



ORDNANCE SURVEY GB

# OS MASTERMAP HIGHWAYS NETWORK – PRODUCT GUIDE

## Version History

Version	Date	Description
1.0	03/2016	Initial release.
2.0	10/2016	Minor updates.
2.1	04/2017	Minor updates.
2.2	10/2017	Minor updates.
2.3	07/2018	Minor updates.
2.4	03/2021	Addition of Scottish Street information.

## Purpose of this Document

This is the Product Guide for the OS MasterMap Highways Network product. This Guide provides greater insight into this product and its potential applications. For information on the contents and structure of OS MasterMap Highways Network, please refer to the Getting Started Guide and Technical Specifications.

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# I. Introduction

## I.1 Overview

Ordnance Survey, GeoPlace and Improvement Service have collaborated to bring together the Ordnance Survey's detailed road and path information, the National Street Gazetteer (NSG), the Trunk Road Street Gazetteer (TRSG), and the Scottish Street Gazetteer (SSG) to create the authoritative road and path network for Great Britain, OS MasterMap Highways Network. The Highways Network integrates the Unique Street Reference Number (USRN) from the gazetteers with the most detailed definitive geometry from Ordnance Survey (Figure 1). The OS MasterMap Highways Network was produced in partnership with GeoPlace and the Local Government Association, and as of March 2021, contains data created and maintained by Scottish Local Government.

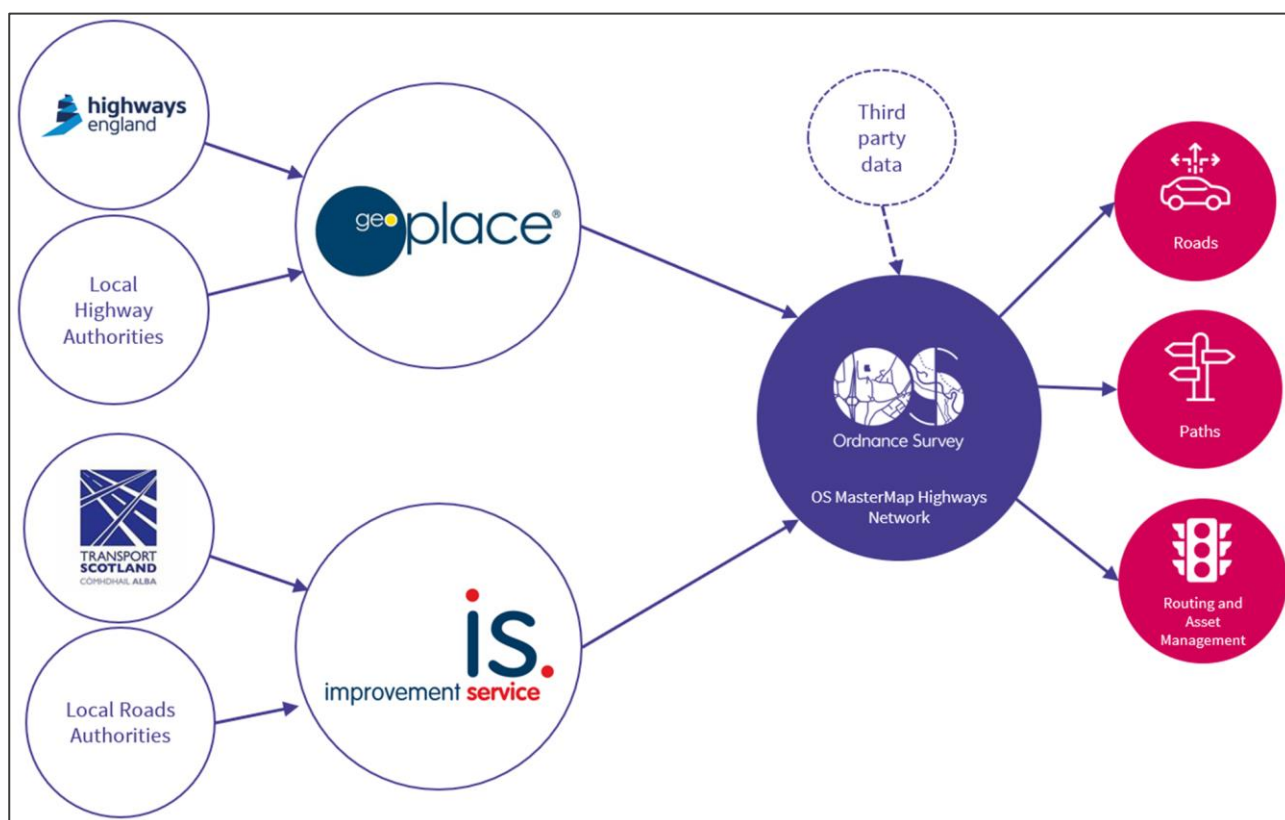


Figure 1: Bringing together data to create OS MasterMap Highways Network.

The OS MasterMap Highways Network product family includes three core products:

- OS MasterMap Highways Network – Roads
- OS MasterMap Highways Network – Routing and Asset Management Information
- OS MasterMap Highways Network – Paths

In addition to the three core products, the OS MasterMap Highways Network family is enhanced with three speed data products:

- OS Master Highways Network with Routing and Asset Management Information and Average Speed
- OS Master Highways Network with Routing and Asset Management Information and Speed Limits
- OS Master Highways Network with Routing and Asset Management Information and Average Speed and Speed Limits

These three new products are supplied with an additional data file which will be either Average Speed, Speed Limits or a combination of both.

The OS MasterMap Highways Network product family includes a road network, a path network, connectivity across British islands through a ferry network, routing and asset management information, as well as detailed speed information on all roads.

## 1.2 About GeoPlace

GeoPlace is a limited liability partnership jointly owned by the Local Government Association and Ordnance Survey. It is responsible for compiling and maintaining the National Street Gazetteer (NSG).

This is the definitive referencing system used in the notification process and the coordination of street works. Under legislation, each highway authority in England and Wales is required to create and maintain its own Local Street Gazetteer (LSG) and Associated Street Data (ASD). These are then compiled into the only master index built to the national standard (BS 7666).

## 1.3 Standards

The OS MasterMap Highways Network has been designed to be [INSPIRE](#) compliant. INSPIRE is the Infrastructure for Spatial Information in Europe. It is designed to ensure that the spatial data infrastructures of the Member States of the European Community are compatible and usable between member states to improve decision making and operations. The INSPIRE Transport Networks Data Specification form the basis of the [Roads](#), [Routing and Asset Management Information](#) and [Paths](#) product specifications.

OS MasterMap Highways Network specifications have also been extended to include additional properties included in British Standard 7666-1:2006, spatial datasets for geographical referencing.

## 1.4 Coordinate reference system

The coordinate reference system used by OS MasterMap Highways Network is the [British National Grid](#) (BNG). The BNG spatial reference system uses the OSGB36 geodetic datum and a single Transverse Mercator projection for the whole of Great Britain. Positions on this projection are described using easting and northing coordinates in units of metres. The BNG is a horizontal spatial reference system only; it does not include a vertical (height) reference system.

