# Regional rail usage:

## Quality and methodology report

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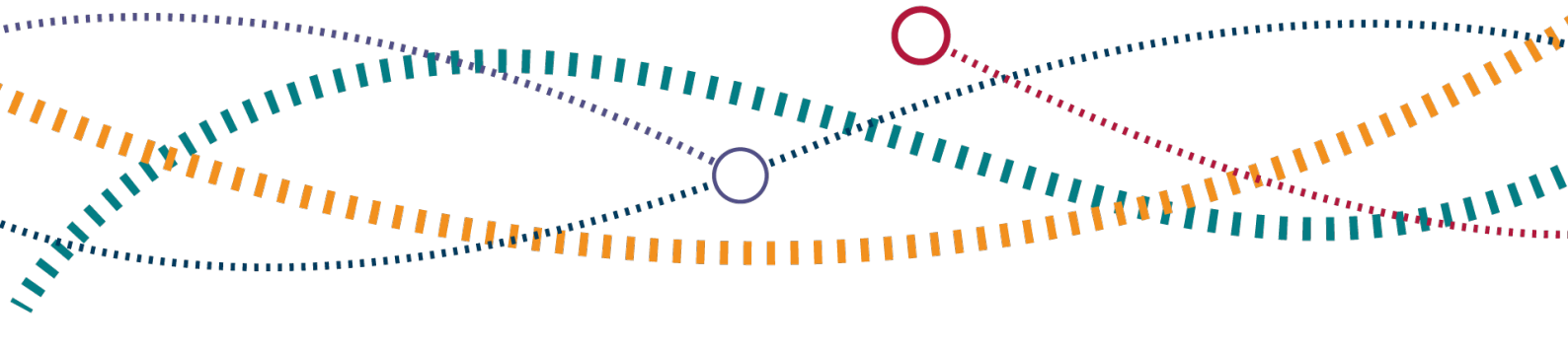

# Contents

# Introduction

This is a report on the quality of the annual Regional rail usage statistical release and associated data tables. It helps users to understand the quality of our statistics, and also ensures ORR is compliant with the three quality principles in the Code of Practice for Official Statistics - Q1: Suitable data sources, Q2: Sound methods, and Q3: Assured quality. This report also provides information on the methodology and data sources used to produce the statistics.

This report covers the following areas:

- Data sources, methodology and definitions – detail on the various data sources, methodology used to compile the statistics, and definitions;
- Historic background – background to the time series (summary of methodological improvements are detailed in annex 2);
- Relevance to users – the users of the statistics, and our engagement;
- Accuracy and reliability – the accuracy, data coverage and quality assurance of the statistics;
- Timeliness and punctuality – our timescales for the production and publication of the statistics;
- Accessibility and clarity – the format of our statistics and where they can be found;
- Coherence and comparability – similar statistics published elsewhere and the degree in which the statistics can be compared over time;
- Annex 1 – Geographic areas;
- Annex 2 – Details of methodology changes over time (April 2006 to March 2024).

**ORR commission Steer to produce the Origin Destination Matrix (ODM), which is used to derive the Regional rail usage statistics. The ODM is also used to produce the Estimates of station usage. More detailed information on methodology and changes each year are available in two reports produced by Steer: Estimates of Station Usage 2023/24: Methodology Report and Station Usage and Origin Destination Matrix 2023/24: Historical Methodological Changes.**

# Data sources, methodology and definitions

## Data Sources

These statistics are derived from the Origin Destination Matrix (ODM). The ODM is produced each year by Steer on behalf of the ORR. The journey data in the ODM is primarily based on sales data from LENNON, the rail industry's ticketing and revenue system. These are supplemented with some local ticketing data. Listed below are the data sources used to create the ODM:

- LENNON, Transport for London (TfL) data and train operator data (Gatwick Express and Stansted Express), as an input to the MOIRA2.2 base matrix
- Local ticketing data from Passenger Transport Executives (PTEs)
- Manual station counts
- Heathrow Express ticketing data
- Transport for London data for contactless and Oyster Pay As You Go journeys on the Elizabeth line

## Methodology

These statistics on usage are **estimates** based primarily on tickets sales using the methodology described below. This methodology is the best approach possible given Britain does not have a fully gated rail network or comprehensive and robust count data at every station. However, this data does have weaknesses when utilised for this purpose. Although some of these are catered for in the methodology and we continue to seek improvements to address identified issues, users should be aware of these acknowledged limitations and bear these in mind when using the data. The key **limitations** are detailed in the *Accuracy and reliability* section of this report.

Regional rail usage statistics are primarily based on data originating from LENNON, the rail industry's ticketing and revenue system. LENNON contains the majority of National Rail tickets purchased in Great Britain. However, it excludes some tickets sales e.g. London Travelcards. These ticket sales, together with LENNON data are used to derive a matrix of journeys and revenue which is an input to the MOIRA2.2 rail planning tool. Steer take this MOIRA2.2 base matrix and supplement it with updated local ticketing data for Passenger Transport Executive (PTE) areas. Various adjustments are made to the data to

deal with a range of issues to create a comprehensive matrix of passenger flows throughout Great Britain, the Origin Destination Matrix (ODM). For more information on these adjustments, please see pages 4 to 6 of the Estimates of station usage quality and methodology report.

## Methodology changes

The methodology to produce the ODM and therefore Regional rail usage statistics is reviewed annually and enhancements are implemented to address known issues. Often these enhancements utilise new sources of data that were not previously available to improve the estimates.

Consistency with past datasets is important to enable comparisons to be made over time. Nonetheless, stakeholders have indicated that they are keen to see improvements, even where this reduces consistency with historic data, provided any changes are clearly explained. ORR has worked with Steer to scope and implement methodological enhancements to address identified issues and utilise new data as it is made available whether this is from primary data collection (e.g. passenger counts at stations), or industry systems such as TfL's Oyster Clicks Model (OCM).

A number of improvements to the methodology have been implemented over recent years (see Annex 2). These changes should be taken into account when considering year-on-year changes in journeys for some regions as it may not reflect an actual change in demand.

