

ORDNANCE SURVEY GB

OS OPEN ROADS™ – TECHNICAL SPECIFICATION

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 Overview.

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I. Introduction

OS Open Roads is a topologically-structured link-and-node road network of Great Britain. The links represent an approximate central alignment of the road carriageways and include all classified and unclassified roads that make up Great Britain's road network.

OS Open Roads is a generalised product which is automatically derived 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.1 Available formats

OS Open Roads is supplied in the following formats:

- Geography Markup Language (GML): A national 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 (.gpkg) file.
- Vector tiles: A national vector tiles file (MBTiles).

I.2 Identifiers

Each feature has a unique identifier. The identifier property name, which holds the feature's unique identifier, differs for each format:

- GML: *gml:identifier* property.
- Esri shapefile: *identifier* property.
- GeoPackage: *id* property.

Note: The identifier is not persistent between product versions and there is therefore no change history information for features.

I.3 Adherence to standards

OS Open Roads is based on the INSPIRE Transport Networks Road application schema, which is based on the ISO/TC 211 family of open standards.

I.3.1 Extending the INSPIRE specification

- OS Open Roads extends the INSPIRE specification with an additional feature type, MotorwayJunction.

- The OS RoadLink feature type extends the INSPIRE RoadLink feature type with a number of additional properties.

1.3.2 UML diagram and table conventions

The data structure is described by Unified Modelling Language (UML) class diagrams and accompanying tables containing text. The UML diagrams conform to the approach specified in ISO 19103 - Conceptual schema language and ISO 19109 - Rules for application schema, as adopted by INSPIRE.

Colour conventions are used in the diagrams and tables to distinguish the INSPIRE specification from the additional properties that have been added in the Ordnance Survey specification. In the UML diagrams, classes from the INSPIRE data specification are grey, whereas classes in the Ordnance Survey specification are orange. All code lists are blue and enumerations are green (see Figure 1. below) The tables which follow later in this technical specification use orange for feature types, blue for code lists, and green for enumerations.

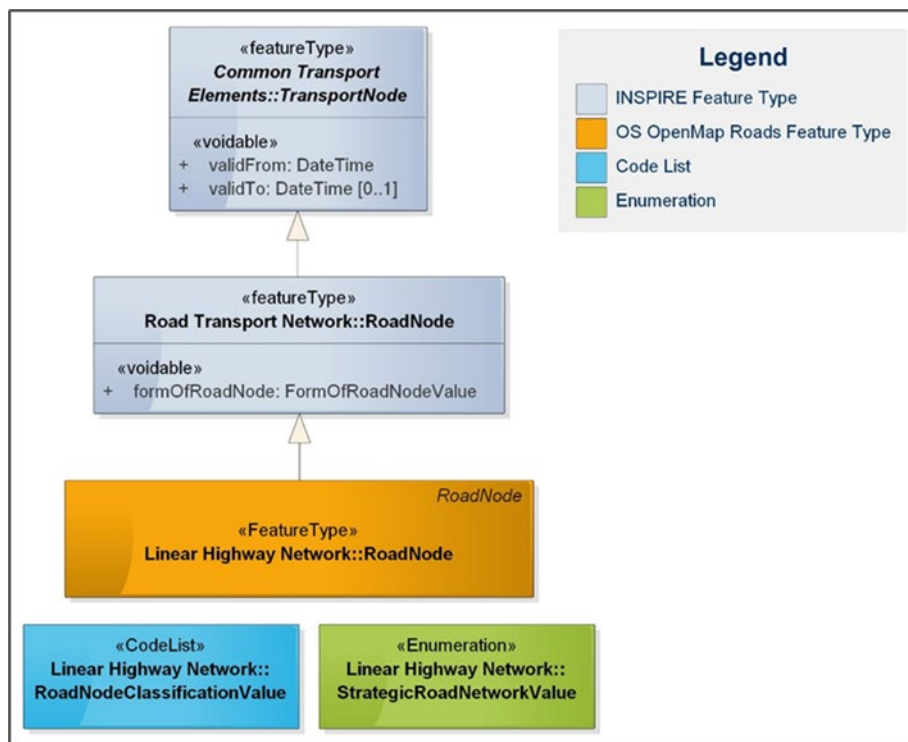


Figure 1: UML diagram using the colour conventions specified in this technical specification.

1.3.3 Lexical conventions

- Class names are conceptually meaningful names (singular noun) in UpperCamelCase.
- Class names end in *Value* when the class is assigned the stereotype <<CodeList>> or <<Enumeration>>.
- Property names (attributes and associations) are in lowerCamelCase.

