Rail infrastructure and assets
April 2021 to March 2022

20 October 2022
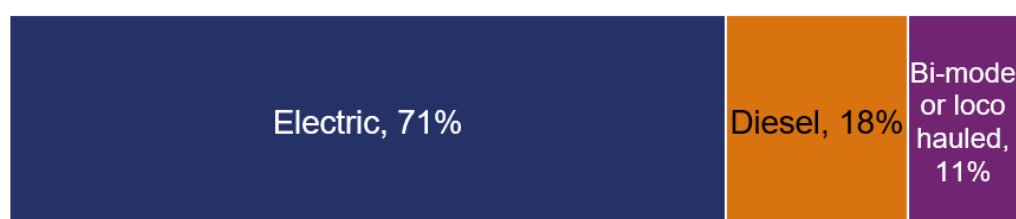
As of 31 March 2022, 71% of all passenger train operator rolling stock were **electric**. **Diesel vehicles** made up 18%, and 11% of the passenger fleet were either **bi-mode or locomotive hauled**.

Figure 1 The majority of all passenger rolling stock was electric

Proportion of passenger rolling stock by traction type, Great Britain, as of 31 March 2022

The **average age of rolling stock** for all passenger train operators as of 31 March 2022 was 16.9 years. Greater Anglia had the largest annual decrease in average age due to the introduction of new Class 720 trains, falling by 5.4 years to 11.3 years. Lumo started operating in October 2021, and has the lowest average age for all operators of 0.8 years.

In the latest year (April 2021 to March 2022), **2.2 electrified track km were added** to the network. This was due to remodelling at London King's Cross as part of the East Coast upgrade.

The **proportion of electrified route** remained similar compared with the previous year at 38.1%.

Soham station opened in December 2021. This brings the **total number of mainline stations in Great Britain** as of 31 March 2022 to 2,570.

New data: Data for passenger rolling stock by traction type and operator has been included for the first time. This covers the passenger fleet as of 31 March 2022.

All data tables, a quality and methodology report and an interactive dashboard associated with this release are published on the Rail infrastructure and assets page of the data portal. Key definitions are in annex 1 of this release.
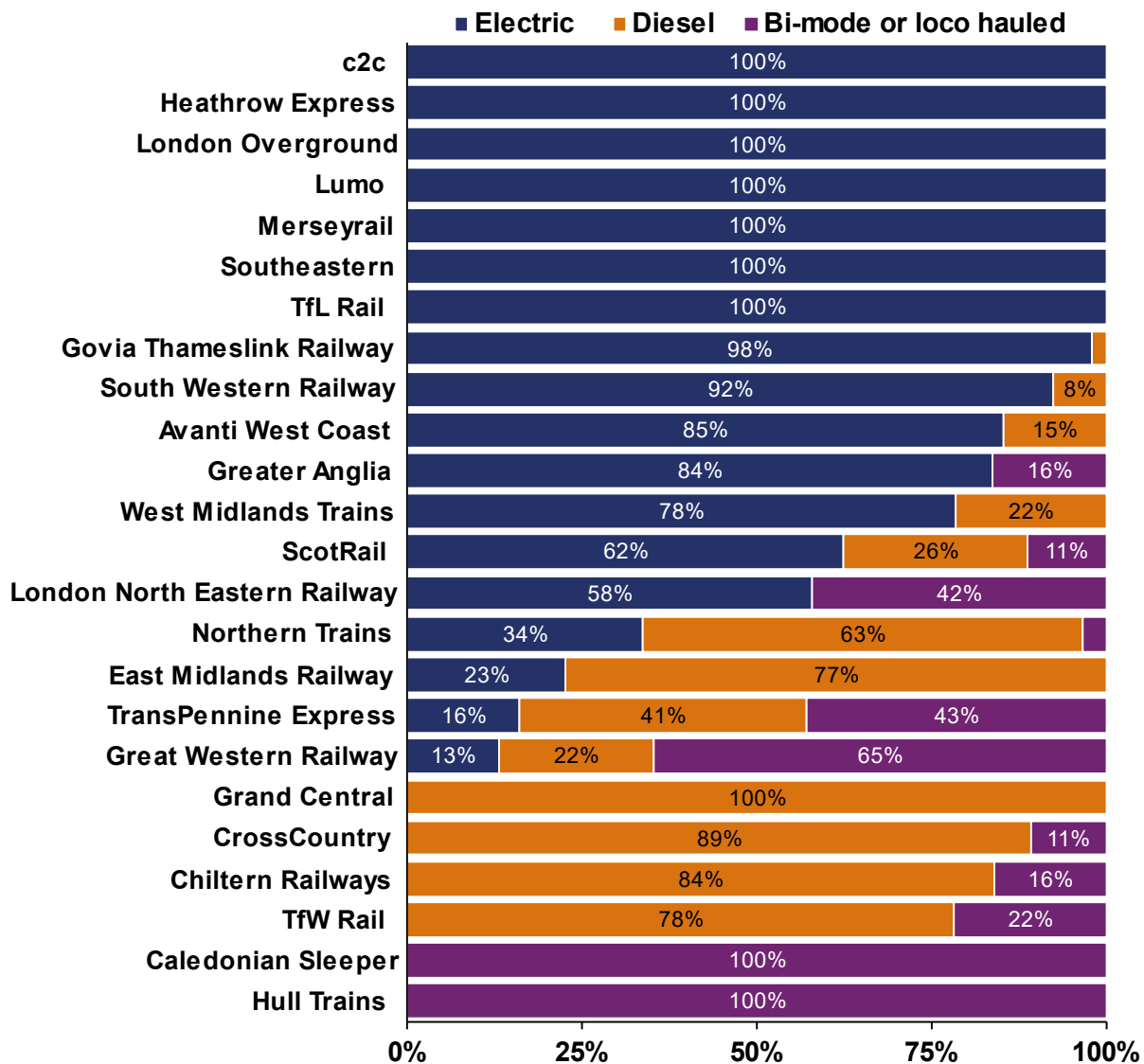
1. Rolling stock by traction type