In the Geography Markup Language (GML) data, this is represented by reference to its entry in the EPSG registry, as <http://www.opengis.net/def/crs/EPSSG/0/27700>.

## 1.5 Key features

OS MasterMap Highways Network products contain a number of features, including the following:

- Unique Street Reference Number (USRN)
- Road names from the naming and numbering authority
- DfT road classifications
- Road maintenance authority
- Motorway Junction to junction information
- Routing information
- Height, weight, width and length restrictions information
- Special designations
- Road reinstatement information
- Connected network across GB including islands through the Ferry Network
- Average Speed information broken down into six time periods for each day
- Speed Limits

One of the key strengths of this product is the collection of street information at the local highway authority level. The benefit of this is that the data capture is at the earliest point of creation within the local highway authority and there is detailed local knowledge driven by statutory requirements.

## 1.6 Applications

OS MasterMap Highways Network is designed to be used as a single source of highway asset management by private and public sectors alike. It can be used for the following applications:

- As a source for legal road identifications
- To estimate costs or benefits of road policies
- For efficient funding allocations and evidence-based policy making
  - Managing policies
  - Producing statistics
  - Allocating funding
  - Supporting legislation
- Asset management
- Journey planning, routing and navigation
- Emergency service and civil contingency planning
- Transport planning
- Smart Cities
- For speed data calculations and analysis:
  - Congestion analysis and drive time studies
  - Environmental analysis to monitor emissions and carry out standing time analysis
  - Routing and route optimisation
  - Planning emergency response routing
  - Planning and development using traffic and infrastructure modelling
  - Autonomous vehicles usage of speed limits



## 2. OS MasterMap Highways Network

### 2.1 Overview

OS MasterMap Highways Network brings together Ordnance Surveys detailed road and path information together with the authoritative sources of the National Street Gazetteer (NSG), the Trunk Road Street Gazetteer (TRSG) and the Scottish Street Gazetteer (SSG). These sources contain the definitive information provided by the Local and National Roads and Highways authorities.

To bring this information together, where possible the geometry of streets captured by a Roads or Highway Authority is spatially matched to the geometry of OS RoadLinks and PathLinks. Where this match is successful, the Ordnance Survey geometry is the base geometry used for the Highways Network, enabling the bringing together of the NSG, SSG and TRSG with Ordnance Survey data. Where spatial matching cannot match the geometry captured by the Roads or Highway Authority to OS geometry, the Roads or Highway authority geometry is used as the source geometry to represent the extent of the Street, ensuring that all USRNs and associated data provided are included in the product.

Additionally, OS MasterMap Highways Network is enriched with third party information on speed data which is connected to the Ordnance Survey road network and will provide detailed information on average speed and speed limits across Great Britain.

The bringing together of this information has brought the following products into the market under the OS MasterMap Highways Network product family.

### 2.2 OS MasterMap Highways Network – Roads

The Roads product provides a topologically structured link and node representation of the road network and provides connectivity across Great Britain through Ferry features. The Roads product provides information on names associated to the road network whether that be the legal definitive view of a road name, the plated road name, road numbering and junction names and numbers. In addition to naming information the product will also provide information on road classification, road function, primary routes, and road node classification.

### 2.3 OS MasterMap Highways Network – Routing and Asset Management Information

The Routing and Asset Management Information product provides the same functionality as the Roads product with additional information provided on managing the road as an asset and routing information which aids navigation. The routing and asset management information integrates information from Ordnance Surveys large scale information and the Additional Street Data held within the National Street Gazetteer and Scottish Street Gazetteer. The routing information provides information on vehicle restrictions, covering access, manoeuvres, and physical characteristics. The asset management information provides information on the authority responsible for maintaining a road, how a road should be restored following street works and if there are any unusual conditions that the local highway authority have associated to a road.

## 2.4 OS MasterMap Highways Network – Routing and Asset Management Information and Speed Data

The Speed data is made available along with OS MasterMap Highways Network – Routing and Asset Management Information product and is supplied in three separate products which will provide Average Speed, Speed Limits and the combined version of both Average Speed and Speed Limits.

OS Master Highways Network with Routing and Asset Management Information and Average Speed will provide detailed historical speed information on the average speed travelled for the entire road network in Great Britain. The average speed is provided for each road link and for six distinct times of each day, in both directions of travel. This dataset is based on a year's worth of information and will aid in calculating congestion and drive times, routing optimisation and planning.

OS Master Highways Network with Routing and Asset Management Information and Speed Limits will provide the speed limit for each road link in Great Britain based on road traffic signs. This dataset will enable you to determine speed restrictions on the road, optimise routing, as well as to calculate congestion and drive times.

Both Average Speed and Speed Limits data are linked to the corresponding OS MasterMap Highways Network Road Link feature to which it belongs, identified by the Road Link TOID.

## 2.5 OS MasterMap Highways Network – Paths

The Paths product provides a topologically structured link and node representation of the pedestrian path and ferry network within urban areas. The path network will provide connectivity between the road network but will not provide a route which can be inferred from the road network. Instead, the path network can be connected to the road network within the Roads or Routing and Asset Management Information products. The Paths product provides information on names associated to the path network, the path function, and its surface type. In addition to the network information, the product also provides asset management information which provides information on the authority responsible for maintaining the path, how the path should be restored following street works and if there are any unusual conditions that the local highways or roads authority have associated to it.

## 3. Feature types

### 3.1 Overview

OS MasterMap Highways Network products features are classified into feature types. Each feature type has associated attribution and further detail of this can be found in the Technical Specifications.

Core features in the Roads product		
Road Link	Street	Ferry Node
Road Node	Road Junction	Ferry Terminal
Road	Ferry Link	

Core features in the Routing and Asset Management Information product		
Road Link	Ferry Node	Hazards
Road Node	Ferry Terminal	Structures
Road	Highways Dedication	Maintenance
Street	Access Restrictions	Reinstatement
Road Junction	Turn Restrictions	Special Designation
Ferry Link	Restrictions For Vehicles	

Core features in the Paths product		
Path Link	Street	Maintenance
Path Node	Highways Dedication	Reinstatement
Connecting Link	Ferry Link	Special Designation
Connecting Node	Ferry Node	
Path	Ferry Terminal	

Core features and speed features in the Routing and Asset Management Information and Speed product suite		
Average Speed	Ferry Link	Hazards
Speed Limits	Ferry Node	Structures
Road Link	Ferry Terminal	Maintenance
Road Node	Highways Dedication	Reinstatement
Road	Access Restrictions	Special Designation
Street	Turn Restrictions	
Road Junction	Restrictions For Vehicles	