In the April 2023 to March 2024 dataset the following methodological improvements have been implemented:

- An adjustment to how Elizabeth line journeys are adjusted, to account for the overstatement in LENNON;
- An update to the split ticketing adjustment, where a passenger completes one journey using two or more tickets;
- An adjustment to journeys where the origin and destination were the same;
- Updates to journeys made using West Yorkshire and Strathclyde PTE tickets;
- Updates to the origin and destination of journeys made with season tickets, where tickets were purchased at stations other than the one they travelled from;
- A change in how entries and exits are allocated to stations for tickets to London Terminals, using a more up to date data source;

- An update to the journeys apportioned to group stations, based on passenger counts;
- An adjustment was developed to remove auto ticket on departure (AutoTOD) journeys, where the journey was not actually carried out;
- Caledonian Sleeper tickets, that are excluded from MOIRA2.2 in previous years, have been included using methodology developed in April 2020 to March 2021;
- Demand splits across the three Heathrow terminal stations has been updated, according to data provided by Gateline data.

For more detailed information on the methodology see *Steer's Estimates of Station Usage 2023/24: Methodology Report*.

## Adjustment due to season ticket refunds

For April 2019 to March 2020 only, two adjustments were made to the source data to reflect refunds of season tickets due to the impact of the coronavirus (COVID-19) pandemic. These were:

- Firstly, for refund requests that were received and processed in the final weeks of March 2020 (i.e. at the start of the national lockdown), all the refunded journeys and revenue would appear in the April 2019 to March 2020 financial year when in 'reality' those refunded journeys should be distributed over the season ticket's remaining validity. Therefore, an adjustment was required to remove the proportion of refunded journeys that should not have applied to April 2019 to March 2020.
- The second adjustment related to the refund requests that were processed after March 2020. These refunded journeys would all be allocated to the April 2020 to March 2021 financial year, whereas it is likely that some of the journeys should be backdated to mid-March 2020 when the national lockdown commenced. This meant that a small proportion of these refunded journeys should be added to the April 2019 to March 2020 estimates (i.e. the 2019-20 usage figures reduced) and Steer undertook this adjustment by using refunds data from LENNON for the first 5 periods of April 2020 to March 2021 (i.e. to 22nd August 2020) to calculate the adjustment required for each flow.

For April 2020 to March 2021 only, an amendment was made to the source data to reflect refunds of season tickets due to the impact of the coronavirus (COVID-19) pandemic:

- A high volume of season ticket refund requests were received in the final weeks of March 2020 (i.e. at the start of the national lockdown). The majority of these requests were processed after March 2020 (and so did not appear in LENNON until the April

2020 to March 2021 year). These refunded journeys would all be allocated to the April 2020 to March 2021 financial year, which would have led to a large under estimate in (net) usage. To account for this, refunds for annual and monthly season tickets were excluded from the MOIRA2.2 base matrix for April 2020 to March 2021. However, it also means that any refunds for these season tickets purchased in April 2020 to March 2021 were not counted. As a result, usage of these tickets in April 2020 to March 2021 is likely to have been slightly overstated.

## Definitions

- **Origin Destination Matrix** (**ODM**) – a comprehensive matrix of passenger flows throughout Great Britain.

- **MOIRA2.2 base matrix** – produced by Resonate as an input into the MOIRA2.2 rail panning tool, it provides an estimate of journeys on the Great Britain rail network for the duration of a financial year. It includes all journeys associated with point to point flows and includes overlays ("infills") to reflect travel using tickets not included in LENNON (e.g. London Travelcards and some specific tickets to or from airports and multi-modal and zonal products sponsored by PTEs).

- **LENNON** – 'Latest Earnings Networked Nationally Over Night' is the rail industry's ticketing and revenue system. It contains information on the majority of national rail tickets purchased in Great Britain. However, it excludes some tickets sales.

- **Passenger Transport Executive (PTE)** – There are six metropolitan counties in England. These are Greater Manchester, Merseyside, South Yorkshire, Tyne and Wear, West Midlands, West Yorkshire. Formerly, each of these areas had a Passenger Transport Executive (PTE), which was a local government body with public transport responsibilities. They were accountable to Integrated Transport Authorities (ITAs), which have now been reformed into Combined Authorities, some with a larger geographic coverage than the ITA they replace. Some Combined Authorities (Greater Manchester, Merseyside, North East, South Yorkshire) continue to have a free-standing transport executive, whilst in others (West Midlands and West Yorkshire) the transport executive has been incorporated within the Combined Authority. In Scotland the Strathclyde Partnership for Transport is the equivalent body covering the region of Strathclyde. For convenience, in this report we continue to refer to these seven areas as PTEs.

- **Passenger journeys** are estimated based on travel from an origin station to a destination station. For the purpose of these statistics, travel between an origin and

destination counts as one journey irrespective of any changes of train. For example, a journey from Leicester to Manchester would be classed as one journey despite the need to change trains. This differs from the definition used in the Passenger rail usage statistical release, which would class this example as two journeys.

- The data is disaggregated by the following geographies, which are based upon the **2021 International Territorial Levels (ITL)** classification. These were formerly known as **Nomenclature of Territorial Units for Statistics (NUTS)** areas:
    - **ITL1 – Scotland, Wales, and regions of England:** journeys within each ITL1 area and journeys between each pair of ITL1 areas.
    - **ITL2 – Groups of local government areas:** journeys within an ITL1 area beginning and/or ending within an ITL2 area and journeys to or from other ITL1 areas beginning or ending within an ITL2 area.
- The April 2022 to March 2024 data is also disaggregated by **local authority district and county**, with associated geography codes in Table 1595 sourced from data managed by the Office for National Statistics. In this publication, the geography is referred to as 'local authority', however in the case of non-metropolitan districts in England, these are aggregated up to counties.

A full list of the local authority districts and counties in each of the ITL2 areas can be found in Annex 1.