In the latest year, there were seven operators with a completely electric passenger fleet. Hull Trains' fleet consisted entirely of bi-mode vehicles (run in either electric or diesel mode). Caledonian Sleeper's fleet was 100% locomotive hauled (vehicles do not run under their own power). Grand Central's passenger fleet was 100% diesel vehicles.

The remaining 14 operator fleets were comprised of varying proportions of electric, diesel, bi-mode and locomotive hauled vehicles.

Figure 1.1 Seven of the 24 passenger operators had a fully electric fleet
Proportion of rolling stock by traction type and by train operator, Great Britain, as of 31 March 2022 (Table 6314)

Legend: ■ Electric ■ Diesel ■ Bi-mode or loco hauled

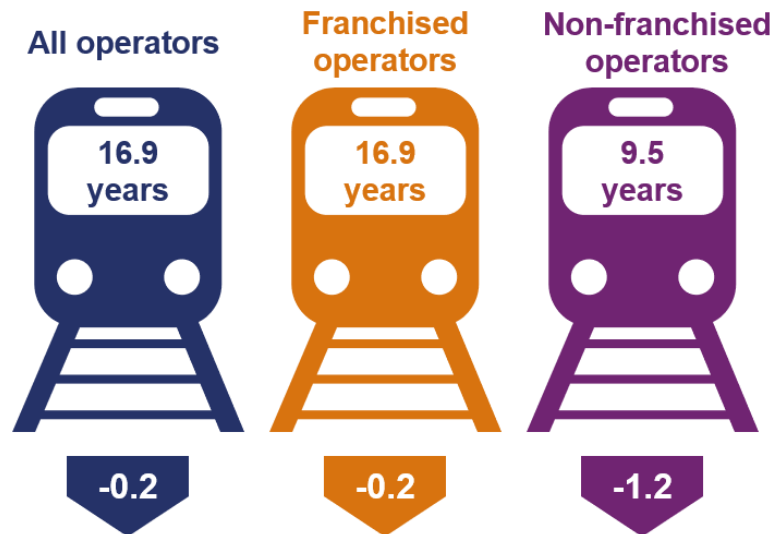| Operator	Electric	Diesel	Bi-mode or loco hauled
c2c	100%		
Heathrow Express	100%		
London Overground	100%		
Lumo	100%		
Merseyrail	100%		
Southeastern	100%		
TfL Rail	100%		
Govia Thameslink Railway	98%		
South Western Railway	92%	8%	
Avanti West Coast	85%	15%	
Greater Anglia	84%		16%
West Midlands Trains	78%	22%	
ScotRail	62%	26%	11%
London North Eastern Railway	58%		42%
Northern Trains	34%	63%	
East Midlands Railway	23%	77%	
TransPennine Express	16%	41%	43%
Great Western Railway	13%	22%	65%
Grand Central		100%	
CrossCountry		89%	11%
Chiltern Railways		84%	16%
TfW Rail		78%	22%
Caledonian Sleeper			100%
Hull Trains			100%

As of 31 March 2022, there were 15,277 railway vehicles registered in operation for all passenger train operators. This was comprised of:

- 10,850 electric vehicles (71%)

- 2,746 diesel vehicles (18%)

- 1,132 bi-mode vehicles (7%), and

- 549 locomotive hauled vehicles (4%)

Bi-mode vehicles can be powered either by electric power from overhead lines or third rail, or by using diesel engines. This means the trains can run on both electrified and non-electrified track. Although the vehicles for TfW Rail are bi-mode meaning they could run using either electric or diesel, in the latest year they were only operated using diesel.

2. Average age of rolling stock

All operators

16.9 years

-0.2

Franchised operators

16.9 years

-0.2

Non-franchised operators

9.5 years

-1.2

As of 31 March 2022, the average age of passenger train operators rolling stock fleet (railway vehicles) in Great Britain decreased by 0.2 years compared with a year earlier.

For franchised operators, the age decreased by 0.2 years and for non-franchised operators the age decreased by 1.2 years. The non-franchised operators' rolling stock makes up around 1% of all passenger stock. The decrease for non-franchised was largely driven by the introduction of Lumo in October 2021 and their new electric rolling stock.