Feature type	OS MasterMap Highways Network products			
	Roads	RAMI	Paths	RAMI and Speed
Road Link	✓	✓		✓
Road Node	✓	✓		✓
Path Link			✓	
Path Node			✓	
Connecting Link			✓	
Connecting Node			✓	
Road	✓	✓		✓
Path			✓	
Street	✓	✓	✓	✓
Road Junction	✓	✓		✓
Ferry Link	✓	✓	✓	✓
Ferry Node	✓	✓	✓	✓
Ferry Terminal	✓	✓	✓	✓
Access Restrictions		✓		✓
Turn Restrictions		✓		✓
Restrictions For Vehicles		✓		✓
Hazards		✓		✓
Structures		✓		✓
Maintenance		✓	✓	✓
Reinstatement		✓	✓	✓

Feature type	OS MasterMap Highways Network products			
	Roads	RAMI	Paths	RAMI and Speed
Special Designation		✓	✓	✓
Highways Dedication		✓	✓	✓
Average Speed				✓
Speed Limits				✓
Feature Validation Data Set	✓	✓	✓	✓
OS Open Roads lookup table	✓	✓		✓
TEN-T lookup table	✓	✓		✓

## 3.2 Road Link

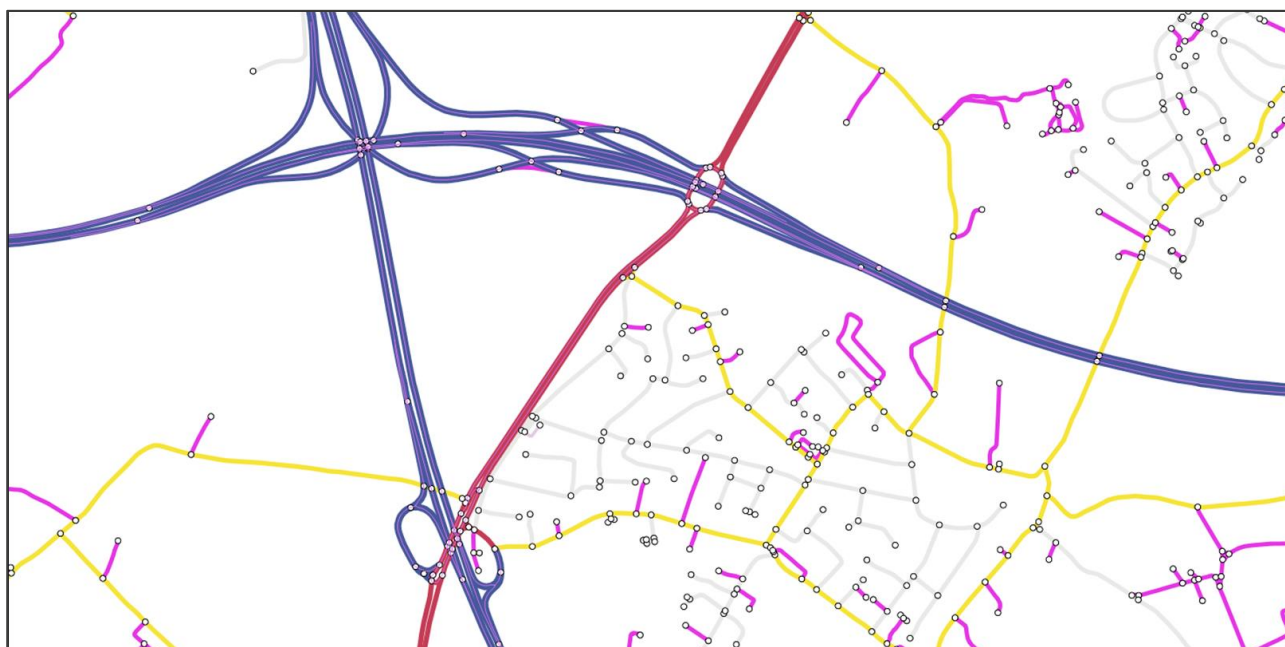


Figure 2: Road Links and Road Nodes forming the base network geometry of the OS MasterMap Highways Network – Roads product.

A Road Link is a line segment representing the general alignment of the road carriageway. It can represent single carriageways, dual carriageway, slip roads, roundabouts and indicative trajectories across traffic squares (Figure 2). It defines the geometry and connectivity of a road network between two points. Road Links hold information on the road name, classification, form, length and other attributes which are specified in the [Technical Specification](#).

### 3.3 Road Node

A Road Node is a topological node connecting to at least one Road Link, providing network connectivity (Figure 2). It is a point used to represent connectivity between road links or the end of a road. A Road Node will hold information on its classification and if the Road Node forms a part of a numbered junction then the Road Node will provide this number.

### 3.4 Path Link

A Path Link is a line segment representing the alignment of a path and hold information about the name of the path, its length and its nature alongside other attribution which is detailed in the [Technical Specification](#). A Path Link will be captured where:

- they provide a route that cannot be inferred from the Road Network;
- they provide connectivity between road networks;
- there is a canal path or tow path, and/or
- there are paths over footbridges and under subways.

Path Links will not be captured where:

- they run parallel to the Road Network, for example, a pavement;
- they are within school boundaries and cemeteries where there are closing times;
- they are connected to a Motorway;
- there is a physical obstruction which prevents connectivity, and/or
- there are multiple paths that essentially serve the same purpose when some rationalisation is applied.

Path Links defines the geometry and connectivity of the Path Network between two points. In the current release of the Paths product, Path Links will only be available in urban areas over 5 km<sup>2</sup>.

### 3.5 Path Node

A Path Node is a topological node connecting to at least one Path Link, providing network connectivity. It is a point used to represent connectivity between path links or the end of a road.

### 3.6 Connecting Link

The road and path network are two independent topologically structured networks. Therefore, they do not structure together (Figure 3). The role of the Connecting Link is to connect the road and path network without splitting the road network. A Connecting Link is a line segment and is a logical connection between the road and path network which do not represent a real-world feature.

## 3.7 Connecting Node

A Connecting Node is a point feature which identifies where a Path would join the road network. The Connecting Node has been snapped to a vertex along a Road Link to enable a connection between the path network and the road network (Figure 4). A Connecting Node does not cause a Road Link to split.



Figure 3: The road network and path network are not topologically structured together. They are independent networks.



Figure 4: How Connecting Links and Connecting Nodes connect the road and path network together.

## 3.8 Road

A Road feature holds information about road names and road numbers which have been captured by Ordnance Survey. A Road feature will reference the Road Links which share the same name (for example, Wellington Road; Figure 5) or number (for example, the A41; Figure 6), irrespective of which local authority is responsible for it. The link set may not be contiguous across junctions or where a road consists of separate sections, which may be separated by some considerable distance. A Road Link could be referenced by multiple Road features.



