that this station would not reopen when services between Okehampton and Exeter resume. Estimates of usage at this and other closed stations prior to when services ceased are included in our time series table (Table 1415).

Figure 2.2: Stations opened and closed in 2020-21, Great Britain



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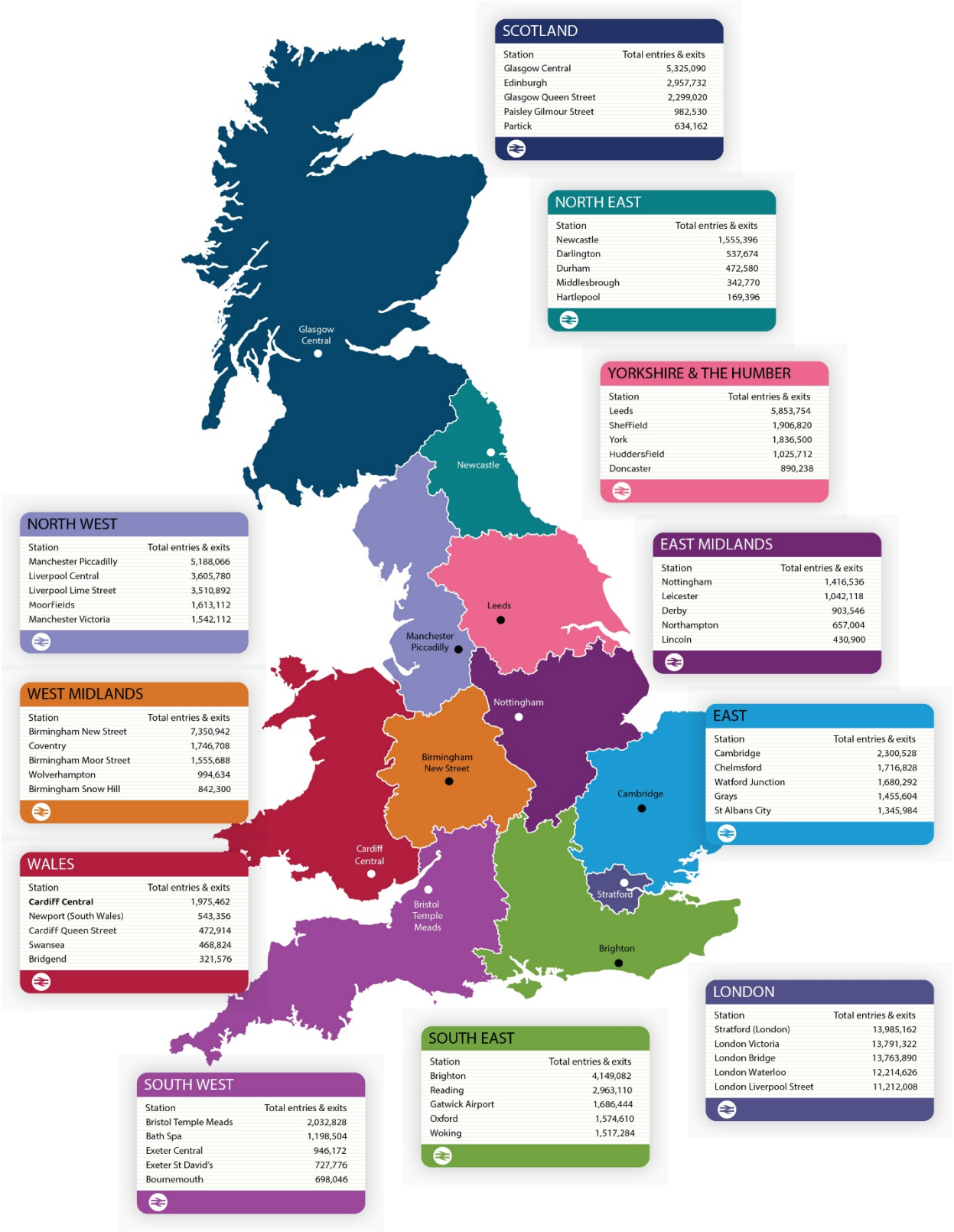
In Great Britain, 2,569 stations were served by mainline rail services as at 31 March 2021, as presented in our latest Rail infrastructure and assets statistics. This publication included a new dataset (Table 6329) containing geographic and other attribute information for each mainline station, including location coordinates (Easting and Northing), county, constituency and station facility owner. We welcome feedback on the content and format of this new table, as well as suggestions for additional information. Please email us at rail.stats@orr.gov.uk.

Stations with the most entries and exits by region

Figure 2.3: Top five most used stations in each region in England, Wales and Scotland in 2020-21



The most used station in each region in 2020-21 was the same as in the previous year, except in London and the South East of England. For the latter, Brighton was the most used station in 2020-21 replacing Gatwick Airport which was the most used station in this region in 2019-20. The top five most used stations were the same in many regions in 2020-21 as in the previous year (although usually in a different order).

In the East of England, there was a 91% fall in usage at Stansted Airport station in 2020-21 compared with the previous year as air travel was severely impacted by the pandemic. This decrease in usage took Stansted Airport out of the top 5 most used stations in 2020-21, replaced by Grays.