Figure 2.1   The average age of rolling stock has continued to fall in recent years
Average age of rolling stock in years (franchised operators), Great Britain, as of 31 March 2008 to 31 March 2022 (Table 6313)
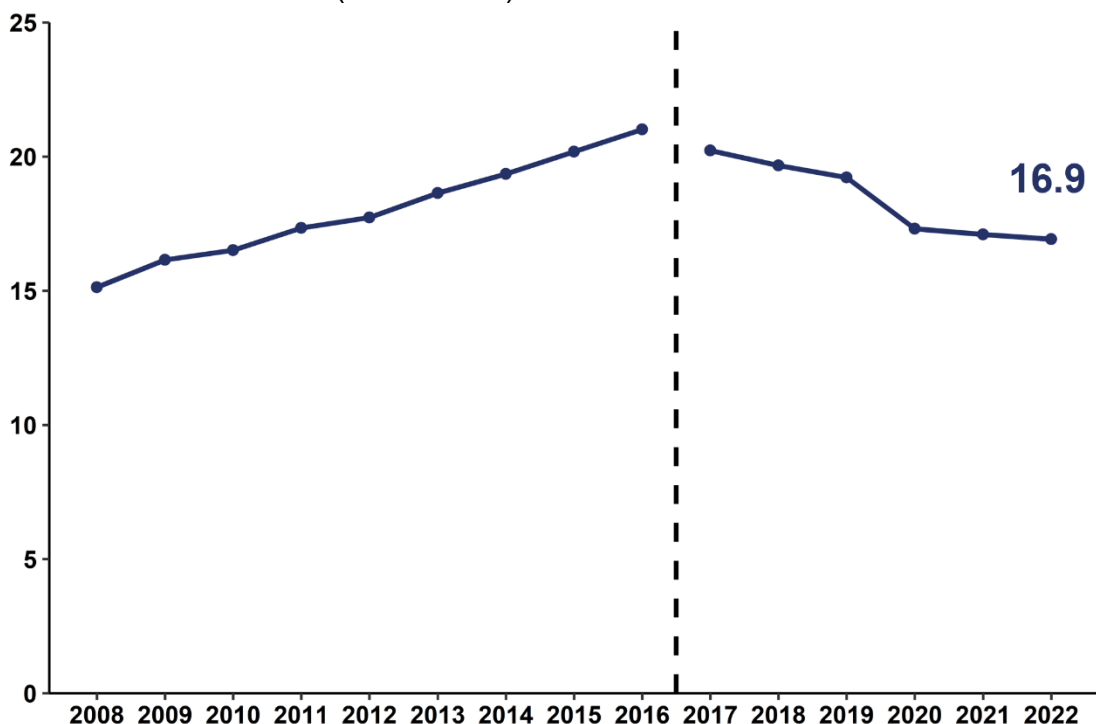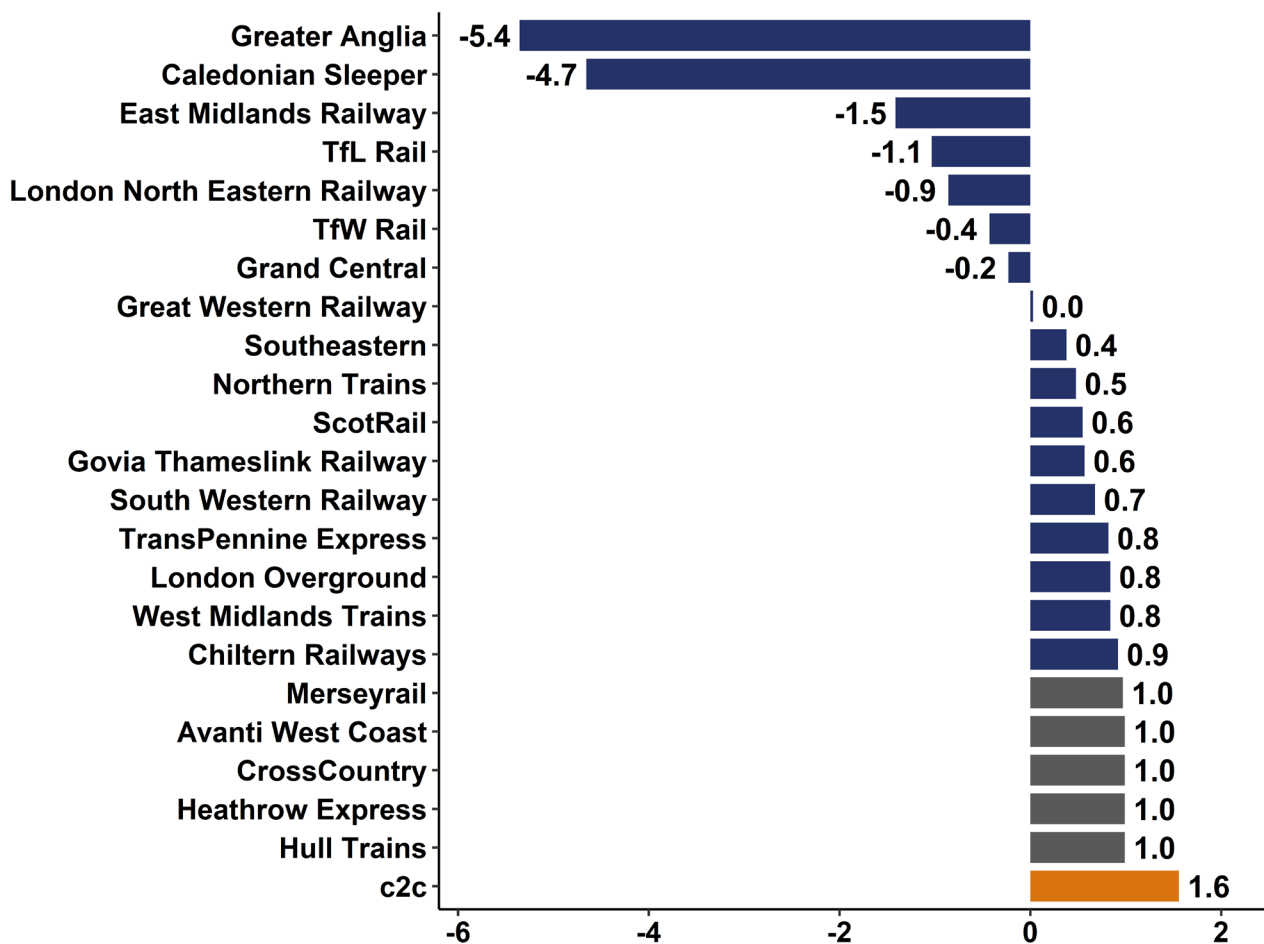
How the average age of rolling stock is calculated