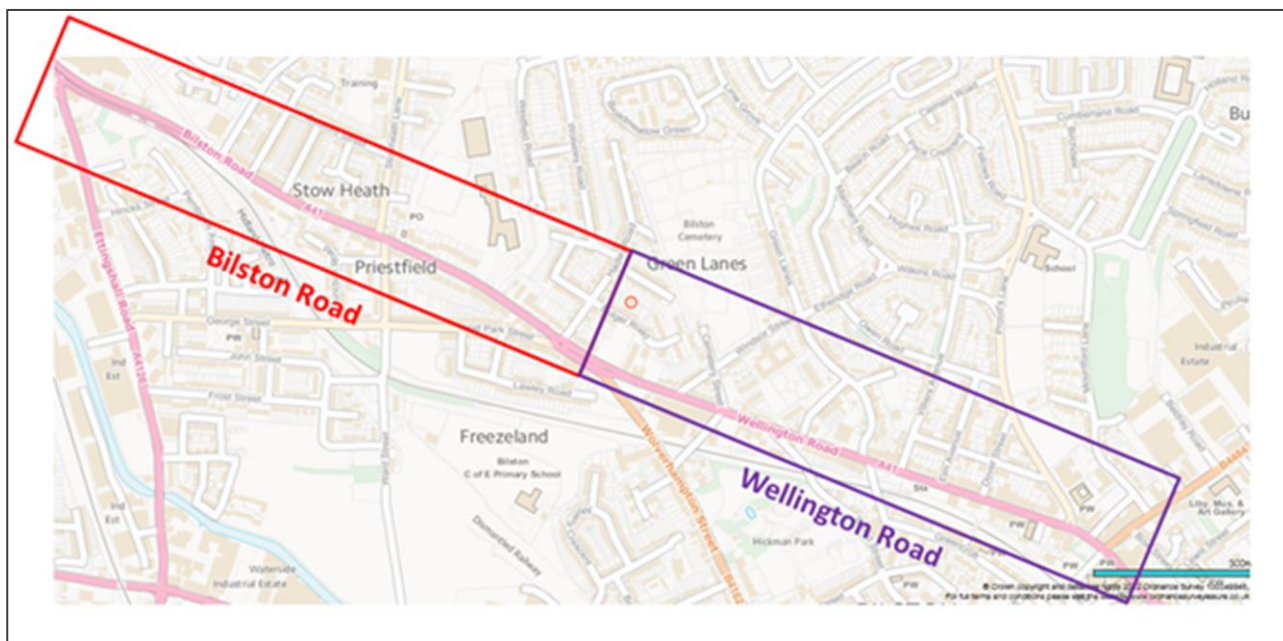


Figure 5: Road references all the links that represent individually named roads, for example, Bilston Road.

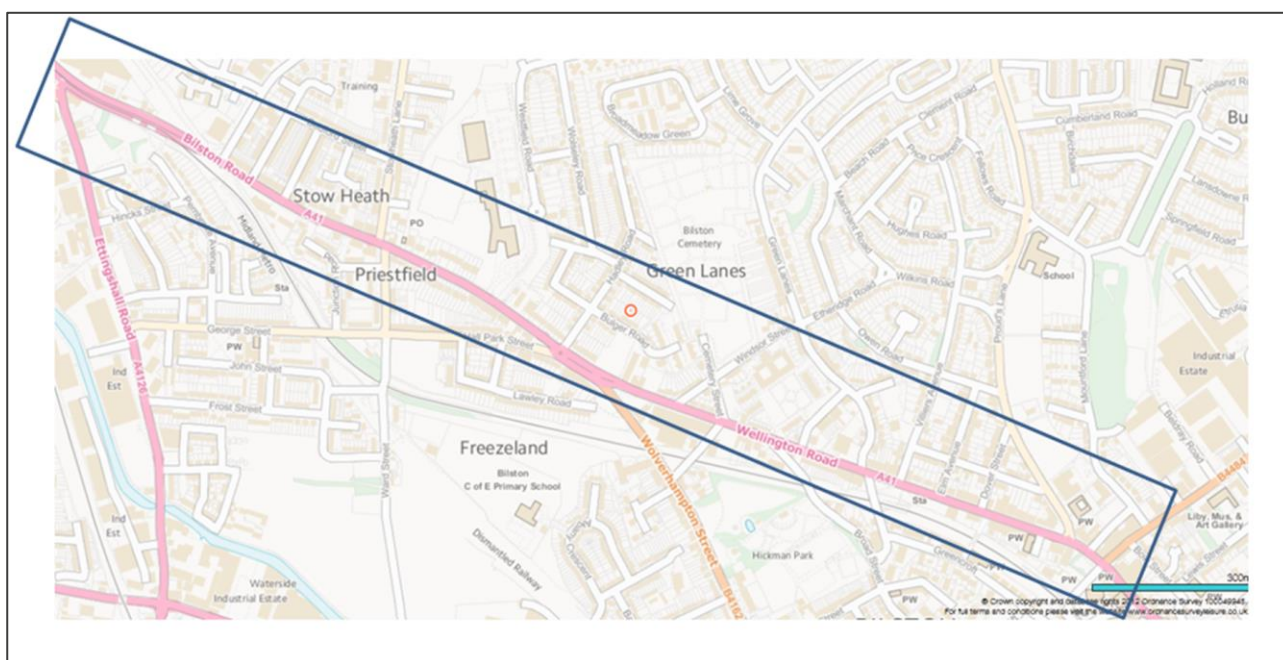


Figure 6: Road references all the links that represent a numbered road, for example, the A41.

### 3.9 Path

A Path feature is similar to a Road feature as it holds information about path names which have been captured by Ordnance Survey. A Path feature is a link set which will reference the Path Links which share the same name irrespective of which local authority is responsible for it. A Path Link could be referenced by multiple Path features.



## 3.10 Street

The Street feature is the definition of the street as defined in the National or Scottish Street Gazetteer. Local authorities have a statutory responsibility that means they are the source of information for both street naming and managing the highways/roads network.

Each Street feature has a USRN, a unique and persistent identifier for a street contained in either the National or Scottish Street Gazetteer. Every street, road, track, path, cycle track or way is assigned a USRN by a Roads Authority, Local Highway Authority or Highways England. Each authority is provided a USRN range, that is centrally allocated and managed by GeoPlace in England and Wales, and Improvement Service in Scotland.

A Street feature encompasses both Roads and Paths. Therefore, a Street feature will reference the Road Links or Path Links. Where a Street crosses an administrative boundary, a new Street feature will be created (Figure 7). A Road Link or Path Link could be referenced by multiple Street features.

The Street features which are supplied with the Routing and Asset Management Information product will contain all Street features which have either been matched to at least one Road Link or have not been matched. The Street features which are supplied with the Paths product will only contain Street features which have only been matched to a Path Link.