# Historical background

**April 1995 to March 2003:**

Regional rail usage statistics were calculated from CAPRI (Computer Analysis of Passenger Revenue Information) which was the rail industry's former central ticketing system.

**April 2003 to March 2024:**

From April 2003 onwards, LENNON (Latest Earnings Networked Nationally Over Night), which is currently the rail industry's central ticketing and revenue system, has been the basis for calculating these statistics.

Several improvements to the methodology have been implemented over the years. A summary of methodology improvements from April 2006 to March 2024 can be found in Annex 2. Also see Steer's *historical methodological changes report*.

Steer has been contracted by ORR to produce these statistics since April 2011. Prior to that (from April 2005) (now known as Resonate) were the contractor.

# Relevance to users

The degree to which the statistical product meets the user needs in both coverage and content.

Regional rail usage statistics provide a clear indication of the number of passengers using rail and the volume of journeys made on the network, providing an indication of the levels of demand for rail travel at a regional and sub-regional level. This can help in both short-term and long-term planning for the industry and wider stakeholders.

One of the main strengths of these statistics is that they provide a data series going back to April 1995. This means that users can explore trends over time and combine the data with their own local knowledge to understand the impact of infrastructure projects or changes to the usage of the rail network.

For the April 2008 to March 2009 publication, following feedback and consultation with our stakeholders, we changed the format for presenting Regional rail usage statistics, moving from an index based approach to providing underlying numbers. As part of this, we also published data at a greater level of disaggregation, providing sub-region level data for both journeys between regions and journeys within regions.

From the April 2022 to March 2023 publication, we included data on the number of journeys between all local authority pairs for the first time.

ORR's last user survey took place from mid-January to mid-April 2020. The aim of the survey was to gather feedback on ORR's new data portal; this incudes statistical releases, data tables and other supplementary material. There were 42 responses to the survey. ORR created an implementation plan following the 2020 user survey.

More detailed information on users of ORR statistics and meeting the needs of users is available on our user engagement webpage.

## How these statistics can and cannot be used

- Monitoring the number of annual journeys within and between Scotland, Wales and regions of England
- Monitoring how usage in different regions changes over time (subject to methodology changes) and insights as to why
- Comparing the relative usage of regions and sub-regions (ITL2 areas and local authorities) across the whole of Great Britain

- Monitoring passenger rail usage by train operating company or by ticket type (refer to Passenger rail usage statistics)
- Monitoring the number of entries and exits or interchanges at individual stations (refer to Estimates of station usage)
- Exploring rail journey flows between origin and destination stations

# Accuracy and reliability

The proximity between an estimate and the unknown true value.

## Estimates

These statistics on passenger journeys are **estimates** based primarily on tickets sales using the methodology described above. This methodology is the best approach possible given Britain does not have a fully gated rail network or comprehensive and robust count data at every station. The methodology's national coverage makes it suitable as a basis for the production of these statistics.

## Data coverage

The data presented in this release cover journeys made to or from all open mainline stations in Great Britain, i.e. those with a timetabled train service, made using mainline operators in Great Britain. The data does not include journeys on Eurostar, London Underground, light rail, heritage and charter services.

## Limitations

A number of improvements to the methodology have been implemented in recent years. These changes should be taken into account when considering changes in usage between years, as it may be a result of improved methodology, rather than reflecting an actual change in demand at stations. These improvements, and the reasons for them are documented in Steer's *historical methodological changes report*.

As these statistics are primarily based on ticket sales, there are a number of limitations that users should be aware of which are summarised below. There is more detail on these in Chapter 5 of Steer's *methodology report*.

**Regions with stations with known underestimates or no estimates** - Eurostar ticket sales are not the rail industry's ticketing system (LENNON). Therefore our estimated number of journeys to or from St. Pancras, Ashford International and Ebbsfleet stations will not be a true reflection of the total usage at these stations, and therefore in London and the South East regions. There are two other stations which we do not have estimates for as tickets sales are not recorded in LENNON: Corfe Castle and Bishops Lydeard, which are both in the South West.

**Concessionary travel** - TfL and most PTEs subsidise some form of free travel for certain types of users including those over a certain age, students and those with disabilities. This creates a substantial additional element of demand which is very difficult to include in these estimates as information on the level and distribution of journeys associated with these free travel products is not recorded and will not even have point of sale information. The current approach to this in the ODM is to include this demand where data have been made available by TfL and PTEs, which would generally be estimates based on surveys. Currently, concessionary travel data is included for London, Greater Manchester, Merseyside, South Yorkshire, Tyne and Wear, West Midlands and West Yorkshire areas. No information is available for Strathclyde. Therefore, there will be some underestimates of usage at some stations in these areas. Concessionary travel for under 5s is not included in the ODM.

**Ticketless travel** - As the ODM, and therefore Regional rail usage statistics are based on ticket sales, journeys associated with ticketless travel is not included in the data. This is more likely to be an issue on some flows and where ticketless travel is significant. It should also be noted that levels of ticketless travel may have changed during the pandemic and those changes may vary substantially by station. As more stations have been gated over time and train operators focus on revenue protection activities, this is likely to be less of an issue than in the past. It can be argued that it is not appropriate to include ticketless travel in the dataset, as its purpose is to record genuine journeys on the rail network. Ticketless travel also includes an element of individuals who are legitimately travelling for free, such as the British Transport Police or some rail industry employees.

**Season ticket fare zones** - In some areas, multiple stations have identically priced season tickets to London. As a result, London season tickets are generally sold as being from the furthest station, regardless of the actual origin of travel, giving the passenger additional flexibility for no increase in fare. This means that the ticket sales data shows that there are more people travelling to/from this station than is the case. Therefore, for stations where this is a known issue, the data is adjusted to reflect actual usage at each station. For example, stations along the Southend Victoria and Central branches. There may be similar issues at stations where we don’t make adjustments to the data.