The average age of rolling stock shown is the age at the end of the financial year. A vehicle drops out of the dataset if it is no longer leased by a train operator. As all existing rolling stock will age by one year between one year and the next, any change in average age of less than 1.0 years is an indication of either the introduction of newer rolling stock or the removal of older stock from the fleet.

Average age of rolling stock by train operator

Figure 2.2   Greater Anglia had the largest annual decrease in average age

Age change in years of rolling stock between 31 March 2021 and 31 March 2022 by train operator, Great Britain (Table 6313)

For five operators, the rolling stock fleet was unchanged (no additions or removals) in the latest year. Therefore their average age increased by one year.

For one operator (c2c), the average age of rolling stock increased by more than one year. Increases and decreases are further explained in Table 2.1 for each operator.

For 17 operators, the average age of the rolling stock either decreased, or increased by less than a year. This was due to new rolling stock being introduced, older rolling stock being phased out, or a combination of both of these factors.

As of 31 March 2022, Lumo had the lowest average age of 0.8 years, whilst Merseyrail had the oldest fleet with an average age of 42.6 years.

Figure 2.3   The average age of rolling stock varied by operator

Average age of rolling stock in years by train operator, Great Britain, as of 31 March 2022 (Table 6313)
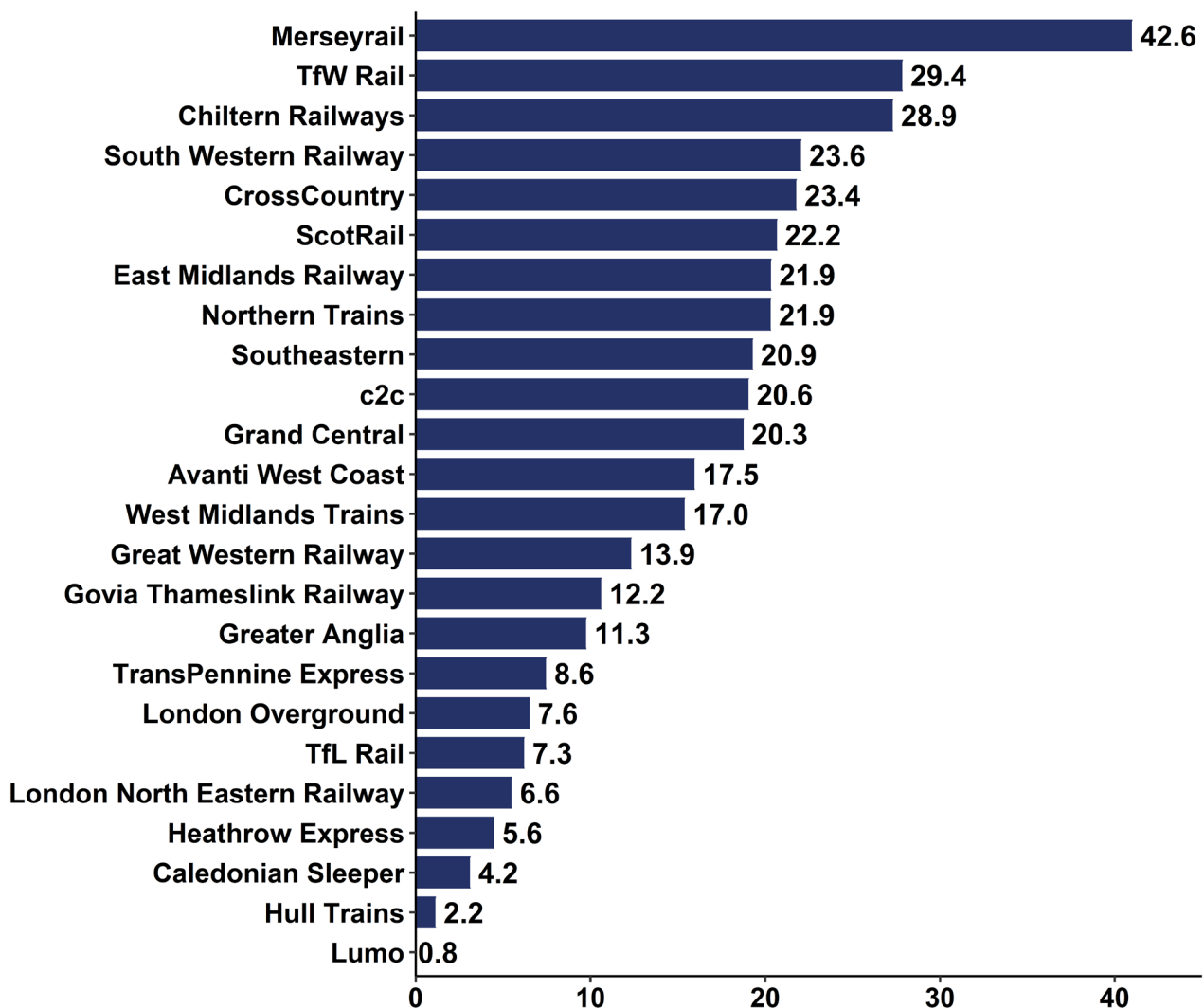
Average age of rolling stock: further detail by train operator