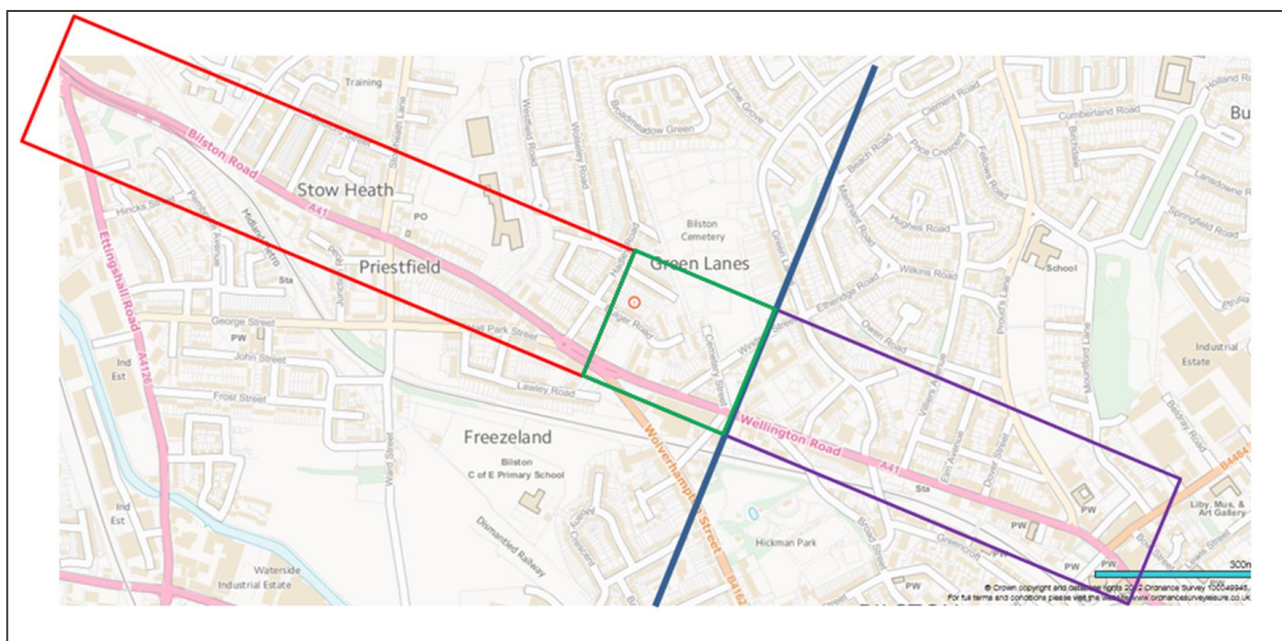


Figure 7: Where a named road crosses an administrative boundary a new Street feature will be created as can be seen in the above example for Wellington Road.

## 3.11 Road Junction

The Road Junction holds information about junction names and numbers. The feature will reference all the Road Nodes which represent the junction the feature is representing (Figure 8). Multiple Road Junction features could reference a Road Node. In the current release the Road Junction feature will only identify Numbered Motorway Junctions.

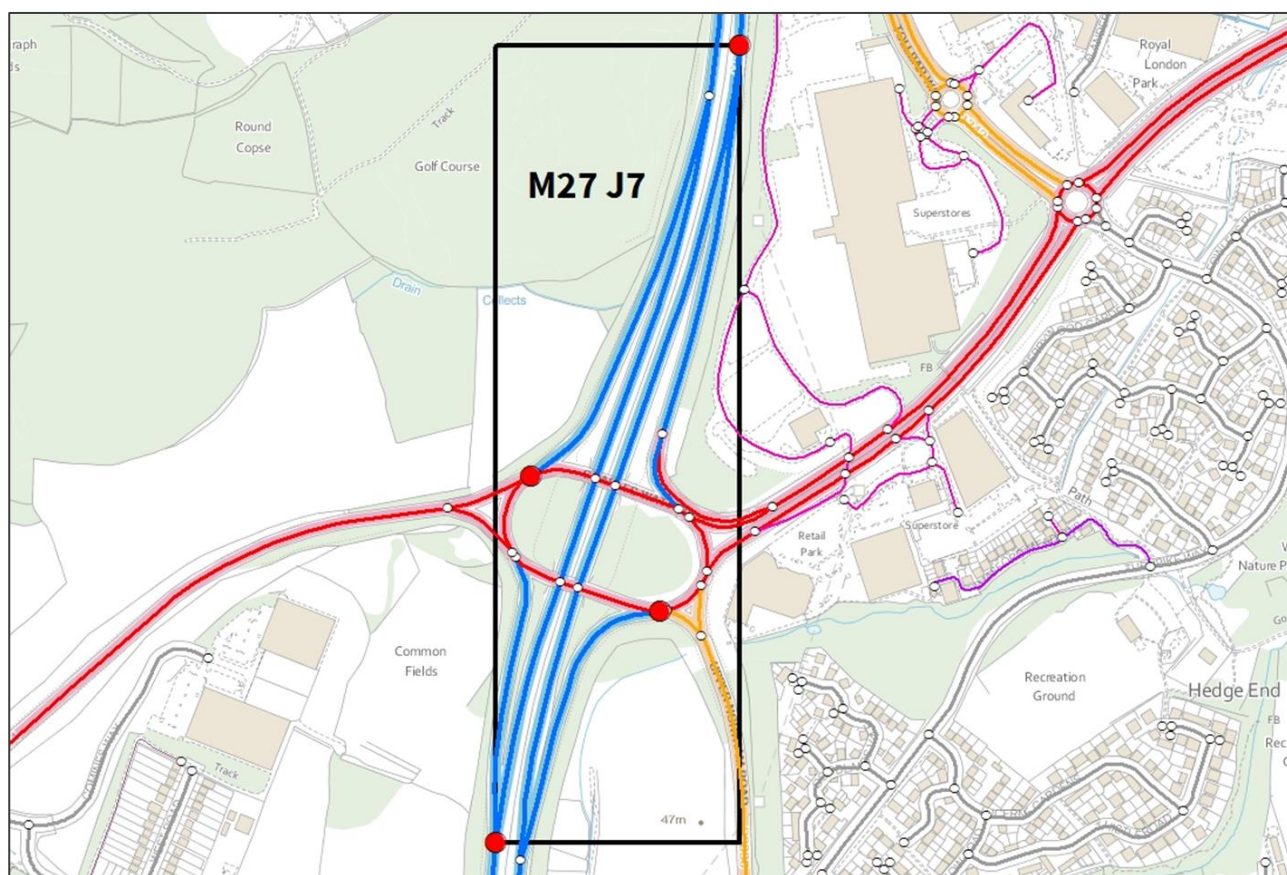


Figure 8: A Road Junction feature references all the Road Nodes that represent it.

### 3.12 Ferry Link

A Ferry Link is a line segment that connects the road network and path network across bodies of water. The link can represent the route a ferry may take between terminals otherwise the link will be a straight line between two terminals. In addition to the connectivity the Ferry Link provides information on who operates the service and if the service is limited to pedestrians. A Ferry Link will only be captured where both terminals are within Great Britain, and there is a timetabled service available to the public.