**Season ticket journey factors** – Ticket sales in LENNON are converted into an estimate of the number of journeys made by applying a series of ticket type journey factors. Therefore these statistics are based on an assumed number of journeys made based on the ticket type sold. The journeys factors used for the main season tickets are as follows:

| Season ticket validity | Journey factor |
|---|---|
| Weekly | 10.3 |
| Monthly | 45 |
| 3 monthly | 135 |
| 6 monthly | 270 |
| Annual | 480 |

## Adjustment due to season ticket refunds

Amendments were made to the source data to reflect refunds of season tickets due to the impact of the pandemic (April 2019 to March 2020 and April 2021 to March 2022). More information on these adjustments can be found on page 5 of this report.

## Quality assurance

Prior to finalising the ODM, Steer and ORR conduct thorough quality assurance of the it and the related Estimates of station usage dataset, which is also based on the ODM. This process is described in detail on pages 17 and 18 of the Estimates of station usage quality and methodology report.

Steer provide the ODM to ORR in a standard format that can be loaded into our data warehouse. We check: the data is in the correct format, there are no inconsistencies in the data and trends over time are similar. These checks ensure accurate data is published.

The final data is then prepared for publication by the lead statistician. The process includes quality assuring the tables and charts produced and providing supporting commentary regarding the key trends and any methodology changes. These are subject to peer review by another analyst following a well-documented process which is followed for all ORR statistical releases. The final stage of the quality assurance process is a sign off by the Head of Profession for Statistics confirming the statistical release and associated outputs, e.g. data tables, meet quality standards and are fit for publication.

## Revisions policy

ORR's statement on orderly release and revisions policy outlines ORR's revision policy. Details of any revisions are available in the revisions log. Further information on revisions and data series breaks can also be found in the data tables.

# Timeliness and punctuality

Timeliness refers to the time gap between publication and the reference period. Punctuality refers to the gap between planned and actual publication dates.

ORR aims to publish the Regional rail usage statistics as soon as possible after the end of the financial year, which is currently around eleven months after, in February. It is important to take time to implement the detailed methodology, collect additional data (e.g. from PTEs) and carry out a series of quality assurance checks to ensure the final data is as accurate as possible.

ORR will continue to work with our consultants and stakeholders to shorten the time between the reference period and publication.

The publication schedule available on the data portal outlines the publication dates for National Statistics quarterly and annual statistical releases and other official statistics up to 12 months in advance.

ORR is committed to releasing its statistics in an open and transparent manner that promotes confidence.

# Accessibility and clarity

Accessibility is the ease with which users are able to access the data, also reflecting the format in which the data is available and the availability of supporting information. Clarity refers to the quality and sufficiency of the metadata, illustrations and accompanying advice.

Statistics need to be presented in a clear and understandable form. All our rail statistics data tables can be accessed free of charge on our data portal. Commentary about the statistics and trends are provided in the statistical releases. Interactive dashboards (PowerBI) are also available.

Our data portal and its content meet the accessibility standards of the Public Sector Bodies Website Accessibility Regulations. We support our users by providing the information they need in a way that is clear and accessible. Our statistical releases use plain language, and any technical terms, acronyms and definitions are clearly defined and explained when this is appropriate, to ensure that the statistics can be used effectively. Our data tables are available at the highest level of detail that is practical and in accessible formats. All data tables are available in an OpenDocument Spreadsheet (.ods) format. We can also provide data in comma separated file (csv) format on request.

Please see our accessibility statement for further details, including any non-accessible content.

## Data Tables

All tables associated with this release can be found under the Data tables heading at the bottom of the Regional rail usage theme page.

- Regional passenger journeys between England, Scotland and Wales – Table 1510
- Regional passenger journeys between regions – Table 1520
- Regional passenger journeys – East Midlands – Table 1540
- Regional passenger journeys – East of England – Table 1545
- Regional passenger journeys – London – Table 1550
- Regional passenger journeys – North East – Table 1555
- Regional passenger journeys – North West – Table 1560
- Regional passenger journeys – Scotland – Table 1565
- Regional passenger journeys – South East – Table 1570

- Regional passenger journeys – South West – Table 1575
- Regional passenger journeys – Wales – Table 1580
- Regional passenger journeys – West Midlands – Table 1585
- Regional passenger journeys – Yorkshire and the Humber – Table 1590
- Local authority flow journeys – Great Britain – Table 1595
  - This table is in a comma separated value (csv) format. Descriptions of the columns presented can be found below:

    (1) Time period: The time period the data covers;

    (2) Local authority flow: The names of the two local authorities which the journeys are between, ordered alphabetically. In this table, each flow only appears once. For example, only Aberdeenshire to and or from York and not vice versa will be shown;

    (3) Journeys: The number of journeys made on a flow;

    (4) Local authority: county or unitary 1: The name of the first local authority involved in the local authority flow. The local authorities are ordered alphabetically;

    (5) Local authority: county or unitary 2: The name of the second local authority involved in the local authority flow;

    (6) Local authority: county or unitary code 1: The code for the first local authority;

    (7) Local authority: county or unitary code 2: The code for the second local authority.

The ODM (station to station flow data) is available on the Rail Data Marketplace. In addition, the key results on station to station flows are discussed in the Estimates of station usage publication.

# Coherence and comparability

Coherence is the degree to which data that is derived from different sources or methods, but refer to the same topic, are similar. Comparability is the degree to which data can be compared over time and domain.

## Related data

**Passenger rail usage (ORR):**

Quarterly statistics reporting the volume of passenger journeys, kilometres and revenue on the mainline network in Great Britain. Statistics are presented by ticket type, sector, and train operating company. Long-running time series on passenger journeys (Table 1220) and passenger kilometres (Table 1230) are updated annually.

**Estimates of station usage (ORR):**

Annual statistics providing estimates for the numbers of entries/exits and interchanges for each mainline station of Great Britain. These estimates are also based on the ODM.

**Origin and destination Matrix (ORR):**

The ODM contains the estimated number of journeys between each pair of mainline stations in Great Britain. Annual datasets going back to April 2018 to March 2019 are available on the Rail Data Marketplace.