The table below provides some further detail about key rolling stock changes and future rolling stock orders.

Table 2.1   Average age of rolling stock by passenger train operator as of 31 March 2022, annual age change and reason (Table 6313)

| Train operator	Average age of rolling stock	Age change compared with 31 March 2021 (years)	Reason for change
Avanti West Coast	17.5 years	+1.0	No change
c2c	20.6 years	+1.6	Withdrew Class 387/3 fleet
Caledonian Sleeper	4.2 years	−4.7	Removal of older Mark 3 vehicles, due to introduction of newer Mark 5 carriages
Chiltern Railways	28.9 years	+0.9	Removal of older rolling stock
CrossCountry	23.4 years	+1.0	No change
East Midlands Railway	21.9 years	−1.5	Removal of older rolling stock
Govia Thameslink Railway	12.2 years	+0.6	Removal of Class 365 vehicles
Grand Central	20.3 years	−0.2	Removal of Mark 3 vehicles
Great Western Railway	13.9 years	+0.0	Removal of older rolling stock
Greater Anglia	11.3 years	−5.4	Fall in average age due to introduction of Class 720 rolling stock
Heathrow Express	5.6 years	+1.0	No change
Hull Trains	2.3 years	+1.0	No change
London North Eastern Railway	6.6 years	−0.9	Removal of older rolling stock
London Overground	7.6 years	+0.9	Continued to add newer Class 710/3 rolling stock to fleet
Lumo	0.8 years	No comparison	Lumo started running services October 2021
Merseyrail	42.6 years	+1.0	No change

Train operator	Average age of rolling stock	Age change compared with 31 March 2021 (years)	Reason for change
Northern Trains	21.9 years	+0.5	Replaced older Pacer vehicles
ScotRail	22.3 years	+0.6	Removal of older rolling stock
South Western Railway	23.6 years	+0.7	Removal of older Class 442 vehicles
Southeastern	20.9 years	+0.4	Introduction of new City Beam Trains from September 2021
TfL Rail	7.3 years	−1.1	Introduction of newer Class 345 vehicles
TfW Rail	29.4 years	−0.4	Removal of older Class 143 vehicles
TransPennine Express	8.6 years	+0.8	Increase in age by less than a year due to introduction of new Nova 3 fleet (five car Mark a carriages hauled by Class 68 locomotives)
West Midlands Trains	17.0 years	+0.8	Addition of Class 172 vehicles

Rolling stock additional information

While new rolling stock may be more efficient and technologically advanced, existing trains can be refurbished during their lifetime to add better facilities (e.g. WiFi capability or increased seating capacity). Both newly-built and refurbished rolling stock can offer a more comfortable service for passengers. Therefore, the age of rolling stock does not necessarily affect passenger satisfaction. The introduction of refurbished rolling stock is not reflected in these statistics.

3. Infrastructure on the railway

Rail network length
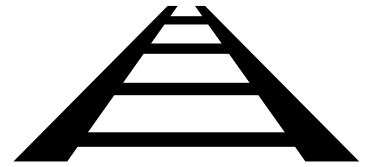
**Track length in Great Britain as of 31 March 2022: 31,209 km**

Route length open for traffic in Great Britain as of 31 March 2022: 15,874 km

In England, the total route length decreased by 53 km from 11,703 km as of 31 March 2021 to 11,650 km as of 31 March 2022. The route length in Wales decreased by 5 km, and the route length in Scotland decreased by 4 km compared with the previous year.

In Great Britain as of 31 March 2022, 6,042 km of route were electrified (38.1%). This is slightly higher than the proportion of 37.9% in the previous year, although the electrified route length decreased slightly by 3 km. The highest proportion of electrified route length as of 31 March 2022 was in England with 43.8%. In Wales, 3.7% of the route length was electrified and in Scotland 32.8% was electrified.