### 3.13 Ferry Node

A Ferry Node is a point feature which identifies where the Ferry Network terminates. The Ferry Node will always be referenced by at least one Ferry Link.

### 3.14 Ferry Terminal

The road and path network is connected to the ferry network through the Ferry Terminal feature, which acts as a network connection feature. The Ferry Terminal is a logical connection and therefore no geometry is supplied. In addition to connecting the networks together, the Ferry Terminal feature will also

provide terminal name and the three letter NaPTAN code used by the Government to identify terminals uniquely.

### 3.15 Access Restrictions

An Access Restriction is a feature where access to a road or area by vehicles can be legally prohibited. Prohibited access restrictions are indicated by regulatory signs with a red circle or a no entry sign (Figure 9). In addition, access could be limited for use by particular classes of vehicle; these are indicated by regulatory signs with a blue circle (Figure 10). Access restrictions may also include exemptions to the restriction. The Access Restriction feature type comprises these types of restrictions.



Figure 9: Examples of prohibited access restrictions which will be included in OS MasterMap Highways Network.

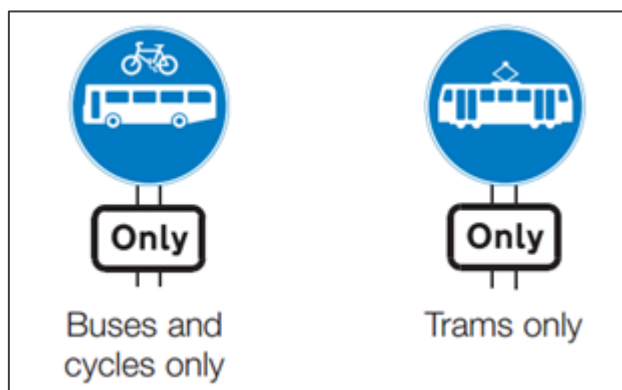


Figure 10: Examples of access limited to access restrictions which will be included in OS MasterMap Highways Network.

### 3.16 Turn Restrictions

A Turn Restriction is a restriction based upon a vehicle manoeuvre. The types of restriction include a prohibitive driving instruction, mandatory driving instruction and implicit restrictions. Prohibited instructions are indicated by road signs within a red circle; examples include No U-turns, No Right Turn and No Left Turn (Figure 11). These can include exceptions to the instruction and are typically elements like Except for Buses. Mandatory driving instructions indicated by road signs within a blue circle or painted on the roadway, such as Turn Right and Ahead Only (Figure 12). Implicit restrictions occur where a turn is not signed as prohibited but would not be a normal manoeuvre, for example, where a road splits around a

traffic island or at complex junctions where additional geometry has been captured to reflect the traffic flow. These are not differentiated from actual signed restrictions.



Figure 11: Examples of prohibitive driving instructions.



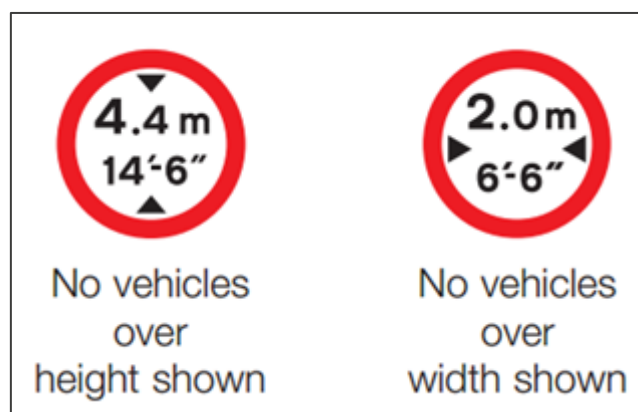
Figure 12: Examples of mandatory driving instructions.

### 3.17 Restrictions For Vehicles

A Restriction For Vehicles are restrictions that apply to the physical characteristics of vehicles. These are required to protect structures such as bridges and tunnels from damage, or to restrict/prohibit use by vehicle that exceed dimensions, usually for physical reasons. In addition, the Restriction For Vehicles includes exemption to the restriction when a specific use conditions apply (for example, loading and unloading). The restrictions include:

- Maximum Height
- Maximum Width
- Maximum Length
- Maximum Weight

Height, weight, width and length restrictions may be defined using either regulatory signs (Figure 13) or warning signs. By default, the restriction is always provided in the metric unit and the imperial measure will be provided where it is signed.



*Figure 13: Examples of a regulatory vehicle restrictions.*

### 3.18 Hazards

Hazards are locations which are hazardous, and caution should be taken to ensure safe travel. Hazards are usually signed using a warning sign. Hazards include Fords and Dangerous Bends.

### 3.19 Structures

Structures are the location of key built features that relate to the highway network. The types of features provided include bridges; barriers which can control, obstruct or prevent passage or access; tunnels, and equipment which would control the flow of traffic.

### 3.20 Maintenance

Maintenance provides information about whether the path is maintained at public expense by a national or local highway authority, a road authority or is maintained by another responsible organisation (i.e. not maintained at public expense). If a path is prospectively maintainable at public expense, then this is not currently maintained by a road or highway authority, but the responsible organisation has started the process for a highway or road authority to become responsible for the maintenance of the street at public expense.

*Note: Maintenance responsibility is not an indication of ownership.*

### 3.21 Reinstatement

Reinstatement defines the standard to which the highway must be restored to following opening due to works in the highway as defined in the [New Roads and Street Works Act Specification for the Reinstatement of Openings in Highways](#) in England and Wales and the [New Roads and Street Works Act 1991 Specification for the Reinstatement of Openings](#) in Roads in Scotland.



## 3.22 Highways Dedication

Highway Dedications provide an indication of the type of user who has access to that particular section of the Highway. Highway Dedications may reference public rights of way but are not a definitive record of such.

Every section of geometry supplied by a local highway authority will have a type of dedication associated in line with the [Highways Act 1980](#) and the [Countryside and Rights of Way Act 2000](#) which determines the Highway user access.

## 3.23 Special Designations

Special Designations are statutory and advisory designations that can be applied to protect a highway when street works are to be undertaken. Special Designations exist to reduce the bureaucracy involved in managing street works, with an emphasis on minimising delay and inconvenience to road users, whilst protecting the integrity of the street and any apparatus on it.

## 3.24 Average Speed

Average Speed is the detailed historical speed information collected by in-vehicle telematics devices that collect data for all major roads. The Average Speed information is based on a year's worth of collected data and is given for six distinct times of each day and for both directions of a road link. The Average Speed is provided in km/h for each road link.

## 3.25 Speed Limits

The Speed Limits feature identifies the speed limit for each stretch of road in Great Britain and is based on road traffic signs. The speed limit is provided in miles per hour (mph).

## 4. Product supply

### 4.1 Supply format

#### 4.1.1 OS MasterMap Highways Network core products

All OS MasterMap Highways Network core products (Roads, Routing and Asset Management Information, and Paths) will be supplied as GML 3.2.1. zipped as single files using gzip.