In the West Midlands region, Birmingham International dropped out of the top 5 most used stations in the region in 2020-21, replaced by Wolverhampton. Usage at Birmingham International was impacted by the pandemic as less people accessed the airport and National Exhibition Centre in 2020-21.

Additional commentary on changes in usage at these and other stations can be found in Table 1410.

3. Station interchanges

Stations with the most interchanges

An interchange is where a passenger needs to transfer from one train to another during their journey from origin to destination station.

In 2020-21, the station with the highest number of interchanges was Clapham Junction. This station has had the highest number of interchanges each year since 2004-05.

Stratford (London), which had the most entries and exits in 2020-21, had the third highest number of interchanges.

Figure 3.1: Top 10 stations with the most interchanges in Great Britain, 2020-21

Rank	Station	Interchanges
1	Clapham Junction	6,823,770
2	London Bridge	2,360,736
3	Stratford (London)	1,746,052
4	Hackney Central	1,575,649
5	London Victoria	1,384,525
6	London Waterloo	1,375,141
7	London Liverpool Street	1,130,924
8	Highbury & Islington	1,115,752
9	Hackney Downs	1,050,008
10	Birmingham New Street	1,024,050

These estimates are made using a model which makes assumptions about the route taken travelling between specific origins and destinations and whether that route includes one or more interchanges. In practice, passengers travelling between specific origins and destinations may interchange at a different station to the one assumed by the model. As a result, estimates may be higher or lower than expected. Further information can be found in Annex 1 of this release and in the Quality and methodology report.

4. Annexes

Annex 1 – Quality and methodology

Data sources and methodology

These statistics on station usage are estimates primarily based on tickets sales, sourced from LENNON, the rail industry's ticketing and revenue system and local ticketing data. These data sources and the methodology used provide the best approach possible given Great Britain does not have a fully gated rail network or robust count data for every station.

LENNON data feeds into a base matrix which is an input into the MOIRA2.2 rail planning tool. This is supplemented by local ticketing data for Passenger Transport Executive (PTE) areas. These sources are combined, and further adjustments are made to the data to address known issues with the MOIRA2.2 base matrix. These include an allocation of tickets sold to 'London Terminals,' allocation of demand between individual stations in group stations outside of London and a number of cases where adjustments are made to selected stations to account for specific known issues, for example Digby & Sowton. Further information on the data sources/ adjustments used to estimate usage at individual stations can be found in Table 1410 (column L).

The resulting dataset is used to produce the Origin Destination Matrix (ODM), a comprehensive matrix of passenger flows throughout Great Britain. The ODM is then used to derive estimates for the number of entries and exits at each station in Great Britain.

Interchanges at stations have been estimated by combining the number of journeys made on each flow (from the ODM) with the information on passenger journeys taken from the Central Allocations File (CAF). The CAF is an output of the ORCATS system which predicts passenger choices of rail route and train used.

Limitations

As the estimates of station usage are primarily based on ticket sales, there are a number of limitations that users should be aware of:

- Some ticket sales (e.g. Eurostar tickets) are not included, which may mean that usage at some stations is underestimated.
- Journeys with no associated ticket sales such as staff travel, and particularly fare evaders, are not included.
- Ticket sales data does not always specify precise journey origins and/or destinations, so these are estimated using alternative data sources.
- Methodology improvements e.g. inclusion of ticket sales previously not available means that estimates are not always comparable over time. Improvements should be taken into account when considering changes in usage between years.

- Assumptions are made about the number of journeys made with multi-use tickets e.g. that each weekly season ticket will be used to make 10.3 journeys.
- Passengers may purchase tickets from/to different stations to the ones they use in practice e.g. to stations at the end of the fare zone.

Methodology changes

Whilst consistency with past datasets is important to enable comparisons to be made over time, users have indicated that they are keen to see improvements in station usage estimates, even where this reduces consistency with historic data, provided any changes are clearly explained. The main methodology changes made this year are presented on page 2 of this release.

How these statistics can and cannot be used

- Monitoring the number of annual entries and exits or interchanges at individual stations e.g. to understand demand
- Monitoring how usage at individual stations changes over time (subject to methodology changes) and insights as to why
- Comparing the relative usage of stations within local areas, regions or across the whole of Great Britain
- To gauge the use of different ticket types e.g. season vs reduced

- Monitoring passenger rail usage at a national level, by train operating company or by ticket type (refer to Passenger rail usage statistics)
- Monitoring the number of passenger journeys between and within regions (refer to Regional rail usage statistics)
- Exploring rail journey flows between origin and destination stations
- Volume of entries compared to exits at an individual station (methodology makes these equal)

Revisions

No revisions have been made to previously published estimates as part of the release of these statistics. Details on any historic revisions can be found in the Revisions log.

Further details on data collection, the methodology used to calculate the estimates within this release and limitations of these estimates can be found in the Estimates of station usage quality and methodology report and Frequently Asked Questions document.

