Track Model Technical Specification

Open Data

Version History

Version	Date	Description
1.0	14/12/2022	Initial Draft
2.0	01/06/2023	Revised for release
2.1	03/07/2023	Revised for new OS License number
2.2	28/06/2024	Revised for new Shapefile names

Purpose of this specification

This is the Technical Specification for Network Rails Track Model that will be made available from Network Rail as open data through the ENRICH programme.

This data may only be used under the Open Government Licence full details of which are available via the API platform.

What this specification does not detail is the sources of information that have been used to compile this data although sources do include Ordnance Survey data. Ordnance Survey have been consulted prior to the data's release and have given their permission for the model to be the released under the Open Data terms and conditions and the appropriate copyright statements must be used alongside this data.

Contents

1. Introduction

1.1 Overview

This document describes the Track Model open data which is a set of geospatial data that depicts the rail network. Within the data is a link-node model of the track centrelines which is attributed with ownership information. The location of the links dataset (tracks) is an approximation of the location between the railheads. In addition, the approximate waymark locations as well the Engineers Line Reference (ELR) lines will also be provided.

The data, as managed by the Network and Infrastructure Team within Asset Information Services (AIS), is made available as open data through the ENRICH Programme. The data is refreshed every 4 weeks as part of an automated process based on Network Rails master data.

1.2 Purpose

The purpose of this document is to support users of the data, providing a high-level overview of what is included within the data and some terminology that is bespoke to the Railway. It clearly defines which geospatial data layers are available, the schema of that data, the file formats, and the coordinate system in which the data is release to the API in.

1.3 Data Formats

The 4 components of the Track Model have been created as Esri shapefiles (.shp) and passed to the ENRICH Programme who manage the dissemination of the data via an API download. Subsets of the data and availability of the data in different formats may be made available for future release through the ENRICH Programme via the API. This specification document is for the initial release of the Track Model data to the ENRICH Programme for consumption into the API only.

1.4 Coverage

The Track Model has national coverage of the rail network for Great Britain (England, Wales, and Scotland). Any tracks that do not have a history of having been owned and or maintained by Network Rail are not likely to be found within the data.

1.5 Credits

This has embedded Ordnance Survey data, with permission from OS and under the Open Government Licence Network Rail is able to release the data with the following copyright statement.

2. Track Model Creation for Release as Open Data

The data being released as open data has been derived from the master geospatial Track Model data contained within a geodatabase on the corporate network, its primary function is to support Network Rail's monitoring fleet activities.

The information pertaining to ownership is not mastered within the Track Model, a new process has been developed to enable this information to be attributed to facilitate the release of the data. Ownership information is only available at track level within the 'NWR_TrackCentreLines' file, providing indicative rather than absolute information.

The data is being released on an 'as is' with a 4 weekly update frequency under the Open Government Licence. The data is for information only and must not be used to derive any safety critical decisions.

3. Spatial Data Layer Extents and Coordinate System

Coverage: National
Update Frequency: Four Weekly
Projection: British National Grid
Largest Extent:
- Right: 669556.7318
- Left: 147517.7204
- Top: 967996.3483
- Bottom: 30543.3388

4. Track Model Files and Schema

The Track Model contains 4 components, this section details these components and the schema for each of them in turn. All files are released into the API as national coverage as an ESRI Shapefile.

4.1 Links

The 'NWR_TrackCentreLines.shp' data contains an approximate geographic centreline representation of the rail network at track level. The links start/end for the following reasons: convergence or divergence of the tracks, buffer end stops or a change in key attribution used for the railway ELR or Track Identification (TRACKID) information. Explanations of TRACKID can be found in the Appendix.

The ownership information is attributed to this dataset only. The ownership field provides a percentage value relating to the length of track identified as being in one of the following three categories: Network Rail, Third Party or Unclassified. More information is found in the schema for this data. This is displayed as a concatenated string, if the percentage is '0' in any classification all three categories will still be present.

With a confidence level of 95 % of the rail network that is maintained by Network Rail the centreline data (NetworkLinks) has a geospatial accuracy of within + or - 1.5m.

Data Type – Polyline

4.1.1 NWR_TrackCentreLines.shp Schema

Attribute Name	Data Type	Description
FID*	Object ID	Unique identifier generated when the shapefile is created.
Shape *	Geometry	Polyline – Represents the approximate centreline of the railway track.
ASSET_ID	Text - 12	Unique ID which is consistent and maintained as far as possible. ASSET_ID's are retired/introduced when track layouts change significantly.
ELR	Text - 4	Engineers Line Reference, a railway term used to refer to a section of track covering multiple lines.
TRACK_ID	Text - 4	A four digit code used within the railway to identify each section of track which indicates speed, direction and type of use.
START	Double	The start calibrated mileage value for the link. The value is always in mile.yards irrespective of the unit of measurement within the corresponding NWR_WaymarkS.shp data.
END	Double	The end calibrated mileage value for the link. The value is always in mile.yards irrespective of the unit of measurement within the corresponding NWR_Waymarks.shp data.
VERSION	Double	This is the version number linked to the ASSET_ID which is increased each time the data is amended in the main system, this is either its attribution or geometry.
OWNER	Text - 100	A concatenated comma separated data field which shows the percentage of track for each link by distance, for which the owner is identified as: 'NETWORK RAIL', 'THIRD PARTY' or 'UNCLASSIFIED'. 'UNCLASSIFIED' mostly refers to third party data where all information is not available or where data is being updated and is awaiting confirmation from the business. The percentage is to the nearest whole number and is rounded up to 1 % to ensure that the existence of different information is represented. For this reason, the percentage values should only be used as an approximation and not as a definitive convertible distance length.
EXTRACTED	Date	The date the 'NWR_TrackCentreLines' and corresponding information was extracted from the master data to create the Open Data

*Attribution added when ESRI Shapefile was created

4.2 Nodes

The 'NWR_TrackNodes.shp' data, derived from the NWR_TrackCentreLines dataset, occur at the start and or end of a link, with a minimum of one connected link and a maximum of 4 connected links as detailed in the NWR_TrackNodes.shp Schema.

