

ORDNANCE SURVEY GB

OS DETAILED PATH NETWORK – TECHNICAL SPECIFICATION

Version history

Version	Date	Description
1.1	09/2015	Initial release.
1.2	09/2016	Minor updates.
1.3	07/2017	Minor updates.
1.4	10/2021	Addition of vector tiles and GeoPackage formats to the product.

Purpose of this document

This document provides information about and insight into the OS Detailed Path Network product and its potential applications. For information on the contents and structure of OS Detailed Path Network, please refer to the Overview and Getting Started Guide.

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1:25 000 Scale Colour Raster
Explorer
OS MasterMap Topography Layer
OS MasterMap Highways Network
OS Terrain 5
OS Terrain 50

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

The OS Detailed Path Network product is a topologically connected link and node network for roads, tracks, paths and rights of way within the National Parks of Great Britain. The product has been created from a number of existing Ordnance Survey data sources, including OS MasterMap Topography Layer, OS MasterMap Highways Network, 1:25 000 Scale Colour Raster, OS Terrain 5 and OS Terrain 50. The data is intended to provide sufficient detail for routing pedestrians, cyclists and horse riders when using mobile devices, with a typical positional accuracy of 10m.

I.1 Adherence to standards

OS Detailed Path Network is a derived product that has been designed with consideration of the [INSPIRE](https://inspire.ec.europa.eu/) (<https://inspire.ec.europa.eu/>) Transport Networks Data Specification, although INSPIRE does not apply to off road transport. Due to the process of deriving OS Detailed Path Network, feature instances and their identifiers will be regenerated at each data refresh.

2. Product structure

The data is supplied as a link and node model similar to that used for the [OS MasterMap Highways Networks products](https://www.ordnancesurvey.co.uk/business-government/tools-support/mastermap-highways-support) (<https://www.ordnancesurvey.co.uk/business-government/tools-support/mastermap-highways-support>).

Route Links represent the general alignment of roads, tracks, paths and rights of way and Route Nodes are used to record the connectivity between links explicitly. A Route feature, that records collections of links or link sets, is used to record recognised named routes as single features.

OS Detailed Path Network contains three feature types (Route, RouteLink and RouteNode); the product's structure is demonstrated in [Figure 1](#).

2.1 Route

A Route is a feature representing a named entity that forms a recognised and signed route that the public can use. For example, a [National Trail](https://www.nationaltrail.co.uk/) (<https://www.nationaltrail.co.uk/>), such as the Pennine Way, or one of [Scotland's Great Trails](https://www.scotlandsgreattrails.com/) (<https://www.scotlandsgreattrails.com/>), such as the West Highland Way.

A route can include references to different types of RouteLink, for example, a route may include sections of paths, tracks and public roads to create a continuous named trail.

The Route feature is not included in the vector tiles format, as these would directly overlay and replicate the RouteLink features referenced by a single route.

See [Route](#) for more details.

2.2 RouteLink

A RouteLink is a feature that represents all or part of a road, track, path or right of way that can be used by pedestrians, cyclists and horse riders.

See [RouteLink](#) for more details.

2.3 RouteNode

A RouteNode is a feature at the end of one or more RouteLinks. It allows software to quickly identify connections by using references to the unique identifier. The RouteNode also indicates:

- The junction of three or more RouteLink features.
- A change in real-world information (for example, the route type) that requires the creation of two RouteLink features with different attribution.
- The start or end of a RouteLink feature.

See [RouteNode](#) for more details.

