ORDNANCE SURVEY GB

OS MASTERMAP HIGHWAYS NETWORK – PATHS™ – 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	10/2017	Minor updates.
2.3	03/2021	Addition of Scottish Street information.
2.4	02/2022	Introduction of GeoPackage and vector tiles formats to the product.
2.5	06/2023	Minor updates to feature type descriptions due to the Path Network now being topologically structured with the Road Network.

Purpose of this document

This document provides information about and insight into the OS MasterMap Highways Network – Paths product and its potential applications. For information on the contents and structure of OS MasterMap Highways Network, please refer to the Getting Started Guide and the Product Guide.

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Contact details

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

Contents

1. Introduction

OS MasterMap Highways Network is the authoritative highway network for Great Britain. It brings together Ordnance Survey's large-scale roads and paths content, the National Street Gazetteer (NSG), the Trunk Road Street Gazetteer (TRSG) and the Scottish Street Gazetteer (SSG).

OS MasterMap Highways Network is made up of four product schemas: Linear Highway Network, Highways Dedication, Routing and Asset Management Information and Highways Water Transport Network (Figure 1). These four schemas create the following three products which are a part of the OS MasterMap Highways Network family:

• OS MasterMap Highways Network – Roads

• OS MasterMap Highways Network – Routing and Asset Management Information (RAMI)

• OS MasterMap Highways Network – Paths

This technical specification will cover the OS MasterMap Highways Network – Paths (from here referred to as Path Network) product specification. For details on Roads or RAMI products' specifications, see their respective *Technical Specifications*.
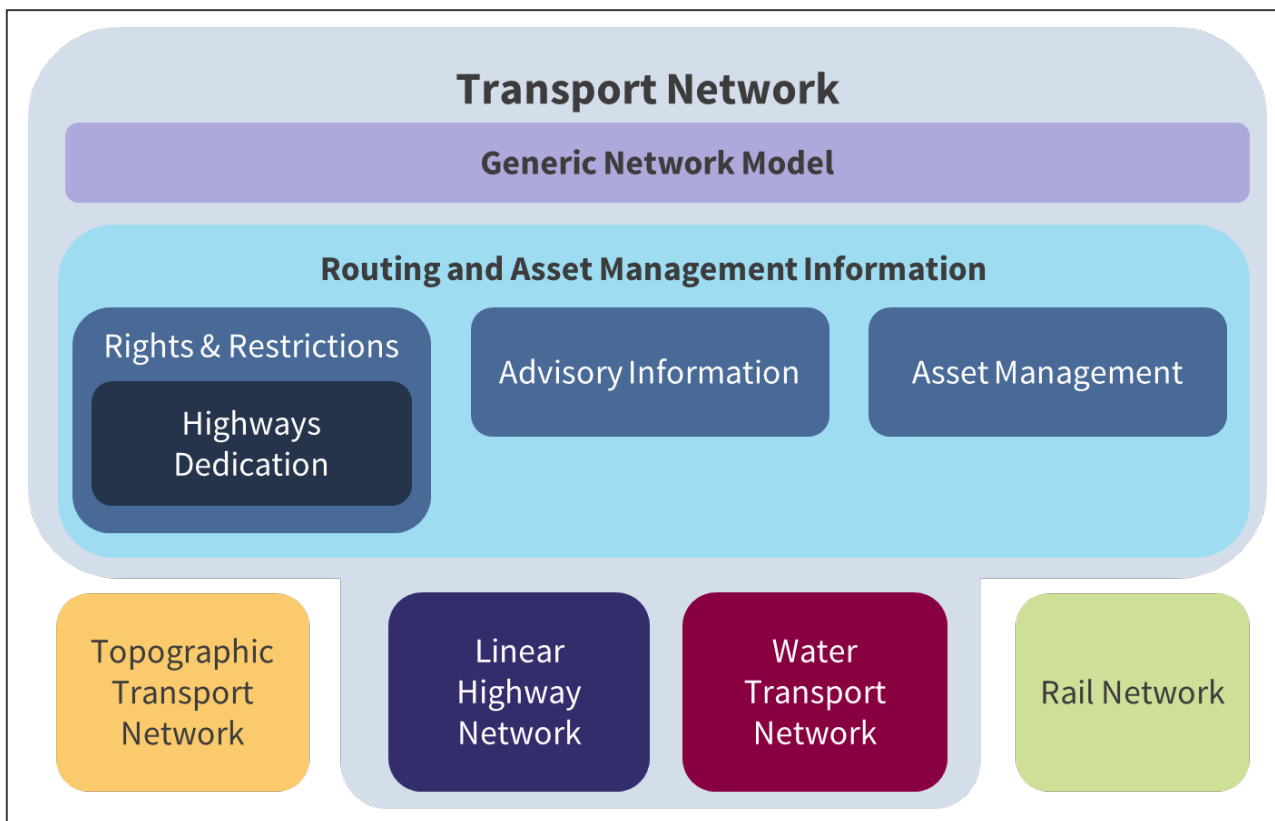
Figure 1: The conceptual INSPIRE Transport Network Model. OS MasterMap Highways will include the Linear Network, RAMI and the Water Transport Network within the Generic Network Model.

1.1 Identifiers

All features that comprise the OS MasterMap Highways Network – Paths will be assigned a persistent identifier; in most instances this is an Ordnance Survey TOID. For features which have originated from the National Street Gazetteer, the persistent identifier will be either a Unique Street Reference Number (USRN) for Street features or a unique ID for Maintenance, Reinstatement, Special Designation and Highway Dedication.

Identifiers shall be encoded in three properties in the data:

1. gml:id – This is a feature identifier comprised of the shorthand prefix namespace and local identifier which is used to uniquely identify and reference the feature within the dataset.
   Example: osgb4000000009461245

2. gml:identifier – This is a global feature identifier and can be used to identify and reference the feature within other datasets. Example: http://data.os.uk/id/4000000009461245

3. inspireID – This is a complex property made up of a localId, namespace and versionId which uniquely identifies the feature and version within an INSPIRE dataset. The versionId will not be populated in the OS MasterMap Highways Network products.

```
  <highway:Road gml:id="osgb4000000009461245">
   <gml:identifier
codeSpace="http://inspire.jrc.ec.europa.eu/ids">http://data.os.uk/id/4000000009461245</gml:identifier>
    <net:beginLifespanVersion>2010-04-01T00:00:00.000</net:beginLifespanVersion>
    <net:inspireId>
     <base:Identifier>
       <base:localId>4000000009461245</base:localId>
       <base:namespace>http://data.os.uk/</base:namespace>
       <base:versionId>16</base:versionId>
     </base:Identifier>
    </net:inspireId>
```

Where features have come from OS MasterMap ITN Layer the identifier will be persistent and correspond to the same feature in ITN.

The gml:id is used throughout the OS MasterMap Highways Network products as the identifier used to reference to other features.

1.1.1 TOIDs

TOIDs are strings of up to twenty characters which consist of two parts:

- Namespace – This is either a HTTP URI (http://data.os.uk/) or shorthand prefix ('osgb')
- Local identifier – 16-digit numeric string (0–9)

Examples:
- gml:id – 'osgb4000000009461245'
- localId – '4000000009461245'
- identifier - 'http://data.os.uk/4000000009461245'

1.1.2   USRNs

USRNs are strings of up to 12 characters which consist of 2 parts:

- Namespace – This is either a HTTP URI (http://data.os.uk/) or shorthand prefix ('usrn')
- Local identifier – Up to an 8-digit numeric string (0–9)

Examples:
- gml:id – 'usrn82101225'
- localId – '82101225'
- identifier – 'http://data.os.uk/82101225'

Although the gml:id is the identifier used for referencing to features in OS MasterMap Highways Network products the localId is the identifier used by the National Street Gazetteer, National Land and Property Gazetteer and the OS AddressBase family of products.

1.1.3   Unique IDs

Unique IDs for Maintenance, Reinstatement, Special Designation are strings of up to seventeen characters which consist of two parts:

- Namespace – This is either a HTTP URI (http://data.os.uk/) or shorthand prefix ('id_')
- Local identifier – 14 alphanumeric string

The ID for HighwayDedication is a string of up to 25 characters comprised of the characters "esu" followed by three parts separated by "_":

- LHA authority code
- ESU it references
- dedication code in the NSG
Example: esu4720_4280330430163_8, esu4720_4280340431456_11

Examples given for both unique ID formats:
- *gml:id* – 'id_3700MA01862142' or 'esu4720_4280330430163_8'
- *localId* – '3700MA01862142' or 'esu4720_4280330430163_8'
- *identifier* – 'http://data.os.uk/3700MA01862142' or 'https://data.os.uk/id/ esu4720_4280330430163_8'

1.2   Available formats

OS MasterMap Highways Network– Paths is supplied in three formats: Geography Markup Language (GML 3.2.1), GeoPackage and vector tiles. All formats are compressed into a regular zip file (.ZIP).

1.3   Adherence to standards

- OS MasterMap Highways Network extends the INSPIRE Transport Networks (Road and Water) Technical Specification (version 3.2).

- OS MasterMap Generic Network model extends the INSPIRE Base Models - Generic Network Model (version 3.0rc3)

1.3.1 Extending INSPIRE Specification

OS MasterMap Highways Network extends the INSPIRE specification to include the additional properties required by BS 7666-1:2006 defined within the National Street Gazetteer (NSG) Data Transfer Format (DTF) and Scottish DTF (SDTF) to ensure that conformance to both INSPIRE and BS7666-1:2006 can be achieved.

1.4 Notation

1.4.1 UML Diagram and Table Conventions

The data structure is described by means of UML class diagrams and accompanying data dictionary tables. The specification conforms to the rules for application schema specified in ISO 19103 Conceptual schema language and ISO 19109 Rules for application schema, as adopted by INSPIRE.

Colour conventions have been used in the diagrams and tables to allow users to easily distinguish the INSPIRE feature classes (coloured grey) from the Ordnance Survey feature classes which extends the INSPIRE specifications (coloured orange). All code lists classes are coloured blue, enumeration classes are green and data types/union classes are purple (Figure 2).
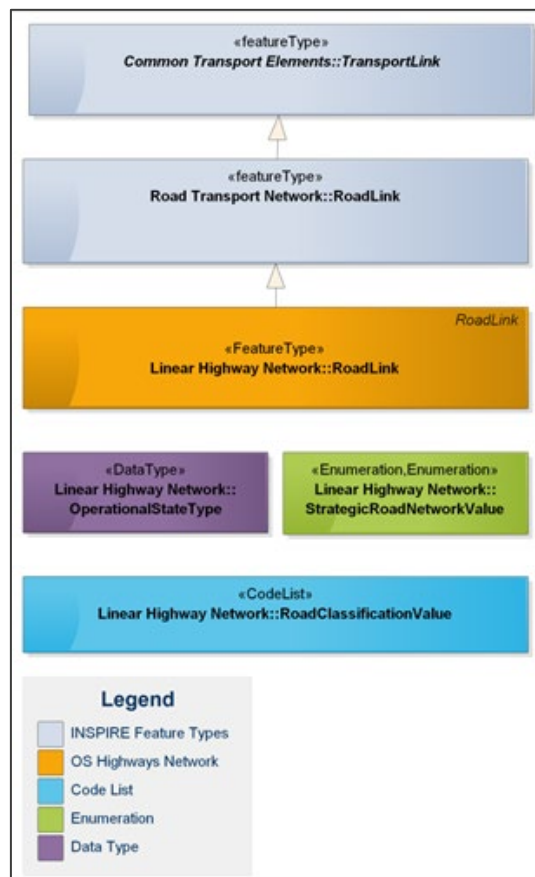
Figure 2: Colour conventions used in the UML diagrams

The data dictionary tables use orange for a feature type; blue for a code list; green for enumerations and purple for data types.

1.4.2   Lexical Conventions

1. Class names are conceptually meaningful names (singular noun) in UpperCamelCase.

2. Class names end in "Value" where the class is assigned the stereotype <<CodeList>> or <<Enumeration>>.

3. Class names shall end in "Type" where the class is assigned the stereotype <<DataType>>.

4. Property names (attributes and associations) are in lowerCamelCase.

1.4.3   Stereotypes

The following stereotypes are used on UML elements:

Stereotype	UML Element	Description
<<ApplicationSchema>>	Package	Parent package containing sub-packages and elements that comprise part of the modular specification.
<<FeatureType>>	Class	A spatial object type [ISO 19136].
<<Type>>	Class	A structured data type with identity.
<<DataType>>	Class	A structured data type without identity [ISO/TS 19103].
<<Union>>	Class	A structured data type without identity where exactly one of the properties of the type is present in any instance.
<<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.