**Passenger numbers and crowding (Department for Transport):**

Rail passenger numbers and crowding statistics provides 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.

## Comparability

The passenger journey totals should not be compared with those published as part of ORR's Passenger rail usage statistical release as they are calculated on a different basis. For example, a journey from Leicester to Manchester would be classed as one journey in regional rail usage despite the need to change trains. However, in Passenger rail usage, it is treated as two journeys reflecting the change of trains. Please see Passenger journeys in Great Britain which explains the differences in more detail.

Consistency with past datasets is important to enable comparisons to be made over time. Nonetheless, stakeholders have indicated that they are keen to see improvements, even where this reduces consistency with historic data, provided any changes are clearly explained. See Annex 2 below for more information.

## Length of comparable time series

| Measures | Disaggregation | Start of time series |
|---|---|---|
| **Passenger journeys between ITL1 areas** | ITL1 areas: Scotland, Wales and regions of England | April 1995 to March 1996 |
| **Passenger journeys within ITL1 areas and to or from other ITL1 areas** | ITL2 areas: sub-regional areas | April 1995 to March 1996 |

The following series breaks exist in the time series:

- Since **April 2006 to March 2007**, estimates for rail travel using TfL sold travelcards and airport links have been included. This mostly affected usage estimates for London, but estimates for journeys to or from the East of England, the East Midlands and the South East were also affected.
- Since **April 2008 to March 2009**, usage on PTE products has been included in the estimates. This affected usage estimates for Scotland the North East, the North West, Yorkshire and the Humber, and the West Midlands.
- Since **April 2018 to March 2019**, usage on concessionary tickets in the Greater Manchester PTE area and since April 2019 to March 2020 usage on Merseyside PTE Saveway and Trio products purchased off network have been included. These changes have affected the number of journeys in the North West.
- Since **April 2020 to March 2021**, journeys made on dedicated Caledonian Sleeper tickets were included for the first time.

- Since **April 2022 to March 2023** an adjustment for split tickets has been included for the first time.

Other changes that have had a smaller impact on the estimates are documented in Annex 2 below.

# Annexes

## Annex 1 – Geographic areas

Listed below is the 2021 International Territorial Levels (ITL) hierarchy for the **ITL2** and local authority district or county included in each ITL1 area.

### East of England

| ITL2 Area | Local authority district or county |
|---|---|
| Bedfordshire and Hertfordshire | Bedford |
| Bedfordshire and Hertfordshire | Central Bedfordshire |
| Bedfordshire and Hertfordshire | Luton |
| Bedfordshire and Hertfordshire | Hertfordshire |
| East Anglia | Cambridgeshire |
| East Anglia | Peterborough |
| East Anglia | Norfolk |
| East Anglia | Suffolk |
| Essex | Essex |
| Essex | Southend-on-Sea |
| Essex | Thurrock |

### East Midlands

| ITL2 Area | Local authority district or county |
|---|---|
| Derbyshire and Nottinghamshire | Derbyshire |
| Derbyshire and Nottinghamshire | Derby |
| Derbyshire and Nottinghamshire | Nottinghamshire |
| Derbyshire and Nottinghamshire | Nottingham |
| Leicestershire, Rutland and Northamptonshire | Leicestershire |
| Leicestershire, Rutland and Northamptonshire | Leicester |
| Leicestershire, Rutland and Northamptonshire | Rutland |
| Leicestershire, Rutland and Northamptonshire | Northamptonshire |
| Leicestershire, Rutland and Northamptonshire | North Northamptonshire |
| Leicestershire, Rutland and Northamptonshire | West Northamptonshire |
| Lincolnshire | Lincolnshire |

### London

| ITL2 Area | Local authority district or county |
|---|---|
| Inner London - East | Hackney |
| Inner London – East | Haringey |
| Inner London – East | Islington |
| Inner London – East | Lambeth |
| Inner London – East | Lewisham |
| Inner London – East | Newham |
| Inner London – East | Southwark |
| Inner London – East | Tower Hamlets |
| Inner London – West | Camden |
| Inner London – West | City of London |
| Inner London – West | Hammersmith and Fulham |
| Inner London – West | Kensington and Chelsea |
| Inner London – West | Wandsworth |
| Inner London – West | Westminster |
| Outer London - East and North East | Barking and Dagenham |
| Outer London - East and North East | Bexley |
| Outer London - East and North East | Enfield |
| Outer London - East and North East | Greenwich |
| Outer London - East and North East | Havering |
| Outer London - East and North East | Redbridge |
| Outer London - East and North East | Waltham Forest |
| Outer London - South | Bromley |
| Outer London - South | Croydon |
| Outer London - South | Kingston upon Thames |
| Outer London - South | Merton |
| Outer London - South | Sutton |
| Outer London - West and North West | Barnet |
| Outer London - West and North West | Brent |
| Outer London - West and North West | Ealing |
| Outer London - West and North West | Harrow |
| Outer London - West and North West | Hillingdon |
| Outer London - West and North West | Hounslow |
| Outer London - West and North West | Richmond upon Thames |

## North East

| ITL2 Area | Local authority district or county |
|---|---|
| Northumberland, Tyne and Wear | Northumberland |
| Northumberland, Tyne and Wear | Gateshead |
| Northumberland, Tyne and Wear | Newcastle upon Tyne |
| Northumberland, Tyne and Wear | Northumberland |
| Tees Valley and Durham | County Durham |
| Tees Valley and Durham | Darlington |
| Tees Valley and Durham | Hartlepool |
| Tees Valley and Durham | Middlesbrough |
| Tees Valley and Durham | Redcar and Cleveland |
| Tees Valley and Durham | Stockton-on-Tees |