1.3.4 Stereotypes

The following stereotypes are used on UML elements:

Stereotype	UML element	Description
Application schema	Package	Parent package containing sub-packages and elements that comprise part of the modular specification.
FeatureType	Class	A spatial object type [ISO 19136].
No stereotype	Class	A non-spatial object type, for example, document or organisation.
Type	Class	A structured data type with identity.
Enumeration	Class	A fixed controlled set of values for a free text data type.
CodeList	Class	A controlled set of values for a free text data type that may be extended.
Voidable	Property	A property that is required but is either not currently captured (unknown) or is partially populated (unpopulated).
LifecycleInfo	Property	Property considered part of the life cycle information.

1.3.5 Relationships and associations

There are four key types of relationship that can be defined between classes, only the following two exist in OS Open Roads (see Figure 2 below):

1. **Generalisation/specialisation** – This is used to denote either:
 - a. An extension relationship - The target class represents the same real-world phenomenon. It has the same name as the class it extends. It simply includes additional properties.

OR

 - b. A sub-typing relationship - The target class defines a specialised sub-type of a parent feature, for example, a TransportNetwork is a sub-type of a generic Network class.
2. **Directed association** – This is used to denote relationships between features. These relationships are by reference only (that is, they are implemented by a property whose value is the identifier of the related feature or object). The directed end is assigned a name that describes the relationship and a multiplicity.

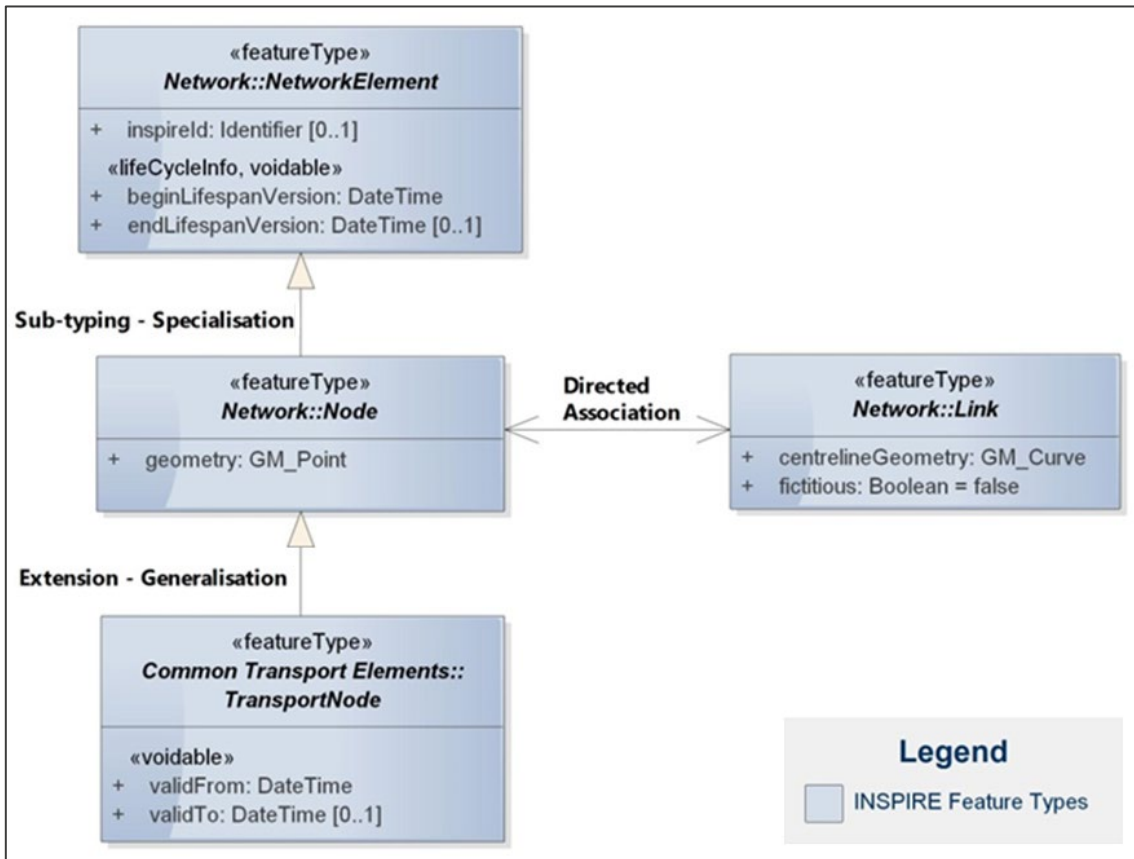


Figure 2: UML diagram illustrating the two key types of relationships in OS Open Roads: directed association and generalisation/specialisation, which is split into two sub-types, extension relationships and sub-typing relationships.