1.4.4   Constraints

Constraints are defined on the Class using human readable language only. Constraints are displayed on class diagrams (Figure 3). These constraints are used to define co-constraints or restrict INSPIRE properties only.
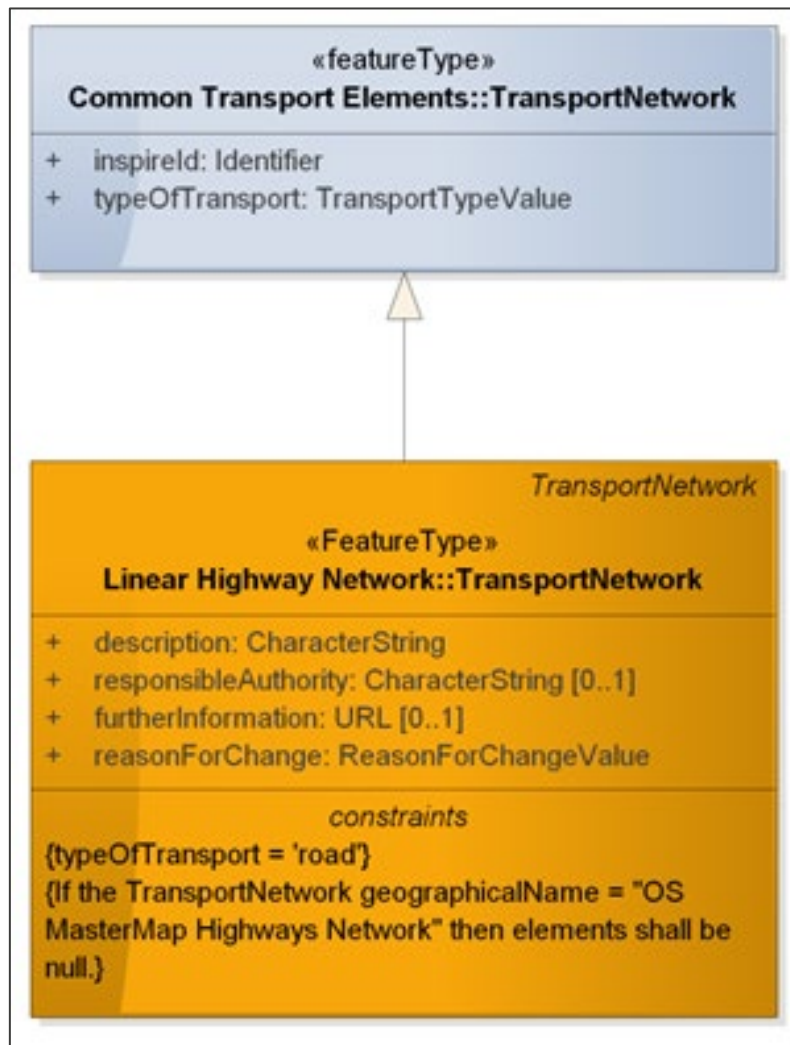
Figure 3: Representation of constraints in UML diagrams

1.4.5   Relationships and Associations

There are three key types of relationship defined between classes (Figure 4):

- **Generalisation/Specialisation:** This is used to denote either:

  - An extension relationship: where the target class represents the same real-world entity and is extending it to include additional properties not defined on the parent class.

Note: This class has the same name as the class it is extending.

  - A sub-typing relationship. The target class defined a specialised sub-type of parent feature. For example, *TransportNode* is a specialised sub-type of a generic Node class.

- **Directed Association:** Used to denote relationships between features. These relationships are encoded as references to the related feature via the identifier assigned in the gml:id. The directed end shall be assigned a name which describes the relationship between the two features and a multiplicity.

- **Aggregation:** These denote part-of relationships. Aggregations are used to describe loose part-of relationships. If the parent feature ceases to exist then the part feature can continue to exist. For example, a Road Name may cease to exist, but the Road will still exist.
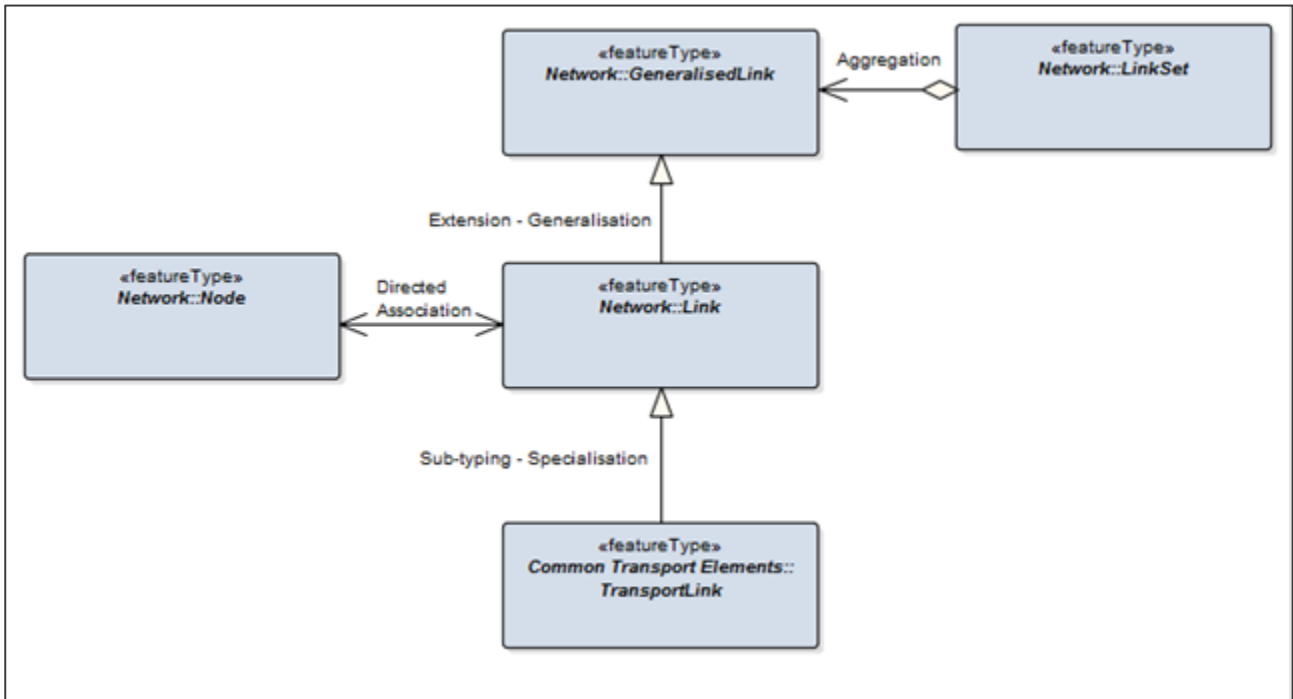
Figure 4: Relationships between feature types

2.   Specification changes

There have been small enhancements to the OS MasterMap Highways Network Version 2 to enable the release of new attributes and the capability to release change only updates. This section will outline the main changes to the Path Network product. For changes to the Roads and RAMI products, please see their respective *Technical Specifications*.

2.1   Features

1. PathLink and PathNode z values have been enhanced to reduce discrepancies when the path passes over a structure, for example, a bridge.

2. Added new feature type "HighwayDedication" to denote dedications of highways as defined in the Highway Act 1980 (http://www.legislation.gov.uk/ukpga/1980/66/contents) and Countryside and Rights of Way Act 2000 (http://www.legislation.gov.uk/ukpga/2000/37/contents).

3. As a result, there is a new code list, "DedicationValue".

2.2   Code lists, data types and enumerations

1. *March 2021* – The "ReinstatementTypeValue" code list has been updated with four new values added to include Scottish codes.

2. *March 2021* – The "SpecialDesignationTypeValue" code list has been updated with five new values added to include Scottish codes.

3. The "OperationalState" attribute on the Street features has introduced a new value "Addressing Only" into the "OperationalStateValue" codelist. The "NetworkReferenceLocation" has been further extended to accept additional geometry types, lines and polygons, in addition to start and end points. This affects "Maintenance", "Reinstatement" and "Special Designation" and the information provided on their location for partial records. The "SpecialDesignationTypeValue" code list has been updated with multiple new values added. The "MaintenanceValue" enumeration has been updated with two values added.

2.3   Schema changes

1. v2.1 RAMI schema is being released which will enable the code list and enumerations described above to be brought through.

2. v1.0 Highways Dedication schema has been introduced which defines the Highways Dedication feature.

3.   OS MasterMap Highways Network – Paths

The Path Network is a topologically structured link and node network made up of the following feature types:

- *PathLink* – A line segment representing the general alignment of the path.

- *PathNode* – A node connecting to at least one PathLink, providing network connectivity.

- *ConnectingLink* – A logical indicator of the connection between the Path Network and the Road Network.

- *ConnectingNode* – A node which connects the Road Network to the Path Network.

- *Path* – A Path defines the complete collection of references to PathLink features which share the same path name, for example, Three Brooks Walk.

- *Street* – A Street feature is the definition of the street as defined in the National or Scottish Street Gazetteer, made up of aggregated geometry with a unique identifier (USRN).

- *FerryLink* – A feature which represents a ferry route between two FerryNodes.

- *Ferrynode* – A feature representing the point at which a pedestrian ferry route or section of ferry route starts or ends.

- *FerryTerminal* – A feature representing the point at which pedestrians transfer from the Ferry Network to the Path Network or vice versa.

- *Maintenance* – Identifies what the maintenance status is of a Street.

- *Reinstatement* – A feature which identifies how a Street should be re-instated after street works.

- *Special Designation* – A feature which identifies if there is additional information about the Street.

- *Highway Dedication* – A feature which identifies the type of Highway user that has access to that particular section of the Highway.

The relationships between Path feature types are shown in Figure 5:
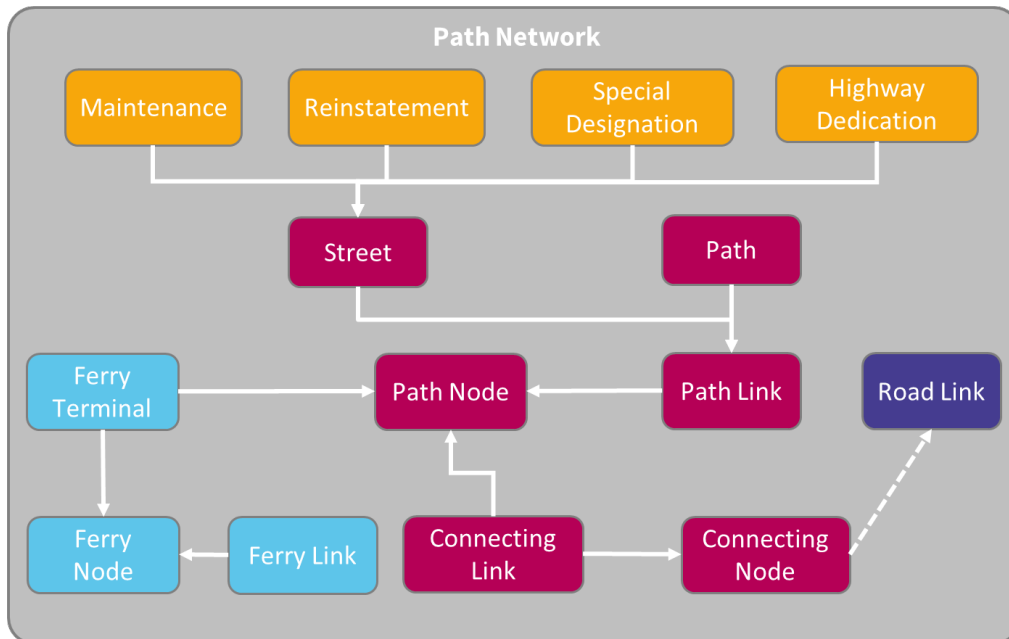
Figure 5: Relationships between Path Network feature types.

The Road and Path Networks are topologically structured together. ConnectingLinks and ConnectingNodes enable a connection between the Road Network and the Path Network. ConnectingLinks are logical connections between the Path Network and the Road Network; they do not represent a feature in the real world. A ConnectingNode is a feature which indicates where the Path will connect with the Road Network. Connecting Nodes are spatially coincident with RoadNodes and can share the same identifier. The ConnectingLink feature will reference the PathNode and ConnectingNode that it connects with, whilst the ConnectingNode will reference one of the RoadLinks that it connects to.

3.1   Common attribution

Each feature within the OS MasterMap Highways Network will have the following common attribution:

- gml:id, gml:identifier and inspireId
- beginLifespanVersion
- inNetwork – This shall always be set to "OSHighwayNetwork"
- reasonForChange
- validFrom (*Note: This is assigned a nilReason value "unknown" for most features.*)

In addition, many of the attributes which have been inherited from the INSPIRE Transport Network model have a stereotype of 'voidable', for example, "beginLifespanVersion". Where these attributes have not been populated then there is a requirement to give a reason for this. This will be specified in the GML through an attribute called "nilReason".

3.2 Network referencing

The Asset Management features of the Path Network product relate back to the Path Network features using Network Referencing, through the networkRef attribute. All RAMI features extend the INSPIRE NetworkProperty class (Figure 6).

In the Path Network product, only one type of Network Reference is used which is the INSPIRE NetworkProperty class. This class has been extended in cases where the feature only partially references the network feature.
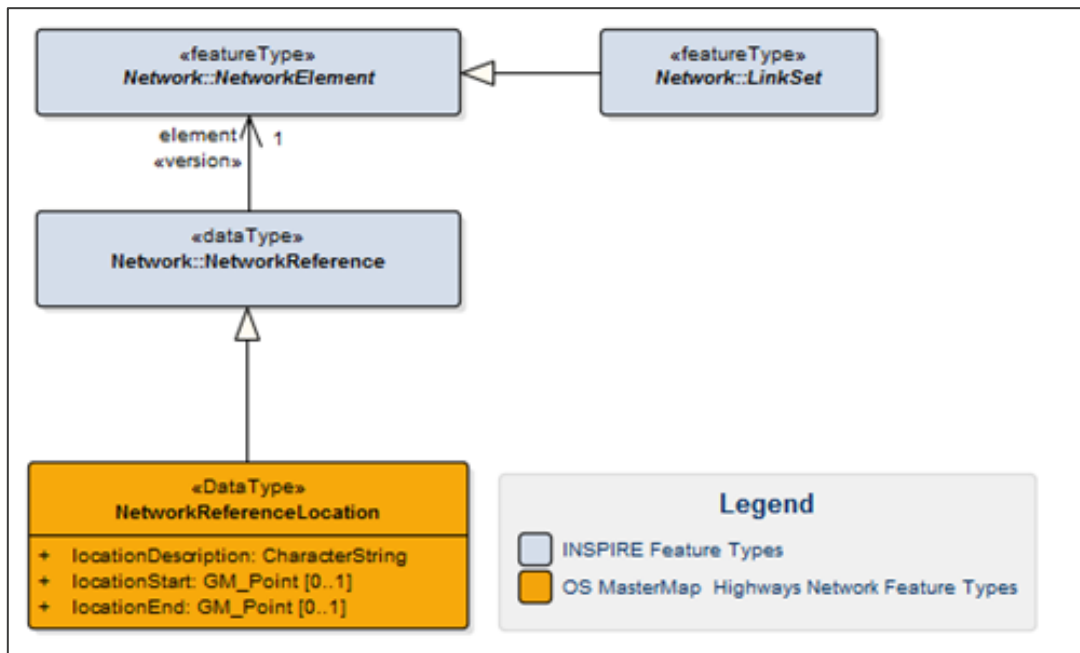
Figure 6: INSPIRE Network Referencing Model.

