Rail infrastructure and assets
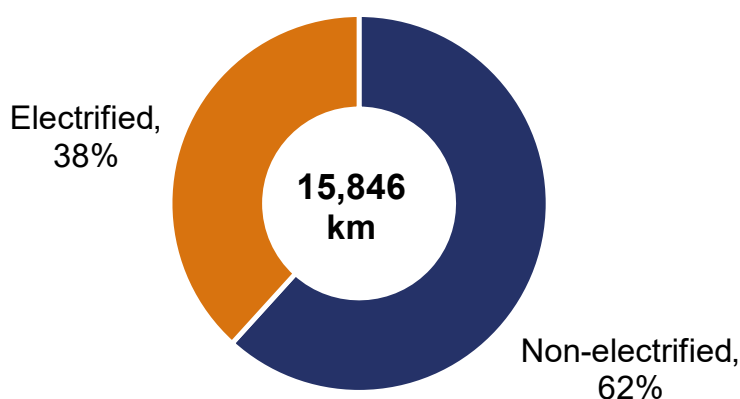## April 2022 to March 2023

19 October 2023

As of 31 March 2023, there were **15,220 railway vehicles** registered in operation for all passenger train operators. Of these, **70% were electric**, **19% were diesel, 7% were bi-mode** and **4% were locomotive hauled.**

The **average age of rolling stock** for all passenger train operators as of 31 March 2023 was **16.7 years**. Merseyrail had the largest annual decrease in average age due to the introduction of Class 777 trains, falling by 20.9 years to 21.7 years.

Figure 1   More than a third of the total route length in Great Britain is electrified

Total route length and proportion of route length electrified, Great Britain, as of 31 March 2023

In the latest year (April 2022 to March 2023), **62.2 kilometres of electrified track were added** to the network. This was due to the opening of the Elizabeth line central section and the Barking Riverside project.

In the latest year, **eight new stations opened**. This brings the total number of mainline stations in Great Britain as of 31 March 2023 to 2,578.

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

As of 31 March 2023, there were 15,220 railway vehicles registered in operation for all passenger train operators. This was comprised of:

- 10,855 electric vehicles (70%)

- 2,898 diesel vehicles (19%)

- 912 bi-mode vehicles (7%)

- 555 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.

Figure 1.1   The majority of rolling stock was electric

Proportion of passenger operators' rolling stock by traction type, Great Britain, as of 31 March 2023 (Table 6314)
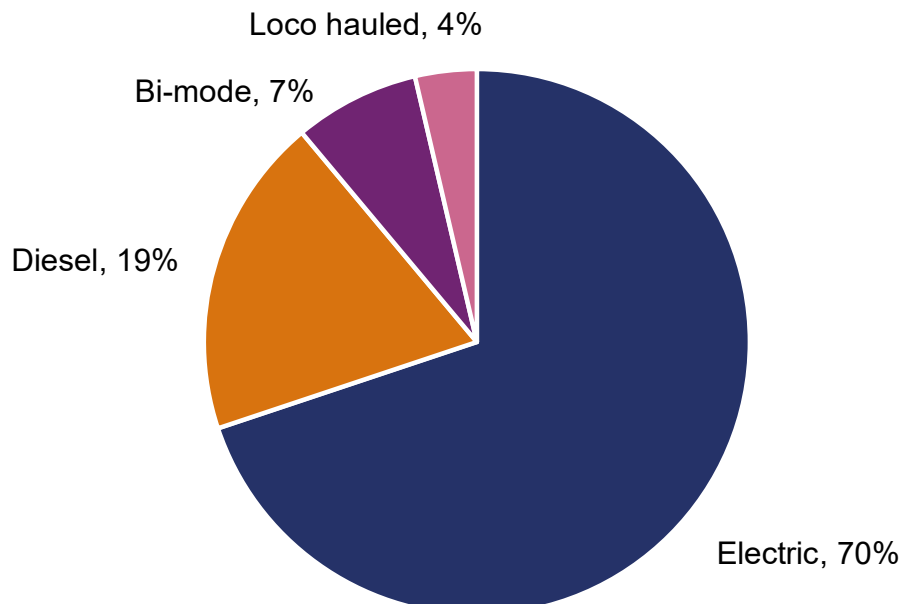
Table 1.1   Seven of the 24 operators had a fully electric fleet