2. OS Open Roads structure

2.1 Product structure

OS Open Roads consists of three core features:

1. **RoadLink** – A feature which represents all or part of a road.
2. **RoadNode** – A feature which represents the end of the network, a change in attribution, or a junction.
3. **MotorwayJunction** – A feature which provides junction information along roads classified as a Motorway.

Features are provided as a FeatureCollection.

This product was built with the INSPIRE Transport Networks Data Specification as a basis, which results in the product inheriting attribution from INSPIRE. An overview of the product structure is detailed in Figure 3, which highlights the inherited INSPIRE feature types and attribution. Note that properties of the INSPIRE specification which are voidable are not included in Figure 3 or the subsequent tables. For information on the INSPIRE properties omitted from this product, please see the [INSPIRE Transport Networks Data Specification](#).

Note: GML attribute naming is used in the main text of this guide. GeoPackage and vector tile attribute naming is very similar to GML as there are no character-length limitations in the GML, GeoPackage or MBTiles formats. However, shapefile attribute naming is different due to the 11-character limit for attribute names in the shapefile format. Attribute mappings between the formats are provided in [Section 4.1](#) (GML and shapefile), [Section 5.1](#) (GML and GeoPackage), and [Section 6.2](#) (GML and vector tiles).

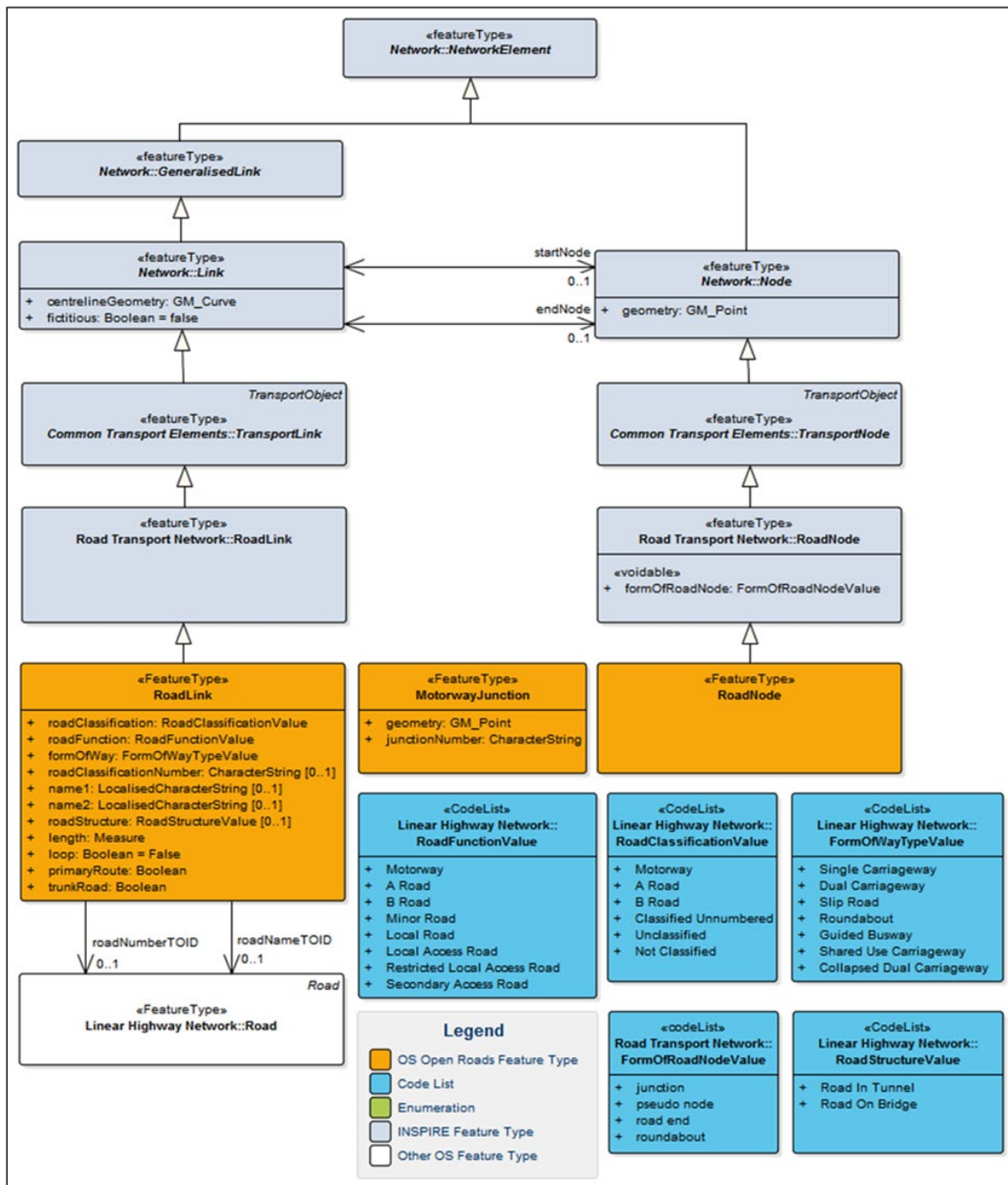


Figure 3: UML diagram illustrating the data structure of OS Open Roads and how it has been extended from the INSPIRE Transport Networks Data Specification.

The individual feature types and code list nodes within this UML diagram are explained in detail in the sections that follow.

2.2 Features

This section describes the three features available in OS Open Roads and provides the following information about each attribute and association:

- **Name and Definition** – The name of the attribute and what it describes.
- **Attribute Type** – The nature of the attribute, for example, a numeric value or a logical indicator.
- **Multiplicity** – If the element is expected to be populated in the data, and if so, the number of times. An attribute may be optional or mandatory, and may have multiple occurrences. For example:
 - ‘1’ – There must be a value.
 - ‘2’ – There must be two values.
 - ‘n’ – There may be one or more values.
 - ‘0’ – Population is optional.These values may be used in combination.
- **Association** – Identifies the relationship between features. These relationships are by reference only and the value will be the identifier of the referenced feature.

2.2.1 RoadLink

The RoadLink feature is a generalised representation of the road network alignment.

RoadLink features are split in the following circumstances:

- Where the classification changes.
- Where the name changes (or ceases to apply).