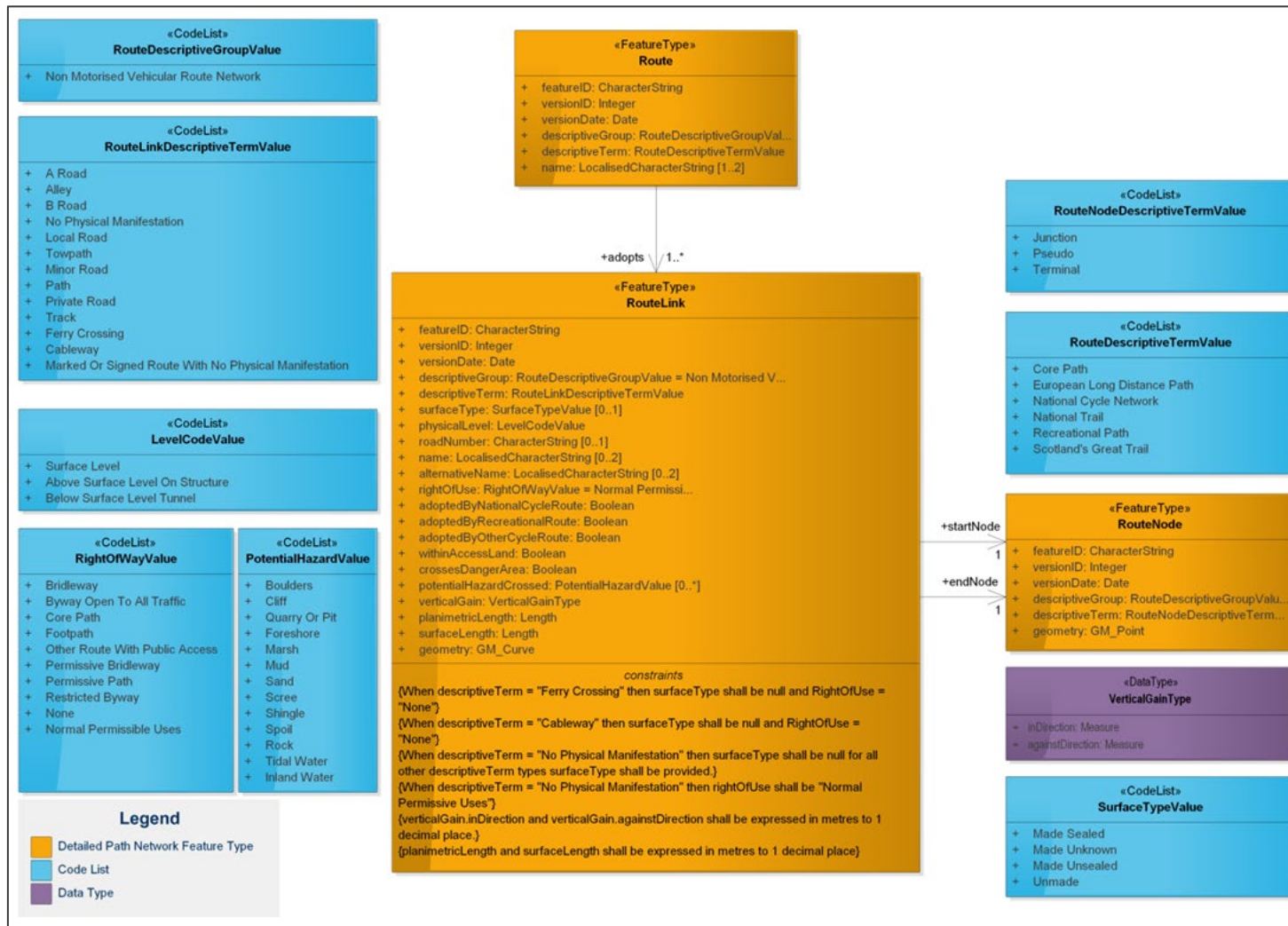


Figure 1: UML diagram of the OS Detailed Path Network product model.

2.4 Features

This section describes the three features available in the OS Detailed Path Network product (Route, RouteLink and RouteNode), giving the following information about each attribute and association:

Name and Definition: The name of the attribute and what it is describing.

Attribute Type: The nature of the attribute, for example, a numeric value or a logical indicator.

Length: Values are given here to indicate the maximum length that you will find in the data, to aid in developing applications. Length is not constrained in the GML (Geography Markup Language).

Multiplicity: Describes how many times this element is expected to be populated in the data. An attribute may be optional or mandatory, and it 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: An association identifies the relationship between features. The relationships are by reference only and the value will be the identifier of the referenced feature.

2.4.1 Route

«FeatureType» Route		
Definition: A Route is a feature representing a named entity that forms a recognised and signed route that the public can use.		
Attribute: featureID		
Definition: A unique identifier assigned to a Route. The ID is in the form of a GUID.		
<i>Note: In the current version of the product, featureID values are not maintained between product supplies; see Feature Level Metadata.</i>		
Type: CharacterString	Length: 36	Multiplicity: [1]
Attribute: versionID		
Definition: A number assigned to uniquely identify and manage change. The versionID is used to distinguish between different revisions of a feature and within the set of all revisions, the versionID is unique.		
<i>Note: In the current version of the product, versionID values are not maintained between product supplies; see Feature Level Metadata.</i>		
Type: Number	Length: 20	Multiplicity: [1]

«FeatureType» Route		
Attribute: versionDate		
Definition: The date on which the feature was last edited.		
Note: <i>In the current version of the product, versionDate values are not maintained between product supplies; see Feature Level Metadata.</i>		
Type: Date	Multiplicity: [1]	
Attribute: descriptiveGroup		
Definition: The primary classification attribute of a feature.		
For OS Detailed Path Network features, this value will always be set to "Non Motorised Vehicular Route Network".		
Type: RouteDescriptiveGroupValue	Length: 50	Multiplicity: [1]
Attribute: descriptiveTerm		
Definition: The recognised classification of the type of Route. For example, National Cycle Network, National Trail and Core Path.		
Type: RouteDescriptiveTermValue	Length: 50	Multiplicity: [1]
Attribute: name		
Definition: A proper name assigned to identify to the Route.		
If the proper name is defined in multiple languages, then each name is provided with an associated language qualifier. If the proper name is only defined in one language, then no language qualifier will be provided.		
Type: LocalisedCharacterString	Length: 50	Multiplicity: [1..2]
Association: adopts		
Definition: Ordered list of references to the RouteLink features that comprise the Route.		
Multiplicity: 1..*		

2.4.2 RouteLink

«FeatureType» RouteLink		
Definition: A RouteLink is a feature that represents all or part of a road, track, path or right of way that can be used by pedestrians, cyclists or horses being ridden.		
Attribute: featureID		
Definition: A unique identifier for a RouteLink. The ID is in the form of a GUID.		
Note: In the current version of the product, featureID values are not maintained between product supplies; see Feature Level Metadata .		
Type: CharacterString	Length: 36	Multiplicity: [1]
Attribute: versionID		
Definition: A number assigned to uniquely identify and manage change. The versionID is used to distinguish between different revisions of a feature and within the set of all revisions; the versionID is unique.		
Note: In the current version of the product, versionID values are not maintained between product supplies; see Feature Level Metadata .		
Type: Number	Length: 20	Multiplicity: [1]
Attribute: versionDate		
Definition: The date on which the version was created.		
Note: In the current version of the product, versionDate values are not maintained between product supplies; see Feature Level Metadata .		
Type: Date	Multiplicity: [1]	
Attribute: descriptiveGroup		
Definition: The primary classification attribute of a feature. For OS Detailed Path Network features, this value is set to "Non Motorised Vehicular Route Network"		
Type: RouteDescriptiveGroupValue	Length: 50	Multiplicity: [1]
Attribute: descriptiveTerm		
Definition: Further classification indicating the type way that the RouteLink alignment is along or alongside. See RouteLinkDescriptiveTermValue for more information.		
Type: RouteLinkDescriptiveTermValue	Length: 50	Multiplicity: [1]
Attribute: surfaceType		
Definition: Type of material used to protect the surface of the way.		
Type: SurfaceTypeValue	Length: 30	Multiplicity: [0..1]

«FeatureType» RouteLink		
Attribute: physicalLevel		
Definition: Relative vertical position of the RouteLink in relation to the ground surface.		
Type: LevelCodeValue	Length: 30	Multiplicity: [1]
Attribute: roadNumber		
Definition: Official number assigned to identify the road by the Department for Transport (DfT), for example, A64		
Type: CharacterString	Length: 5	Multiplicity: [0..1]
Attribute: name		
Definition: A proper name in common use that applies to the RouteLink, the same name may apply to more than one RouteLink. If the proper name is defined in multiple languages, then each name will be provided with an associated language qualifier. If the proper name is only defined in one language, then no language qualifier will be provided.		
Type: LocalisedCharacterString	Length: 40	Multiplicity: [0..2]
Attribute: alternativeName		
Definition: A second, different, proper name that applies to the RouteLink. If the alternative proper name is defined in multiple languages, then each name will be provided with an associated language qualifier. If the alternative proper name is only defined in one language, then no language qualifier will be provided.		
Type: LocalisedCharacterString	Length: 40	Multiplicity: [0..2]
Attribute: rightOfUse		
Definition: The designated rights of access that apply to the RouteLink. These may be legally designated rights such as Public Rights of Way or may be public rights of access across private lands allowed by the Landowner (for example, Permissive Paths).		
Type: RightOfWayValue	Length: 60	Multiplicity: [1]
Attribute: adoptedByRecreationalRoute		
Definition: Indicates whether the link is part of a recognised recreational route.		
Type: Boolean	Length: 5	Multiplicity: [1]
Attribute: adoptedByNationalCycleRoute		
Definition: Indicates whether the link is part of the National Cycle Network.		
Type: Boolean	Length: 5	Multiplicity: [1]
Attribute: adoptedByOtherCycleRoute		
Definition: Indicates whether the link is part of a recognised cycle route that is not part of the National Cycle Network.		
Type: Boolean	Length: 5	Multiplicity: [1]