Data Type – Point

4.2.1 NWR_TrackNodes.shp Schema

Attribute Name	Data Type	Description
FID*	Object ID	Unique identifier generated when the shapefile is created.
Shape *	Geometry	Point – Represent the start and end of every 'NWR_TrackCentreLines'
ASSET_ID	Text - 12	Unique ID which is consistent and maintained as far as possible. ASSET_ID's are retired/introduced when track layouts change significantly.
VALANCY	Double	The number of links that connect to the point, this value can be between 1 and 4: 1 – Tracks start/end or no connecting data held 2 – Pseudo Node – no change in direction is not possible, attributional change only 3 – Directional change possible 4 – Centre of diamond crossing no directional change possible at this location although attributional changes may occur.
VERSION	Double	This is the version number linked to the ASSET_ID which is increased each time the data is amended in the main system, either its attribution or geometry.
EXTRACTED	Date	The date the 'NWR_TrackNodes' were extracted from the master data to create the Open Data

*Attribution added when ESRI Shapefile was created

4.3 Reference Lines

The 'NWR_ELRs.shp' is a geographical representation of the model at route level. This is a virtual line which has been generated by creating a best fit between the main lines of each Engineer's Line Reference (ELR) and as such is generalised and not a seamless linear feature.

The reference line extends beyond the usable extent of the tracks to varying lengths to allow for assets associated with any given ELR to be visualised within Network Rail.

There is only one polyline for each ELR. Where there are two sections of an ELR that are not connected on the ground a straight line is used to connect these sections and does not represent the historical track location. Reference lines information is visible with no associated tracks which are there for historical purposes.

Data Type – Polyline

4.3.1 NWR_ELRs.shp Schema

Attribute Name	Data Type	Description
FID*	Object ID	Unique identifier generated when the shapefile is created.
Shape *	Geometry	Polyline – Represent the general location of the ELR
ASSET_ID	Text - 12	Unique ID which is consistent and maintained as far as possible. Each ELR has only one ASSET_ID
ELR	Text - 4	Engineers Line Reference, a railway term used to refer to a section of track covering multiple lines.
START	Double	The start calibrated mileage value for the ELR The value is always in mile.yards irrespective of the unit of measurement within the corresponding NWR_Waymarks.shp data.
END	Double	The end calibrated mileage value for the ELR. The value is always in mile.yards irrespective of the unit of measurement within the corresponding NWR_Waymarks.shp data.
VERSION	Double	This is the version number linked to the ASSET_ID which is increased each time the data is amended in the main system, this is either its attribution or geometry.
EXTRACTED	Date	The date the 'NWR_ELRs' were extracted from the master data to create the Open Data

*Attribution added when ESRI Shapefile was created

4.4 Waymarks

The 'NWR_Waymarks.shp' data contains the approximate location of milepost for the national network as well additional waymarks which have been added to support business needs. For user awareness, it is known and understood that the waymarks are not always a precise measurement of 440 yards between each post where the line is measured in miles.

The data is also used to calibrate the linear referencing system for asset location.

Data Type – Point

4.1.1 NWR_Waymarks.shp Schema

Attribute Name	Data Type	Description
FID*	Object ID	Unique identifier generated when the shapefile is created.
Shape *	Geometry	Point – Represents the approximate location of a milepost or is a point added to support business needs.
ASSET_ID	Text - 12	Unique ID which is consistent and maintained as far as possible. ASSET_ID's are retired/introduced when track layouts change significantly.
ELR	Text - 4	Engineers Line Reference, a railway term used to refer to a section of track covering multiple lines.
UNIT	Text - 1	This denotes the master unit of measurement for the ELR: K – Kilometres M – Miles
VALUE	Double	This is the locational value in either miles or kilometres of point
VERSION	Double	This is the version number linked to the ASSET_ID which is increased each time the data is amended in the main system, this is either its attribution or geometry.
EXTRACTED	Date	The date the 'NWR_Waymarks' and corresponding information was extracted from the master data to create the Open Data

*Attribution added when ESRI Shapefile was created

Appendix 1

Network Rail Track ID/Codes Description Overview

Track Name	Track ID
UP MAIN FAST	1100
UP SLOW	1200
UP GOODS	1300
UP SINGLE	1400
UP LOOP	1500
UP TERMINAL	1600
UP CROSSOVER	1700
UP OTHER/ENGINE	1800
UP SIDING	1900
DOWN MAIN FAST	2100
DOWN SLOW	2200
DOWN GOODS	2300
DOWN SINGLE	2400
DOWN LOOP	2500
DOWN TERMINAL	2600
DOWN CROSSOVER	2700
DOWN OTHER/ENGINE	2800
DOWN SIDING	2900
REVERSIBLE/BI-DIRECTIONAL MAIN FAST	3100
REVERSIBLE/BI-DIRECTIONAL SLOW	3200
REVERSIBLE/BI-DIRECTIONAL GOODS	3300
REVERSIBLE/BI-DIRECTIONAL SINGLE	3400
REVERSIBLE/BI-DIRECTIONAL LOOP	3500
REVERSIBLE/BI-DIRECTIONAL TERMINAL	3600
REVERSIBLE/BI-DIRECTIONAL CROSSOVER	3700
REVERSIBLE/BI-DIRECTIONAL OTHER/ENGINE	3800
REVERSIBLE/BI-DIRECTIONAL SIDING	3900