Where there is a junction or roundabout at the same physical level.

The following table lists the attribution the RoadLink feature can have, and details the definition, data type, length (where applicable), and multiplicity of each attribute.

«FeatureType» RoadLink		
Definition: A feature which represents a part or all of a named or numbered road.		
Attribute: id		
Definition: Unique identifier. For RoadLink this is a GUID, which is not persistent.		
Type: <code>CharacterString</code>	Length: 38	Multiplicity: [1]
Attribute: centrelineGeometry		
Definition: The geometry that represents the centreline of the link.		
Type: <code>GM_Curve</code>	Multiplicity: [1]	
Attribute: fictitious		
Definition: Indicator that the centreline geometry of the link is a straight line with no intermediate control points – unless the straight line represents the geography in the resolution of the data set appropriately.		
Type: <code>Boolean</code>	Length: 5	Multiplicity: [1]
Attribute: roadClassification		
Definition: Road classification uses a common system of route numbering, which is centrally administered for England and Wales by the Department for Transport. In all other respects, roads classification is a devolved matter outside of England.		
Type: RoadClassificationValue	Length: 22	Multiplicity: [1]
Attribute: roadFunction		
Definition: A alternative classification of the Road based on its usage.		
Type: RoadFunctionValue	Length:30	Multiplicity: [1]
Attribute: formOfWay		
Definition: A description of the RoadLink based on its form or function.		
Type: FormOfWayValue	Length: 50	Multiplicity: [1]
Attribute: roadClassificationNumber		
Definition: The official road number assigned by the appropriate authority. Note: This includes at least one letter. For example, 'A329(M)'.		
Type: <code>CharacterString</code>	Length: 10	Multiplicity: [0..1]
Attribute: nameI		
Definition: The name of the RoadLink. Note 1: Where a road has a name in more than one language, this attribute will be the Welsh or Gaelic version. Note 2: Where a feature has more than one name, the language of each name is provided as a three-digit ISO 639-2 code ('eng', 'cym', 'gla').		
Type: <code>LocalisedCharacterString</code>	Length: 150	Multiplicity: [0..1]

Attribute: name2

Definition: The alternative name of the RoadLink, if any.

Note 1: Where a road has a name in more than one language, this attribute will be the English version.

Note 2: Where a feature has more than one name, the language of each name is provided as a three-digit ISO 639-2 code ('eng', 'cym', 'gla').

Type: LocalisedCharacterString	Length: 150	Multiplicity: [0..1]
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Attribute: roadStructure

Definition: Identifies if this section of road passes through or over a physical structure, such as a tunnel or bridge.

Type: RoadStructureValue	Length: 14	Multiplicity: [0..1]
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Attribute: length

Definition: The calculated length of the RoadLink in metres.