Total vehicles by operator and proportion by each traction type, Great Britain, as of 31 March 2023 (Table 6314)

Operator	Total vehicles	Electric	Diesel	Bi-mode	Loco hauled
c2c	296	100%			
Elizabeth line	630	100%			
Heathrow Express	48	100%			
London Overground	507	100%			
Lumo	25	100%			
Merseyrail	339	100%			
Southeastern	1,644	100%			
Govia Thameslink Railway	2,511	98%	2%		
South Western Railway	1,425	92%	8%		
Avanti West Coast	664	86%	14%		
Greater Anglia	933	81%		19%	
West Midlands Trains	645	72%	28%		
ScotRail	1,039	62%	26%		11%
London North Eastern Railway	572	58%		29%	13%
Northern Trains	953	33%	63%	3%	
East Midlands Railway	379	22%	78%		
TransPennine Express	373	16%	41%	25%	17%
Great Western Railway	1,087	12%	22%	56%	10%
Caledonian Sleeper	75				100%
Chiltern Railways	205		84%		16%
Cross Country	372		89%		11%
Grand Central	50		100%		
Hull Trains	25			100%	
TfW Rail	423		83%	8%	10%

Note: Blank cells mean there were no vehicles for that traction type. Due to rounding may not sum to 100%.

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

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

2. Average age of rolling stock

16.7 years — All operators

16.8 years — Franchised operators

**10.2 years** — Non-franchised operators

As of 31 March 2023, there were 15,220 railway vehicles registered in operation for all passenger train operators. The average age of all rolling stock 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 increased by 0.7 years. The non-franchised operators' rolling stock makes up around 1% of all passenger vehicles.

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 an 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 year indicates either the introduction of newer rolling stock or the removal of older stock from the fleet.

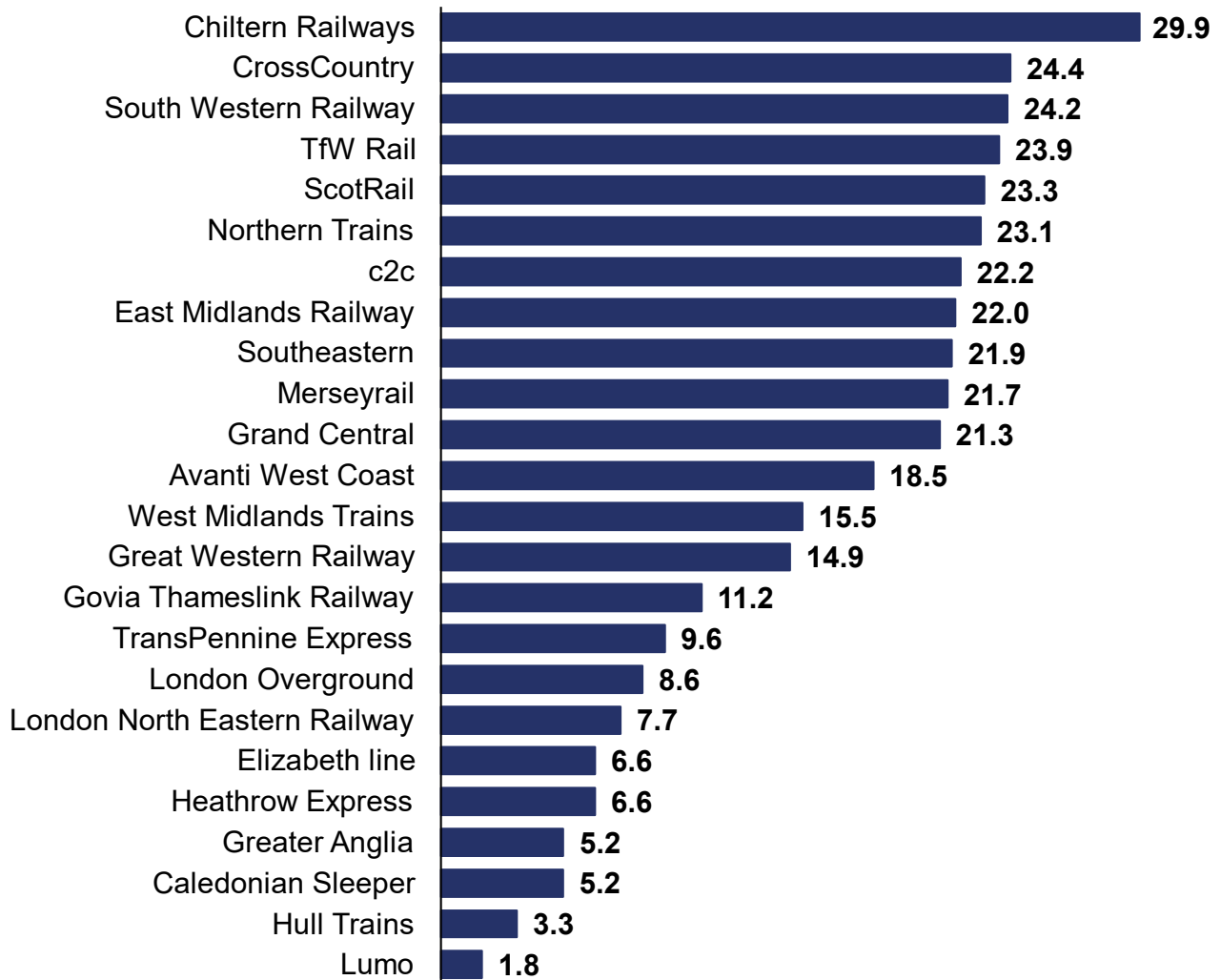**Figure 2.1   The average age has continued to decrease**

