

ORDNANCE SURVEY GB

OS OPEN ROADS™ – OVERVIEW

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	10/2020	Minor updates.
2.3	04/2021	Introduction of vector tiles.
2.4	04/2023	GeoPackage format attribute name changes. Formatting and content improvements.

Purpose of this document

This document provides information about and insight into the OS Open Roads product and its potential applications. For information on the contents and structure of OS Open Roads, please refer to the Technical Specification.

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Contact details

[OS website 'Contact us' page \(https://www.ordnancesurvey.co.uk/contact-us\)](https://www.ordnancesurvey.co.uk/contact-us).

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I. Introduction

I.1 Overview

OS Open Roads is a digital representation of Great Britain's roads. The links represent an approximate central alignment of the road carriageway and include roads classified by the national or local highway authority (for example, A roads) and unclassified roads, which together make up Great Britain's road network.

Attributes identify the roads that make up the strategic route network (SRN) and the primary route network (PRN). The SRN is made up of nationally significant roads used for the distribution of goods and services, and as a network for the travelling public. They are known as trunk roads. The PRN is made up of roads used for transport on a regional or county level and includes all roads which make up the SRN.

OS Open Roads is a generalised product which is automatically simplified from Ordnance Survey large-scale data. Generalisation is the process of reducing the scale and complexity of the data whilst maintaining the important elements and characteristics of the features. The appropriate product scale is 1:25 000, with a recommended viewing scale range of 1:15 000 to 1:30 000.

I.2 Key features

The key features of the OS Open Roads product are as follows:

- Comprehensive coverage of the road network for Great Britain.
- A topologically-structured link-and-node network.
- The identification of roads that form part of the SRN.
- The ability to reference between the OS Open Roads and OS MasterMap Highways Network products.

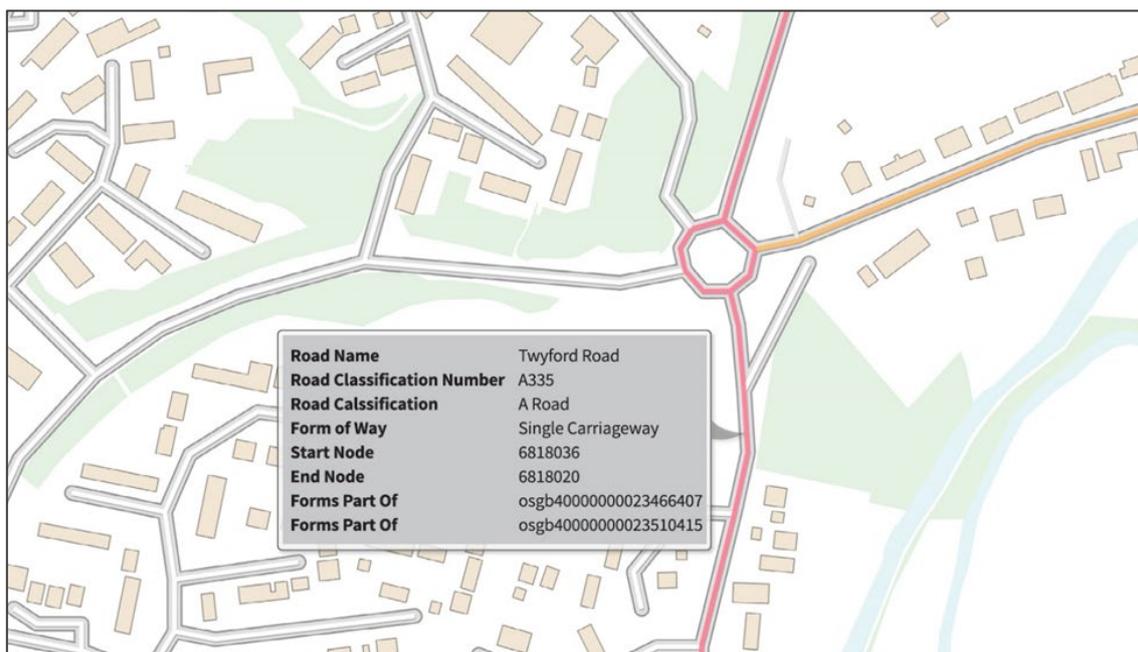


Figure 1. Example map of an A road, highlighting a single carriageway.