Type: Measure	Length: 10	Multiplicity: [1]
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Attribute: loop

Definition: Indicates if the RoadLink feature connects back on itself by having the same start and end roadNode.

Type: Boolean	Length: 5	Multiplicity: [1]
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Attribute: primaryRoute

Definition: States if the RoadLink forms part of the primary route network.

Type: Boolean	Length: 5	Multiplicity: [1]
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Attribute: trunkRoad

Definition: States if the RoadLink forms part of the trunk road network.

Type: Boolean	Length: 5	Multiplicity: [1]
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Association: startNode

Definition: The node coincident with the first vertex of the geometry attribute.

Multiplicity: 1	Length: 38
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Association: endNode

Definition: The node coincident with the last vertex of the geometry attribute.

Multiplicity: 1	Length: 38
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Association: roadNumberTOID

Definition: Identifier of the Road feature that holds the information about the road classification number the RoadLink forms part of in the OS MasterMap Highways Network product.

Multiplicity: 0..1	Length: 20
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Association: roadNameTOID

Definition: Identifier of the Road feature that holds the information about the road name the RoadLink forms part of in the OS MasterMap Highways Network product.

Multiplicity: 0..1

Length: 20

2.2.2 RoadNode

RoadNode features are added at the start and end of every [RoadLink feature](#). Where roads connect at the same level, a single RoadNode feature is captured.

The following table lists the attribution the RoadNode feature can have, and details the definition, data type, length (where applicable), and multiplicity of each attribute.

«FeatureType» RoadNode		
Definition: A point representing either the start or end of a highway, or connectivity between two or more RoadLink features.		
Attribute: id		
Definition: Unique identifier. For RoadNode, this is a GUID, which is not persistent.		
Type: CharacterString	Length: 38	Multiplicity: [1]
Attribute: formOfRoadNode «voidable»		
Definition: Description of the function of a road node in the road transport network.		
Type: FormOfRoadNodeValue	Length: 20	Multiplicity: [1]
Attribute: geometry		
Definition: The location of the node.		
Type: GM_Point	Multiplicity: [1]	

2.2.3 MotorwayJunction

Motorway junctions are represented by a MotorwayJunction feature.

The following table lists the attribution the MotorwayJunction feature can have, and details the definition, data type, length (where applicable), and multiplicity of each attribute.

«FeatureType» MotorwayJunction		
Definition: A feature that represents the numbered motorway junction.		
Attribute: id		
Definition: Unique identifier. For MotorwayJunction, this is a GUID, which is not persistent.		
Type: CharacterString	Length: 38	Multiplicity: [1]
Attribute: geometry		
Definition: The location of the node.		
Type: GM_Point	Multiplicity: [1]	
Attribute: junctionNumber		
Definition: The Motorway junction number designated by the national authority (Department for Transport), for example, M3 J9.		
<i>Note: Where two Motorway Junctions meet, there are two features, for example, M3 J2 and M25 J12.</i>		
Type: CharacterString	Length: 12	Multiplicity: [1]

2.3 Code lists and enumerations

A code list is a controlled set of values for a free text data type which can be extended. This section identifies the code lists used within OS Open Roads and describes their values.

2.3.1 RoadClassificationValue

Classification of roads exists to ensure that there is a feasible, logical road network throughout the country. Road classifications should be set to take into account the traffic management goals and road categorisation approach of the local highway authority (LHA).

The [RoadLink feature](#) is attributed with a *roadClassification* with a data type of *RoadClassificationValue*. The following table lists the codes which are used populate this field and gives a description for each code.

Code List: RoadClassificationValue	
Code	Description
Motorway	A multi-carriageway public road connecting important cities, classified by the Department for Transport. A Motorway does not form part of the official road classification scheme as it is a Special Road. However, it has been included to allow them to be classified.
A Road	A major road intended to provide large-scale transport links within or between areas.
B Road	A road intended to connect different areas and to feed traffic between A roads and smaller roads on the network.
Classified Unnumbered	Smaller roads intended to connect unclassified roads with A and B roads; often linking a housing estate or a village to the rest of the network. <i>Note 1: These were ‘minor roads’ in ITN (retired OS product) and are sometimes known unofficially as C roads.</i> <i>Note 2: A Street may be assigned a local classification number by the local highways authority.</i>
Unclassified	Roads intended for local traffic. <i>Note 1: The vast majority (60%) of roads in the UK fall within this category.</i> <i>Note 2: These may be designed unofficial local road classifications, for example, D, E, F and G roads.</i>
Not Classified	Roads that have not been assigned a road classification at national or local level by a designation authority.
Unknown	The classification of the road is unknown because the RoadLink is not a Motorway, A or B road, and the RoadLink has not been matched to any other road classification at national or local level.