Average age of rolling stock in years (franchised operators), Great Britain, as of 31 March, 2008 to 2023 (Table 6313)
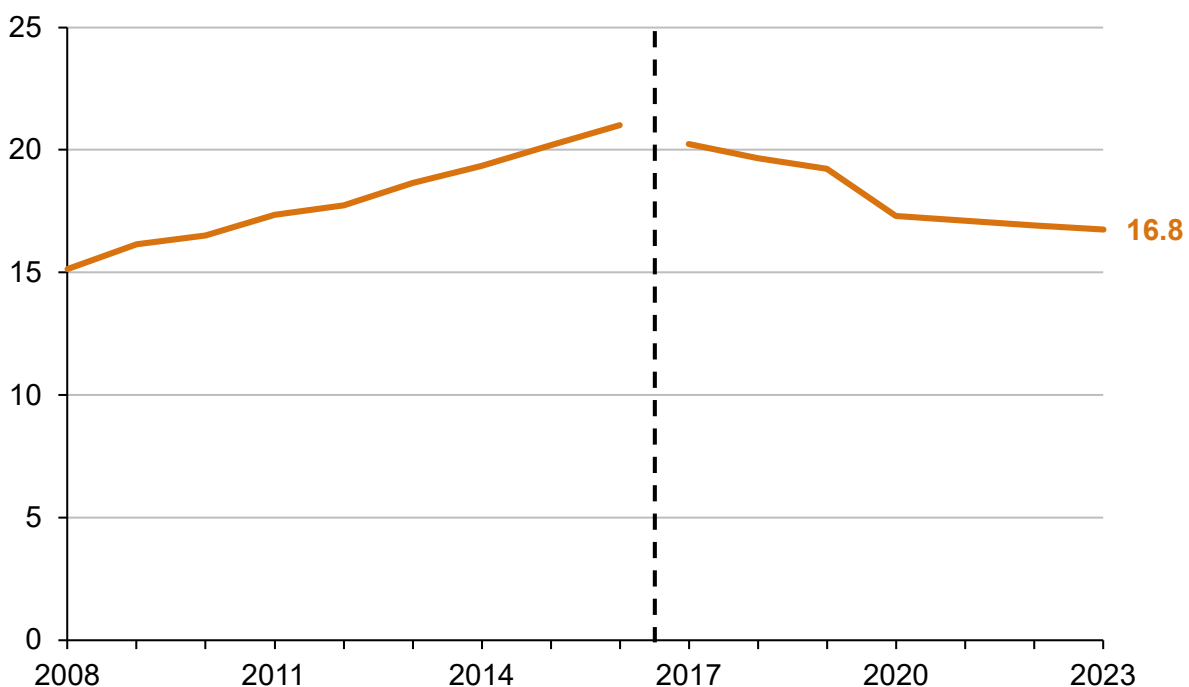
Average age of rolling stock by operator