Each feature type will be outputted in its own GML file and no other feature types will be supplied in that GML.

#### 4.1.2 OS MasterMap Highways Network speed products

OS MasterMap Highways Network with Average Speed is available in CSV file format only. The CSV file will be supplied with headers. The data is provided zipped as single file(.zip). Data is provided as full supply only and is refreshed annually (in April).

OS MasterMap Highways Network with Speed Limits is available in SHAPE file format only. The data is provided zipped as single file(.zip). Data is provided as full supply only and is refreshed quarterly (in April, July, October and January).

### 4.2 Supply media

#### 4.2.1 OS MasterMap Highways Network core products

OS MasterMap Highways Network core products are available to PSGA, commercial customers and partners through the [OS Orders website](#). The products are available as both full supply and change only update (COU) and a customer can order an Area of Interest (AOI) or a Managed GB Set. The products are available as download for all customers, and DVD for customers ordering a Managed GB Set.

#### 4.2.2 OS MasterMap Highways Network speed products

OS MasterMap Highways Network with Average Speed data is supplied as download only. The file within OS Orders is named *OS MasterMap Highways Network with Average Speed*. OS MasterMap Highways Network with Speed Limits data is also supplied as download only. The file within OS Orders is named *OS MasterMap Highways Network with Speed Limits*. Both Speed products are available for partners only and can be ordered from the [OS Orders website](#).

### 4.3 Coverage

All products will cover Great Britain.

## 4.4 Non-geographic chunks

OS MasterMap Highways Network core products will only be supplied as non-geographic chunks. Non-geographic chunking is a way of dividing up data into chunks that are supplied in separate volumes that have a feature count, as opposed to a given geographic National Grid area. For this reason, it is possible for features from various geographic locations to appear in one volume and for adjacent features to appear in different volumes. Non-geographic chunk volumes are designed to be loaded into spatial databases but can be used in a file format as long as all chunks are translated or imported into the system at the same time. For information on the volume feature counts for each feature type in OS MasterMap Highways Network, please see Annex A – Volume feature count.

## 4.5 Product packaging

### 4.5.1 OS MasterMap Highways Network core products

When a customer receives an order, the product will be packaged as follows:

#### **Data folder**

The data folder will contain the GML files which make up the ordered product. The data folder will have been compressed to *data.zip* to enable a single download of the product. Once this has been downloaded, the *data.zip* file will contain all the GML files which make up the ordered product and these files will have been compressed using gzip.

#### **Doc folder**

The doc folder will contain a *summary.gml* file which will contain specific information about the customer order, including:

- The order number
- Query extent polygon(s) of the order
- The order type: Full supply or COU
- For COU orders, the change-since date

The doc will have been compressed to *doc.zip* to enable a single download of the associated documents.

#### **Resources folder**

The resources folder will contain the product's Feature Validation Data Set (FVDS), a lookup table to the OS Open Roads product and a lookup table to the Ten-T network. For further information on these resources, please refer to the [Feature validation data set](#), [OS Open Roads lookup table](#) or [Ten-T lookup table](#) sections. The folder will have been compressed to *resource.zip* to enable a single download of the resources and within the zipped folder the contents will have been compressed.

### 4.5.2 OS MasterMap Highways Network speed products

When a partner receives an order, the product will be packaged as follows:

#### **Data folder**

The data folder will contain the CSV (for Average Speed product) or Shape file (for Speed Limits product) which make up the ordered product. The data folder will have been compressed to either *hnavsp\_csv\_gb.zip* (for Average Speed) or *hnsplm\_shp\_gb.zip* (for Speed Limits) to enable a single download of the product. Once this has been downloaded, the zip file will contain the corresponding csv



(*Highways\_AverageSpeed\_GB.csv*) or shape files (*Highways\_SpeedLimits\_GB.shp*) which make up the ordered product and these files will have been compressed using zip.

### Text file

A text file named *Readme.txt* will contain notes on the product supply and release information.

## 4.6 File naming

### 4.6.1 OS MasterMap Highways Network core products

The file naming for the OS MasterMap Highways Network GML will be constructed as *Highways\_ProductName\_FeatureType\_SupplyType\_NullorDelete\_volumenumber.gml.gz*, where:

- *Highways* identifies that the GML is from the OS MasterMap Highways Network product family.
- *ProductName* is the name of the product that is being supplied, for example, Roads.
- *FeatureType* is the name of the feature type that is being supplied in the GML file, for example, RoadLink.
- *SupplyType* is the type of supply the GML is, for example, Full or COU.
- *NullorDelete* – This will not be present in any GML file names if the GML forms part of a full supply. If the GML forms part of a COU supply, then *Delete* will identify if the file contains all the features which need removing from the customer holding as a part of the COU application.
- *volumenumber* will be the volume number for the file which will be three digits and the first volume will be 001.

Examples of the file names would be as follows:

- *Highways\_Roads\_RoadLink\_Full\_001.gml.gz*
- *Highways\_RoadsAndRAM\_AccessRestriction\_Full\_001.gml.gz*
- *Highways\_Paths\_Maintenance\_Full\_001.gml.gz*
- *Highways\_Roads\_RoadNode\_COU\_001.gml.gz*
- *Highways\_Roads\_RoadNode\_COU\_Delete\_001.gml.gz*
- *Highways\_RoadsAndRAM\_RoadLink\_COU\_001.gml.gz*
- *Highways\_RoadsAndRAM\_RoadLink\_COU\_Delete\_001.gml.gz*
- *Highways\_Paths\_PathLink\_COU\_001.gml.gz*
- *Highways\_Paths\_PathLink\_COU\_Delete\_001.gml.gz*

### 4.6.2 OS MasterMap Highways Network speed products

OS MasterMap Highways Network with Average Speed is supplied within a zip file with the following name: *hnavsp\_csv\_gb.zip*. Within the zip file you will find the CSV file containing all records, which will have the following name: *Highways\_AverageSpeed\_GB.csv*.

OS MasterMap Highways Network with Speed Limits is supplied within a zip file with the following name: *hnsplm\_shp\_gb.zip*. Within the zip file you will find the Shape file containing all records, which will have the following named file extensions:

- *Highways\_SpeedLimits\_GB.shp*
- *Highways\_SpeedLimits\_GB.prj*
- *Highways\_SpeedLimits\_GB.qpj*
- *Highways\_SpeedLimits\_GB.dbf*
- *Highways\_SpeedLimits\_GB.shx*

## 4.7 Feature validation data set

A feature validation data set (FVDS) reports on all the data it expects to find in the customer's holding after the application of the supply. It does not identify what is contained in the supply if the order is not full supply. This enables a customer to validate that the data holding contains the correct set of features after loading the data with which it was supplied. All orders of the OS MasterMap Highways Network product will be supplied with a FVDS.