Annex 2 – List of outputs associated with this release and related statistics

Data tables and other outputs

All tables and other outputs associated with this release can be found on the Estimates of station usage page on the data portal.

- Passenger entries and exits and interchanges by station (2020-21) – Table 1410 (ods and csv)
- Time series of passenger entries and exits and interchanges by station (1997-98 to 2020-21) – Table 1415 (ods)
- Interactive dashboard (Power BI)
- Animated charts (MP4) and infographics (PDF)

Related statistics

We publish Passenger rail usage statistics on a quarterly basis. These statistics include estimates of the number of passenger rail journeys in Great Britain, by sector (London and the South East, Regional, and Long distance), by operator and by ticket type. This publication also includes statistics on passenger kilometres and train kilometres.

We also publish annual statistics on Regional rail usage, which includes the number of rail journeys between and within regions. These statistics are also derived from the ODM used to produce these statistics i.e. primarily based on the LENNON ticketing system and local ticketing data.

Network Rail publishes information on station footfall at 18 Network Rail managed stations only. These data are collected using a different method to the statistics in this release and include all people using the stations e.g. visiting shops and restaurants who may not make a rail journey.

The Department for Transport (DfT) publishes Rail passenger numbers and crowding statistics providing information on the number of passengers travelling by rail into and out of major city centres in England and Wales. The statistics represent passengers on National Rail services on a 'typical' weekday. DfT also currently publish daily estimates of transport use by mode.

Annex 3 – ORR's statistical publications

Statistical Releases

This publication is part of ORR's National Statistics accredited releases, which consist of seven annual publications: **Estimates of Station Usage**, **Rail Industry Finance (UK); Rail Fares Index; Rail Safety Statistics; Rail Infrastructure and Assets; Rail Emissions; Regional Rail Usage**; and four quarterly publications: **Passenger Rail Performance; Freight Rail Usage and Performance; Passenger Rail Usage; Passenger Rail Service Complaints.**

In addition, ORR also publishes a number of Official Statistics, which consist of three annual publications: **Train Operating Company Key Statistics; Rail Statistics Compendium; Occupational Health**; and four quarterly publications: **Signals passed at danger (SPADS); Delay Compensation Claims; Disabled Person's Railcard (DPRC); Passenger assistance.**

All the above publications are available on the data portal along with a list of publication dates for the next 12 months.

National Statistics

The United Kingdom Statistics Authority designated these statistics as National Statistics, in accordance with the Statistics and Registration Service Act 2007 and signifying compliance with the Code of Practice for Official Statistics. National Statistics status means that official statistics meet the highest standards of **trustworthiness**, **quality** and public **value**.

Estimates of station usage statistics were assessed and designated in 2020.

Our other statistical releases were assessed in 2012 and also hold National Statistics status. Since this assessment we have improved the content, presentation and quality of our statistical releases. In addition, in July 2019 we launched our new data portal. Therefore, in late 2019 we worked with the Office for Statistics Regulation (OSR) to conduct a compliance check to ensure we are still meeting the standards of the Code. On 4 November 2019, OSR published a letter confirming that ORR's statistics should continue to be designated as National Statistics. OSR found many positive aspects in the way that we produce and present our statistics and welcomed the range of improvements made since the statistics were last assessed.

For more information on how we adhere to the Code please see our compliance statements. For more details or to provide feedback, please contact the Statistics Head of Profession (Lyndsey Melbourne) at rail.stats@orr.gov.uk.

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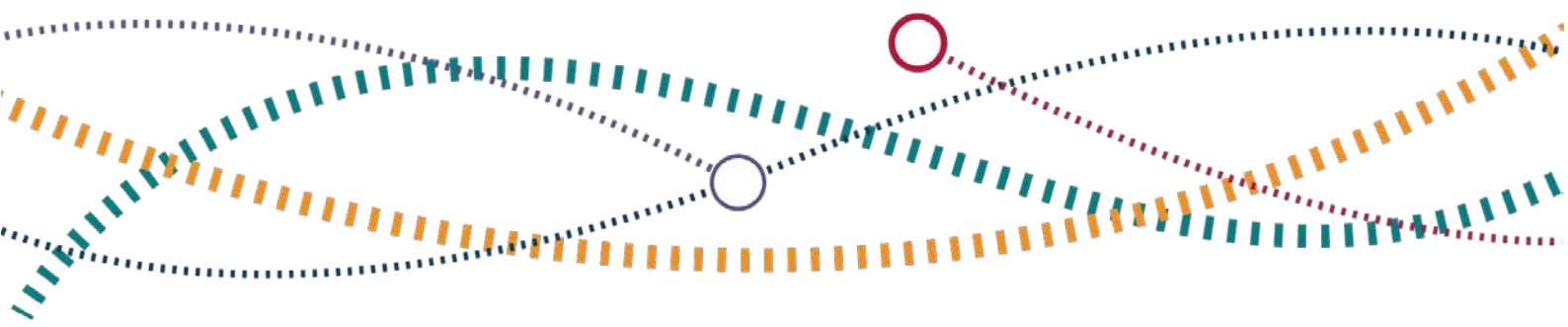
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