Figure 2.2   The average age of rolling stock varied by operator

Average age of rolling stock in years by operator, Great Britain, as of 31 March 2023 (Table 6313)

Operator	Average age
Chiltern Railways	29.9
CrossCountry	24.4
South Western Railway	24.2
TfW Rail	23.9
ScotRail	23.3
Northern Trains	23.1
c2c	22.2
East Midlands Railway	22.0
Southeastern	21.9
Merseyrail	21.7
Grand Central	21.3
Avanti West Coast	18.5
West Midlands Trains	15.5
Great Western Railway	14.9
Govia Thameslink Railway	11.2
TransPennine Express	9.6
London Overground	8.6
London North Eastern Railway	7.7
Elizabeth line	6.6
Heathrow Express	6.6
Greater Anglia	5.2
Caledonian Sleeper	5.2
Hull Trains	3.3
Lumo	1.8

As of 31 March 2023, Lumo had the lowest average age at 1.8 years, while Chiltern Railways had the oldest fleet with an average age of 29.9 years.

Figure 2.3 Merseyrail had the largest annual decrease in average age

Age change in years of rolling stock between 31 March 2022 and 31 March 2023 by operator, Great Britain (Table 6313)

Operator	Age change (years)
Merseyrail	-20.9
Greater Anglia	-6.1
TfW Rail	-5.6
West Midlands Trains	-1.5
Govia Thameslink Railway	-1.0
Elizabeth line	-0.7
East Midlands Railway	0.1
South Western Railway	0.6
Avanti West Coast	1.0
Southeastern	1.0
Lumo	1.0
Caledonian Sleeper	1.0
Chiltern Railways	1.0
CrossCountry	1.0
Grand Central	1.0
Heathrow Express	1.0
Hull Trains	1.0
London Overground	1.0
ScotRail	1.0
TransPennine Express	1.0
Great Western Railway	1.0
London North Eastern Railway	1.1
Northern Trains	1.2
c2c	1.6

Note: Due to rounding to one decimal place, Avanti West Coast, Southeastern, Lumo and Great Western Railway all show above as one year. See Table 2.1 for more information.

For nine operators, their rolling stock was unchanged (no additions or removals) in the latest year. Therefore, their average age increased by exactly one year (shown as grey bars on the chart above). For four operators, the average age of rolling stock increased by more than one year. For 11 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 factors.

Average age of rolling stock: further detail on changes by operator

Table 2.1   Average age of rolling stock by passenger train operator as of 31 March 2023, annual age change and reason (Table 6313)

Operator	Average age of rolling stock (years)	Age change compared with 31 March 2022 (years)	Reason for change
Avanti West Coast	18.5	+0.97	Removal of older vehicles
c2c	22.2	+1.6	Removal of newer 387/3 vehicles
Caledonian Sleeper	5.2	+1.0	No change
Chiltern Railways	29.9	+1.0	No change
CrossCountry	24.4	+1.0	No change
East Midlands Railway	22.0	+0.1	Removal of older vehicles
Elizabeth line	6.6	−0.7	Introduction of new Class 345/0 vehicles and removal of older Class 315s
Govia Thameslink Railway	11.2	−1.0	Removal of older vehicles
Grand Central	21.3	+1.0	No change
Great Western Railway	14.9	+1.03	Removal of newer vehicles
Greater Anglia	5.2	−6.1	Introduction of new Class 720 vehicles and removal of older vehicles
Heathrow Express	6.6	+1.0	No change
Hull Trains	3.3	+1.0	No change
London North Eastern Railway	7.7	+1.1	Two older Mark 4 locomotive hauled vehicles added