In the INSPIRE specification, the networkRef is a voidable field. For all features in the OS MasterMap Highways Network the networkRef will never be voided.

3.2.1 Network reference

The Network Reference references the feature back to the network element. The Network Reference has been extended and the asset management feature types which use Network Referencing are Maintenance, Reinstatement, Special Designation and Highways Dedication. These features will all reference back to the id of the Street feature, the USRN. Geometry will not be provided. However, where these features do not reference an entire Street feature, and are a partial reference, they will provide a Network Reference Location. This is made up of a locationDescription which provides a textual description of where the feature relates to which will be populated directly from the NSG.

«DataType» NetworkReferenceLocation		
Attribute: element		
Definition: The identifier of the feature being referenced; this will always be the gml:id .		
Multiplicity: [1]	Size: 20	
Attribute: locationDescription		
Definition: Textual description of the location extent of the referenced property when the feature partially references the network.		
Type: CharacterString	Multiplicity: [1]	Size: 250
Attribute: locationStart		
Definition: The geometry of where the feature starts.		
Type: GM_Point	Multiplicity: [0..1]	
Attribute: locationEnd		
Definition: The geometry of where the feature ends.		
Type: GM_Point	Multiplicity: [0..1]	
Attribute: locationLine		
Definition: A linear representation of the feature.		
Type: GM_MultiCurve	Multiplicity: [0..1]	
Attribute: locationArea		
Definition: An area representation of the feature.		
Type: GM_MultiSurface	Multiplicity: [0..1]	

3.3   Temporal properties

The Special Designation and Highways Dedication features contain information on restrictions which apply to a temporal period. The different temporal properties have been categorised and the different categories are detailed below. In addition, they have been given a hierarchy within the RAMI product which is illustrated in Figure 7.

3.3.1   Named Date

A Named Date would be when a restriction applies to a specified date which is named. For example, All Year or January. There are no further sub-categories of a Named Date.

3.3.2   Date Range

A Date Range is provided when a restriction applies between two dates and there will always be a start date and an end date. These two dates can be specified using two different data types: either StartDate and EndDate or StartMonthDay or EndMonthDay.

The StartDate and EndDate will always be used for Date Ranges for Special Designation features. These are formatted as YYYY-MM-DD, for example, 2016-09-20.

3.3.3   Day Period

A Day period would be a restriction which applies on a specified day. A Day Period is made up of the following properties:

- *Named Day* – A restriction which applies to a specified day which is named, for example, Monday or Weekends

- *Named Period* – A restriction which applies to a specified period which is named, for example, School Holidays.

- *Time Period* – A time period is made up of a further two properties:

  - *Named Time* – A restriction which applies to a specified time period which is named. That does not necessarily relate to the same time each day consistently across the country, for example, Peak Time.

  - *Time Range* – When a restriction applies between two specified times which will always have a start time and an end time. These data types are formatted as HH:MM:SS and will use the 24hr clock, for example, 16:30:00.
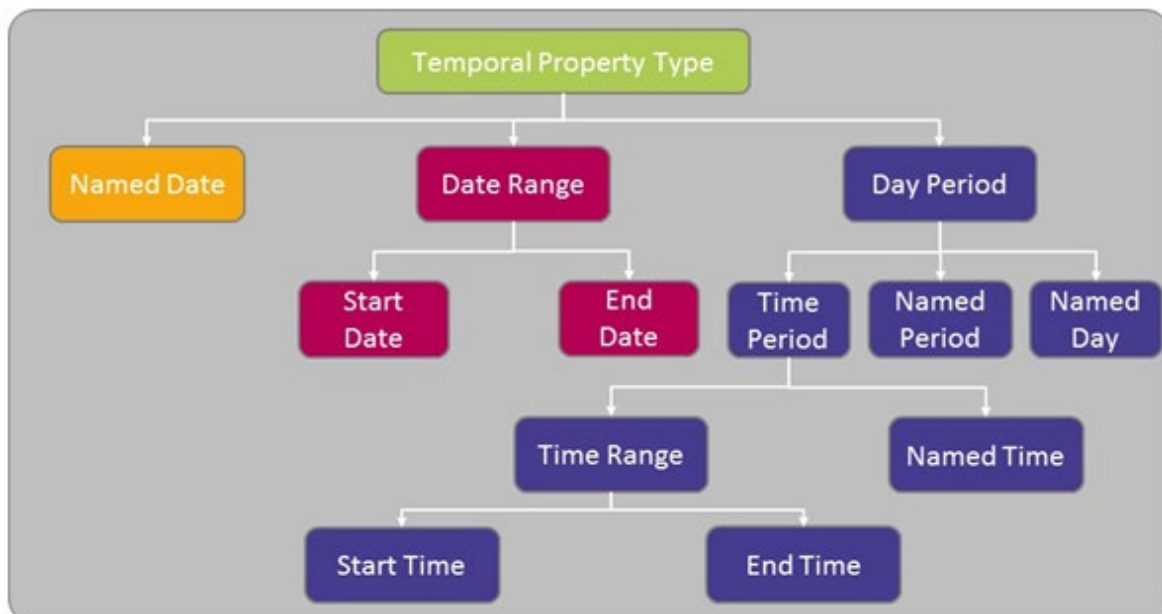
Figure 7: Structure of the Temporal Property Data Type.

3.4   PathLink

3.4.1   Overview

A PathLink is a linear spatial object that defines the geometry and connectivity of the Path Network between two points in the network. PathLinks will be split for connectivity purposes (for example, at junctions) and PathNodes will connect the PathLinks together. Each PathLink will provide a reference to the PathNodes at the start and end of the PathLink.

A PathLink will be captured where:

•   They provide a route that cannot be inferred from the Road Network

•   They provide connectivity between Road Networks

•   There is a canal path or tow path

•   There are paths over footbridges and under subways

•   There are recreational paths in urban, rural and mountain and moorland areas.

PathLinks will not be captured where:

•   They run parallel to the Road Network, for example, a pavement

•   They are connected to a Motorway

•   There is a physical obstruction which prevents connectivity

PathLinks will split where two PathLinks cross over or under one another when there is no connectivity, for example, at bridges and flyovers. Therefore, the attributes "startGradeSeparation" and "endGradeSeparation" have been populated on the PathLink. The Grade Separation attribute will indicate where there is or is not a physical connection between the Paths in the real world. Grade Separation will determine if a PathLink is above another. If the two PathLinks, when referencing the same PathNode, have different values, then it is not possible to move between them at that point.

Where a PathLink crosses a RoadLink at a different level, both the PathLink and RoadLink will split. The attributes "startGradeSeparation" and "endGradeSeparation" will be populated on the PathLink and RoadLink. The Grade Separation attribute will indicate where there is or is not a physical connection between the path and road in the real world. Where the two links cross, the Road Node and Path Node will have the same identifier. Grade Separation will determine if one link is above another. If the two links, when referencing a Road Node and Path Node with the same TOID, have different grade separation values, then it is not possible to move between them at that point.

The context diagram (Figure 8) shows how the PathLink has been inherited from INSPIRE and the attribution held on the PathLink.
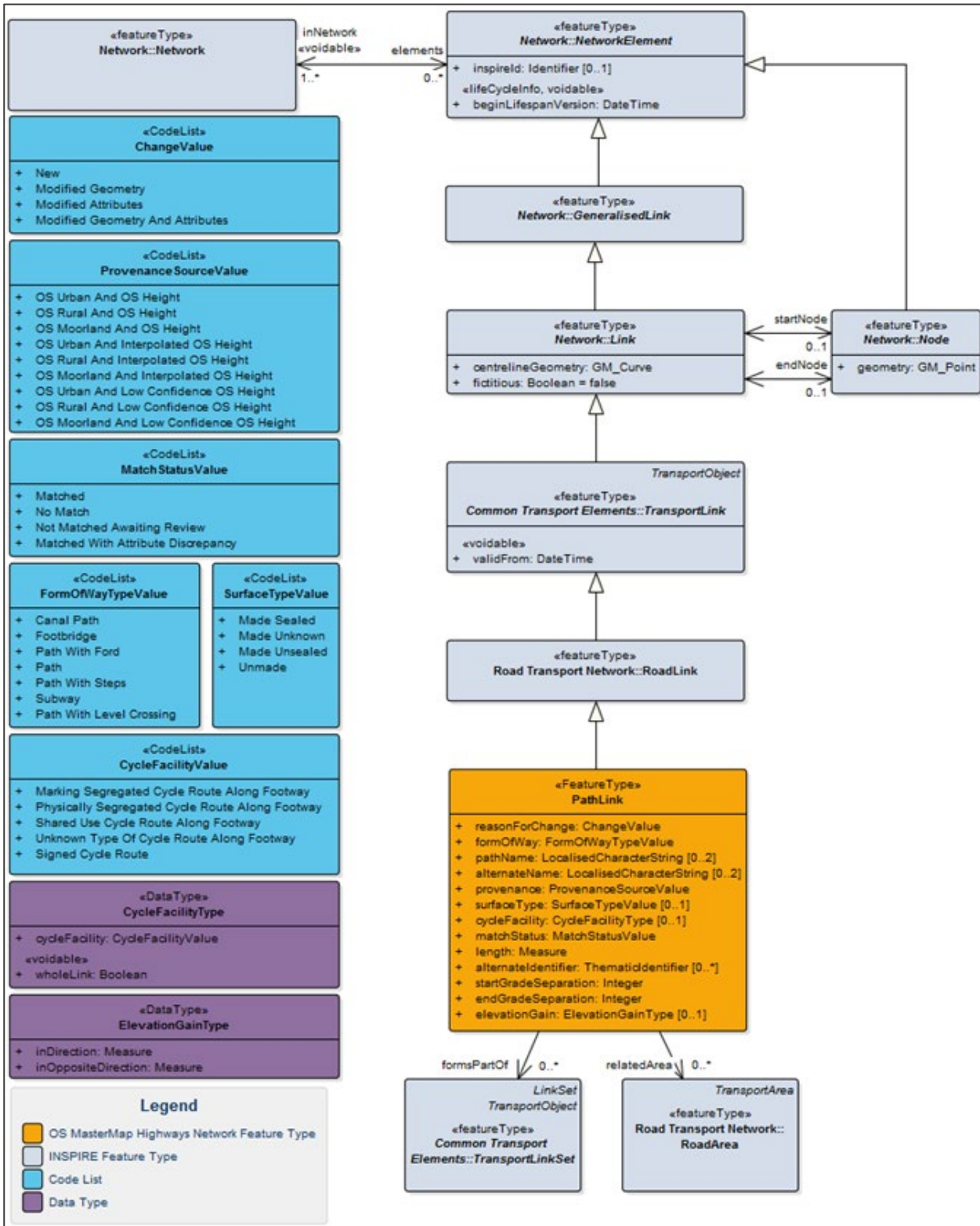
Figure 8: Context diagram: PathLink.

3.4.2   Attributes

«FeatureType» PathLink		
Definition: A linear feature that represents the general alignment of a route used by pedestrians.		
Attribute: id		
Definition: Unique identifier; for PathLink, this is a TOID.		
Type: CharacterString	Size: 20	Multiplicity: [1]
Attribute: identifier		
Definition: Uniform Resource Identifier.		
Type: CharacterString	Size: 37	Multiplicity: [1]
Attribute: inspireId		INSPIRE
Definition: External object identifier of the spatial object.		
Type: Identifer		Multiplicity: [0..1]
Attribute: beginLifespanVersion «voidable» «lifeCycleInfo»		INSPIRE
Definition: Date and time at which this version of the spatial object was inserted or changed in the spatial data set.		
Note: The time part is always set to zero.		
Type: DateTime		Multiplicity: [1]
Attribute: centrelineGeometry		INSPIRE
Definition: The three-dimensional geometry that represents the alignment of the path.		
Type: GM_Curve		Multiplicity: [1]
Attribute: fictitious		INSPIRE
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: Boolean	Size: 5	Multiplicity: [1]
Attribute: validFrom «voidable»		INSPIRE
Definition: The time when the transport link started to exist in the real world.		
Note: The time part is always set to zero.		
Type: DateTime		Multiplicity: [1]
Attribute: reasonForChange		
Definition: The reason for a change made to a feature.		
Type: ChangeValue	Size: 32	Multiplicity: [1]

«FeatureType» PathLink		
Attribute: formOfWay		
Definition: A description of the PathLink based on its nature or use.		
Type: FormOfWayTypeValue	Size: 42	Multiplicity: [1]
Attribute: pathName		
Definition: The name of the path the feature is part of, when a PathLink is referenced by a Street with a streetStateType of Designated Street Name this is the name used else the name is from Path.		
Note: Where a feature has more than one name, the language of each name is provided as a 3-digit ISO 639-2 code ('eng', 'cym', 'gla').		
Type: LocalisedCharacterString	Size: 255	Multiplicity: [0..2]
Attribute: alternateName		
Definition: Another name for the path the feature is part of, this is populated with the name captured by Ordnance Survey when it differs from that in Street.		
Note: Where a feature has more than one name, the language of each name is provided as a 3-digit ISO 639-2 code ('eng', 'cym', 'gla').		
Type: LocalisedCharacterString	Size: 255	Multiplicity: [0..2]
Attribute: provenance		
Definition: The origin and derivation of the three-dimensional geometry of the PathLink.		
Type: ProvenanceSourceValue	Size: 23	Multiplicity: [1]
Attribute: surfaceType		
Definition: Nature of the material that the path is made up of.		
Type: SurfaceTypeValue	Size: 13	Multiplicity: [0..1]
Attribute: cycleFacility		
Definition: Identifies if the PathLink has facilities for a cyclist.		
Type: CycleFacilityType		Multiplicity: [0..1]
Attribute: matchStatus		
Definition: Indication whether the feature has been matched to a feature in the NSG		
Type: MatchStatusValue	Size: 39	Multiplicity: [1]
Attribute: length		
Definition: The calculated two-dimensional length of the PathLink in metres.		
Note: A Unit of Measure (uom) is provided as part of the attribute which will always be 'm'.		
Type: Measure	Size: 7,2	Multiplicity: [1]