1.3 Applications

OS Open Roads supports a wide range of customer applications that use geographic information. The product can be used alone or in combination with other Ordnance Survey products, such as Terrain 50 or VectorMap District. OS Open Roads has numerous applications, including but not limited to, the following examples:

- Assigning information to the road network for both personal and business use.
- High-level analytical queries, for example, how many kilometres (kms) of road are there in Great Britain, an individual country, or a region.
- Simple drive-time analysis, for example, what is within a 25-minute drive of any given location?
- Identifying community problems and reporting back to a relevant authority.

Detailed turn-by-turn routing is not supported in OS Open Roads; this requires the additional detail and complexity available in OS MasterMap Highways Network.

Definitive details of the responsibility for road maintenance are not supported in OS Open Roads; this requires the additional detail held in the OS MasterMap Highways Network.

2. OS Open Roads

2.1 Simplification

The detail within OS Open Roads is automatically generalised from Ordnance Survey large-scale data. Simplification is the process of reducing the scale and complexity of data whilst maintaining the important elements and characteristics of the location.

OS Open Roads simplification comprises the following processes:

- **Selection/omission** – Some features that display at higher resolutions are removed at the lower resolutions. For example, cul-de-sacs of less than a specified length are not supplied.
- **Simplification of geometry** – Simplification can take several forms in OS Open Roads. Examples include reducing the number of vertices that represent a curve and representing a roundabout below a certain size with a RoadNode that is specifically attributed as a roundabout.

2.2 Feature types

OS Open Roads features are classified into three feature types. Each feature type has associated attribution and further detail of this can be found in the [Technical Specification](#).

These are the descriptions for each feature type:

- **RoadLink** – This feature represents the generalised alignment of the road carriageway. It can represent either part or all of a road. Links end where there is a change in attribution or at a junction. Where a RoadLink crosses over another RoadLink, for example at a bridge, neither link will be split. Each end of a RoadLink's geometry is coincident with a RoadNode.
- **RoadNode** – This feature represents a junction, roundabout, change in attribution, or the end of a road. The geometry of a RoadNode is coincident with the end of related links.
- **MotorwayJunction** – This is a point feature representing the generalised location of a motorway junction. It provides information on the motorway number and the junction number, for example *M42 J2*. Where two motorway junctions meet, for example *M3 J2* and *M25 J12*, there will be two MotorwayJunction features, one representing each junction.

2.3 Coordinate reference system

The Geography Markup Language (GML), shapefile, and GeoPackage product formats enable the use of the British National Grid (BNG) coordinate reference system. In the GML data, this is represented by reference to its entry in the EPSG registry, as: <http://www.opengis.net/def/crs/EPSSG/0/27700>.

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.

The vector tiles format is in the Web Mercator (EPSG:3857) projection. This is a global coordinate reference system.

2.4 Currency

OS Open Roads is derived from Ordnance Survey large-scale data and is refreshed every six months.

2.5 Completeness

Quality control procedures are undertaken at all stages of production to ensure that the data is accurate, complete, and conforms to the specification. Quality control checks include automated data testing against the product specification and visual checks by operators.

2.6 Precision

OS Open Roads features are published with geometry given to a precision of two decimal places.

3. Product supply

3.1 Supply format

OS Open Roads is available in the following formats:

- Geography Markup Language (GML): A vector dataset in GML version 3.2.1 Simple Features Profile – Level 1.
- Shapefile: A national vector dataset in ESRI shapefile (.shp).
- GeoPackage: A national vector GeoPackage file (.gpkg).
- Vector tiles: A national vector tiles file (MBTiles).