## North West

| ITL2 Area | Local authority district or county |
|---|---|
| Cheshire | Cheshire East |
| Cheshire | Cheshire West and Chester |
| Cheshire | Warrington |
| Cumbria | Cumberland |
| Cumbria | Westmorland and Furness |
| Greater Manchester | Bolton |
| Greater Manchester | Manchester |
| Greater Manchester | Oldham |
| Greater Manchester | Rochdale |
| Greater Manchester | Salford |
| Greater Manchester | Stockport |
| Greater Manchester | Tameside |
| Greater Manchester | Trafford |
| Greater Manchester | Wigan |
| Lancashire | Blackburn with Darwen |
| Lancashire | Blackpool |
| Lancashire | Lancashire |
| Merseyside | Halton |
| Merseyside | Knowsley |
| Merseyside | Liverpool |
| Merseyside | Sefton |

| ITL2 Area | Local authority district or county |
|---|---|
| Merseyside | St Helens |
| Merseyside | Wirral |

## Scotland

| ITL2 Area | Local authority district or county |
|---|---|
| Eastern Scotland | Angus |
| Eastern Scotland | City of Edinburgh |
| Eastern Scotland | Clackmannanshire |
| Eastern Scotland | Dundee City |
| Eastern Scotland | East Lothian |
| Eastern Scotland | Falkirk |
| Eastern Scotland | Fife |
| Eastern Scotland | Midlothian |
| Eastern Scotland | Perth and Kinross |
| Eastern Scotland | Stirling |
| Eastern Scotland | West Lothian |
| Highlands and Islands | Argyll and Bute (except Helensburgh and Lomond) |
| Highlands and Islands | Highland |
| Highlands and Islands | Moray |
| North Eastern Scotland | Aberdeen City |
| North Eastern Scotland | Aberdeenshire |
| Southern Scotland | Dumfries and Galloway |
| Southern Scotland | East Ayrshire |
| Southern Scotland | North Ayrshire |
| Southern Scotland | Scottish Borders |
| Southern Scotland | South Ayrshire |
| Southern Scotland | South Lanarkshire |
| West Central Scotland | Argyll and Bute (Helensburgh and Lomond only) |
| West Central Scotland | East Dunbartonshire |
| West Central Scotland | East Renfrewshire |
| West Central Scotland | Glasgow City |
| West Central Scotland | Inverclyde |
| West Central Scotland | North Lanarkshire |
| West Central Scotland | Renfrewshire |
| West Central Scotland | West Dunbartonshire |

## South West

| ITL2 Area | Local authority district or county |
|---|---|
| Cornwall and Isles of Scilly | Cornwall |
| Devon | Devon |
| Devon | Plymouth |
| Devon | Torbay |
| Dorset and Somerset | Bournemouth, Christchurch and Poole |
| Dorset and Somerset | Dorset |
| Dorset and Somerset | Somerset |
| Gloucestershire, Wiltshire and Bristol/Bath area | Bath and North East Somerset |
| Gloucestershire, Wiltshire and Bristol/Bath area | City of Bristol |
| Gloucestershire, Wiltshire and Bristol/Bath area | Gloucestershire |
| Gloucestershire, Wiltshire and Bristol/Bath area | North Somerset |
| Gloucestershire, Wiltshire and Bristol/Bath area | South Gloucestershire |
| Gloucestershire, Wiltshire and Bristol/Bath area | Swindon |
| Gloucestershire, Wiltshire and Bristol/Bath area | Wiltshire |

## Wales

| ITL2 Area | Local authority district or county |
|---|---|
| East Wales | Cardiff - Caerdydd |
| East Wales | Flintshire - Sir Y Fflint |
| East Wales | Monmouthshire - Sir Fynwy |
| East Wales | Newport - Casnewydd |
| East Wales | Powys - Powys |
| East Wales | The Vale of Glamorgan - Bro Morgannwg |
| East Wales | Wrexham - Wrecsam |
| West Wales and The Valleys | Blaenau Gwent |
| West Wales and The Valleys | Bridgend - Pen-Y-Bont Ar Ogwr |
| West Wales and The Valleys | Caerphilly - Caerffili |
| West Wales and The Valleys | Carmarthenshire - Sir Gaerfyrddin |
| West Wales and The Valleys | Ceredigion - Sir Ceredigion |
| West Wales and The Valleys | Conwy - Conwy |
| West Wales and The Valleys | Denbighshire - Sir Ddinbych |
| West Wales and The Valleys | Gwynedd - Gwynedd |
| West Wales and The Valleys | Isle of Anglesey - Sir Ynys Mon |

| ITL2 Area | Local authority district or county |
|---|---|
| West Wales and The Valleys | Merthyr Tydfil - Merthyr Tudful |
| West Wales and The Valleys | Neath Port Talbot - Castell-Nedd Port Talbot |
| West Wales and The Valleys | Pembrokeshire - Sir Benfro |
| West Wales and The Valleys | Rhondda Cynon Taff - Rhondda Cynon Taf |
| West Wales and The Valleys | Swansea - Abertawe |
| West Wales and The Valleys | Torfaen - Tor-Faen |

### West Midland

| ITL2 Area | Local authority district or county |
|---|---|
| Herefordshire, Worcestershire and Warwickshire | Herefordshire, County of |
| Herefordshire, Worcestershire and Warwickshire | Warwickshire |
| Herefordshire, Worcestershire and Warwickshire | Worcestershire |
| Shropshire and Staffordshire | Shropshire |
| Shropshire and Staffordshire | Staffordshire |
| Shropshire and Staffordshire | Stoke-on-Trent |
| Shropshire and Staffordshire | Telford and Wrekin |
| West Midlands | Birmingham |
| West Midlands | Coventry |
| West Midlands | Dudley |
| West Midlands | Sandwell |
| West Midlands | Solihull |
| West Midlands | Walsall |
| West Midlands | Wolverhampton |

### Yorkshire and the Humber

| ITL2 Area | Local authority district or county |
|---|---|
| East Yorkshire and Northern Lincolnshire | East Riding of Yorkshire |
| East Yorkshire and Northern Lincolnshire | City of Kingston upon Hull |
| East Yorkshire and Northern Lincolnshire | North East Lincolnshire |
| East Yorkshire and Northern Lincolnshire | North Lincolnshire |
| North Yorkshire | North Yorkshire |
| North Yorkshire | York |
| South Yorkshire | Barnsley |
| South Yorkshire | Doncaster |

| ITL2 Area | Local authority district or county |
|---|---|
| South Yorkshire | Rotherham |
| South Yorkshire | Sheffield |
| West Yorkshire | Bradford |
| West Yorkshire | Calderdale |
| West Yorkshire | Kirklees |
| West Yorkshire | Leeds |
| West Yorkshire | Wakefield |