«FeatureType» PathLink		
Attribute: alternateIdentifier		
Definition: Identifier(s) of the Elementary Street Unit from NSG or TRSG		
Type: ThematicIdentifier	Size: 20	Multiplicity: [0..*]
Attribute: startGradeSeparation		
Definition: The relative level of the link at the startNode.		
Type: Integer		Multiplicity: [1]
Attribute: endGradeSeparation		
Definition: The relative level of the link at the endNode.		
Type: Integer		Multiplicity: [1]
Attribute: elevationGain		
Definition: The elevation gain is calculated from three-dimensional geometry to define the total ascent experienced when passing along a PathLink feature. The value is expressed both with and against the direction of digitising.		
Type: ElevationGainType		Multiplicity: [0..1]
Association: formsPartOf		
Definition: Identifier of the Path or Street to which the PathLink forms part of.		
Multiplicity: 0..*		Size: 20
Association: startNode		INSPIRE
Definition: The node coincident with the first vertex of the geometry attribute.		
Multiplicity: 0..1		Size: 20
Association: endNode		INSPIRE
Definition: The node coincident with the last vertex of the geometry attribute.		
Multiplicity: 0..1		Size: 20
Association: relatedRoadArea		
Definition: Reference to the topographic representation(s) of the same part of the path.		
Multiplicity: 1..*		Size: 20

3.5   PathNode

3.5.1   Overview

A point spatial object that is used to break up the Path Network for connectivity. The PathNode extends the RoadNode feature in the INSPIRE Transport Network (roads) model. The Path Network splits for the following circumstances:

• The location where an attribute changes

• The intersection or crossing of PathLinks

• The start/end of a PathLink

The context diagram (Figure 9) shows how the PathNode has been inherited from INSPIRE and the attribution held on the PathNode:
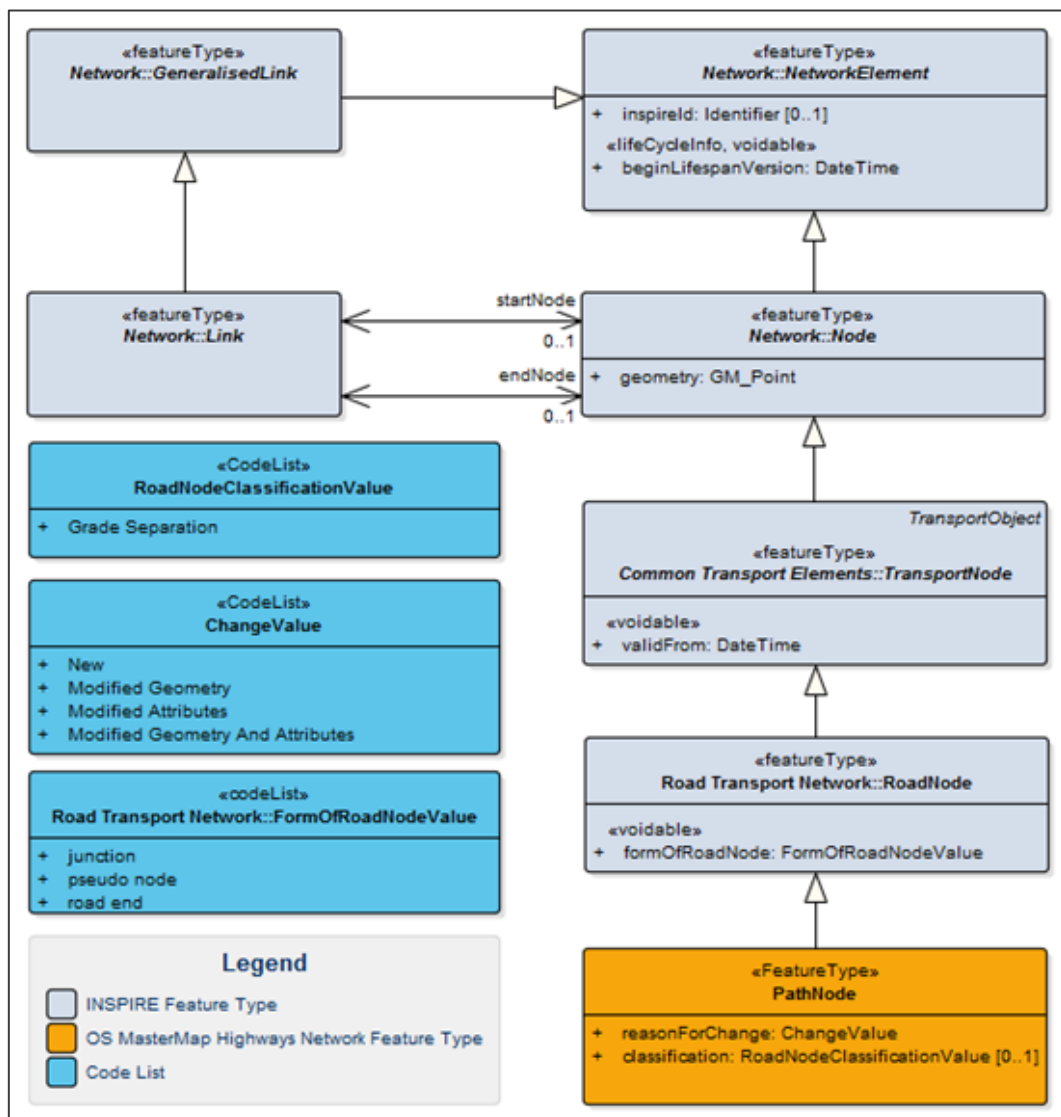
Figure 9: Context diagram: PathNode.

3.5.2 Attributes

«FeatureType» PathNode		
Definition: A point representing either the start/end of a path, the connectivity between two or more paths, or where one of the recorded attributes changes.		
Attribute: id		
Definition: Unique identifier; for PathNode, this is a TOID.		
Type: CharacterString	Size: 20	Multiplicity: [1]
Attribute: identifier		
Definition: Uniform Resource Identifier		
Type: CharacterString	Size: 37	Multiplicity: [1]
Attribute: inspireId	INSPIRE	
Definition: External object identifier of the spatial object.		
Type: Identifier		Multiplicity: [0..1]
Attribute: beginLifespanVersion «lifeCycleInfo» «voidable»	INSPIRE	
Definition: Date and time at which this version of the spatial object was inserted or changed in the spatial data set.		
Note: The time part is always set to zero.		
Type: DateTime		Multiplicity: [1]
Attribute: geometry	INSPIRE	
Definition: The location of the node.		
Type: GM_Point		Multiplicity: [1]
Attribute: validFrom «voidable»	INSPIRE	
Definition: The time when the transport node started to exist in the real world.		
Note: The time part is always set to zero.		
Type: DateTime		Multiplicity: [1]
Attribute: formOfRoadNode «voidable»	INSPIRE	
Definition: Description of the function of a path node in the road transport network.		
Type: FormOfRoadNodeValue	Size: 21	Multiplicity: [1]
Attribute: reasonForChange		
Definition: The reason for a change made to a feature.		
Type: ChangeValue	Size: 32	Multiplicity: [1]

«FeatureType» PathNode		
Attribute: classification		
Definition: Further specialisation of the form of path node		
Type: RoadNodeClassificationValue	Size: 19	Multiplicity: [0..1]

3.6 ConnectingLink

3.6.1 Overview

The Road and Path Network are topologically structured together. ConnectingLinks enable a connection between the Road Network and the Path Network. A ConnectingLink feature is a linear spatial object which represents a logical connection between the Path Network and the Road Network; it does not represent a feature in the real world. A ConnectingLink will always reference a PathNode and a ConnectingNode. The context diagram (Figure 10) shows how the ConnectingLink relates to PathNodes and ConnectingNodes.

Three-dimensional geometry has been given to ConnectingLink features. This is to facilitate routing that requires coincidence of co-ordinates. Given the nature of connecting feature, this geometry is for connectivity purposes only.
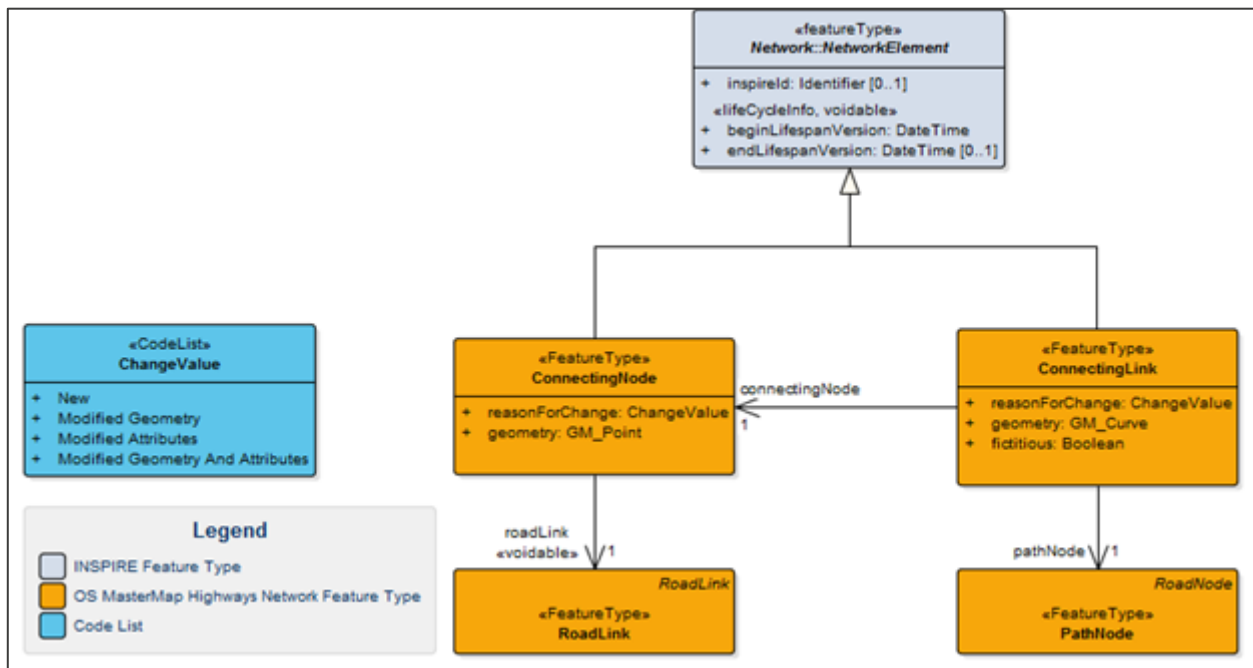
Figure 10: Context diagram: ConnectingLink and ConnectingNode.

3.6.2 Attributes

«FeatureType» ConnectingLink		
Definition: A ConnectingLink is not a representation of a real-world object. It is a logical indicator of the connection between the Path Network and the Road Network		
Attribute: id		
Definition: Unique identifier; for ConnectingLink, this is a TOID.		
Type: CharacterString	Size: 20	Multiplicity: [1]
Attribute: identifier		
Definition: Uniform Resource Identifier		
Type: CharacterString	Size: 37	Multiplicity: [1]
Attribute: inspireId		INSPIRE
Definition: External object identifier of the spatial object.		
Type: Identifier		Multiplicity: [0..1]
Attribute: beginLifespanVersion		INSPIRE
Definition: Date and time at which this version of the spatial object was inserted or changed in the spatial data set.		
Note: The time part is always set to zero.		
Type: DateTime		Multiplicity: [1]
Attribute: reasonForChange		
Definition: The reason for a change made to a feature.		
Type: ChangeValue	Size: 32	Multiplicity: [1]
Attribute: geometry		
Definition: The implied connection between the RoadLink and the PathLink. Note, this is represented as a three-dimensional geometry to facilitate connectivity, but it is a logical connection not a physical alignment.		
Type: GM_Curve		Multiplicity: [1]
Attribute: fictitious		
Definition: Indicator that the 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: Boolean	Size: 5	Multiplicity: [1]
Association: connectingNode		
Definition: A reference to the ConnectingNode which the ConnectingLink references.		
Multiplicity: 1		Size: 20

«FeatureType» ConnectingLink	
Association: pathNode	
Definition: A reference to the PathNode which the ConnectingLink references.	
Multiplicity: 1	Size: 20

3.7 ConnectingNode

3.7.1 Overview

A ConnectingNode is a point feature that identifies where a Path connects to the Road Network. The ConnectingNode connects to the start or end of one or more RoadLinks and provides a reference to one of the RoadLinks it connects to. Connecting Nodes are spatially coincident with RoadNodes and can share the same identifier. The ConnectingNode is referenced by a ConnectingLink.

The context diagram (Figure 10) shows how the ConnectingNode relates to the RoadLink.

Three-dimensional geometry has been applied to ConnectingNode features. This is to facilitate routing that requires coincidence of co-ordinates. Given the nature of connecting feature this geometry is for connectivity purposes only.

3.7.2 Attributes

«FeatureType» ConnectingNode		
Definition: A point which connects the Road Network to the Path Network.		
Attribute: id		
Definition: Unique identifier; for ConnectingNode, this is a TOID.		
Type: CharacterString	Size: 20	Multiplicity: [1]
Attribute: identifier		
Definition: Uniform Resource Identifier		
Type: CharacterString	Size: 37	Multiplicity: [1]
Attribute: inspireId		
Definition: External object identifier of the spatial object.		
Type: Identifier		Multiplicity: [0..1]
Attribute: beginLifespanVersion		
Definition: Date and time at which this version of the spatial object was inserted or changed in the spatial data set.		
Note: The time part is always set to zero.		