«FeatureType» RouteLink

Attribute: withinAccessLand

Definition: Indicates whether the link falls within an area of Access Land as represented on Ordnance Survey Explorer mapping. See [Access Land scope](#) for more information.

Note: Selective use of 'true' or 'false' only applies in England and Wales. In Scotland all links without another right to be used are attributed as 'true' to reflect the access rights in Scotland, see [Rights to use a RouteLink](#).

Type: Boolean

Length: 5

Multiplicity: [1]

Attribute: crossesDangerArea

Definition: Indicates whether the RouteLink intersects a Ministry of Defence firing range.

Note: The public may have access to these Danger Areas when they are not in use. Therefore, when wishing to use these areas it is recommended that other sources of data are referred to for firing times and any signals (red flags by day and red lamps at night) must be heeded.

Type: Boolean

Length: 5

Multiplicity: [1]

Attribute: potentialHazardCrossed

Definition: Indication that the RouteLink passes through an area that may pose an impediment to passage or a level of risk.

For example, the RouteLink is in close proximity to a cliff or the RouteLink passes through an area of scree or shingle which may be difficult or dangerous to traverse.

See [PotentialHazardValue](#) for more information.

Type: [PotentialHazardValue](#)

Length: 20

Multiplicity: [0..*]

Attribute: verticalGain

Definition: Vertical gain is calculated from the three-dimensional geometry to define the total ascent experienced when passing along a routeLink feature.

The value is expressed both with and against the direction of digitising.

-- Note --

[1] Calculated from the data held in Ordnance Survey Terrain Store.

[2] In metres to 1 decimal place.

See [VerticalGainType](#) for more information.

Type: VerticalGainType

Multiplicity: [1]

Attribute: planimetricLength

Definition: Measurement of the length of the RouteLink along a planar surface.

Note: In metres to 1 decimal place.

Type: Length

Multiplicity: [1]

Attribute: surfaceLength

Definition: Measurement of the length of the RouteLink along the three-dimensional surface used to create the three-dimensional geometry.

Note: In metres to 1 decimal place.

Type: Length

Multiplicity: [1]

«FeatureType» RouteLink

Attribute: geometry

Definition: Linear geometry representing the approximate centreline of the road, track, path or right of way, with each vertex given by coordinates in three-dimensional space. That is, each coordinate has an explicit elevation.

Note: The minimum length of a RouteLink is 1 m.

Type: GM_Curve

Multiplicity: [1]

Association: startNode

Definition: References the node at the start of the RouteLink feature that is coincident with the first vertex.

Multiplicity: 1

Association: endNode

Definition: References the node at the end of the RouteLink feature that is coincident with the last vertex.

Multiplicity: 1

2.4.3 RouteNode

«FeatureType» RouteNode		
Definition: A feature at the end of one or more RouteLink features that indicates either: <ul style="list-style-type: none"> • The junction of three or more RouteLink features • A change in the attribution resulting in the creation of two RouteLink feature • The start or end of a RouteLink feature 		
Attribute: featureID		
Definition: A unique identifier for a RouteNode. The ID is in the form of a GUID. <i>Note: In the current version of the product, featureID values are not maintained between product supplies, see Feature Level Metadata</i>		
Type: CharacterString	Length: 36	Multiplicity: [1]
Attribute: versionID		
Definition: A number assigned to uniquely identify and manage change. The versionID is used to distinguish between different revisions of a feature; within the set of all revisions, the versionID is unique. <i>Note: In the current version of the product, versionID values are not maintained between product supplies; see Feature Level Metadata.</i>		
Type: Number	Length: 20	Multiplicity: [1]
Attribute: versionDate		
Definition: The date on which the version was created. <i>Note: In the current version of the product, versionDate values are not maintained between product supplies; see Feature Level Metadata.</i>		
Type: Date	Multiplicity: [1]	
Attribute: descriptiveGroup		
Definition: The primary classification attribute of a feature. For OS Detailed Path Network features, this value is set to "Non Motorised Vehicular Route Network"		
Type: RouteDescriptiveGroupValue	Length: 50	Multiplicity: [1]
Attribute: descriptiveTerm		
Definition: The reason that a RouteLink feature has started on ended.		
Type: RouteNodeDescriptiveTermValue	Length: 10	Multiplicity: [1]
Attribute: geometry		
Definition: Point geometry recording, in three dimensions, the position of the node where RouteLink features join, start or end.		
Type: GM_Point	Multiplicity: [1]	

2.5 Code lists

The following tables contain the permitted values for each attribute and an explanation where required.

2.5.1 CodeList: RouteDescriptiveGroupValue

codeList: RouteDescriptiveGroupValue	
Value	Description
Non Motorised Vehicular Route Network	Route usable by pedestrians, cyclists and ridden horses.

2.5.2 CodeList: RouteDescriptiveTermValue

codeList: RouteDescriptiveTermValue	
Value	Description
Core Path	A route in Scotland identified as part of the Core Path network. Not populated in current release.
European Long Distance Path	The European long-distance paths are a network of long-distance footpaths that traverse Europe. While most long-distance footpaths in Europe are located in just one country or region, each of these numbered European long-distance paths passes through many different countries. The European long-distance paths were designated by the European Ramblers' Association. Not populated in release 1.
National Cycle Network	A route which is part of the Sustrans® National Cycle Network (NCN).
National Trail	An extensive route of national importance supported by Natural England, Natural Resources Wales or Scottish Natural Heritage.
Recreational Path	A named route that: <ul style="list-style-type: none"> • is at least 10km long; • is fully and distinctively waymarked; • is endorsed by all of the local authorities the route traverses • is supported by a Guidebook or Leaflet; and • has a responsible person who informs Ordnance Survey of future route amendments.
Scotland's Great Trail	Great Trails, formerly Long-distance routes, are named routes in Scotland established under the Countryside (Scotland) Act of 1967 and are nominated by Scottish Natural Heritage. Not populated in release 1.