2.3.2 RoadFunctionValue

The [RoadLink feature](#) is attributed with a *roadFunction* with a data type of *RoadFunctionValue*. The following table lists the codes which are used to populate this field and gives a description for each code.

Code List: RoadFunctionValue	
Code	Description
Motorway	A multi-carriageway public road connecting important cities.
A Road	A major road intended to provide large-scale transport links within or between areas.
B Road	A road intended to connect different areas and to feed traffic between A roads and smaller roads on the network.
Minor Road	A public road that provides interconnectivity to higher-classified roads or leads to a point of interest.
Local Road	A public road that provides access to land and/or houses, usually named with addresses. Generally, not intended for through traffic.
Local Access Road	A road intended for the start or end of a journey; it is not intended for through traffic but will be openly accessible.
Restricted Local Access Road	A road intended for the start or end of a journey; it is not intended for through traffic and will have a restriction on who can use it.
Secondary Access Road	A road that provides alternate/secondary access to property or land; it is not intended for through traffic.

2.3.3 FormOfWayValue

The [RoadLink feature](#) is attributed with a *formOfWay* with a data type of *FormOfWayValue*. The following table lists the codes which are used to populate this field and gives a description for each code.

Code List: FormOfWayValue	
Code	Description
Single Carriageway	A road consisting of one carriageway with traffic in one or both directions. There may be more than one lane in either direction.
Dual Carriageway	A road consisting of two separate carriageways with separate flow directions. The carriageways are partitioned by physical features, such as a barrier and/or verge.
Slip Road	A link that provides exit from or entry to another link.
Roundabout	A method of controlling traffic flow by allowing vehicles from a particular direction priority.
Collapsed Dual Carriageway	The geometry of the dual carriageway has collapsed; this occurs where they run parallel and are less than a defined distance apart, resulting in a single line representing both carriageways of a dual carriageway.
Guided Busway	A specially-constructed or modified route for passenger road vehicles that have been built or adapted to be steered by external means. Typically, along guided busways there is a raised kerb with a track along which small wheels protruding from the sides of the modified vehicle run. This classification is only for specific cases where buses run along specifically-designed tracks or channels that remove the need for steering.
Shared Use Carriageway	Roads that have been altered for use principally by pedestrians, but may also provide some access for certain types of vehicles.

2.3.4 RoadStructureValue

The [RoadLink feature](#) is attributed with a *roadStructure* with a data type of *RoadStructureValue*. The following table lists the codes which are used to populate this field and gives a description for each code.

Code List: RoadStructureValue Values for structure	
Code	Description
Road In Tunnel	A road that passes underground or under water.
Road On Bridge	A road that passes over a river, railway, road, or ravine on a structure. <i>Note: This value is currently not populated.</i>

2.3.5 FormOfRoadNodeValues

The *RoadNode* feature is attributed with a *RoadNodeCategory* with a data type of *TransportNodeTypeValue*. The following table lists the codes which are used to populate this field and gives a description for each code.

Note: This code list is inherited from INSPIRE and is not extendable.

Code List: FormOfRoadNodeValue Functions of road nodes within Euroroads http://inspire.ec.europa.eu/codelist/FormOfRoadNodeValue	
Code	Description
junction	Road node where three or more road links connect.
pseudo node	Exactly two road links connect to the road node.
road end	Only one road link connects to the road node. It signifies the end of a road.
roundabout	The road node represents or is a part of a roundabout.

3. GML overview

This section describes the GML format for OS Open Roads. We recommended you read this in conjunction with the Open Geospatial Consortium's (OGC), [OpenGIS® Geography Markup Language Encoding Standard v3.2.1](#).

The XML specifications that GML is based on are available from the World Wide Web Consortium (W3C) website: <https://www.w3.org/XML/>.

Information about Unicode and UTF-8, the character encoding that we use, is available on the Unicode Consortium website: <http://www.unicode.org/>.

3.1 Schema overview and location

XML schemas are used to define and validate the format and content of the GML data. The GML v3.2.1 standard provides a set of schemas that define the GML feature constructs and geometric types. These are designed to be used as a basis for building application-specific schemas which define the data content.

The Ordnance Survey application schema, [OSOpenRoads.xsd](#), which is referenced by the data, is available on the [OS Open page](#) (<https://www.ordnancesurvey.co.uk/xml/open/index.html>) of the XML file resources section of our website.