«FeatureType» ConnectingNode		
Type: DateTime		Multiplicity: [1]
Attribute: reasonForChange		
Definition: The reason for a change made to a feature.		
Type: ChangeValue	Size: 32	Multiplicity: [1]
Attribute: geometry		
Definition: The location of the node which indicates where the Path Network connects to the Road Network		
Type: GM_Point		Multiplicity: [1]
Association: roadLink «voidable»		
Definition: A reference to the RoadLink which the ConnectingNode connects to.		
Multiplicity: 1		Size: 20

3.8   Path

3.8.1   Overview

A Path feature is a link set which represents a collection of PathLink features that share the same name (for example, Church Walk). A Path will reference the complete collection of RoadLink features irrespective of which authority boundary it falls within. A PathLink feature may be referenced by multiple Path features.

The context diagram (Figure 11) shows how the Path feature has been inherited from INSPIRE and the attribution held on the Path.
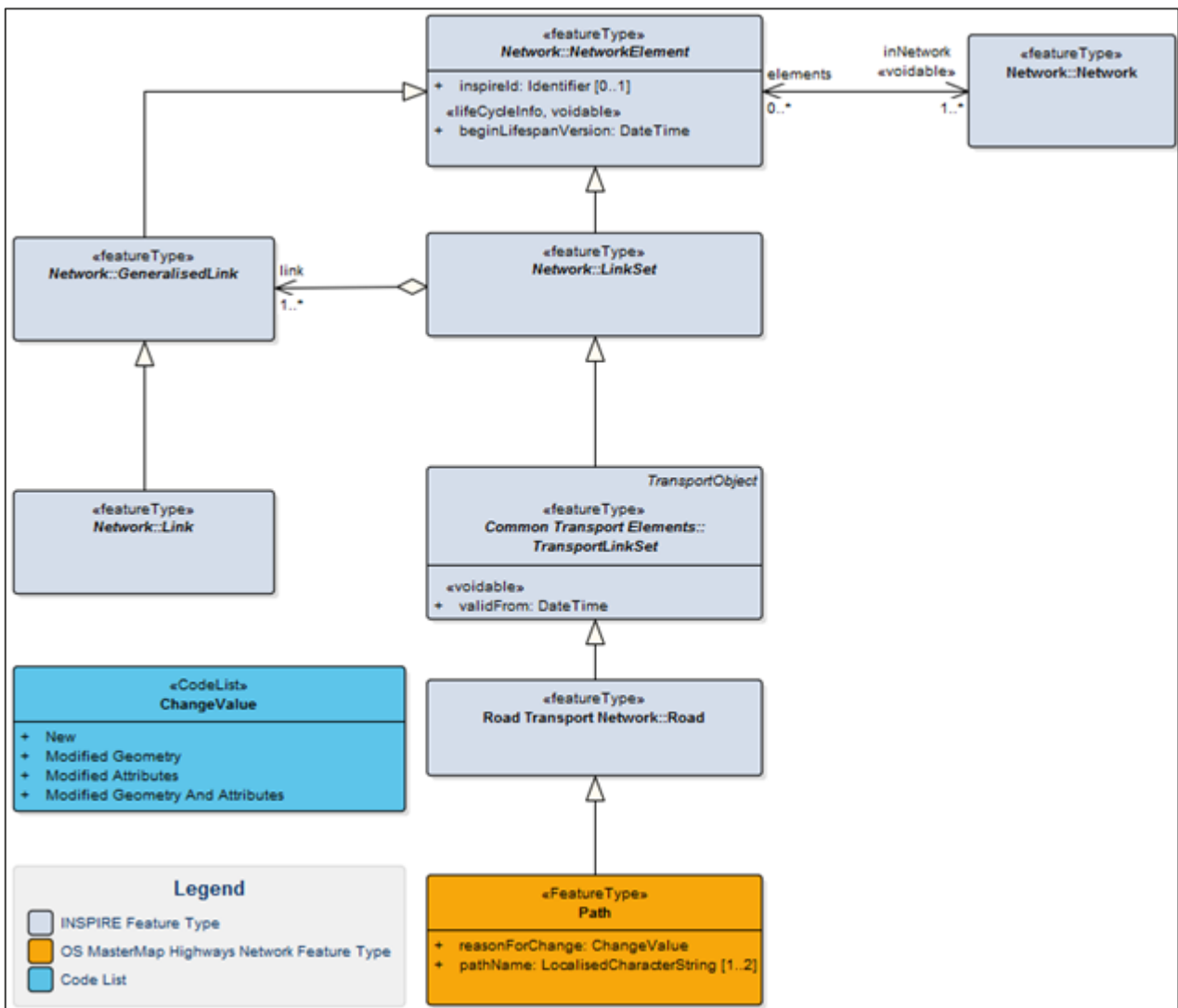
Figure 11: Context diagram: Path

3.8.2   Attributes

«FeatureType» Path		
Definition: A compound feature that represents a path with a name. This references a collection of PathLinks.		
Attribute: id		
Definition: Unique identifier; for Path, this is a TOID.		
Type: CharacterString	Size: 20	Multiplicity: [1]
Attribute: identifier		
Definition: Uniform Resource Identifier		
Type: CharacterString	Size: 37	Multiplicity: [1]
Attribute: inspireId	INSPIRE	
Definition: External object identifier of the spatial object.		
Type: Identifier		Multiplicity: [0..1]
Attribute: beginLifespanVersion «lideCycleInfo» «voidable»	INSPIRE	
Definition: Date and time at which this version of the spatial object was inserted or changed in the spatial data set.		
Note: The time part is always set to zero.		
Type: DateTime		Multiplicity: [1]
Attribute: validFrom «voidable»	INSPIRE	
Definition: The time when the transport link set started to exist in the real world.		
Note: The time part is always set to zero.		
Type: DateTime		Multiplicity: [1]
Attribute: reasonForChange		
Definition: The reason for a change made to a feature.		
Type: ChangeValue	Size: 32	Multiplicity: [1]
Attribute: pathName		
Definition: The name assigned to the feature which all the referenced links have in common.		
Note: Where a feature has more than one name, the language of each name is provided as a 3-digit ISO 639-2 code ('eng', 'cym', 'gla').		
Type: LocalisedCharacterString	Size: 255	Multiplicity: [1..2]
Aggregation: link	INSPIRE	
Definition: The reference to the PathLink features which builds up the Path feature.		
Multiplicity: 1..*		Size: 20

3.9 Street

3.9.1 Overview

A Street feature extends and specialises the Road feature (Figure 12) and in the Path Network product they will only represent Streets made up of PathLinks. A Street feature is populated from the National and Scottish Street Gazetteers and will exist where their Elementary Street Unit geometry has been matched to only PathLinks. They will represent either the complete Street or a section of a Street within an Administrative Unit, Town, or Locality and provides additional information about who is responsible for its naming and or numbering. A PathLink can be referenced by multiple Street features.
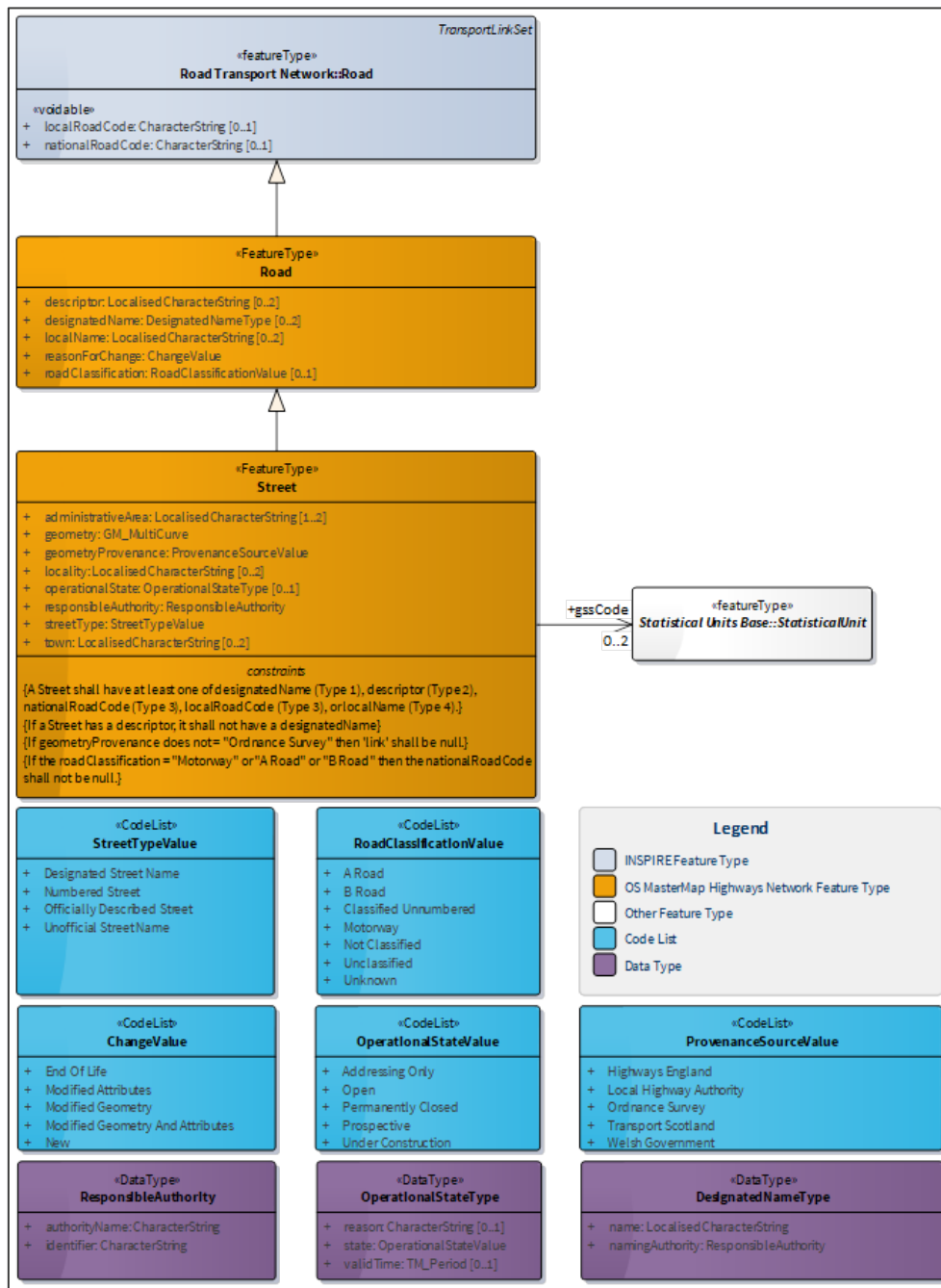
Figure 12: Context diagram: Street.

The Street extends the Road feature to provide the additional attribution required to adhere to BS 7666:

- *USRN*: The Unique Street Reference Number is the unique and persistent identifier of a Street assigned by the Roads or Highway Authority

- *Street Type*: The type of Gazetteer record for which the USRN relates. It is mandatory for all USRNs to be assigned a Street Type

- *Operational State*: Indicates whether the Street is proposed, under construction, open, or closed (permanently or temporarily)

- *Responsible Authority:* Reference to the authority which performs an administrative function – notably naming and numbering

A Street will split when it crosses the boundary of an Administrative Area where the local maintenance responsibility changes. A Street could also split at a town or locality boundary to allow properties to be located uniquely upon a street via a unique identifier (i.e. USRN).

Note: In the definitions below, users should read the term Highways as Roads when applied to streets in Scotland.

3.9.2   Attributes

«FeatureType» Street		
Definition: Any road, footway, path, cycletrack, track or passageway that forms a highway. A highway represents individual subsections of Road which are managed (naming/numbering) by a specified responsible authority.		
Constraints: A Street shall have at least one of designatedName (Type 1), descriptor (Type 2), nationalRoadCode (Type 3), or localName (Type 4). If a Street has a descriptor, it shall not have a designatedName		
Attribute: id		
Definition: Unique Street Reference Number (USRN), a unique and persistent identifier assigned by the Roads or Highway Authority.		
Type: CharacterString	Size: 12	Multiplicity: [1]
Attribute: identifier		
Definition: Uniform Resource Identifier		
Type: CharacterString	Size: 29	Multiplicity: [1]
Attribute: inspireId		
Definition: External object identifier of the spatial object.		
Note: This is the USRN from the NSG or TRSG or SSG.		
Type: Identifier		Multiplicity: [0..1]
Attribute: beginLifespanVersion «lifeCycleInfo» «voidable»		

«FeatureType» Street	
Definition: Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	
Note: The time part is always set to zero.	
Type: DateTime	Multiplicity: [1]
Attribute: validFrom «voidable»	
Definition: The time when the transport link set started to exist in the real world.	
Note: The time part is always set to zero.	
Type: DateTime	Multiplicity: [1]

Attribute: descriptor		
Definition: Street description allocated by a Street Naming Authority or Highway Authority used to identify a street that does not have a designated name.		
Note: Where a feature has more than one name, the language of each name is provided as a 3-digit ISO 639-2 code ('eng', 'cym', 'gla').		
Type: LocalisedCharacterString	Size: 120	Multiplicity: [0..2]

Attribute: designatedName	
Definition: Official name assigned to the highway by a designated Street Naming Authority.	
Type: DesignatedNameType	Multiplicity: [0..2]

Attribute: localName		
Definition: Unofficial local name associated to the highway.		
Note: Where a feature has more than one name, the language of each name is provided as a 3-digit ISO 639-2 code ('eng', 'cym', 'gla').		
Type: LocalisedCharacterString	Size: 120	Multiplicity: [0..2]

Attribute: reasonForChange		
Definition: The reason for a change made to a feature.		
Type: ChangeValue	Size: 32	Multiplicity: [1]

Attribute: streetType		
Definition: Classification of the type of Street from the National Street Gazetteer.		
Type: StreetTypeValue	Size: 35	Multiplicity: [1]

Attribute: operationalState	
Definition: Indicator identifying the physical nature of the road e.g. Under Construction.	
Type: OperationalStateType	Multiplicity: [1]

«FeatureType» Street

Attribute: locality

Definition: The Populated Place representing the locality that the Street is located within

Note: Where a feature has more than one name, the language of each name is provided as a 3-digit ISO 639-2 code ('eng', 'cym', 'gla').

