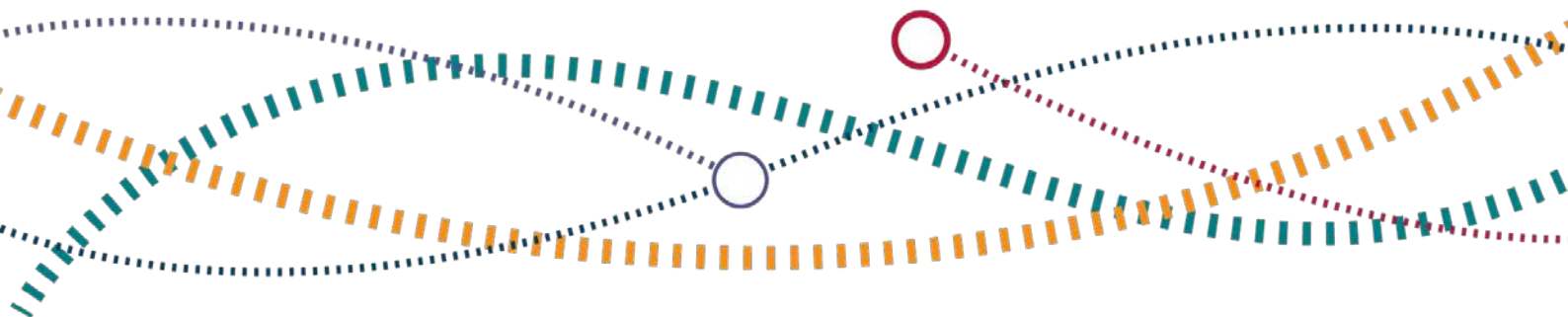




Freight rail usage and Performance: Quality and Methodology Report

September 2020



Contents

Introduction	2
Methodology and definitions	3
Historical background	9
Relevance	10
Accuracy and reliability	11
Accessibility and Clarity and insight	14
Data governance	15

Introduction

This is a report on the quality of the quarterly freight rail usage and performance 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:

- Methodology and definitions – detail on the various data sources, methodology used to compile the statistics and changes to data previously published;
- Historic background – background to each performance metric and details of changes throughout the time series;
- Relevance to users – the users of the statistics, and our engagement;
- Assured quality – the accuracy, reliability and coherence of the statistics;
- Orderly release – our timescales for the production, quality assurance and publication of the statistics;
- Accessibility and Clarity and insight – the format of our statistics and where they can be found;
- Data governance – information security and data management

Freight data is supplied by Network Rail, freight operators, Department for Business, Energy & Industrial Strategy and Department for Transport. Freight data is measured using four metrics, which are covered in detail in the methodology section below.

Methodology and definitions

Quarterly and periodic data

The rail industry reports data on a periodic basis rather than the more recognised reporting cycles such as monthly or quarterly. A period is normally a 28-day, or four weekly, period for business reporting purposes (Sunday to Saturday) and there are 13 periods in a financial year. The length of a period may differ at the end of the financial year, 31 March, and the beginning of the financial year, 1 April, to ensure a break is made at 31 March.

Some quarterly datasets, such as Freight Delivery Metric and Freight Moved, require apportionment of these data.

The standard method for apportionment is based on the number of days within the period that fall into the relevant quarter. For example, the dates in period 4 cover both Q1 and Q2. When the quarterly data are calculated for 2019-20, 8/28 of the data are assigned to Q1 (covering 23 June to 30 June) and 20/28 of the data are assigned to Q2 (covering 1 July to 20 July).