A FVDS is divided into files on a non-geographic basis, and each FVDS will contain up to 4 million rows in a single volume. Where a file will exceed 4 million rows a new FVDS volume will be created. The FVDS is a comma separated value (.csv) file that provides the ID, version date and feature type of every feature that should exist in the current data holding and the fields are separated by a comma. Each row will be terminated by Carriage Return / Line Feed and where a field has no value in a record, two commas will be placed together in the record (one for the end of the previous field and one for the end of the null field). The FVDS will not contain any header information but the following table identifies the different columns within the file. Each file is compressed using gzip.

Feature validation data set
<b>ID</b>
Definition: The id (gml:id) of the OS MasterMap Highways Network feature.
<b>Version Date</b>
Definition: The 'beginLifespanVersion' attribute of the feature. This is the date this feature came into existence and will be formatted as follows: YYYY-MM-DD. For example, 2016-06-12.
<b>Feature Type</b>
Definition: A textual description of the feature type that the record refers to.

## 4.8 OS Open Roads lookup table

OS Open Roads is part of Ordnance Survey's open data portfolio and is a structured road network which has been generalised to 1:15 000 scale. The OS Open Roads lookup table provides the ID of the OS MasterMap Highways Network RoadLink feature and the id of the feature which represents the same feature in OS Open Roads product which could be either a RoadLink or a RoadNode. The lookup table will enable a customer to share information they have calculated and pinned to the OS MasterMap Highways Network easily through the OS Open Roads product. Not all RoadLink IDs from OS MasterMap Highways Network are included in the lookup table, particularly where the RoadLinks are shorter than 20 m.

The lookup table has been provided as a comma separated value (.csv) file so the attributes are separated by a comma. Each row will be terminated by Carriage Return / Line Feed and where an attribute has no value in a record, two commas will be placed together in the record (one for the end of the previous attribute and one for the end of the null attribute). The file will be supplied with headers and the information is detailed in the table below.

The file will be supplied with all orders of OS MasterMap Highways Network – Roads or OS MasterMap Highways Network – Routing and Asset Management Information and will be a national set, including with Area of Interest (AOI) orders. The lookup table is updated every six months, which is aligned to when OS Open Roads is released. During this period, some of the OS MasterMap Highways Network RoadLink IDs could change, be removed from the product or have new IDs inserted which will not be represented in the

lookup table because the OS Open Roads product has not been updated to reflect this change. The version of OS MasterMap Highways Network the OS Open Roads Lookup table aligns to can be identified in the file name.

The file is named *OSOpenRoadLookupTable\_YYYY\_MM.csv*, where YYYY is the four-digit year and MM is the two-digit month (for example, *OSOpenRoadLookupTable\_2017\_09.csv*).

### OS Open Roads lookup table

Constraint:

- When OSOpenRoads\_RoadLinkIdentifier is null, OSOpenRoads\_RoadNodeIdentifier cannot be null.
- When OSOpenRoads\_RoadNodeIdentifier is null, OSOpenRoads\_RoadLinkIdentifier cannot be null.

#### Attribute: RoadLink\_ID

Definition: The id of the OS MasterMap Highways Network RoadLink feature being represented in OS Open Roads.

Multiplicity: [1]

Size: 20

#### Attribute: OSOpenRoads\_RoadLinkIdentifier

Definition: The RoadLink identifier in OS Open Roads which the Highways feature has been generalised to.

Multiplicity: [0..1]

Size: 38

#### Attribute: OSOpenRoads\_RoadNodeIdentifier

Definition: The RoadNode identifier in OS Open Roads which the Highways feature has been generalised to (for example, a collapsed roundabout).

Multiplicity: [0..1]

Size: 38

## 4.9 TEN-T lookup table

The Trans-European Transport (TEN-T) Network forms a set of road, rail, air and water transport networks spanning the European Union. The TEN-T networks are part of a wider system of trans-European networks, including telecommunications and a proposed energy network.

In GB, the TEN-T network connects the cities of Edinburgh, Glasgow, Liverpool, Manchester, Birmingham, London, Southampton, Dover and Felixstowe, including their ports, rail terminals and airports.

Roads belonging to the TEN-T network should fulfil one or more of the following criteria:

- play an important role in long-distance traffic;
- bypass the main urban centres on the routes identified by the network;
- provide interconnection with other modes of transport, and / or
- link landlocked and peripheral regions to central regions.

The lookup table allows RoadLinks belonging to the TEN-T network to be identified within the Highways dataset. Due to the table referencing links within a connected network the output of any matching will result in a connected TEN-T network within GB. The lookup table has been provided as a comma

separated value (.csv) file so the attributes are separated by a comma. Each row will be terminated by Carriage Return / Line Feed. The file will be supplied with headers and the information is detailed in the table below. The file will be supplied with all orders of OS MasterMap Highways Network – Roads or OS MasterMap Highways Network – Routing and Asset Management Information and will be a national set, including with Area of Interest (AOI) orders.

The lookup table is updated approximately every six months. During this period, some of the OS MasterMap Highways Network RoadLink IDs could change, be removed from the product or have new IDs inserted which will not be represented in the lookup table. The version of OS MasterMap Highways Network the TEN-T lookup table aligns to can be identified in the file name.

The file is named *Ten-TLookupTable\_YYYY\_MM.csv*, where YYYY is the four-digit year and MM is the two-digit month (for example, *Ten-TLookupTable\_2017\_09.csv*).

### TEN-T lookup table

#### Attribute: TOID

Definition: The ID of the OS MasterMap Highways Network RoadLink feature.

Multiplicity: [1]

Size: 20

#### Attribute: TEN\_T\_Type

Definition: The TEN-T road type applicable to the link.

Type: TEN-T Type

Multiplicity: [1]

Size: 23

### TEN-T type values

Value	Description
Corridor	The most 'important' routes connecting the principal transport nodes.
Core	Additional to the Corridor routes to connect extra destinations.
Comprehensive	Additional to the Core routes to connect the outer extents of the country.
Core Last Mile	Additional to the Core routes to ensure full connectivity into urban centres and transport terminals but will not necessarily be of the same standard as the Core network.
Comprehensive Last Mile	Additional to Comprehensive routes to ensure full connectivity into urban centres and transport terminals but will not necessarily be of the same standard as the Comprehensive network.

## Annex A – Volume feature count

The OS MasterMap Highways Network products are only being supplied as non-geographic chunks so the data will be supplied in volumes based on a feature count. The following table identifies the volume feature count used for each volume per feature type (maximum number of features per GML file).

Feature type	Volume feature count
Access Restriction	66,000
Connecting Link	118,000
Connecting Node	138,000
Ferry Link	108,000
Ferry Node	126,000
Ferry Terminal	136,000
Hazard	94,000
Maintenance	82,000
Path	138,000
Path Link	72,000
Path Node	126,000
Reinstatement	120,000
Restriction For Vehicles	74,000
Road	88,000
Road Link	46,000
Road Node	120,000
Special Designation	60,000
Street	36,000
Structure	104,000
Turn Restriction	114,000