Type: LocalisedCharacterString	Size: 35	Multiplicity: [0..2]

Attribute: town

Definition: The settlement that the Street falls within.

Note: Where a feature has more than one name, the language of each name is provided as a 3-digit ISO 639-2 code ('eng', 'cym', 'gla').

Type: LocalisedCharacterString	Size: 30	Multiplicity: [0..2]

Attribute: administrativeArea

Definition: The administrative area that the Street is located within

Note: Where a feature has more than one name, the language of each name is provided as a 3-digit ISO 639-2 code ('eng', 'cym', 'gla').

Type: LocalisedCharacterString	Size: 30	Multiplicity: [1..2]

Attribute: responsibleAuthority

Definition: Reference to the authority that has current responsibility for naming and numbering.

Type: ResponsibleAuthority	Multiplicity: [1]

Attribute: geometryProvenance

Definition: Identify where the geometry of the feature originated.

Type: ProvenanceSourceValue	Multiplicity: [1]

Attribute: geometry

Definition: The aggregated geometry of all the PathLink features which make up the feature.

Type: GM_MultiCurve	Multiplicity: [1]

Association: gssCode

Definition: A reference to the unique identifier of administrative areas managed by the Office for National Statistics. Role is used to describe the authority - 'Upper Tier Local Authority', 'Lower Tier Local Authority' and 'Unitary Local Authority'

Multiplicity: 0..2	Size: 9

Aggregation: link

Definition: The reference to the PathLink features which builds up the Street feature.

Multiplicity: 1..*	Size: 20

3.10   FerryLink

3.10.1   Overview

A FerryLink is a linear spatial object which represents the connectivity of a vehicular ferry route across a body of water. A FerryLink will only be captured where the route is limited to pedestrians only and both terminals are within Great Britain, and there is a timetabled service which is open to the public.

The context diagram (Figure 13) shows how the FerryLink has been inherited from INSPIRE, the attribution held on the FerryLink and how it relates to the other Ferry components.

Figure 13: Context Diagram: FerryLink, FerryNode and FerryTerminal

3.10.2 Attributes

«FeatureType» FerryLink		
Definition: A network link representing a route for a vehicular or pedestrian ferry route.		
Attribute: id		
Definition: Unique identifier; for FerryLink, this is a TOID.		
Type: CharacterString	Size: 20	Multiplicity: [1]
Attribute: identifier		
Definition: Uniform Resource Identifier		
Type: CharacterString	Size: 37	Multiplicity: [1]
Attribute: inspireId	INSPIRE	
Definition: External object identifier of the spatial object.		
Type: Identifier		Multiplicity: [0..1]
Attribute: beginLifespanVersion «lifeCycleInfo» «voidable»	INSPIRE	
Definition: Date and time at which this version of the spatial object was inserted or changed in the spatial data set.		
Note: The time part is always set to zero.		
Type: DateTime		Multiplicity: [1]
Attribute: centrelineGeometry	INSPIRE	
Definition: The three-dimensional geometry that represents the connection between the ferry terminals. Where a detailed alignment is provided it is only an indication of the route a vessel would take. The third dimension is only provided for connectivity and does not reflect any real-world value.		
Type: GM_Curve		Multiplicity: [1]
Attribute: fictitious	INSPIRE	
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: Boolean	Size: 5	Multiplicity: [1]
Attribute: validFrom «voidable»	INSPIRE	
Definition: The time when the transport node started to exist in the real world.		
Note: The time part is always set to zero.		
Type: DateTime		Multiplicity: [1]
Attribute: vehicularFerry		
Definition: An indicator if this FerryLink represents a ferry that can be used by vehicles.		

«FeatureType» FerryLink		
Note: This will always be set to false in the Path Network product.		
Type: Boolean	Size: 5	Multiplicity: [1]
Attribute: routeOperator		
Definition: The URL to the operator of this Ferry route.		
Type: CharacterString	Size: 250	Multiplicity: [0..1]
Attribute: reasonForChange		
Definition: The reason for a change made to a feature.		
Type: ChangeValue	Size: 32	Multiplicity: [1]
Association: startNode		INSPIRE
Definition: The node coincident with the first vertex of the geometry attribute.		
Multiplicity: 0..1		Size: 20
Association: endNode		INSPIRE
Definition: The node coincident with the last vertex of the geometry attribute.		
Multiplicity: 0..1		Size: 20

3.11   FerryNode

3.11.1   Overview

A FerryNode is a point spatial object which is used to represent the connectivity between FerryLinks and where the FerryLinks start and end. A FerryNode feature may serve multiple FerryLink features if more than one destination is served from the same location. FerryNodes will always be referenced by at least one FerryLink.

The context diagram (Figure 13) shows how the FerryNode has been inherited from INSPIRE, the attribution held on the FerryNode and how it relates to the other Ferry components.

3.11.2   Attributes

«FeatureType» FerryNode		
Definition: A feature representing the point at which a vehicular or pedestrian ferry route or section of ferry route starts or ends.		
Attribute: id		
Definition: Unique identifier; for FerryNode, this is a TOID.		
Type: CharacterString	Size: 20	Multiplicity: [1]
Attribute: identifier		
Definition: Uniform Resource Identifier		
Type: CharacterString	Size: 37	Multiplicity: [1]
Attribute: inspireId	INSPIRE	
Definition: External object identifier of the spatial object.		
Type: Identifier		Multiplicity: [0..1]
Attribute: beginLifespanVersion	INSPIRE	
Definition: Date and time at which this version of the spatial object was inserted or changed in the spatial data set.		
Note: The time part is always set to zero.		
Type: DateTime		Multiplicity: [1]
Attribute: geometry	INSPIRE	
Definition: The location of the node.		
Type: GM_Point		Multiplicity: [1]
Attribute: validFrom	INSPIRE	
Definition: The time when the transport node started to exist in the real world.		
Note: The time part is always set to zero.		
Type: DateTime		Multiplicity: [1]
Attribute: formOfWaterwayNode	INSPIRE	
Definition: Description of the function of a waterway node in the water transport network.		
Type: FormOfWaterwayNodeValue	Size: 14	Multiplicity: [1]
Attribute: reasonForChange		
Definition: The reason for a change made to a feature.		
Type: ChangeValue	Size: 32	Multiplicity: [1]

3.12   FerryTerminal

3.12.1   Overview

The Ferry and Road Network elements are linked together through a FerryTerminal. A FerryTerminal is a logical connection between the two networks and therefore there is no geometry supplied with these features. They will reference one PathNode and one FerryNode. The FerryTerminals will also provide a reference to the OS MasterMap Sites feature.

The context diagram (Figure 13) shows how the FerryTerminal has been inherited from INSPIRE, the attribution held on the FerryTerminal and how it relates to the other Ferry components.
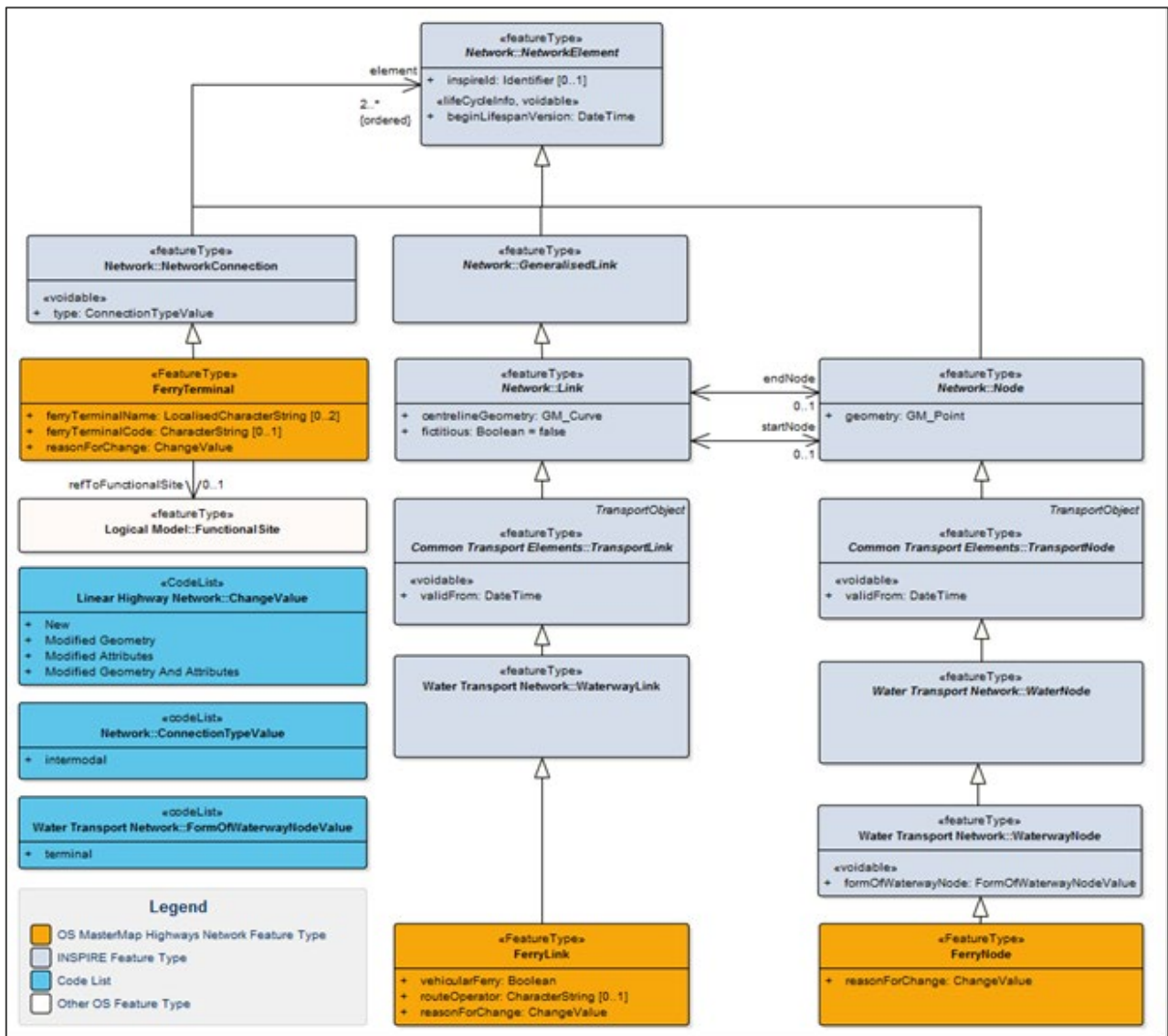
3.12.2   Attributes

«FeatureType» FerryTerminal		
Definition: A logical connection between a PathNode or RoadNode and the FerryNode. It represents the connection between the Road or Path Network and the Ferry Network.		
Attribute: id		
Definition: Unique identifier; for FerryTerminal, this is a TOID.		
Type: CharacterString	Size: 20	Multiplicity: [1]
Attribute: identifier		
Definition: Uniform Resource Identifier		
Type: CharacterString	Size: 37	Multiplicity: [1]
Attribute: inspireId INSPIRE		
Definition: External object identifier of the spatial object.		
Type: Identifier		Multiplicity: [0..1]
Attribute: beginLifespanVersion INSPIRE		
Definition: Date and time at which this version of the spatial object was inserted or changed in the spatial data set.		
Note: The time part is always set to zero.		
Type: DateTime		Multiplicity: [1]
Attribute: type INSPIRE		
Definition: Categorisation of the network connection.		
Type: ConnectionTypeValue	Size: 10	Multiplicity: [1]
Attribute: ferryTerminalName		
Definition: The name of the Ferry Terminal.		