2.5.3 CodeList: RouteLinkDescriptiveTermValue

codeList: RouteLinkDescriptiveTermValue Detailed classification of type of feature that the RouteLink represents which the non-vehicular traffic can travel along or alongside.	
Value	Description
A Road	Route is along or alongside a road classified by the Department for Transport as an A Road.
Alley	Route is along or alongside a vehicular route that provides secondary access to land or properties.
B Road	Route is along or alongside a road classified by the Department for Transport as a B Road.
Cableway	Route uses a form of scheduled cableway service, for example, a Cabin Cable Car, Chair Lift or Ski Tow. As a minimum, it can be assumed that the cableway will carry pedestrians; the carriage of other users is not recorded.
Ferry Crossing	Route uses a boat or ship that provides a scheduled service to cross a body of water. As a minimum, it can be assumed that the ferry will carry pedestrians; the carriage of other users is not recorded.
Local Road	Route is along or alongside a road providing access to land or houses and is not generally intended for through traffic. No right of use for motorised vehicles should be inferred, see Usage – further information .
Marked Or Signed Route With No Physical Manifestation	A route that has sufficient signage or waymarking to make it easy to follow, but where there is not a visible continuous or near continuous path to follow on the ground.
Minor Road	Route is along a public road or alongside a public road without a Department for Transport (DfT) classification of Motorway, A or B. Where the road connects to B and higher classification roads.
No Physical Manifestation	A linear route that is not easily identifiable on the ground but where there are rights of use. For example, a legal bridleway across a field where there is no evidence along the route such as a worn strip of ground or a constructed surface of gravel or similar (see Figure 2).
Path	Route is along a surface built for pedestrians or cyclists or created by the passage of pedestrians or cyclists over a natural surface. See SurfaceTypeValue for further information.

codeList: RouteLinkDescriptiveTermValue Detailed classification of type of feature that the RouteLink represents which the non-vehicular traffic can travel along or alongside.	
Value	Description
Private Road	Route is along or alongside a road not maintained by a Highway Authority. <i>Note: For Private Roads where the only right to use is because the road is in Access Land, there may not be a right to use the road itself.</i> No right of use for motorised vehicles should be inferred; see Usage – further information . The right of use by pedestrians, cyclists and horses being ridden may be restricted; see RightOfWayValue .
Towpath	A towpath is a way alongside the bank of a river used for inland navigation, or canal whose original purpose was to provide access in support of inland navigation. Not populated in current release; where present, will be described as Path.
Track	Route is along an unmade way created by the passage of vehicles although no right of use by vehicles is implied. The right of use by pedestrians, cyclists and horses being ridden may be restricted; see RightOfWayValue .

No physical manifestation – examples

In these examples, public rights of way exist but there is no physical disturbance on the ground. These are indicated with a descriptiveTerm value of “No Physical Manifestation”.



Figure 2: Two examples of where there is a linear route that is not easily identifiable on the ground but where there are rights of use.

2.5.4 Routes along roads – further information

If a RouteLink feature is attributed with one of the following DescriptiveTerm values, it can be considered as being along or alongside a road depending on the user:

- **A Road** **Minor Road**
- **B Road** **Local Road**

For example, the actual route may be along a pavement (if present), a verge or the carriageway itself dependent upon the user. A cyclist may use the road carriageway, a pedestrian the pavement, and a horse rider and their horse may use the verge.

The OS Detailed Path Network data does not currently include information on the presence or absence of a pavement and / or verge.

2.5.5 Usage – further information

The descriptiveTerm attribute indicates the nature of the route. Any right to use the RouteLink feature needs to be identified from the following attributes:

- [RightOfWayValue](#)
- [NationalCycleRoute](#)
- [OtherCycleRoute](#)
- [RecreationalRoute](#)
- [AccessLand](#)

The description of a RouteLink with a descriptiveTerm of Local Road or Private Road does not indicate that any right of use by motorised vehicles exists.

2.5.6 CodeList: SurfaceTypeValue

codeList: SurfaceTypeValue	
State of a surface in the context of the origin of the surface and resistance to environmental elements.	
Value	Description
Made Sealed	A constructed surface, commonly mineral based, that consists of a solid material that is bonded (i.e. is not loose), such as asphalt or concrete (Figure 3)
Made Unknown	A constructed surface, commonly mineral based, that may be bonded or loose. This value is used where the revision method employed does not allow it to be differentiated into ‘Made Sealed’ or ‘Made Unsealed’.
Made Unsealed	A constructed surface, commonly mineral based, that consists of an un-bonded surface (i.e. the material is loose), such as gravel (including self-binding gravel), cinder or hoggin. Also used to describe surfaces that are bonded but which have been employed as a mesh / grid or similar form to allow vegetation to grow and water to drain through the surface (Figure 4).
Unmade	A surface that has not been constructed but has evolved through use by pedestrians, cyclists, horses being ridden, or motorised vehicles, and where the use has removed or minimised the natural vegetation and fully or partly exposed the underlying mineral surface and / or mud.

As a general note, it can be problematic to precisely differentiate between surface types. For example, the difference between an unsealed road and a track is open to interpretation. The images in the three following figures illustrate typical examples of different surface types.

Made sealed surface – examples



Figure 3: Two examples of made sealed surfaces on roads.

Made unsealed surface – examples



Figure 4: Examples of made unsealed surfaces on a road (left) and a path (right).

Unmade surface – examples



Figure 5: Examples of an unmade track (left) and an unmade path (right).

2.5.7 CodeList: LevelCodeValue

The LevelCode value is used to indicate when a route is above or below normal ground level. The attribute is only applied where the level difference extends for distances greater than approximately 50m.

Routes that cross at different levels are not split at the intersection; those that are in tunnels or on bridges less than 50m long are given the default LevelCode attribute of Surface Level.

codeList: LevelCodeValue	
Value	Description
Surface Level	The route is at the same level as the surrounding terrain. This is the default value for RouteLink features.
Above Surface Level On Structure	The RouteLink is supported or suspended above ground level on a manmade structure that extends for more than 50m. For example, a road, track or path may be on a bridge, footbridge or viaduct (Figure 6).
Below Surface Level Tunnel	The route passes through a specially built construction underneath the normal terrain surface primarily to avoid or reduce the effect of the terrain surface or to avoid an obstruction such as a river or mountain (Figure 7) and extends for more than 50m.