3.2 Supply mechanism

OS Open Roads is supplied as an online download and is available from the [OS Data Hub Open Roads](https://osdatahub.os.uk/downloads/open/OpenRoads) (<https://osdatahub.os.uk/downloads/open/OpenRoads>) download page. You can select a data format during the download process.

3.3 Coverage and file sizes

3.3.1 GML

- A zipped file comprising a national set.
- The size of the zipped file is approximately 568 MB.
- The zipped file contains 52 GML files, which each contain up to three feature types (see [Product chunking](#) below for more information).
- The size of each GML file ranges from 19 KB to 870 MB.
- The data is not encrypted.

3.3.2 ESRI shapefile

- A zipped file comprising a national set.
- The size of the zipped file is approximately 566 MB.
- The product is split into 100 km² tiles (see [Product chunking](#) below for more information).
- The zipped file contains up to 156 shapefiles.

- Each shapefile contains a single feature type for a 100 km² area.
- The data is not encrypted.

3.3.3 GeoPackage

- A zipped file comprising a single national GeoPackage file.
- The size of the zipped file is approximately 973 MB.
- The GeoPackage file contains three individual layers, one for each feature type, each with national coverage.
- The data is not encrypted.

3.3.4 Vector tiles

- A zipped file comprising a single national MBTiles file.
- The size of the zipped file is approximately 1.3 GB.
- The MBTiles file contains a full set of national vector tiles.
- The data is not encrypted.

3.4 Product chunking

Ordnance Survey divides Great Britain into squares of 100 km by 100 km. Each of these squares has a unique two-letter reference, for example, TG in Figure 2 below.

To ensure that file sizes are manageable, GML and shapefile files are supplied as 100 km-by-100 km tiles.

				HP (N42)		
			HT (N31)	HU (N41)		
	HW (N10)	HX (N20)	HY (N30)	HZ (N40)		
NA (09)	NB (19)	NC (29)	ND (39)			
NF (08)	NG (18)	NH (28)	NJ (38)	NK (48)		
NL (07)	NM (17)	NN (27)	NO (37)			
	NR (16)	NS (26)	NT (36)	NU (46)		
	NW (15)	NX (25)	NY (35)	NZ (45)		
			SD (34)	SE (44)	TA (54)	
		SH (23)	SJ (33)	SK (43)	TF (53)	TG (63)
	SM (12)	SN (22)	SO (32)	SP (42)	TL (52)	TM (62)
	SR (11)	SS (21)	ST (31)	SU (41)	TQ (51)	TR (61)
SV (00)	SW (10)	SX (20)	SY (30)	SZ (40)	TV (50)	

Figure 2. UK map showing 100 km-by-100 km tiles used to chunk up the OS Open Roads GML and shapefile data.

Note: The tiles are not cut at the tile edge of the zones. Consequently, features that extend across the edge of the tiles are supplied in more than one file. Users need to remove the duplicate features once the data has been translated. Each feature has a unique identifier (id) for this purpose.

Annex A: Related documentation

Guides

You can find additional information and documentation on the [OS Open Roads Support page](https://www.ordnancesurvey.co.uk/business-government/tools-support/open-map-roads-support) (<https://www.ordnancesurvey.co.uk/business-government/tools-support/open-map-roads-support>) of the OS website.

We recommend you read the following guides:

- *OS Open Roads – Technical Specification.*
- *Getting Started with GeoPackage.*
- *Getting Started with Vector Tiles.*

Stylesheets

Predefined stylesheets for OS Open Roads are available for download from the <https://github.com/OrdnanceSurvey/OS-Open-Roads-stylesheets> (<https://github.com/OrdnanceSurvey/OS-Open-Roads-stylesheets>).

To download a zip containing all stylesheets, navigate to *Code > Download Zip*.