The breakdown of the calculations used for 2019-20 are as follows:

Quarter	Calculation
2019-20 Quarter 1	Period 1 + Period 2 + Period 3 + 8/28 of Period 4
2019-20 Quarter 2	20/28 of Period 4 + Period 5 + Period 6 + 16/28 of Period 7
2019-20 Quarter 3	12/28 of Period 7 + Period 8 + Period 9 + 24/28 of Period 10
2019-20 Quarter 4	4/28 of Period 10 + Period 11 + Period 12 + Period 13

Moving Annual Average

The moving annual average (MAA) is included within some freight performance metrics. This measures performance over the last 4 quarters or 13 periods. MAAs are used to account for seasonality of data and highlight longer term trends.

Freight usage

Freight moved

- The amount of freight which is moved on the railway, taking into account the weight of the load and the distance carried. Freight moved is measured in net tonne kilometres (NTKm) and takes into account the net weight of the goods carried and the distance carried.

Freight moved data are supplied by Network Rail at the end of each railway period. The data includes a breakdown of total freight moved by commodity and operator. ORR publishes the following commodity groups within our quarterly release; Coal, Metals, Construction, Oil and Petroleum, International, Domestic Intermodal and Other which include domestic automotive, domestic waste, enterprise, general merchandise, mail and premium logistics, royal mail, and biomass.

Freight lifted

- The mass of goods (tonnes) carried on the rail network, excluding the weight of the locomotives and wagons. Unlike the freight moved measure it takes no account of the distance travelled.

Freight lifted data are provided by the four major freight operators; DB Cargo UK, Freightliner Ltd, Direct Rail Services (DRS) and GB Railfreight. Based on freight moved data, these four companies account for around 99% of all freight movements on the rail network.

As the data comes from four different operators, there is little consistency between the commodity groupings that are supplied. Therefore, freight lifted data cannot be published at the same level of disaggregation as freight moved. The published commodities for freight lifted are Coal and Other which include metals, construction, oil & petroleum, infrastructure, domestic intermodal and international.

Both freight moved and lifted data are subject to changes with regards to freight operators entering/leaving the freight market. They cannot be published at operator level because the data are commercially sensitive.

Rail freight market share

This includes rail's share of both surface-based heavy freight transport (i.e. rail plus HGVs) and the overall Great Britain freight sector (water transport). This gives the market share for rail freight in terms of tonnes lifted and tonne kilometres moved. These figures illustrate the relative importance of rail.

Data for freight moved and freight lifted for HGVs are supplied to us by DfT (Road and Water) and are provided on a calendar year basis. The data for other modes of transport previously supplied by DfT is no longer available. The published table now covers freight lifted and freight moved by road (HGVs) and water. The published data refer to the most recent datasets available for all modes of transport which can mean the data are published up to two years after the reference year. This is due to the unavailability of data from other sources.

Pipeline and estimates of light goods vehicles were removed in 2016 due to data being unavailable, therefore they have been excluded from the annual totals and the calculations of market share.

Rail freight impact on road haulage

The measure of rail freight impact on road haulage is calculated annually using two measures:

- **Rail freight lorry kilometres equivalent** – equivalent distance that road vehicles would need to have travelled to move the amounts of freight carried on rail, which is affected more by volume than by weight;
- **Avoided lorry journeys** – the equivalent number of road vehicle trips necessary to move the freight.

DfT supplies the goods moved, goods lifted and loaded vehicle kilometres for Great Britain registered HGVs. The data is annual and by commodity type. The average load for each commodity type is calculated and, using the rail freight moved data, the equivalent number of lorry kilometres that would be required to transport rail freight by lorries is derived. Similarly, the rail freight lifted data is used to calculate the equivalent number of road vehicle journeys necessary to move the freight.

Freight performance

Freight Delivery Metric (FDM)

- The percentage of freight trains that arrive at their destination within 15 minutes of their scheduled arrival time. Freight trains are only considered to have failed FDM where the delay was caused by Network Rail.

The measures of freight performance differ from PPM as there is a uniform measure for the entire freight network, each train being 'on time' if it arrives at its final destination within 10 minutes of its scheduled arrival time for FPM and within 15 minutes of scheduled time for FDM.