Above surface level on structure – example



Figure 6: Example where a RouteLink is supported or suspended above ground level on a manmade structure.

Below surface level tunnel – example



Figure 7: This route passes through a specially built construction underneath the normal terrain surface.

2.5.8 CodeList: RightOfWayValue

Rights of way information for England and Wales has been sourced from Ordnance Survey 1:25 000 Scale Colour Raster mapping and inferred from Ordnance Survey road network data.

The allowable uses for RightOfWayValue are summarised in the table below; this reflects the accepted [legal rights for public rights of way](https://www.gov.uk/right-of-way-open-access-land/use-public-rights-of-way) (<https://www.gov.uk/right-of-way-open-access-land/use-public-rights-of-way>) Further rights of use are also possible and are described in the [Additional rights to use a RouteLink–England sub-section](#).

In all circumstances, information from the Local Highway Authority takes precedence, and any local signage should always be observed. For example, temporary restrictions may exist that override rights of way or access rights in Access Land.

In Scotland, rights of way do exist, but they are not included within the OS Detailed Path Network product as for recreational purposes, they are superseded by rights under the Land Reform Act 2003 (see [Rights to use a RouteLink – Scotland](#)).

codeList: RightOfWayValue		
Classification of the designated rights of access and use assigned to the RouteLink.		
Value	Description	Confirmed allowable users
Bridleway	A route where there is a right to travel on foot, on horseback, to lead a horse and to ride a bicycle	Pedestrians, horses, cyclists
Byway Open To All Traffic	A highway open to all traffic.	Pedestrians, horses, cyclists, motorised vehicles
Core Path	A route in Scotland identified as part of the Core Path network. Not populated in release 1.	Not applicable

codeList: RightOfWayValue		
Classification of the designated rights of access and use assigned to the RouteLink.		
Value	Description	Confirmed allowable users
Footpath	A route where there is a right to travel on foot.	Pedestrians
None	A route where no permissive or conventional right of way has been identified. Use may be allowed if the route has been identified as a cycle route (see NationalCycleRoute , OtherCycleRoute), as part of a RecreationalRoute or as lying within an area of Access Land .	See NationalCycleRoute , OtherCycleRoute , part of a RecreationalRoute or as lying within an area of Access Land
Normal Permissible Uses	No known restrictions on pedestrians, cyclists or horses being ridden. Restrictions may apply to vehicles.	Pedestrians, horses, cyclists – used for public roads without a restriction
Other Route With Public Access	A route that is the responsibility of Local Highway Authorities and maintained at public expense. All Other Routes with Public Access (ORPAs) have rights for pedestrians. Beyond that, any particular ORPA may, or may not, have rights for cyclists and equestrians, and may or may not have rights for motor vehicles. ORPAs are sometimes known as unclassified unsurfaced roads (or unclassified country roads).	Pedestrians ¹
Permissive Bridleway	A route where the landowner has permitted travel on foot, on horseback or leading a horse, and to ride a bicycle. This right may be withdrawn by the landowner.	Pedestrians, horses, cyclists
Permissive Path	A route where the landowner has permitted travel on foot. This right may be withdrawn by the landowner.	Pedestrians
Restricted Byway	A route open to all traffic except mechanically propelled vehicles. Formerly known as Road Used as Public Path (RUPP).	Pedestrians, horses, cyclists

¹ Other rights may exist, but these will need to be determined from the Local Highway Authority.

2.5.9 Right of use on local roads

Most RouteLink features with a descriptiveTerm of Local Road will have a RightOfUse value of ‘Normal Permissible Uses’. However, in some cases, a more restrictive value applies; when this is present, this more restrictive value should be used to determine who may use the route.

2.5.10 Additional rights to use a RouteLink – England and Wales

The [preceding table](#) summarises the type of user who may travel along a specific RouteLink in England and Wales where a right of way exists. The right to use a RouteLink may also be indicated by one or more of the following logical attributes in the table below being set to indicate:

Value	Description	Confirmed Allowable users
adoptedByNationalCycleRoute = TRUE	A link part of the National Cycle Network	Pedestrians, cyclists
adoptedByOtherCycleRoute = TRUE	A link part of a Cycle Network that is not part of the National Cycle Network	Pedestrians, cyclists
adoptedByRecreationalRoute = TRUE	A link part of a Recreational Route	Pedestrians
withinAccessLand = TRUE	A link within Access Land	Pedestrians. Note that for Private Roads where the only right to use is because the road is in Access Land, there may not be a right to use the road itself.

These values may co-exist, for example, a cycle route may pass through an area of Access Land and be coincident with a Restricted Byway.

2.5.11 Rights to use a RouteLink – Scotland

For ease of use of the data in routing applications, all RouteLink features in Scotland have the value of the [AccessLand](#) attribute also set to ‘TRUE’ even though the concept of Access Land is not relevant to routes in Scotland.

In Scotland, the rights of access have been established by the Land Reform (Scotland) Act 2003; these are described in the [Scottish Outdoor Access Code](https://www.outdooraccess-scotland.scot/) (<https://www.outdooraccess-scotland.scot/>). The following is an extracted summary: The following is an extracted summary:

A summary of the access rights:

1. Everyone, whatever their age or ability, has access rights established by the Land Reform (Scotland) Act 2003. You only have access rights if you exercise them responsibly.
2. You can exercise these rights, provided you do so responsibly, over most land and inland water in Scotland, including mountains, moorland, woods and forests, grassland, margins of fields in which crops are growing, paths and tracks, rivers and lochs, the coast and most parks and open spaces. Access rights can be exercised at any time of the day or night.