«FeatureType» FerryTerminal		
Note: Where a feature has more than one name, the language of each name is provided as a 3-digit ISO 639-2 code ('eng', 'cym', 'gla').		
Type: LocalisedCharacterString	Size: 120	Multiplicity: [0..2]
Attribute: ferryTerminalCode		
Definition: The recognised code of the Ferry Terminal.		
Type: CharacterString	Size: 10	Multiplicity: [0..1]
Attribute: reasonForChange		
Definition: The reason for a change made to a feature.		
Type: ChangeValue	Size: 32	Multiplicity: [1]
Association: refToFunctionalSite		
Definition: Reference to the Site representation of the Ferry Terminal in OS MasterMap Sites Layer.		
Multiplicity: 0..1	Size: 20	
Aggregation: element	INSPIRE	
Definition: The reference to the RoadNode or PathNode and the FerryNode. The type of node the element is referencing will be identified through the xlink:title.		
Multiplicity: 2..*	Size: 20	

3.13   Maintenance

3.13.1   Overview

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

Note: Maintenance responsibility is not an indication of ownership.
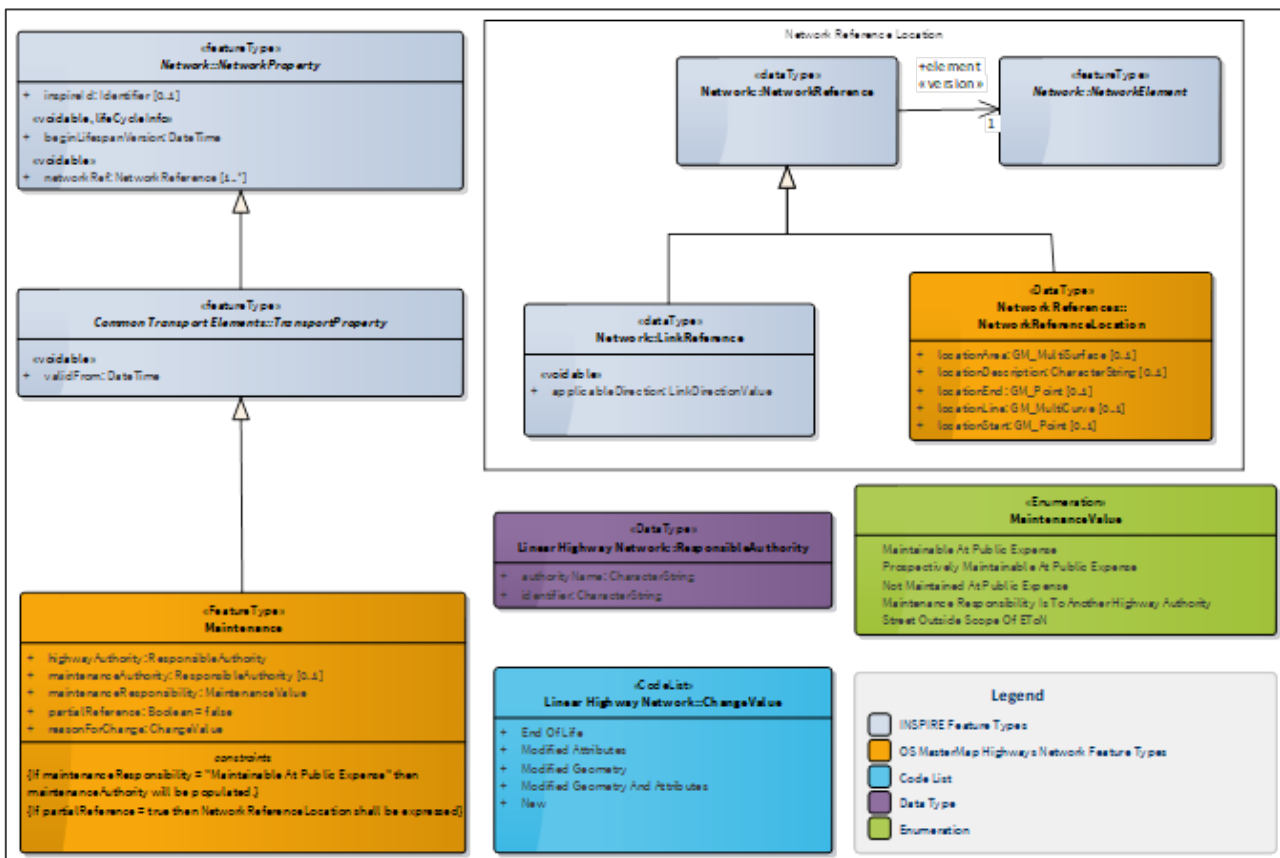
Figure 14: Context diagram: Maintenance

A Maintenance feature will reference back to the Path Network through a Network Reference and will reference a Street Feature. Features which are a partial reference will provide a Network Reference Location. For more information on Network References, see Section 3.2.

3.13.2   Attribution

«FeatureType» Maintenance
Definition: Indication of whether the highway is maintained by a Highways Authority, Local Highways Authority, Road Authority or privately.
Constraints: - If maintenanceResponsibility = "Maintainable At Public Expense" then maintenanceAuthority will be populated.   - If partialRefernce = true then NetworkReferenceLocation shall be expressed.

Attribute: id		
Definition: Unique identifier		
Type: CharacterString	Size: 17	Multiplicity: [1]

Attribute: identifier	
Definition: Uniform Resource Identifier	
Type: CharacterString	Size: 35	Multiplicity: [1]

Attribute: inspireId	INSPIRE
Definition: External object identifier of the spatial object.	
Type: Identifier	Multiplicity: [0..1]

Attribute: beginLifespanVersion «voidable»	INSPIRE
Definition: Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	
Note: The time part is always set to zero.	
Type: DateTime	Multiplicity: [1]

Attribute: networkRef «voidable»	INSPIRE
Definition: Spatial reference of the network-related property.	
Type: NetworkReference	Multiplicity: [1..*]

Attribute: validFrom «voidable»	INSPIRE
Definition: The time when the transport property started to exist in the real world.	
Note: The time part is always set to zero.	
Type: DateTime	Multiplicity: [1]

Attribute: maintenanceResponsibility		
Definition: Indication of whether the highway is maintainable at public expense.		
Type: MaintenanceValue	Size: 44	Multiplicity: [1]

«FeatureType» Maintenance		
Attribute: maintenanceAuthority		
Definition: Authority responsible for maintenance of the highway.		
Note: When maintenanceResponsibility = 'Not Maintained at Public Expense' the maintenanceAuthority will be null.		
Type: ResponsibleAuthority		Multiplicity: [0..1]
Attribute: partialReference		
Definition: Flag to indicate that the maintenance feature partially references a Street.		
Type: Boolean	Size: 5	Multiplicity: [1]
Attribute: highwayAuthority		
Definition: The authority which the highway resides in.		
Note: When the maintenanceAuthority is Highways England then highwayAuthority will be set to Highways England.		
When maintenanceResponsibility = 'Not Maintained at Public Expense' then this is the authority the works operator must contact when applying to carry out works on this street.		
Type: ResponsibleAuthority		Multiplicity: [1]
Attribute: reasonForChange		
Definition: The reason for a change made to a feature.		
Type: ChangeValue	Size: 32	Multiplicity: [1]

3.14   Reinstatement

3.14.1   Overview

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

A Reinstatement feature will reference back to the Path Network through a Network Reference and will reference a Street Feature. Features which are a partial reference will provide a Network Reference Location. For more information on Network References, see Section 3.2.
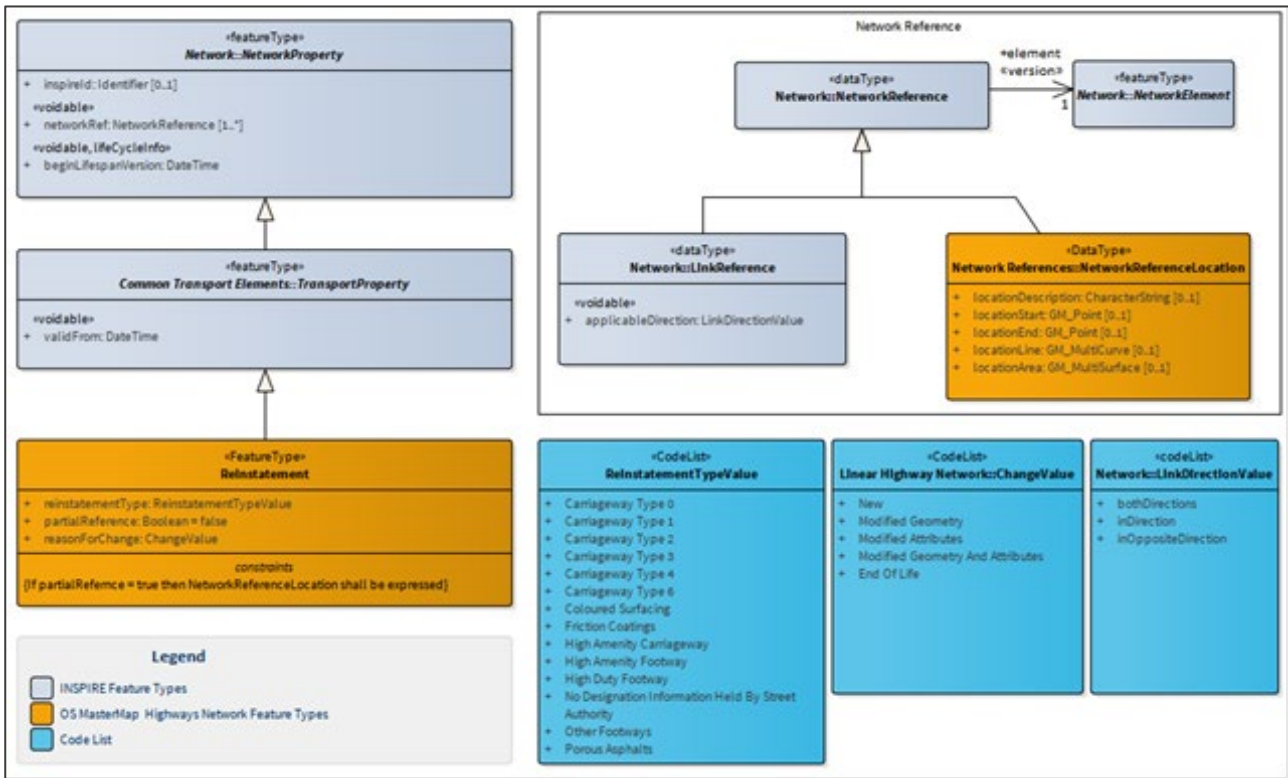
Figure 15: Context diagram: Reinstatement

3.14.2 Attribution

«FeatureType» Reinstatement		
Definition: The standard to which the highway must be restored to following street works.		
Constraints: If partialRefernce = true then NetworkReferenceLocation shall be expressed.		
Attribute: id		
Definition: Unique identifier		
Type: CharacterString	Size: 17	Multiplicity: [1]
Attribute: identifier		
Definition: Uniform Resource Identifier		
Type: CharacterString	Size: 35	Multiplicity: [1]
Attribute: inspireId		INSPIRE
Definition: External object identifier of the spatial object.		
Type: Identifier		Multiplicity: [0..1]
Attribute: beginLifespanVersion «voidable»		INSPIRE

«FeatureType» Reinstatement	
Definition: Date and time at which this version of the spatial object was inserted or changed in the spatial data set.	
Note: The time part is always set to zero.	
Type: DateTime	Multiplicity: [1]
Attribute: networkRef «voidable»	INSPIRE
Definition: Spatial reference of the network-related property.	
Type: NetworkReference	Multiplicity: [1..*]
Attribute: validFrom «voidable»	INSPIRE
Definition: The time when the transport property started to exist in the real world.	
Note: The time part is always set to zero.	
Type: DateTime	Multiplicity: [1]
Attribute: reinstatementType	
Definition: Reinstatement as defined in the Specification for Reinstatement of Opening in Highways codes of practice in England and Wales and the Specification for the Reinstatement of Openings in Roads in Scotland.	
Type: ReinstatementTypeValue	Size: 51	Multiplicity: [1]
Attribute: partialReference	
Definition: Flag to indicate that the maintenance feature partially references a Street.	
Type: Boolean	Size: 5	Multiplicity: [1]
Attribute: reasonForChange	
Definition: The reason for a change made to a feature.	
Type: ChangeValue	Size: 32	Multiplicity: [1]

3.15   SpecialDesignation

3.15.1   Overview

Special Designations are statutory and advisory designations that can be applied to protect a highway when street or road works are to be undertaken.

A Special Designation feature will reference back to the Path Network through Network Reference and will reference a Street Feature. Features which are a partial reference will provide a Network Reference Location. For more information on Network References, see Section 3.2.
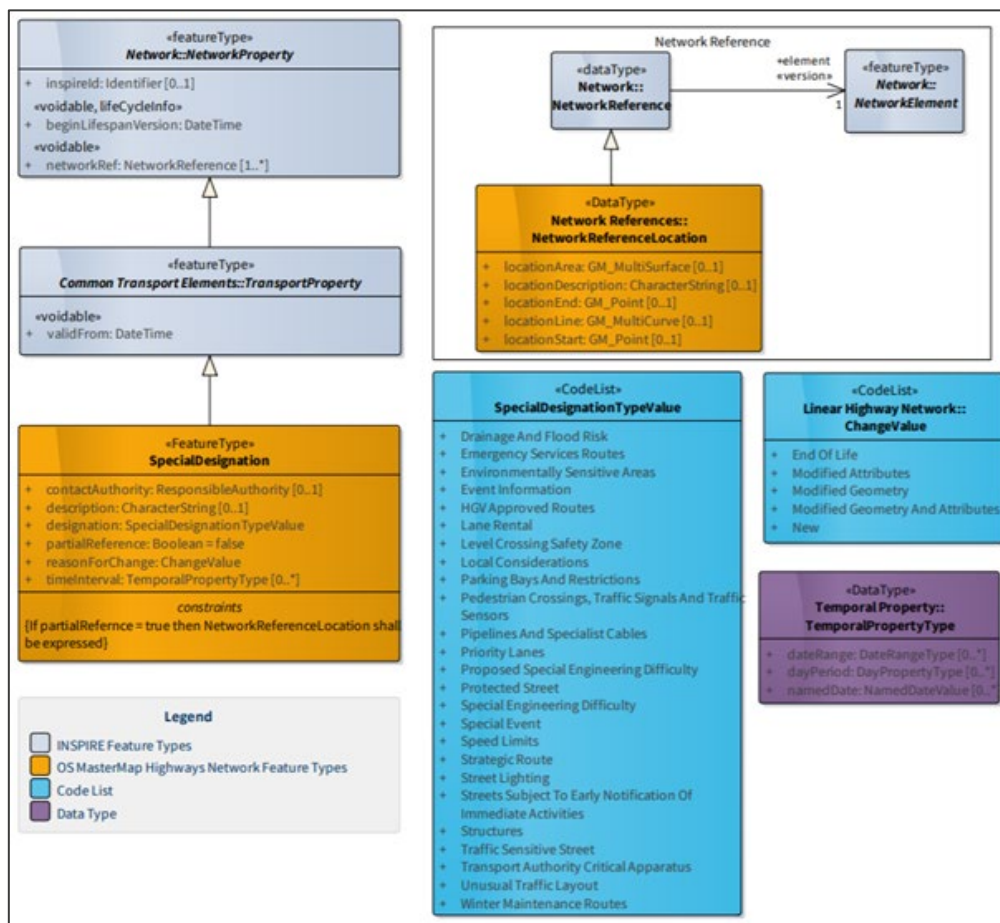
Figure 16: Context diagram: SpecialDesignation

3.15.2   Attribution

«FeatureType» SpecialDesignation		
Definition: A description applied to a highway to protect it during Street or Road Works		
Constraints: If partialRefernce = true then NetworkReferenceLocation shall be expressed.		
Attribute: id		
Definition: Unique identifier		
Type: CharacterString	Size: 17	Multiplicity: [1]
Attribute: identifier		
Definition: Uniform Resource Identifier		
Type: CharacterString	Size: 35	Multiplicity: [1]
Attribute: inspireId		INSPIRE
Definition: External object identifier of the spatial object.		
Type: Identifier		Multiplicity: [0..1]
Attribute: beginLifespanVersion «voidable»		INSPIRE
Definition: Date and time at which this version of the spatial object was inserted or changed in the spatial data set.		
Note: The time part is always set to zero.		
Type: DateTime		Multiplicity: [1]
Attribute: networkRef «voidable»		INSPIRE
Definition: Spatial reference of the network-related property.		
Type: NetworkReference		Multiplicity: [1..*]
Attribute: validFrom «voidable»		INSPIRE
Definition: The time when the transport property started to exist in the real world.		
Note: The time part is always set to zero.		
Type: DateTime		Multiplicity: [1]
Attribute: validTo «voidable»		INSPIRE
Definition: The time from which the transport property no longer exists in the real world.		
Note: The time part is always set to zero.		
Type: DateTime		Multiplicity: [1]
Attribute: designation		
Definition: Type of Special Designation.		