The OS schema imports the INSPIRE Transport Networks Data Specification, which in turn imports the GML 3.2.1 schemas. These in turn import schemas produced by the W3C, which are available from the W3C website at: <http://www.w3.org/XML/1998/namespace.html>.

All of these schemas are defined in XML Schema Definition (XSD) language, as defined by the W3C.

The OS application schema uses the XML namespaces detailed in the table below. A link to each definition is provided in the last column.

Prefix	Namespace identifier	Definition available at
gml	http://www.opengis.net/gml	http://schemas.opengis.net/gml/3.2.1/gml.xsd
xsi	http://www.w3.org/2001/XMLSchema-instance	Built into XML http://www.w3.org/TR/xmlschema-1/
xlink	http://www.w3.org/1999/xlink	http://www.w3.org/1999/xlink.xsd
xml	http://www.w3.org/XML/1998/namespace	http://www.w3.org/2001/xml.xsd
net	urn:x-inspire:specification:gmlas:Network:3.2	http://inspire.ec.europa.eu/schemas/net/4.0/Network.xsd
tn	http://inspire.ec.europa.eu/schemas/net/3.0	https://inspire.ec.europa.eu/schemas/net/3.2/Network.xsd
tn-ro	urn:x-inspire:specificationnn:gmlas:RoadTransportNetwork:3.0	http://inspire.ec.europa.eu/schemas/tn-ro/3.0/RoadTransportNetwork.xsd

Prefix	Namespace identifier	Definition available at
os	http://namespaces.os.uk/product/1.0	https://www.ordnancesurvey.co.uk/xml/schema/product/1.0/OSProduct.xsd
highway	http://namespaces.os.uk/mastermap/highwayNetwork/1.0	https://www.ordnancesurvey.co.uk/xml/schema/highwaysnetwork/v1/LinearHighwayNetwork.xsd
road	http://namespaces.os.uk/Open/Roads/1.0	https://www.ordnancesurvey.co.uk/xml/open/roads/1.0/OSOpenRoads.xsd

3.2 Simple Features Profile – Level 1

OS Open Roads conforms to the GML 3.2.1 Simple Features Profile – Level 1.

GML is designed to support a wide variety of capabilities, ranging from simple contextual mapping to products that include complex geometric property types, and even spatial and temporal topology. The [GML 3.2.1 Simple Features Profile](#) defines a restricted subset of GML, which allows for greater interoperability.

4. Esri shapefile overview

OS Open Roads is supplied as an Esri shapefile. The shapefile format is an open specification format to store geometry and attribute information about spatial features that is developed and maintained by Esri.

4.1 Attribute mapping

The naming of attributes in GML and Esri shapefile is different; in shapefile attribute names are limited to 11 characters. The tables in the following sections map GML attribute names to their equivalent names in shapefile.

Note: GML contains an attribute that describes the geometry of the feature; this is not applicable for shapefile as they are separated by their geometry.

4.1.1 RoadLink

GML attribute	ESRI shapefile attribute
id	identifier
fictitious	fictitious
roadClassification	class
roadFunction	function
roadClassificationNumber	roadNumber
name1	name1
Specified in the GML tag for <i>name1</i> as <i>xml:lang</i>	name1_lang
name2	name2
Specified in the GML tag for <i>name2</i> as <i>xml:lang</i>	name2_lang
formOfWay	formOfWay
length	length
primaryRoute	primary
trunkRoad	trunkRoad
roadStructure	structure
loop	loop
startNode	startNode
endNode	endNode
numberTOID	numberTOID
nameTOID	nameTOID

4.1.2 RoadNode

GML attribute	ESRI shapefile attribute
id	identifier
formOfRoadNode	formOfNode

4.1.3 MotorwayJunction

GML attribute	ESRI shapefile attribute
id	identifier
junctionNumber	number

5. GeoPackage overview

GeoPackage (.gpkg) is defined by the Open Geospatial Consortium (OGC) as an open, non-proprietary, platform-independent, standards-based data format for geographic information systems (GIS). It is designed to be a lightweight format that can contain large amounts of varied and complex data in a single, easy-to-distribute and ready-to-use file. GeoPackage is natively supported by numerous software applications.

GeoPackage offer users the following benefits:

- The single file is easy to transfer and offers the end-user a rich experience.
- Attribute names are not limited in length, making the format user friendly.
- The file size limit is large at 140 TB.

Note: A file size limit could be imposed by the file system to which the file is written.

- It supports raster, vector and database formats, making it a highly versatile solution.
- It is an OGC standard.
- In most cases, it is a plug-in-and-play format.