3. You can exercise access rights for recreational purposes (such as pastimes, family and social activities, and more active pursuits like horse riding, cycling, wild camping and taking part in events), educational purposes (concerned with furthering a person's understanding of the natural and cultural heritage), some commercial purposes (where the activities are the same as those done by the general public) and for crossing over land or water.
4. Existing rights, including public rights of way and navigation, and existing rights on the foreshore, continue.
5. The main places where access rights do not apply are:
 - Houses and gardens, and non-residential buildings and associated land
 - Land in which crops are growing
 - Land next to a school and used by the school
 - Sports or playing fields when these are in use and where the exercise of access rights would interfere with such use
 - Land developed and in use for recreation and where the exercise of access rights would interfere with such use
 - Golf courses (but you can cross a golf course provided you don't interfere with any games of golf)
 - Places like airfields, railways, telecommunication sites, military bases and installations, working quarries and construction sites
 - Visitor attractions or other places which charge for entry
6. Local authorities can formally exempt land from access rights for short periods. Local authorities and some other public bodies can introduce byelaws.
7. Access rights do not extend to:
 - Being on or crossing land for the purpose of doing anything which is an offence, such as theft, breach of the peace, nuisance, poaching, allowing a dog to worry livestock, dropping litter, polluting water or disturbing certain wild birds, animals and plants
 - Hunting, shooting or fishing
 - Any form of motorised recreation or passage (except by people with a disability using a vehicle or vessel adapted for their use)
 - Anyone responsible for a dog which is not under proper control
 - Anyone taking away anything from the land for a commercial purpose
8. Statutory access rights do not extend to some places or to some activities that the public have enjoyed on a customary basis, often over a long period of time. Such access is not affected by the Land Reform (Scotland) Act 2003 and will continue.

2.5.12 CodeList: PotentialHazardValue

This attribute indicates that part or all of the RouteLink passes through an area that may pose an impediment to passage for users or a level of risk.

Only RouteLink features with the descriptiveTerm of ‘No Physical Manifestation’ or ‘Path’ are eligible to have the potentialHazard attribute populated. Values may be multiple if appropriate.

Note: This attribute is particularly relevant where a RouteLink feature has been provided with a descriptiveTerm of ‘Route Without Physical Manifestation’, as some legal rights of way may pass over problematic or even dangerous terrain and may need to be excluded from any route options.

For all other navigableLink features, this value is null.

codeList: PotentialHazardValue	
Classification of hazardous terrain that may pose a risk or impediment to passage.	
Value	Description
Boulders	The route passes through an area of boulders.
Cliff	The route passes over an area of cliffs.
Quarry Or Pit	The route passes through an active or disused excavation, for example, a pit or quarry.
Foreshore ²	The route passes through an area that is covered by the tide at normal High Tides in England and Wales and an area that is covered by the tide at normal Spring High Tides in Scotland. Note that paths near the High Water Mark may also be covered when tides are higher than the marks that Ordnance Survey record – normal High Tides in England and Wales and Spring High Tides in Scotland.
Marsh	The route passes through an area of marsh.
Mud	The route passes through an area of mud.
Sand	The route passes through an area of sand.
Scree	The route passes through an area of scree.
Shingle	The route passes through an area of shingle.
Spoil	The route passes through an area of deposited material.
Rock	The route passes over an area of surface rock.
Tidal Water	The route passes through an area of permanent tidal water.
Inland Water	The route passes through an area of permanent non-tidal water.

² Foreshore is added to all links that are intertidal.

2.5.13 CodeList: RouteNodeDescriptiveTermValue

codeList: RouteNodeDescriptiveTermValue	
Value	Description
Junction	The point where three or more RouteLink features intersect at the same physical level where a choice of route is available.
Pseudo	A node which represents a point where one or more attributes of the RouteLink features connected to it change their value.
Terminal	A Terminal node represents the start or end of a set of RouteLink features.

2.5.14 Within access land

This attribute indicates whether a RouteLink in England and Wales falls within an area of Access Land as depicted on Ordnance Survey 1:25 000 Scale Colour Raster mapping. For ease of use in routing applications, all RouteLink features in Scotland have the value also set to 'TRUE', even though the concept of Access Land is not relevant to routes in Scotland.

Only links with the following descriptiveTerm are eligible to have the accessLand attribute set to 'TRUE':

- Alley
- Path
- Private Road
- Track

This includes Access Land of the following types where access has been agreed:

- CRoW land
- Forest Enterprise
- National Trust
- Other Access
- Section 16
- Woodland Trust
- No information on the type of Access Land is provided
- The Extent of Access land has been simplified to create a routable network

There are sections of RouteLink features within areas of Access Land that are disconnected from the wider network. This is due to the differing resolutions of the network data and the underlying Access Land data.

Work is ongoing to reduce the incidence in future releases.

In Scotland, this attribute is always set to 'TRUE'.

In England and Wales, RouteLink features with this attribute set to 'TRUE' can be used by pedestrians.

For Private Roads where the only right to use is because the road is in Access Land, there may not be a right to use the road itself.

Other users may only use the route if another attribute indicates this is permissible. For example, a Track in Access Land may also be a Bridleway or there may be no other usage rights.

See also [Additional rights to use a RouteLink – England and Wales](#).

2.6 Data type

2.6.1 DataType: VerticalGainType

«DataType» VerticalGainType	
Definition: Describes the total ascent experienced when passing along a RouteLink feature in either direction.	
Attribute: inDirection	
Definition: Total increase in height experienced when passing along the link from the start to the end.	
Type: Measure	Multiplicity: [1]
Attribute: againstDirection	
Definition: Total increase in height experienced when passing along the link from the end to the start.	
Type: Measure	Multiplicity: [1]

See also [Height and Planimetric Correlation](#).

3. Data quality

As the product is created from existing OS data, the quality of the OS Detailed Path Network data depends on the quality of the compilation data.

Our focus has been to provide a connected network with the attribution required to facilitate routing.

3.1 Positional accuracy

The positional accuracy of OS Detailed Path Network has been designed to be usable with readily available GPS-enabled hardware that does not make use of real-time correction, such as mobile phones and personal navigation devices.

3.1.1 Planimetric accuracy – physical routes

The typical device that the data will be used upon is positionally accurate to [approximately 10m](https://www.gps.gov/systems/gps/performance/accuracy/) in plan (<https://www.gps.gov/systems/gps/performance/accuracy/>).

The alignment of roads, tracks and paths has been sourced from Ordnance Survey large-scale data whose positional accuracy is typically between 2.4 and 8.9m (99% confidence level).

Sample data tracked using an ordinary mobile phone showed a correlation of 95% of GPS positions being within 10m of the RouteLink feature contained within the product.

3.1.2 Planimetric accuracy – non-physical routes

Data only sourced from the 1:25 000 Scale Colour Raster will have a lower planimetric accuracy. This is because the processes of generalisation, exaggeration, selection and offsetting reduce the positional accuracy.