Figure 3.1   **The highest proportion of electrified route length was in England with 43.8%**

Total and electrified route length (kilometres) by country, Great Britain, as of 31 March 2022


Rail Infrastructure and Assets April 2021 to March 2022
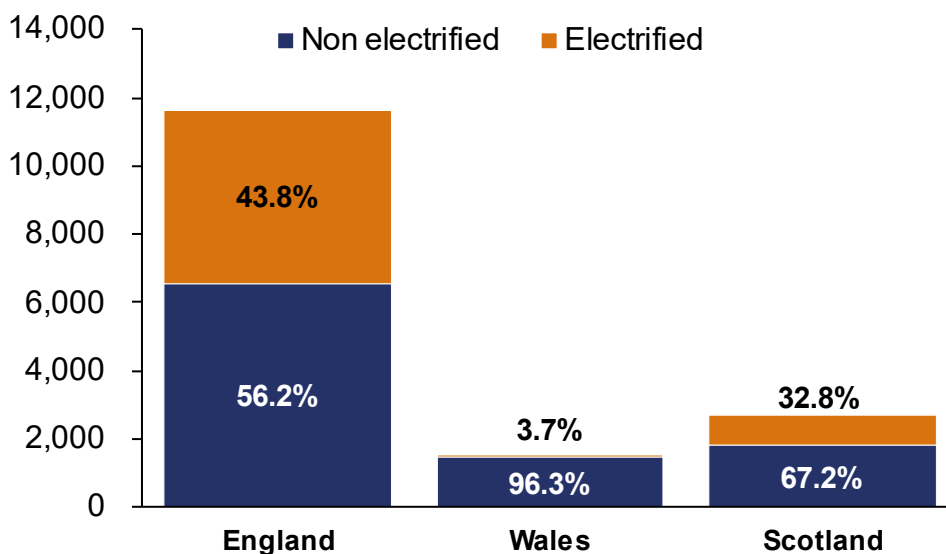
Data on track length for each Network Rail region is available in Network Rail's Annual Return data tables. Please note Network Rail's data tables do not include Core Valley Lines (CVL) infrastructure, which transferred from Network Rail to Transport for Wales on 28 March 2020.

New electrification time series data

In the latest year (April 2021 to March 2022), **2.2 track km** were added to the network. This was due to remodelling at London King's Cross as part of the East Coast upgrade.

Data on the length of electrified track added through various electrification projects that have taken place on the network since April 1995 in Great Britain is available in Table 6320 – Infrastructure on the mainline. The data is shown by country from April 2012. Data by Network Rail region is available in Network Rail's Annual Return data tables (Table 49: Network Capability).

Figure 3.2   Rail network by electrification scheme, Great Britain, as of 31 March 2022
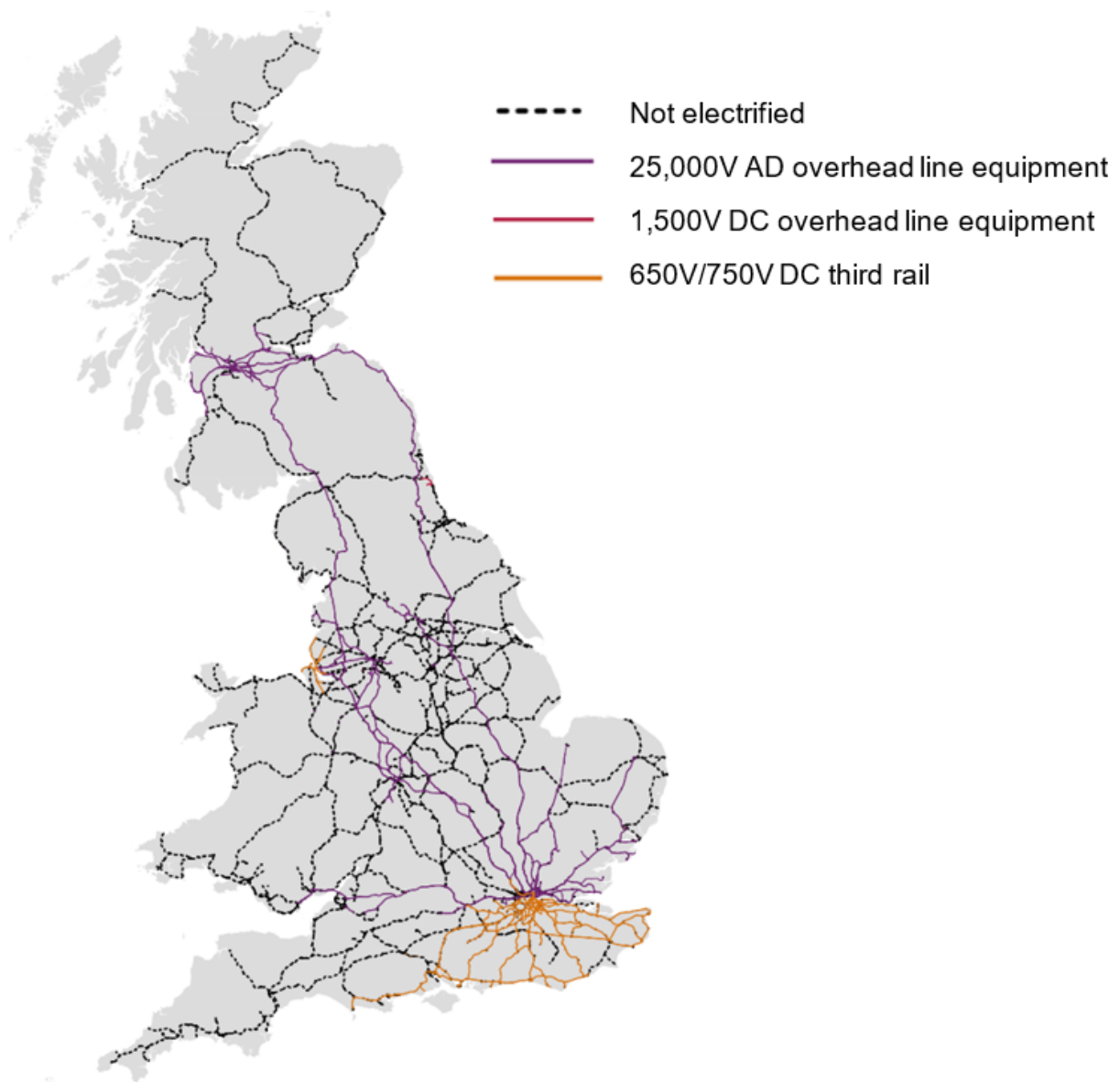
© Crown copyright and database rights (2012) Ordnance Survey (0100043420). Use of this data is subject to terms and conditions.