Operator	Average age of rolling stock (years)	Age change compared with 31 March 2022 (years)	Reason for change
London Overground	8.6	+1.0	No change
Lumo	1.8	+0.99	Added new Class 803 vehicles
Merseyrail	21.7	−20.9	Introduction of new Class 777 vehicles
Northern Trains	23.1	+1.2	Additional class 156/0 vehicles in service
ScotRail	23.3	+1.0	No change
South Western Railway	24.2	+0.6	Removal of older vehicles
Southeastern	21.9	+0.99	Removal of older vehicles
TfW Rail	23.9	−5.6	Introduction of new Class 197 vehicles
TransPennine Express	9.6	+1.0	No change
West Midlands Trains	15.5	−1.5	Introduction of new Class 196 vehicles

Rolling stock additional information

While new rolling stock may be more efficient and technologically advanced, existing vehicles 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.
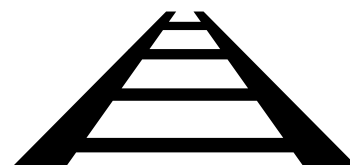
3. Infrastructure on the railway

Rail network length[1]

Route length open for traffic in Great Britain as of 31 March 2023:

15,846 kilometres

Track length in Great Britain as of 31 March 2023:

31,203 kilometres

As of 31 March 2023, total route length open for traffic in Great Britain was 15,846 kilometres. Of this, total route length in England was 11,653 kilometres, 1,498 kilometres in Wales and 2,695 kilometres in Scotland.

In Great Britain as of 31 March 2023, 6,065 kilometres of route was electrified. This represents 38% of the total route length. This is slightly higher than the proportion in the previous year. In England, the proportion of electrified route was 44%. In Wales, 4% of the route length was electrified and in Scotland 33% was electrified.

Figure 3.1   The highest proportion of electrified route was in England

Total and electrified route length (kilometres) by country, Great Britain, as of 31 March 2023 (Table 6320)

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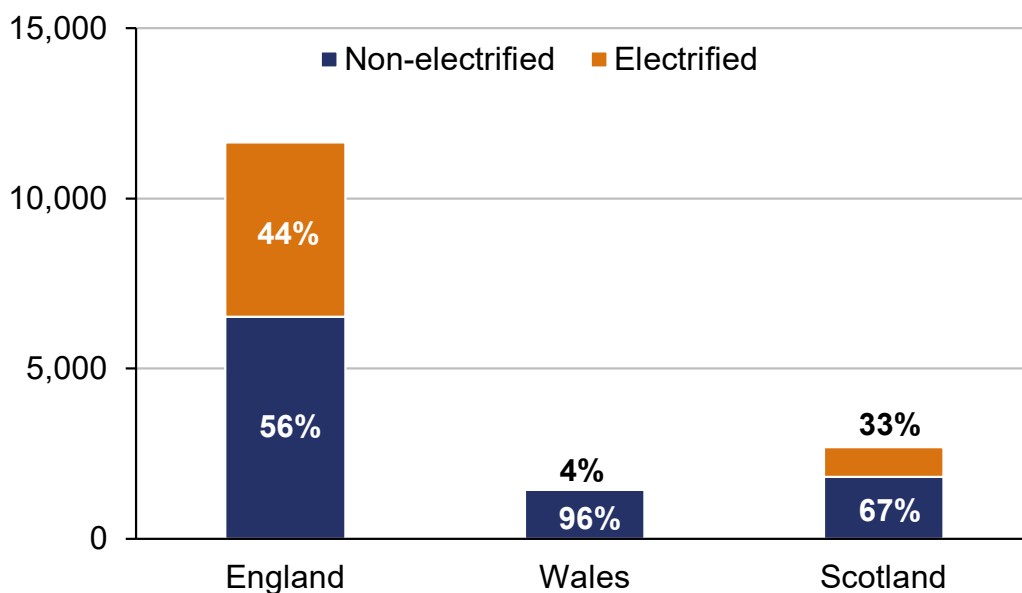
[1] The following infrastructure is not included: High Speed 1 line, Isle of Wight line, Heathrow Link Line.

New electrification projects

In the latest year (April 2022 to March 2023), 62.2 kilometres of electrified track were added to the network.

Of this, 56.3 kilometres is due to the opening of the central section of the Elizabeth line in May 2022. This central section makes up most of the route used by Elizabeth line services that is not part of the Network Rail network. It runs from Westbourne Park Junction in the West to Abbey Wood in the South East and Pudding Mill Lane Junction in the East, largely in new tunnels.