This applies to RouteLink features for rights of way and the extent of danger areas where there is not an Ordnance Survey large-scale data representation.

3.2 Using the data with GPS devices

GPS devices may only provide coordinates using the WGS84 coordinate reference system (EPSG code 4979, although 4326 is often used also). The OS Detailed Path Network data is supplied using a combination of coordinates in the OSGB36 British National Grid system and heights relative to Ordnance Datum Newlyn (EPSG code 7405) for both the Geography Markup Language (GML) and GeoPackage formats. Note that the vector tiles format is supplied in Web Mercator (EPSG code 3857).

To allow the data to be used with positions from GPS devices, a transformation is required. The transformation can be applied to the OS Detailed Path Network data (to move it on to WGS84) or to the GPS coordinates (to provide positions in OSGB36 British National Grid). The choice may depend on the coordinate systems of any other datasets in use.

Given the difference that can ensue from using the incorrect coordinate reference system, care must be taken to use the appropriate transformation. A recommended transformation is the seven parameter one published in [A Guide to Coordinate Systems in Great Britain](https://www.ordnancesurvey.co.uk/documents/resources/guide-coordinate-systems-great-britain.pdf) (<https://www.ordnancesurvey.co.uk/documents/resources/guide-coordinate-systems-great-britain.pdf>), which is available on the OS website. This transformation is EPSG code 1314.

[Further information on coordinate systems and transformations is available on our website](http://www.ordnancesurvey.co.uk/business-and-government/help-and-support/navigation-technology/os-net/surveying.html) (<http://www.ordnancesurvey.co.uk/business-and-government/help-and-support/navigation-technology/os-net/surveying.html>).

3.2.1 Height accuracy

The positional accuracy of OS Detailed Path Network data has been designed to be usable with readily available GPS enabled hardware that does not make use of real-time correction, such as mobile phones and personal navigation devices. Typically, these devices are accurate to [approximately 10 to 20m in height](https://www.gps.gov/systems/gps/performance/accuracy/) (<https://www.gps.gov/systems/gps/performance/accuracy/>).

OS Detailed Path Network data has been heighted using the source data that was in turn used to create the OS Terrain 5 and OS Terrain 50 products – the accuracy of this data is expected to be +/- 6m.

3.2.2 Height and planimetric correlation

The height data used to height the OS Detailed Path Network data was captured in a separate process to the network data. On occasion, there may be discrepancies where the height data has not captured the intricacies of the terrain. For example, along an embankment or locating the precise start and end of a tunnel. The result can be discrepancies in the height value of individual vertices.

These limitations should be considered when using the height values and related calculated attributes to create estimates of journey times and draw profiles.

3.2.3 Completeness

The data includes all roads, tracks and paths contained within Ordnance Survey data and rights of way information contained on 1:25 000 Scale Colour Raster.

Changes to Roads are generally captured within six months of the change occurring.

Changes to Paths and Tracks are captured as part of a cyclic revision programme that completes every three to five years, using aerial photography as the main tool to identify change.

Changes to rights of way are updated when received from Local Highway Authorities or National Park Authorities, where they are responsible as legal custodians of the Definitive Map and Statement for Public Rights of Way.

3.3 Attribute accuracy

3.3.1 Feature representation

Feature classifications are based upon Ordnance Survey datasets, including interpretation of aerial photography. This presents the following data capture limitations:

- Surface descriptions may be limited to made and unmade surfaces.
- Unmade paths in upland areas can be ambiguous and, consequently, are sometimes not captured.
- Changes that have occurred in obscured areas, for example, under trees, can go unrecorded.

Values for proper names have been extracted from existing Ordnance Survey data. The coverage of language alternatives may not be as complete as it is in other datasets.

3.3.2 Feature level attributes

Length of lines is calculated and is not based on real-world measurement.

Three-dimensional capture is based on a terrain model that may not be entirely sympathetic with OS Detailed Path Network data. For example, in the terrain model, disused railway cuttings will not have been explicitly modelled, and bridges and tunnels may not be entirely coincident with OS Detailed Path Network data; see [Height and Planimetric Correlation](#).

3.3.3 Feature level metadata

The featureID, versionID and versionDate attributes have been included to support future developments of the product that would support change-only update (COU) and maintained identifiers. At present, the data is supplied as a complete replacement, and identifiers are not maintained between epochs of data supply.

- **featureID:** This will be unique within each supply. The same feature in a future release will have a different value.
- **versionID**
- **versionDate:** This will be set to the date the product data was created.

Customer input on the desirability of COU and maintained identifiers in future releases is welcome.

3.4 Logical consistency

Content: Attribute values are imposed by edit systems and tested using validation to comply with those in the schema.

Context: Logical combinations of attributes are imposed by edit systems and tested using validation.

Correlation: Basic topology is tested in the edit software and additional validation is applied to ensure the topology is correct.

Connectivity: The connectivity between features at the same and different levels is tested through validation and visual inspection.

4. GML overview

4.1 Schema overview and location

XML schemas are used to define and validate the format and content of the Geography Markup Language (GML). The GML v3.2.1 specification 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 'OS Detailed Path Network' schema document defines the <http://namespaces.os.uk/networks/detailedPathNetwork/1.0> Namespace; this is defined in the XSD available on the [OS Detailed Path Network Product Support page on the OS website](https://www.ordnancesurvey.co.uk/business-government/tools-support/path-network-support) (<https://www.ordnancesurvey.co.uk/business-government/tools-support/path-network-support>).

These schemas make use of XSDs (XML schema definitions) produced by the W3C; these [XSDs are available from the W3C website](http://www.w3.org/XML/1998/namespace.html) (<http://www.w3.org/XML/1998/namespace.html>).

The application schema uses the following XML namespaces, for which definitions are available in Table 1:

Table 1: The XML namespaces used by the application schema and their definitions.

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, see http://www.w3.org/TR/xmlschema-1/
xlink	http://www.w3.org/1999/xlink	http://www.w3.org/1999/xlink.xsd

4.2 Simple Features Profile – Level 1

GML is designed to support a wide variety of capabilities, ranging from simple contextual mapping, such as OS Open Map, to products that include complex geometric property types or even spatial and temporal topology.