## London geographies before April 2008

London annual data between April 1995 and March 2008 was disaggregated into five sub-regions. The table below identifies which boroughs were included in each sub-region.

| London sub-region | London borough |
|---|---|
| Central London | Camden |
| Central London | City of London |
| Central London | Islington |
| Central London | Kensington And Chelsea |
| Central London | Lambeth |
| Central London | Southwark |
| Central London | Westminster |
| East London | Newham |
| East London | Barking and Dagenham |
| East London | Bexley |
| East London | Greenwich |
| East London | Hackney |
| East London | Havering |
| East London | Lewisham |
| East London | Redbridge |
| East London | Tower Hamlets |
| North London | Barnet |
| North London | Enfield |
| North London | Haringey |
| North London | Waltham Forest |
| South London | Bromley |
| South London | Croydon |
| South London | Kingston Upon Thames |
| South London | Merton |

| London sub-region | London borough |
|---|---|
| South London | Richmond Upon Thames |
| South London | Sutton |
| South London | Wandsworth |
| West London | Hillingdon |
| West London | Brent |
| West London | Ealing |
| West London | Hammersmith and Fulham |
| West London | Harrow |
| West London | Hounslow |

# Annex 2 – Methodology changes since April 2006

**April 2006 to March 2007**

- Additional estimates for rail travel using TfL sold travelcards and airport links were included.

**April 2008 to March 2009**

- The generation of the ODM was integrated with the demand matrix in MOIRA, a software tool used by the industry to model the impact of timetable changes on the rail market. In addition to having LENNON data, MOIRA also provided more robust estimates of rail travel on TfL sold travelcards and airport links. It also included estimates of rail travel in PTE areas which had previously been excluded from the ODM due to a lack of data.

**April 2009 to March 2010 and April 2010 to March 2011**

- From January 2010, rail travel using Oyster pay-as-you-go (PAYG) was included in LENNON, so this data was included in the ODM from 2009-10 with the first full year of data being April 2010 to March 2011.

**April 2011 to March 2012**

- Improved estimates of travel in the West Midlands (Centro) PTE area included.

- Estimates of rail travel made using a small number of Rover and Ranger products included. The tickets included were: St Ives Day Rangers, Valleys Night Rider, and Cambrian Coaster Ranger. Whilst volumes of travel on these products are relatively small, in the specific area of use they can be significant.

**April 2012 to March 2013**

- An improved PTE infill was included for two more PTEs – West Yorkshire (WYPTE) and Greater Manchester (GMPTE/TfGM).
- Estimates of rail travel using TfL's concessionary product, the 'Freedom Pass', were included for the first time.
- A further five Rover and Ranger products were included: Anglia Plus, Devon Day Ranger, Devon Evening Ranger, Ride Cornwall, and Freedom Travel Pass (West of England product).

**April 2013 to March 2014**

- A number of changes were made to improve the representation of journeys on PTE-sponsored tickets in South Yorkshire, Merseyside and Strathclyde.

**April 2014 to March 2015**

- An improved infill for the Tyne and Wear PTE area was included.
- An adjustment process was made to account for the change in LENNON treatment of PAYG journeys to make the statistics more consistent with previous years. This adjustment was a one off as in April 2015 to March 2016 it was included in the MOIRA base matrix.
- An adjustment was required due to changes in journey patterns as a result of the London Bridge works. Data from Transport for London's (TfL's) Oyster Clicks Model (OCM) was used to estimate the number of journeys 'to London Bridge' and the number of journeys 'to London Terminals'.
- Journeys using a season ticket product for students have been redistributed to Exeter Central and Exeter St. David's from Digby and Sowton to better reflect actual journey destinations.

**April 2015 to March 2016**

- London (In-boundary) Travelcard Methodology - Oyster Clicks Model (OCM) data was used to allocate journeys made wholly within the London Travelcard Area to individual London stations rather than based on a survey from 2001.
- London Terminals Demand Allocation - improved due to MOIRA base matrix now disaggregated by individual London Terminal where possible, such as where a ticket is bought to a specific terminal rather than to the generic 'London Terminals.'

- St. Ives Branch Line Counts - Passenger counts were carried out at all five stations on the St. Ives Bay line (St. Erth to St. Ives) in August 2016 and the results of these counts were used to produce a more accurate allocation of entries and exits from sales of ranger or rover tickets across the stations.

- Season Ticket Journey Adjustment (Southend) – An adjustment to the allocation of usage at stations around Southend was made to account for season tickets issued for travel to/from Southend Victoria which were actually being used to travel from alternative stations on the branch, as the price of a season ticket is the same.

**April 2016 to March 2017**

- London BR Allocation Update - Reallocation of some journeys for Kensington Olympia due to previous overestimates.

- Season Ticket Journey Adjustments (expanded number stations) - In the production of the April 2014 to March 2015 and April 2015 to March 2016 statistics, some adjustments were made to account for situations where passengers buy season tickets for travel to/from a station other than the one they generally travel from, in order to allow additional flexibility. For the production of the April 2016 to March 2017 statistics additional LENNON analysis was conducted and discussions with train operators to identify and include additional stations in the adjustment to better reflect their usage.

- Updated Demand Allocation at Group Stations – In order to validate and improve the allocation of journeys between stations within groups (e.g. Worcester BR), passenger counts were carried out at selected group stations on the network. These counts were carried out in Autumn and Winter 2016 and have informed the allocation of demand at the following station groups: Dorchester BR, Newark BR, Southend BR, Warrington BR, Wigan BR and Worcester BR.