These measures include all freight trains (loaded or empty) operated by freight operators, excluding services operated on behalf of Network Rail (e.g. sandite, ballast and engineering trains) and any passenger charter services.

Circumstances where trains are not included within FDM are:

- any train cancelled for commercial reasons;
- light engine trains (Class 0 trains);
- any planned or scheduled cancellation;
- very short term planning (VSTP) schedules, where train moves are arranged through the Control Office, rather than timetable planners.

Freight delays per 100 train kilometres

- The number of delay minutes to freight operators caused by Network Rail normalised by train kilometres. The measure is calculated from the total delay experienced by all GB freight operators divided by their train mileage. The dataset is provisional as delay data can be revised as part of the delay attribution process.

Delay minutes data are captured on Network Rail's TRUST system (a nested acronym standing for Train Running System on TOPS (Total Operation Processing System)). There are four key component parts to TRUST:

- the train schedule for each individual train planned to operate on a given day (the 'plan');
- the actual arrival and departure time at all calling points and passing time at other key locations (the 'reality');

- the cause of train delays and reliability events (full or part cancellation, diversion and failure to stop) (the 'reason');
- the organisation and manager responsible for incidents, delays and reliability events (the 'owner').

By comparing the time at which a train actually arrives at, departs from or passes a recording point with that shown in the train schedule, TRUST is able to calculate the 'lateness' at that particular point. By comparing two successive recordings of 'lateness,' TRUST identifies any delay minutes that a train has incurred. This is measured against the working timetable.

The lateness at a given recording point is the aggregate of all the individual delay minutes from origin to the recording point less any time made up e.g. by shortened station dwell times or time allowances for pathing (waiting time) not needed.

Any occurrence resulting in delay minutes within a TRUST section above 3 minutes generates a TRUST alert. Either a new incident must be created and given a reason code and attributed to a responsible owner – Network Rail (Network Rail-on-FOC) or freight operator (FOC-on-FOC and FOC-on-self) – or the delay may be added to an existing incident.

TRUST allows incidents to be allocated to around 200 cause codes and a very wide range of responsible managers. The initial attribution is made by Network Rail but if it is against a freight operator then the operator can refine the cause code and responsible manager code. Disputes by freight operators regarding delay minutes are minimal. This is largely due to freight operators having more flexibility when running services, having the option to minimise or reschedule freight trains during times of disruption. Furthermore, freight trains can operate during the night or outside of peak passenger travel times, allowing them to avoid periods of disruption. For freight operator caused delays, there are 7 freight specific cause codes. The overwhelming majority of attribution details are finalised within eight days of an incident occurring.

In broad terms around half of delay is identified by the TRUST system although the proportion may be rather lower, especially on relatively self-contained and high-performing routes. Delays of less than three minutes do not generate TRUST alerts and are not generally identified or attributed although this may occur if they are identified as part of the investigation of other incidents.

There are two types of delays – primary and reactionary. A primary delay is where the train is directly and immediately affected by an incident. Reactionary delays refer to delays occurring on another TRUST section having been transferred from elsewhere by other

trains or by earlier stages of a train's schedule, e.g. late start from a yard/depot following incomplete goods.

Delays to train journeys experienced by freight companies are broken down into Network Rail attributed delays (Network Rail on FOC) and those attributed to freight operators (FOC-on-FOC or FOC-on-self). Those attributable to Network Rail typically relate to infrastructure, timetabling and operation of the network, and also include external events impacting the network where Network Rail's role is to control or mitigate impacts. Those attributable to train or freight operators typically relate to train operations, station operations, fleet reliability, problems with train crew resources or external causes affecting trains.

For further information on delay minutes please refer to the [Delay Attribution Guide](#).

Freight traffic

Freight train kilometres by operator

- The actual mileage in kilometres operated by freight operators on Network Rail Infrastructure.