The remaining 5.96 kilometres of new electrified track is from the Barking Riverside project, with the extension of the London Overground line to a new station at Barking Riverside in July 2022.

Data on the length of electrified track added through various electrification projects that have taken place on the network since 1 April 1995 in Great Britain is available in Table 6320. From 1 April 2012 (shown as of 31 March 2013 in table), data is also available split by country.

Note that Network Rail publish data on track length and electrification projects by region in their Annual Return data tables (Table 49: Network capability and Table 67: Electrification of the network). These tables do not include non-Network Rail managed infrastructure.

Figure 3.2   Rail network by electrification scheme, Great Britain, as of 31 March 2023
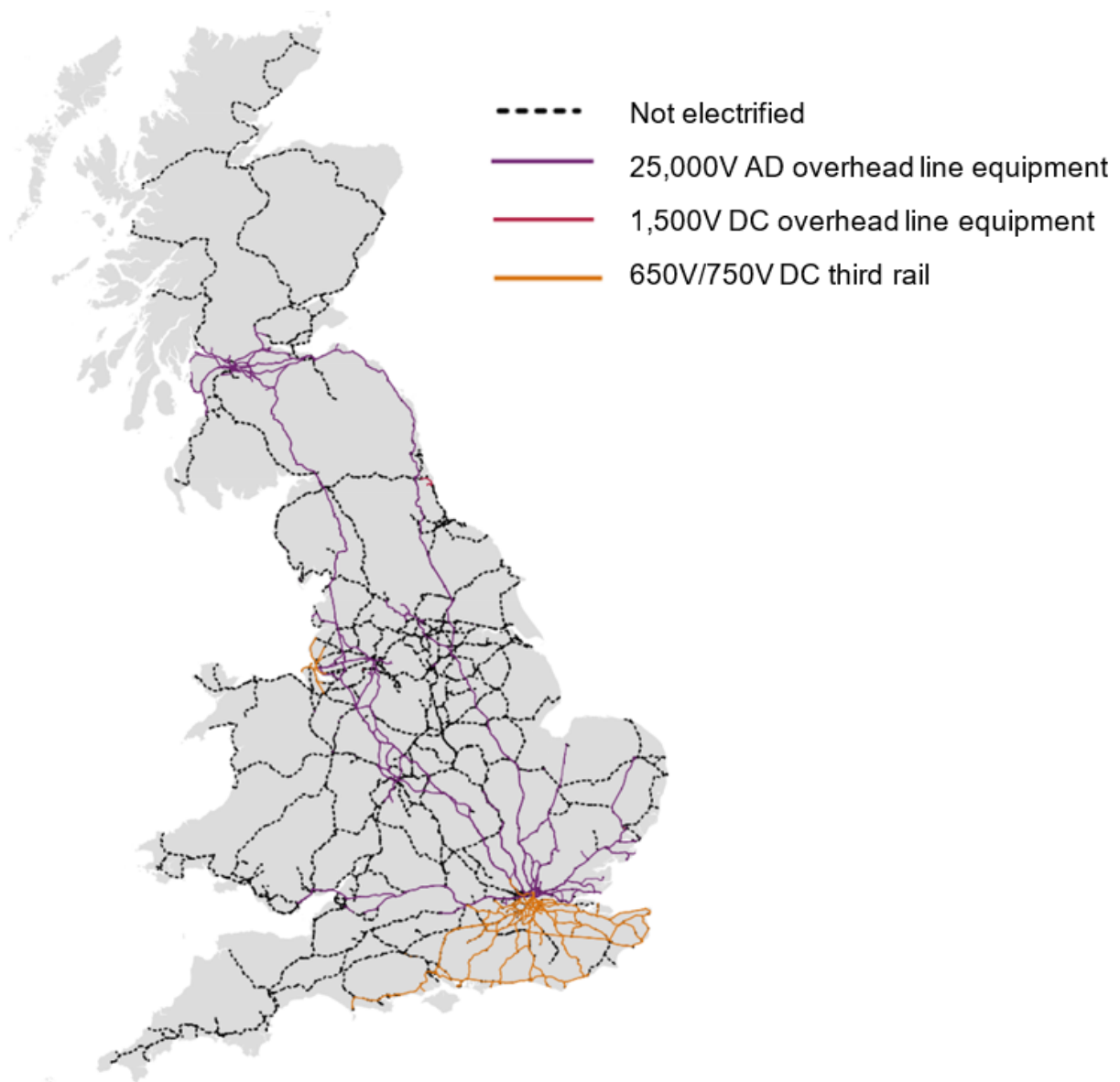
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The different track categories are:

● 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 2023, there were 2,578 open mainline stations in Great Britain
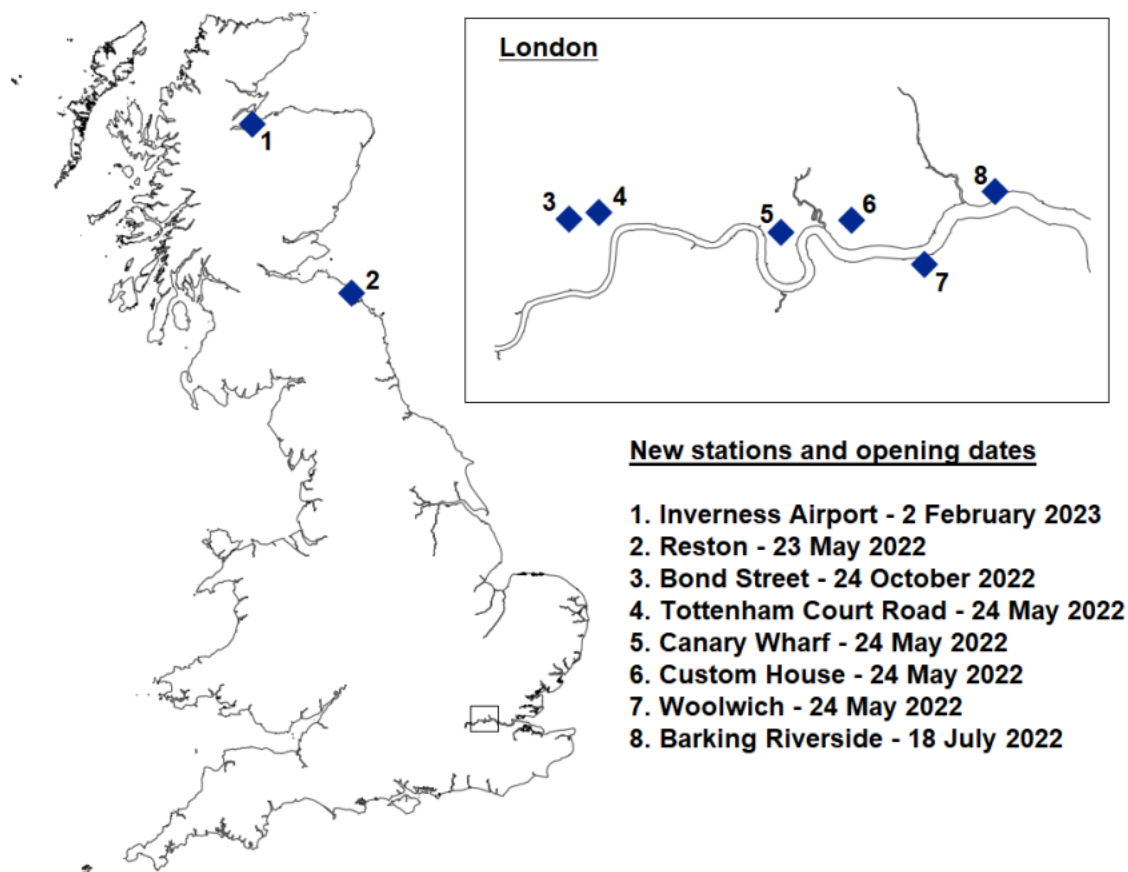
New stations

In the year April 2022 to March 2023, eight new stations opened:

- Barking Riverside (Barking and Dagenham, England) opened 18 July 2022 and is served by London Overground,

- Bond Street (Westminster, England), opened 24 October 2022 and is served by Elizabeth line,

- Canary Wharf (Tower Hamlets, England) opened 24 May 2022 and is served by Elizabeth line,

- Custom House (Newham, England) opened 24 May 2022 and is served by Elizabeth line,

- Inverness Airport (Highland, Scotland) opened 2 February 2023 and is served by ScotRail,

- Reston (Scottish Borders, Scotland) opened 23 May 2022 and is served by ScotRail,

- Tottenham Court Road (Camden, England) opened 24 May 2022 and is served by Elizabeth line, and

- Woolwich (Greenwich, England) opened 24 May 2022 and is served by Elizabeth line.