**April 2017 to March 2018**

- Season Ticket Journey Adjustments - Similar to previous years, adjustments were made to account for situations where passengers buy season tickets from a station other than the one they generally travel from. The analysis underpinning this reallocation was updated with April 2017 to March 2018 LENNON data.

- Updated Demand Allocation at Group Stations – Passenger counts were carried out in Autumn 2017 and have informed the allocation of demand at the following station groups: Bicester BR, Birmingham BR, Farnborough BR, Southend BR, Warrington BR, Wigan BR and Worcester BR.

**April 2018 to March 2019**

- Concessionary travel in Greater Manchester - Concessionary ticketing data was available for Greater Manchester PTE for inclusion in the ODM. This led to a total increase of 3.6 million journeys, or 7.2 million entries and exits, across Greater Manchester.

- Season Ticket Journey Adjustments - Similar to previous years, adjustments were made to account for situations where passengers buy season tickets from a station other than the one they generally travel from. The analysis underpinning this reallocation was updated with April 2018 to March 2019 LENNON data.

**April 2019 to March 2020**

- Merseyside PTE – Off network sales (commercial retailers, non-commercial retailers and Merseytravel centres) of Saveway and Trio tickets included. Previously only sales at stations and on trains were included.

- South Yorkshire PTE - Concessionary tickets (senior and disabled) included.

- Season Ticket Journey Adjustments - analysis underpinning this reallocation was updated with April 2018 to March 2019 LENNON data.

- Updated Demand Allocation at Group Stations – Passenger counts were carried out in Spring 2020 and have informed the allocation of demand at the following station groups: Dorchester BR, Edenbridge BR, Warrington BR and Worcester BR. In addition, updated splits for the Manchester BR group stations were provided by TfGM and implemented.

- Estimates for the three Heathrow stations were included for the first time. This addition also improved the estimates for London Paddington station and other local stations.

**April 2020 to March 2021**

- Inclusion of concessionary tickets for West Yorkshire PTE and updated methodology used to estimate journeys using local tickets across the West Midlands and South Yorkshire areas.

- Updated season ticket journey allocation adjustments, including new adjustments for some stations in Wales.

- Inclusion of Caledonian Sleeper journeys.

- Updated allocation of journeys between selected Group stations based on passenger count surveys.

**April 2021 to March 2022**

- An additional 98,200 entries and exits have been added to stations across the Tyne and Wear PTE area as a result of additional tickets being included in the dataset for the first time. This increased usage estimates across the Tyne and Wear PTE area by 1.3%.

- This year an updated distribution has been used for allocating entries and exits for West Yorkshire PTE tickets. The new distribution used the latest year (April 2021 to March 2022) data (replacing the April 2019 to March 2020 data), better reflecting post-pandemic travel patterns. The sample size is also greater than the previous data, covering a full year rather than one week.

- Gateline data was supplied by Heathrow Airport. This was used to update the distribution of entries and exits across the three Heathrow stations and enabled a more accurate estimate of usage at each one.

- Following a review of tickets included in the estimates, a number of products were identified for inclusion for the first time. This includes the Derbyshire Wayfarer, Brighton and Worthing Unizone cards and more derivatives of the Bristol Freedom Pass product. This led to an addition of 616,000 entries and exits.

**April 2022 to March 2023**

- Split ticketing is where a passenger completes a single journey using two or more tickets. Total journeys at some individual stations will be significantly over estimated due to some passengers not boarding or alighting at the split point and instead staying on the train. In our previous release (Estimates of station usage April 2021 to March 2022) we identified the following common ticket split points: Basingstoke, Croydon BR (East Croydon and West Croydon), Didcot Parkway, Doncaster, Gatwick Airport, Leeds, Milton Keynes Central, Peterborough, Sheffield, and York.

  For this year, we introduced an adjustment to account for split ticketing in the LENNON data. Rail Delivery Group developed an algorithm to detect split tickets, and we have incorporated this into our data processing. Therefore, from this year (April 2022 to March 2023) we only counted an entry and exit at the start of the journey and end of the journey, whereas previously an entry and exit would have been recorded at each split point along the way.

- An updated distribution has been used for allocating journeys for passengers who have bought non-travelcard tickets with a destination of London Terminals, for example Oxford to London Terminals. The new distribution uses modelled data from the December 2022 CAF data to allocate journeys to each station based on possible

travel routes. Previously journeys were allocated using results from the 2001 London Area Travel Survey (LATS). While many allocations to central London stations will be similar to when the LATS took place, some will have changed significantly (e.g. due to the impacts of Thameslink). This represents a significant methodological improvement.

- The methodology for calculating concessionary demand in the Greater Manchester region has been updated. A new data source was available (rail surveys undertaken in August 2023) which covered all ticket types (including concessions on radial Manchester rail routes). Previously survey data from 2017 was used. This data is to estimate the proportion of concessions across all ticket types to account for concessionary travel that would otherwise not be covered by the ticket purchase data.

- An updated distribution has been used for allocating journeys using West Yorkshire Metro tickets. The new distribution uses latest year (April 2022 to March 2023) data (replacing the April 2021 to March 2022 data), better reflecting post-pandemic travel patterns.

**April 2023 to March 2024**

- A methodological adjustment was used to account for journeys in the MOIRA2.2 base matrix that have the same origin and destination. This issue mainly occurred in the Oyster/CPAY area where passengers either did not tap in or tap out. The adjustment reallocates these journeys to other flows based on the underlying distribution of Oyster/CPAY journeys at the station. This removed 1.7 million journeys.

- A methodological adjustment was used to exclude journeys that were paid for but never used. These are tickets that were not collected from 'Ticket on Departure' (TOD) machines. This removed 850,000 journeys.

- An updated distribution was used for allocating journeys using Strathclyde Partnership for Transport tickets. The updated distribution used April 2023 to March 2024 data (replacing pre-pandemic data), better reflecting post-pandemic travel patterns. This change did not affect the total number of journeys but it did impact their distribution across the network.

*See Steer's historical methodological changes report for more detail.*



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