The data is sourced from Network Rail's Track Access Billing System (TABS) and covers only the mileages charged through TABS. Not all freight operators have been in operation throughout the time-series, therefore total year on year comparison should be treated with caution.

Also worth noting that competition between freight operators means we would expect a greater level of variation in mileage from year to year than in the passenger market. Freight train kilometres by operator data cover freight operators on Network Rail infrastructure and were included for the first time in the 2015-16 Q4 statistical release.

Freight trains run

- The number of chargeable freight train movements on Network Rail infrastructure.

Each freight train movement is designated into a chargeable or non-chargeable category. Non-chargeable can include empty trains to/from a depot, operators moving equipment to and from site for Network Rail engineering work and train schedules not planned (i.e. last minute). The data published on the portal only includes chargeable freight train movements.

The number of freight train movements are provided annually by Network Rail and are broken down by operator. The data are not published at operator level as they are commercially sensitive.

Historical background

Freight rail performance measures for Control Period 6

Through consultation with Network Rail and the rail industry, ORR conducts periodic reviews of Network Rail to determine the outputs they must deliver, and the levels of access charge paid by train operators for use of its infrastructure. Subsequently ORR produced a [determination document](#) for the next five year period, Control Period 6 (CP6) which covers 1 April 2019 to 31 March 2024.

Relevance

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

The Freight Delivery Metric and the Regional equivalent (FDM-R) and freight delay minutes are key performance measures, which we take into account in our regulation of Network Rail over CP6.

Freight usage data provides a useful barometer of economic activity and is closely linked to other industries such as manufacturing and imports/exports.

Freight data published on our data portal are used by a range of individuals for planning, analysis, decision making and data validation.

More detailed information on users of ORR statistics and meeting the needs of users is available on our [user engagement webpage](#).

Accuracy and reliability

The proximity between an estimate and the unknown true value.

Freight moved and freight lifted

Freight moved data excludes some possession trains used during engineering works and the weight of locomotives and wagons. The freight moved data are accurate to the nearest tonne kilometre and include all freight operators.

Freight lifted data excludes the weight of locomotives and wagons. The freight lifted data only covers the four largest freight operators (FOCs) due to the unavailability of data from other smaller operators. Based on Network Rail freight moved statistics which covers all operators, these four companies account for around 99% of the freight moved market so the value for freight lifted is underestimated by a very small margin.

Freight lifted and freight moved data cannot be provided by a single source due to concerns over the quality and accuracy of the data.

Delay minutes

Delay minutes data are subject to change after the resolution of incident disputes between train/freight operators and Network Rail over who is responsible for the delay and the affected operators. Based on this, delay minutes can be re-attributed between Network Rail and train/freight operating companies.

ORR receive revised delay minutes data following each railway period and as such the freight delay minutes data presented on the data portal is based on the most recently receive quality assured data. Each time the dataset on the portal is updated, following receipt of revised delay minutes data, there will be minor revisions. Therefore the data on the data portal may differ to the figures quoted in the latest statistical release. The figures and chart in the statistical release will be consistent with the dataset on the data portal at the time of publication.

Data validation, estimates, and coverage

ORR receives freight usage and performance data from Network Rail, the freight operators, and DfT. The data are supplied electronically and stored in a secure data warehouse maintained by ORR. The data supplied is subject to an extensive quality assurance process, including a suite of validation checks to ensure the data meets the required specification and is in line with previous trends. Any arising issues are flagged up with the data suppliers who must confirm the anomalies or correct the data and re-submit.

Explanations from the data providers regarding data anomalies are included within our commentary to clarify the data and trends.

These data are then prepared for publication. The process includes quality assuring the tables and charts produced and providing supporting commentary regarding the key trends, methodology and quality measures. These reports are subject to peer review.

The final stage of the quality assurance process is a sign off by the statistics Head of Profession confirming the data and outputs meet the quality standards and are fit for publication.