Closed stations

No stations permanently closed in the year April 2022 to March 2023.

Figure 4.1   Stations opened in the year April 2022 to March 2023, Great Britain

New stations and opening dates

1. Inverness Airport - 2 February 2023
2. Reston - 23 May 2022
3. Bond Street - 24 October 2022
4. Tottenham Court Road - 24 May 2022
5. Canary Wharf - 24 May 2022
6. Custom House - 24 May 2022
7. Woolwich - 24 May 2022
8. Barking Riverside - 18 July 2022

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Temporary station and line closures

Stanlow & Thornton 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.

Teesside Airport station was temporarily closed from May 2022 until further notice. This was due to repairs being required.

For detailed information on all stations as at 31 March 2023 please see 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/exits and interchanges) 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 European Union.

The following railway vehicles were authorised in the year to 31 March 2023:

- Class 701/0 authorised 1 April 2022

- Class 231/0 authorised 1 September 2022

- JNA(V) (freight wagons) authorised 14 September 2022

- JNA(X) (freight wagons) authorised 21 September 2022

- FEA-G SGNS (freight wagons) authorised 1 November 2022

- Class 197 ETCS Variant authorised 28 November 2022

- JNA(T) (freight wagons) authorised 29 March 2023

For details of authorisations granted by ORR under the Railways (Interoperability) Regulations 2011 in the year to 31 March 2023, 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 included in this release does not include locomotives or freight wagons.

- **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 (although no longer franchises we have retained this term for referring to these operators for consistency and until a new term is adopted across the industry).

- **Non-franchised (open access) operators** are licenced by ORR to run services on specific routes. The data tables that accompany this publication contain data for such operators: Grand Central, Heathrow Express, Hull Trains, Lumo (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 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 each year. 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 track and route length is provided by Network Rail, Amey Infrastructure Wales Ltd (AIW) and Transport for London (TfL). Data for the following infrastructure is not included: High Speed 1 line, Isle of Wight line, Heathrow Link Line.

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 AIW who are the Infrastructure Manager for the CVL network. There are 55 stations on the CVL network, and a map is available in the 2022 CVL network statement.

TfL manage the new Elizabeth line infrastructure (opened May 2022). The Crossrail Central Operating Section (CCOS) makes up most of the route used by Elizabeth line services that is not part of the Network Rail infrastructure.

Data for the **average age of rolling stock and traction type** is provided by Rail Safety and Standards Board (RSSB). 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 since 31 March 2013 has been revised for some or all measures each year. This is due to data quality improvements by Network Rail and to ensure consistency with their 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
- Comparing operators' rolling stock by traction type
- Monitoring new track electrification schemes, and total track and route lengths

- 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 non-mainline operators (e.g. 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

- Stations on the mainline – Table 6325

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

Rolling stock

- Average age of rolling stock by operator – Table 6313

- Rolling stock vehicles by traction type and operator – Table 6314

Other related statistics

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 kilometres. Passenger vehicle and train kilometres split by traction type is published on the Passenger rail usage page and freight vehicle and train kilometres 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 track length by region in their Annual Return data tables. Table 49: Network capability and Table 67: Electrification of the network.

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 2021. As of 2021, the United Kingdom had a route length of 16,316 kilometres.

The [Independent Regulator's Group-Rail (IRG-Rail)](#) publish data on network length, electrified route length and high-speed route length. In 2021, the average proportion of electrified route length was 56% for member countries. The UK ranked 21st 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 five annual publications: **Common Safety Indicators; Passenger satisfaction with complaints handling; Train operating company key statistics; Occupational health**; **Rail statistics compendium**; and four quarterly publications: **Signals passed at danger (SPADS); Delay compensation claims; Disabled Persons Railcards (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 our [statistical releases were assessed in 2012](#) and 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. [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.