The map above shows the different track and electrification categories for the rail network in Great Britain.

The different track categories are:

- not electrified – trains run using diesel;

- electrified with 25,000V AC overhead line equipment;

- electrified with 1,500V DC overhead line equipment – used for Tyne and Wear metro;

- electrified with 650V or 750V DC third rail – supplied from additional rails at track level which are in contact with electricity collection equipment on the train.

4. Number of mainline stations

As of 31 March 2022, there were 2,570 open mainline stations in Great Britain

New stations

Soham (East Cambridgeshire, England) opened 13 December 2021 and is served by Greater Anglia.

Closed stations

No stations permanently closed in the year April 2021 to March 2022.

Figure 4.1   Stations opened in the year April 2021 to March 2022, Great Britain

Soham
opened 13 December 2021

Temporary station and line closures

Heathrow Terminal 4 railway station remained closed throughout the latest year (April 2021 to March 2022). It originally shut in May 2020, due to the temporary closure of the airport's Terminal 4 during the pandemic.

Perry Barr railway station (Birmingham) was temporarily closed from May 2021 for 12 months, for station redevelopment.

Stanlow & Thornton railway station (Cheshire West and Chester) was temporarily closed from February 2022 until further notice. This was due to safety concerns with the footbridge entry to the station.

For detailed information on all stations as at 31 March 2022 please see our table on the data portal: Table 6329 Station attributes for all mainline stations in Great Britain. This covers geographical and other attribute information, such as county, local authority, Easting and Northing, and station facility owner.

For estimates of station usage (entries and exits) at all stations in Great Britain please see Estimates of station usage page on the data portal.

5. Authorisations and accessibility

Authorisations

New, major, upgraded or renewed infrastructure and rolling stock applicants must seek authorisation from ORR to place their subsystems into service. The UK Register of Authorised Types of Railway Vehicles aims to streamline the authorisation process and encourage standardisation on the railway network. There is a requirement for ORR to keep this register since the United Kingdom left the EU.

The following railway vehicles were authorised in the year to 31 March 2022:

- Class 720/5 authorised 14 June 2021

- FFA(G) (freight wagons) authorised 17 September 2021

- Class 777 authorised 22 September 2021

- B66 UC Tamper (special vehicles) authorised 06 October 2021

- JNA(W) (freight wagons) authorised 07 October 2021

- MLA(W) (freight wagons) authorised 05 November 2021

- JNA(U) (freight wagons) authorised 25 November 2021

- FEA(W) (freight wagons) authorised 23 December 2021

- Class 197 authorised 13 January 2022

- Unimat 08 4x4/4S (special vehicles) authorised 21 January 2022

- JNA(T) (freight wagons) authorised 30 March 2022

For details of authorisations granted by ORR under the Railways (Interoperability) Regulations 2011 in the year to 31 March 2022, see the Interoperability authorisations page on ORR's website.

Accessibility

The Railways (Interoperability) Regulations 2011 and the Rail Vehicle Accessibility (Non-Interoperable Rail Systems) Regulations 2010 required that all passenger rail vehicles meet accessibility standards by 1 January 2020.

These requirements included, for example:

- providing access for wheelchair users

- the size and location of handrails, handholds and control devices

- providing passenger information systems and other equipment

DfT reported that around 1,200 vehicles failed to meet this deadline, and were granted an exemption to 31 January 2020. This was later extended to 30 April 2020, and further extended until 31 December 2020.

It was extended further until 30 September 2021, to allow government and industry to create a long-term solution for providing rail replacement services which is fully compliant with current public service vehicles accessibility regulations. This was extended further to the end of the 2021 to 2022 academic year. The medium-term exemption allows for services to still run, while requiring operators become increasing compliant with existing legal obligations.

This exemption is subject to the conditions that:

- train operating companies must source and use compliant vehicles wherever possible in the first instance, only using non-complaint vehicles that have been granted a special authorisation when other options have been exhausted

- train operating companies must provide alternative accessible transport for disabled passengers which offers the same levels of service as those for non-disabled passengers with no detriment to those passengers when no compliant vehicle is available

- arrangements must be made in advance during planned engineering works to ensure alternative accessible transport is readily available

As of July 2020, DfT data showed that around 94% of heavy rail rolling stock was built or refurbished to be accessible to disabled passengers. The latest fleets of trains are fully compliant with accessibility standards.

6. Annexes

Annex 1 – Definitions

- **Rolling stock** are railway vehicles, including both powered and unpowered vehicles, such as carriages, and freight wagons. The average age of rolling stock does not include locomotives.