Independent reporter's assessment of accuracy and reliability of data

Arup (in partnership with Winder Phillips Associates) was appointed as independent reporter by ORR and Network Rail in 2009 to review Network Rail's data and provide us with assurance of the accuracy and reliability of their information.

The delay minute data received a high confidence grade of A3 for freight delay minutes in 2011-12.

The [Freight Delivery Metric was assessed in 2016-17](#) and received a confidence grade of B1.

The ORR website contains more details on the [independent reporters](#), including the confidence grading system used to assess data quality.

Orderly release

Organisations should commit to releasing their statistics in an open and transparent manner that promotes confidence.

Periodic freight moved by commodity type, the number of freight train movements and the distance covered by freight trains data are typically available on the ORR data portal within 20 days of the period ending. Quarterly freight moved and freight lifted data, are on average, published 75 days after the quarter ends. Annual rail market share data are typically published 67 days after the year ends.

As part of our licence agreement with Network Rail they are required to provide the freight moved, freight delay minutes and train mileage data to us within 21 working days. We have automated various processes involved in the production of these statistics, reducing the overall time and burden involved in publishing these statistics.

Furthermore, we have memorandums of understanding (MoUs) with Network Rail and DfT detailing the scope and timeliness of each dataset supplied. This ensures consistent and timely data are received each period. The MoUs are reviewed on an annual basis.

There are currently no MoU's with the freight operators but they typically provide the freight data around 5 weeks from the period ending.

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.

Accessibility and Clarity and insight

Statistics and data should be equally available to all, not given to some people before others. They should be published at a sufficient level of detail and remain publicly available.

Statistics and data should be presented clearly, explained meaningfully and provide authoritative insights that serve the public good.

All rail statistics data tables can be accessed free of charge on the [ORR Data Portal](#). Commentary about the statistics and trends are provided in the statistical releases. An interactive chart (PowerBI) is available on the [Freight rail usage and performance theme page](#).

The freight rail usage and performance data tables currently published on the ORR data portal are:

Freight usage

- Freight moved – Table 1310
- Freight moved (periodic) – Table 1314
- Freight lifted – Table 1315
- Rail freight impact on road haulage – Table 1340
- Rail freight market share – Table 1350

Freight performance

- Freight Delivery Metric (FDM) – Table 1320
- Freight Delivery Metric by Network Rail Region (FDM-R) – Table 1324
- Freight delay per 100 train kilometres – Table 1325

Freight traffic

- Freight trains run – Table 1330
- Freight train kilometres by operator – Table 1333

For further information about these statistics please contact the Information & Analysis team at rail.stats@orr.gov.uk

Data governance

Organisations should look after people's information securely and manage data in ways that are consistent with relevant legislation and serve the public good.

The normalised freight delays data are based on data from Network Rail's TRUST (train running system on total operations processing system (TOPS)). This system records trains running compared with working timetables. These data are processed through Network Rail's systems to produce freight delay minute data.

The freight delay minute data are also subject to change because of the potential for re-attribution of delay minutes. The initial attribution is made by Network Rail but if it is against a train or freight operator then the operator can refine the cause code and responsible manager code or dispute responsibility for the delay. The overwhelming majority of attribution details are finalised within eight days of an incident occurring.

Freight moved statistics differ from freight lifted statistics. Freight lifted takes into account the weight of the load, whereas freight moved takes into account both the weight of the load and distance travelled. We would expect the general trends to move in the same direction but the magnitude of any change will differ.

The latest freight lifted data should always be treated as provisional as the ORR can receive updated data from the freight operators. Similarly, the latest periodic data for the other rail freight data should always be treated as provisional as they can be subject to updates from the different data sources.

The freight moved and freight lifted figures for the rail market share report are in calendar year format. This may differ from Official Statistics published by ORR on freight moved and freight lifted data which are published in financial years. The reason for publishing in calendar years is so rail freight can be consistent with other modes.



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