For information on how to open, use and understand a GeoPackage dataset, please refer to our *Getting Started with GeoPackage* guide, which is available from 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) on the OS website. For further information on GeoPackage, please see the [GeoPackage website \(https://www.geopackage.org/\)](https://www.geopackage.org/).

5.1 Attribute mapping

The naming of attributes between GeoPackage and GML is very similar as neither format limits the number of characters for an attribute name. The following tables map the GML attribute name to the GeoPackage attribute name.

Note: The GML contains an attribute which describes the geometry of the feature; this is not applicable to GeoPackage files as they are separated by their geometry.

5.1.1 RoadLink

GML attribute	GeoPackage attribute
id	id
fictitious	fictitious
roadClassification	road_classification
roadFunction	road_function
roadClassificationNumber	road_classification_number

GML attribute	GeoPackage attribute
name1	name_1
Specified in the GML tag for <i>name1</i> as <i>xml:lang</i>	name_1_lang
name2	name_2
Specified in the GML tag for <i>name2</i> as <i>xml:lang</i>	name_2_lang
formOfWay	form_of_way
length	length (has two fields: <i>length</i> and <i>length_uom</i>)
primaryRoute	primary_route
trunkRoad	trunk_road
roadStructure	road_structure
loop	loop
startNode	start_node
endNode	end_node
numberTOID	road_number_toid
nameTOID	road_name_toid

5.1.2 RoadNode

GML attribute	GeoPackage attribute
id	id
formOfRoadNode	form_of_road_node

5.1.3 MotorwayJunction

GML attribute	GeoPackage attribute
id	id
junctionNumber	junction_number

6. Vector tiles overview

OS Open Roads is supplied as a national vector tile set in a single MBTiles file. This is a lightweight set of tiles that are efficient and fast to render in your software, provide high-resolution data and give a seamless experience when zooming in and out. The data is supplied in Web Mercator projection (ESPG:3857).

6.1 Vector tiles schema overview

The vector tiles schema, as well as the attribute zoom levels, is detailed in the following table. The Zoom levels columns indicate whether or not the specified layer and attribute are displayed within that zoom level (Y – yes, N – no).

Layer	Attribute	Zoom levels						
		0 to 8	9	10	11	12	13	14
motorway_junction	id	N	Y	Y	Y	Y	Y	Y
	junction_number	N	Y	Y	Y	Y	Y	Y
road_link	id	N	Y	Y	Y	Y	Y	Y
	road_classification	N	Y	Y	Y	Y	Y	Y
	road_function	N	Y	Y	Y	Y	Y	Y
	form_of_way	N	Y	Y	Y	Y	Y	Y
	road_classification_number	N	Y	Y	Y	Y	Y	Y
	name_1	N	Y	Y	Y	Y	Y	Y
	name_1_lang	N	Y	Y	Y	Y	Y	Y
	name_2	N	Y	Y	Y	Y	Y	Y
	name_2_lang	N	Y	Y	Y	Y	Y	Y
	length	N	Y	Y	Y	Y	Y	Y
	primary_route	N	Y	Y	Y	Y	Y	Y
	trunk_road	N	Y	Y	Y	Y	Y	Y
road_node	id	N	Y	Y	Y	Y	Y	Y
	form_of_road_node	N	Y	Y	Y	Y	Y	Y

6.2 Attribute mapping

The naming of attributes between vector tiles and GML file is very similar as the vector tiles set within the MBTiles file is not limited in the number of characters for an attribute name. The following tables map the GML attribute name to the attribute name in the vector tiles.

Note: An asterisk symbol () in the following tables indicates that a particular attribute is not available in vector tiles (for example, the fictitious attribute is available in GML, but not in vector tiles).*

6.2.1 RoadLink

GML attribute	Vector tile attribute
id	id
fictitious	*
roadClassification	road_classification
roadFunction	road_function
roadClassificationNumber	road_classification_number
name1	name_1
Specified in the GML tag for name1 as <i>xml:lang</i>	name1_lang
name2	name_2
Specified in the GML tag for name2 as <i>xml:lang</i>	name_2_lang
formOfWay	form_of_way
length	length
primaryRoute	primary_route
trunkRoad	trunk_road
roadStructure	*
loop	*
startNode	*
endNode	*
numberTOID	*
nameTOID	*

6.2.2 RoadNode

GML attribute	Vector tiles attribute
id	id
formOfRoadNode	form_of_road_node

6.2.3 MotorwayJunction

GML attribute	Vector tiles attribute
id	id
junctionNumber	junction_number

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*.