- **Traction type** of the rolling stock refers to how the vehicle is powered. The vehicle may be powered from an electricity supply, or a diesel engine. Some vehicles are bi-mode, which can operate using electricity when running on electrified track or diesel along non electrified track. **Locomotive hauled** vehicles do not run under their own power, but instead have a locomotive at one (or both) ends of the train.

- **Route kilometres** are the total extent of routes available for trains to operate. Sidings and depots are excluded.

- **Track kilometres** takes into account multiple track routes (e.g. for each route kilometre where there is double track, there are two track kilometres). Sidings and depots are excluded.

- **Franchised operators** run services as part of contracts awarded by government.

- **Non-franchised (open access) operators** are licenced by ORR to run services on specific routes. The datasets that accompany this publication contain data for such operators: Grand Central, Heathrow Express, Hull Trains and Lumo (operator began running services on 25 October 2021).

- **Authorisations** are needed by law as no structural or vehicle subsystem can be put into use on or as part of the rail system in Great Britain unless the ORR has provided an interoperability authorisation the placing in service of the subsystem.

Annex 2 – Quality and methodology

Data sources

The number of mainline stations is sourced from data used to produce ORR's Estimates of station usage. This covers all stations on the rail network that are served by mainline services as at 31 March 2022. Any stations where all services have been suspended temporarily are included, whereas stations closed permanently or where all services have been suspended permanently are not.

Data for the track and route length is provided by Network Rail and Amey Keolis Infrastructure Ltd (AKIL). The HS1 line and the Island Line network on Isle of Wight are not included in these figures. The Island Line is leased from Network Rail to First MTR South Western Trains Limited (operating as South Western Railway).

The Core Valley Lines (CVL) network was transferred from Network Rail to Transport for Wales on 28 March 2020. Transport for Wales leases its assets to AKIL who are the Infrastructure Manager for the Core Valley Lines network. There are 55 stations on the CVL Network, and a map is available in the 2022 CVL Network Statement.

Data for the average age of **rolling stock and traction type** is provided by RSSB (Rail Safety and Standards Board). This is from the R2 central asset management system. R2 holds details of every vehicle registered to operate on the railway in Great Britain, and is the single repository for all vehicles and major components with full maintenance history. The data presented in this release are for mainline operators in Great Britain. The data does not include Eurostar, London Underground, light rail, heritage and charter services.

Revisions

There have been revisions to previously published data:

- Table 6320 – data has been revised for track length, route length or the length of new electrification projects for the years: as of 31 March 1998, 31 March 2000, 31 March 2018, 31 March 2020 and 31 March 2021. This was due to data quality improvements and consistency with Network Rail's other published data.

Details on previous revisions can be found in the Revisions log.

Further information on data sources, quality, methodology and the historical background, can be found in the Infrastructure and assets quality and methodology report.

How these statistics can and cannot be used

- Monitoring the number of mainline stations in Great Britain, and newly opened stations
- Comparing the average age of rolling stock by operator over time
- Looking at the types of rolling stock by traction system for passenger operators
- Monitoring new track electrification schemes, and total track length

- Identifying specific rolling stock by operator – this information is held in RSSB's R2 database
- Identifying passenger usage for mainline stations (refer to Estimates of station usage)
- Identifying number of trains running on specific sections of track
- Plans for operators to introduce new rolling stock in future years
- Information on rolling stock for freight operators or heritage

Annex 3 – List of data tables associated with this release and other related statistics

Data tables

All data tables can be accessed on the data portal free of charge in OpenDocument Spreadsheet (.ods) format. We can also provide data in csv format on request.

All tables associated with this release can be found under the Data tables heading at the bottom of the Rail infrastructure and assets page.

Infrastructure on the railways

● Infrastructure on the mainline – Table 6320

● Mainline stations in Great Britain – Table 6325

● Station attributes for all mainline stations in Great Britain – Table 6329

Rolling stock

● Average age of rolling stock by train operator – Table 6313

● Rolling stock vehicles by traction type and train operator – Table 6314 **(New table)**

Other related data

Fuel consumption and estimates of associated emissions of passenger and freight operators are published on the Rail emissions page on the data portal. This includes estimates of emissions by electric and diesel vehicle km. Passenger vehicle and train km split by traction type is published on the Passenger rail usage page and freight vehicle and train km split by traction type is published on the Freight rail usage and performance page.

Estimates of entries/exits and interchanges at each mainline station in Great Britain is published annually in Estimates of Station Usage.

Annual statistics covering Station Stewardship Measure (SSM) and Light Maintenance Depot Stewardship Measure (LMDSM) are published on the Asset condition page of the data portal.

Network Rail publish data on network length in their Annual Return data tables. Table 49 shows network capability by region, and Table 67 Electrification of the network has data on new and historic electrification projects by region.

European Comparisons

Eurostat publish [data on the total length of railway lines in European countries](#), measured in route kilometres. Data is available for calendar years 2008 to 2020. As of 2020, the United Kingdom had a route length of 16,377 route kilometres.

The [Independent Regulator's Group-Rail (IRG-Rail)](#) publish data on network length, electrified route length and high-speed route length. In 2020, the average proportion of electrified route length was 55% for member countries. The UK ranked 22nd out of 31 countries, with a proportion of 38%.

Annex 4 – 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**.

The majority of these [statistical releases were assessed in 2012](#) and hold National Statistics status. Since our 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. [Estimates of Station Usage statistics were assessed in 2020](#).

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.