[The Simple Features Profile of GML 3.2.1](https://portal.ogc.org/modules/admin/license_agreement.php?suppressHeaders=0&access_license_id=3&target=http://portal.opengeospatial.org/files/%3fartifact_id=15201)

(https://portal.ogc.org/modules/admin/license_agreement.php?suppressHeaders=0&access_license_id=3&target=http://portal.opengeospatial.org/files/%3fartifact_id=15201) defines a restricted subset of GML, allowing scope for greater interoperability.

This product conforms to Simple Features Profile – Level 1.

5. GeoPackage overview

OS Detailed Path Network is supplied as one GeoPackage file per National Park area. GeoPackage (*.gpkg) is an open, standards-based data format, as is defined by the Open Geospatial Consortium (OGC). 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 can be used in most GIS software in its native format without translation. GeoPackage attribute names are not limited in length. A GeoPackage file has no size limit, and it supports raster, vector and database formats, making it a highly versatile solution.

5.1 Attribute naming differences between GML and GeoPackage formats

The naming of attributes between GeoPackage and the Geography Markup Language (GML) file is very similar as GeoPackage files are not limited in the number of characters for an attribute name. Therefore, the following tables map the GML attribute name to the attribute name in the GeoPackage files.

The GML contains an attribute which describes the geometry of the feature; this is not applicable for a GeoPackage file as they are separated by their geometry.

5.1.1 Route

GML attribute	GeoPackage attribute
featureID	feature_id
versionID	version_id
versionDate	version_date
descriptiveGroup	descriptive_group
descriptiveTerm	descriptive_term
name	name
adopts	adopts

5.1.2 RouteLink

GML attribute	GeoPackage attribute
featureID	feature_id
versionID	version_id
versionDate	version_date
descriptiveGroup	descriptive_group
descriptiveTerm	descriptive_term

GML attribute	GeoPackage attribute
surfaceType	surface_type
physicalLevel	physical_level
roadNumber	road_number
name	name
alternativeName	alternative_name
rightofUse	right_of_use
adoptedByRecreationalRoute	adopted_by_recreational_route
adoptedByNationalCycleRoute	adopted_by_national_cycle_route
adoptedByOtherCycleRoute	adopted_by_other_cycle_route
withinAccessLand	within_access_land
crossesDangerArea	crosses_danger_area
potentialHazardCrossed	potential_hazard_crossed
verticalGain	vertical_gain_in_direction
verticalGain	vertical_gain_against_direction
planimetricLength	planimetric_length
surfaceLength	surface_length
startNode	start_node
endNode	end_node

5.1.3 RouteNode

GML attribute	GeoPackage attribute
featureID	feature_id
versionID	version_id
versionDate	version_date
descriptiveGroup	descriptive_group
descriptiveTerm	descriptive_term

6. Vector tiles overview

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

Note: The vector tiles format does not include the Route feature, as these would directly overlay and replicate the RouteLink features referenced by a single route.

6.1 Vector tiles schema

The vector tiles schema is detailed in the following table. In the zoom levels columns within the table, the letter *N* indicates that the specified layer and attribute are not mapped within that zoom level, whereas the letter *Y* indicates that the specified later and attribute are mapped within that zoom level.

Layer	Attribute	Zoom level								
		0 to 8	9	10	11	12	13	14	15	
route_link	feature_id	N	Y	Y	Y	Y	Y	Y	Y	Y
	descriptive_group	N	Y	Y	Y	Y	Y	Y	Y	Y
	descriptive_term	N	Y	Y	Y	Y	Y	Y	Y	Y
	surface_type	N	Y	Y	Y	Y	Y	Y	Y	Y
	physical_level	N	Y	Y	Y	Y	Y	Y	Y	Y
	road_number	N	Y	Y	Y	Y	Y	Y	Y	Y
	name	N	Y	Y	Y	Y	Y	Y	Y	Y
	alternative_name	N	Y	Y	Y	Y	Y	Y	Y	Y
	right_of_use	N	Y	Y	Y	Y	Y	Y	Y	Y
	adopted_by_recreational_route	N	Y	Y	Y	Y	Y	Y	Y	Y
	adopted_by_national_cycle_route	N	Y	Y	Y	Y	Y	Y	Y	Y
	adopted_by_other_cycle_route	N	Y	Y	Y	Y	Y	Y	Y	Y
	within_access_land	N	Y	Y	Y	Y	Y	Y	Y	Y
	crosses_danger_area	N	Y	Y	Y	Y	Y	Y	Y	Y
	potential_hazard_crossed	N	Y	Y	Y	Y	Y	Y	Y	Y
	vertical_gain_in_direction	N	Y	Y	Y	Y	Y	Y	Y	Y
	vertical_gain_against_direction	N	Y	Y	Y	Y	Y	Y	Y	Y
	planimetric_length	N	Y	Y	Y	Y	Y	Y	Y	Y
surface_length	N	Y	Y	Y	Y	Y	Y	Y	Y	

Layer	Attribute	Zoom level							
		0 to 8	9	10	11	12	13	14	15
route_node	feature_id	N	Y	Y	Y	Y	Y	Y	Y
	descriptive_group	N	Y	Y	Y	Y	Y	Y	Y
	descriptive_term	N	Y	Y	Y	Y	Y	Y	Y

6.2 Attribute naming differences between GML and vector tiles formats

The naming of attributes between vector tiles and the Geography Markup Language (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. Please note that the use of an asterisk symbol (*) in the following tables indicates that a particular attribute is not mapped to vector tiles.

6.2.1 RouteLink

GML attribute	Vector tiles attribute
featureID	feature_id
versionID	*
versionDate	*
descriptiveGroup	descriptive_group
descriptiveTerm	descriptive_term
surfaceType	surface_type
physicalLevel	physical_level
roadNumber	road_number
name	name
alternativeName	alternative_name
rightofUse	right_of_use
adoptedByRecreationalRoute	adopted_by_recreational_route
adoptedByNationalCycleRoute	adopted_by_national_cycle_route
adoptedByOtherCycleRoute	adopted_by_other_cycle_route
withinAccessLand	within_access_land
crossesDangerArea	crosses_danger_area
potentialHazardCrossed	potential_hazard_crossed

GML attribute	Vector tiles attribute
verticalGain	vertical_gain_in_direction
verticalGain	vertical_gain_against_direction
planimetricLength	planimetric_length
surfaceLength	surface_length
startNode	*
endNode	*

6.2.2 RouteNode

GML attribute	Vector tiles attribute
featureID	feature_id
versionID	*
versionDate	*
descriptiveGroup	descriptive_group
descriptiveTerm	descriptive_term