«FeatureType» SpecialDesignation		
Type: SpecialDesignationTypeValue	Size: 30	Multiplicity: [1]
Attribute: description		
Definition: Additional information describing the special designation.		
Type: CharacterString	Size: 50	Multiplicity: [0..1]
Attribute: timeInterval		
Definition: Time period to which the restriction applies.		
Type: TemporalPropertyType		Multiplicity: [0..1]
Attribute: contactAuthority		
Definition: Highway authority to be contacted for further consultation about the special designation.		
Type: ResponsibleAuthority		Multiplicity: [0..1]
Attribute: partialReference		
Definition: Flag to indicate that the maintenance feature partially references a Street.		
Type: Boolean	Size: 5	Multiplicity: [1]
Attribute: reasonForChange		
Definition: The reason for a change made to a feature.		
Type: ChangeValue	Size: 32	Multiplicity: [1]

3.16   HighwayDedication

3.16.1   Overview

Highway dedication provides an indication of the type of Highway user who has access to that particular section of the Highway.

Against every section of geometry supplied by the local highway authority there will be one of eight different types of Highway Dedication defined in the Highways Act 1980 and the Countryside and Rights of Way Act 2000 which determines the Highway user access.

There can only be one Highway Dedication type applied to the geometry at any given date or time.

It is likely that more than one Highway Dedication type applies to a section of Highway (i.e. a highway open to all vehicles will also have pedestrian way or footway access) so the following is an order of priority where the highway dedications under each is inferred:

- Motorway *
- All Vehicles
- Byway Open to All Traffic

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* Motorways and Cycle Tracks (not Cycle Ways) impose restrictions on all other Highway users.

- Restricted Byway
- Cycle Track * or Cycle Way
- Bridleway
- Pedestrian Way or Footpath

The Highway Dedication also identifies if the feature forms part of a National Cycle Route, Public Right of Way, Quiet Route, Physical Obstruction or Planning Order or Vehicular Traffic order exist.

Note: The Highway dedication value is only an inference of where a Public Right of Way exists and therefore not the definitive record of Public Rights of Way, that is the definitive map held by the relevant authority.

A Highway Dedication feature will reference back to the Path Network through Network Reference and will reference a RoadLink or Street Feature. For more information on Network References, see Section 3.2.

The Highway Dedication Feature Type is not extended to Scotland because this information does not exist in the source local authority data.
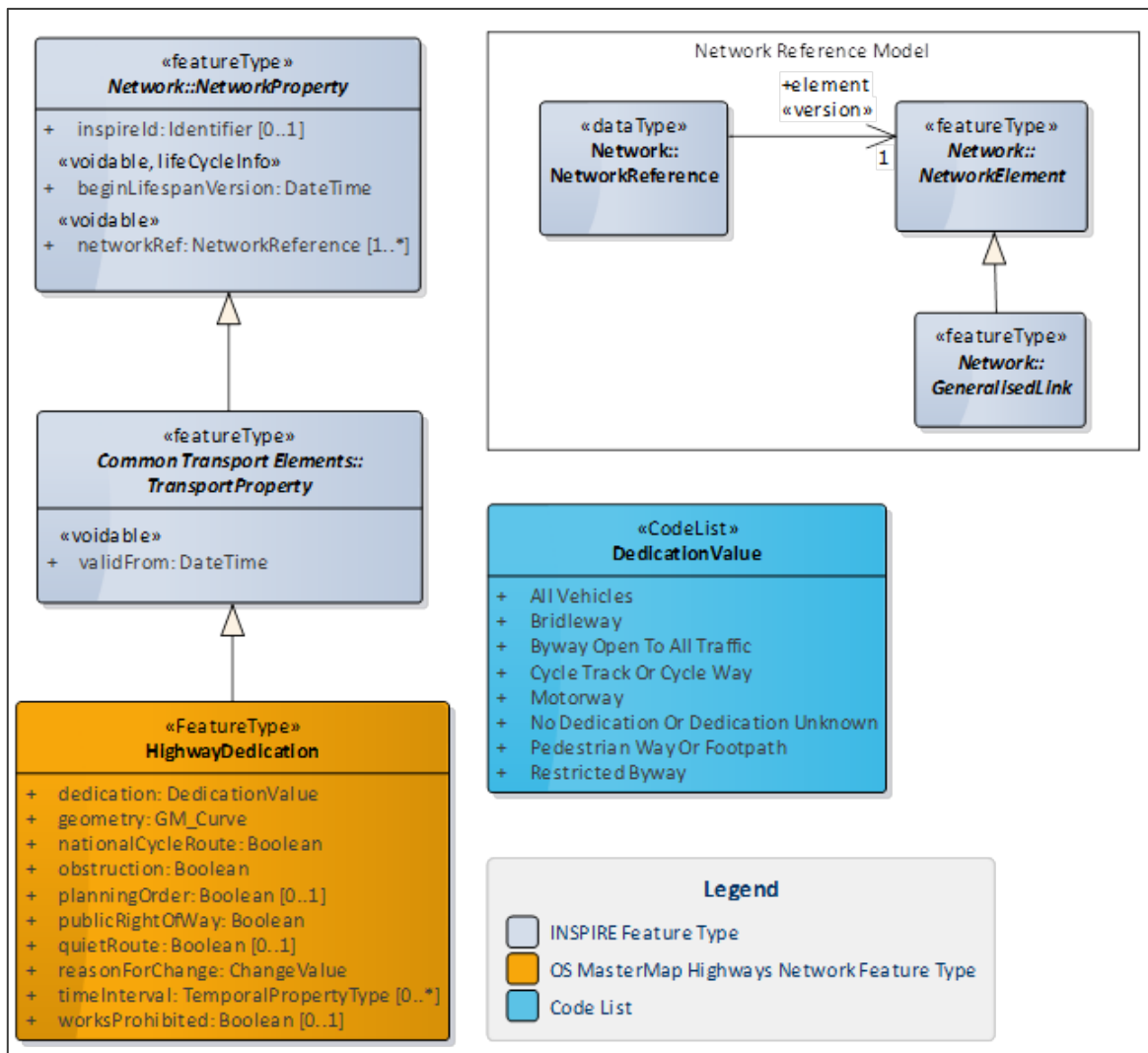
Figure 17: Context diagram: HighwayDedication

3.16.2 Attribution

«FeatureType» HighwayDedication		
Definition: Definition of which type of Highway user has access to a particular section of the Highway.		
Attribute: id		
Definition: Unique identifier		
Type: CharacterString	Size: 20	Multiplicity: [1]
Attribute: identifier		
Definition: Uniform Resource Identifier		
Type: CharacterString	Size: 37	Multiplicity: [1]
Attribute: inspireId	INSPIRE	
Definition: External object identifier of the spatial object.		
Type: Identifier		Multiplicity: [0..1]
Attribute: beginLifespanVersion «voidable»	INSPIRE	
Definition: Date and time at which this version of the spatial object was inserted or changed in the spatial data set.		
Note: The time part is always set to zero.		
Type: DateTime		Multiplicity: [1]
Attribute: networkRef «voidable»	INSPIRE	
Definition: Spatial reference of the network-related property.		
Type: NetworkReference		Multiplicity: [1..*]
Attribute: validFrom «voidable»	INSPIRE	
Definition: The time when the transport property started to exist in the real world.		
Note: The time part is always set to zero.		
Type: DateTime		Multiplicity: [1]
Attribute: reasonForChange		
Definition: The reason for a change made to a feature.		
Type: ChangeValue	Size: 32	Multiplicity: [1]
Attribute: dedication		
Definition: The type of Highway Dedication that applies to this section of the Street.		
Type: DedicationValue	Size: 35	Multiplicity: [1]
Attribute: timeInterval		

«FeatureType» HighwayDedication		
Definition: Time period to which the dedication applies.		
Type: TemporalPropertyType		Multiplicity: [0..*]
Attribute: publicRightOfWay		
Definition: An indication if the dedication is subject to a public right of way.		
Type: Boolean	Size: 5	Multiplicity: [1]
Attribute: nationalCycleRoute		
Definition: An indication if the dedication is subject to a formal cycle classification.		
Type: Boolean	Size: 5	Multiplicity: [1]
Attribute: quietRoute		
Definition: An indication if the dedication is subject to a quiet route.		
Type: Boolean	Size: 5	Multiplicity: [0..1]
Attribute: obstruction		
Definition: An indication if the dedication contains a physical obstruction to vehicles.		
Type: Boolean	Size: 5	Multiplicity: [1]
Attribute: planningOrder		
Definition: An indication if a pedestrian planning order applies to the dedication.		
Type: Boolean	Size: 5	Multiplicity: [0..1]
Attribute: worksProhibited		
Definition: An indication if the dedication has a Traffic Regulation Order prohibiting any works in the Highway at all times.		
Type: Boolean	Size: 5	Multiplicity: [0..1]
Attribute: geometry		
Definition: The geometry that represents the centreline of the dedication.		
Type: GM_Curve		Multiplicity: [1]

3.17   Data types

3.17.1   Identifier

The Identifier is an INSPIRE data type and its elements make up the "inspireId" attribute which can be found across all feature types in the OS MasterMap Highways Network.

«DataType» Identifier		
Definition: External unique object identifier published by the responsible body, which may be used by external applications to reference the spatial object.		
Attribute: localId		
Definition: The local identifier is unique within the namespace, that is no other spatial object carries the same unique identifier.		
Type: CharacterString	Size: 16	Multiplicity: [1]
Attribute: namespace		
Definition: Namespace uniquely identifying the data source of the spatial object.		
Type: CharacterString	Size: 18	Multiplicity: [1]

3.17.2   CycleFacilityType

A PathLink could be attributed with "cycleFacility" with a data type of "CycleFacilityType". The attribution of this data type is detailed below.

«DataType» CycleFacilityType	
Attribute: cycleFacility	
Definition: The cycle amenity available along the link.	
Type: CycleFacilityValue	Multiplicity: [1]
Attribute: wholeLink	
Definition: Identifies if the facility applies to entirety of the link.	
Type: Boolean	Multiplicity: [1]

3.17.3 ElevationGainType

A PathLink could be attributed with "elevationGain" with a data type of "ElevationGainType". The attribution of this data type is detailed below.

«DataType» ElevationGainType	
Attribute: inDirection	
Definition: Total increase in height experienced when passing along the link from the start to the end.	
Type: Measure	Multiplicity: [1]
Attribute: inOppositeDirection	
Definition: Total increase in height experienced when passing along the link from the end to the start.	
Type: Measure	Multiplicity: [1]

3.17.4 OperationalStateType

Streets are attributed with an "operationalState" with a data type of "OperationalStateType". The attribution of this data type is detailed below.

«DataType» OperationalStateType		
Attribute: state		
Definition: Indicator identifying the physical nature of the road, for example, Under Construction		
Type: OperationalStateValue	Size: 19	Multiplicity: [1]
Attribute: validTime		
Definition: If known, the real-world start and end date/times when the state applies.		
Type: TM_Period		Multiplicity: [0..1]
Attribute: reason		
Definition: Short description of the reason for closure.		
Type: CharacterString	Size: 120	Multiplicity: [0..1]

3.17.5   DesignatedNameType

Streets are attributed with a "designatedName" with a data type of "DesignatedNameType". The attribution of this data type is detailed below.

«DataType» DesignatedNameType		
Definition: The name assigned to the road or street by a designated Street Naming Authority.		
Attribute: name		
Definition: Official name assigned to the highway by a designated Street Naming Authority.		
Note: Where a feature has more than one name, the language of each name is provided as a 3-digit ISO 639-2 code ('eng', 'cym', 'gla').		
Type: LocalisedCharacterString	Size: 255	Multiplicity: [1]
Attribute: namingAuthority		
Definition: The Street Naming Authority for the designatedName.		
Type: ResponsibleAuthority		Multiplicity: [1]

3.17.6   ResponsibleAuthority

Street, Maintenance and SpecialDesignation feature types are made up with the 'ResponsibleAuthority' feature type. The below table illustrates what attribution makes up this data type.

«DataType» ResponsibleAuthority		
Definition: The authority responsible for the street naming and numbering or maintenance.		
Attribute: identifier		
Definition: Identification code used to identify the authority Example: 0114		
Type: CharacterString	Size: 4	Multiplicity: [1]
Attribute: authorityName		
Definition: Official name of the authority Example: Bath and North East Somerset		
Type: CharacterString	Size: 100	Multiplicity: [1]

3.17.7 TemporalPropertyType

SpecialDesignations have a property of 'timeInterval' which has the type of 'TemporalPropertyType'. The below table describes this data type and Figure 18 illustrates how it is made up. There is a hierarchal structure to the Temporal Properties which is shown in Figure 7.
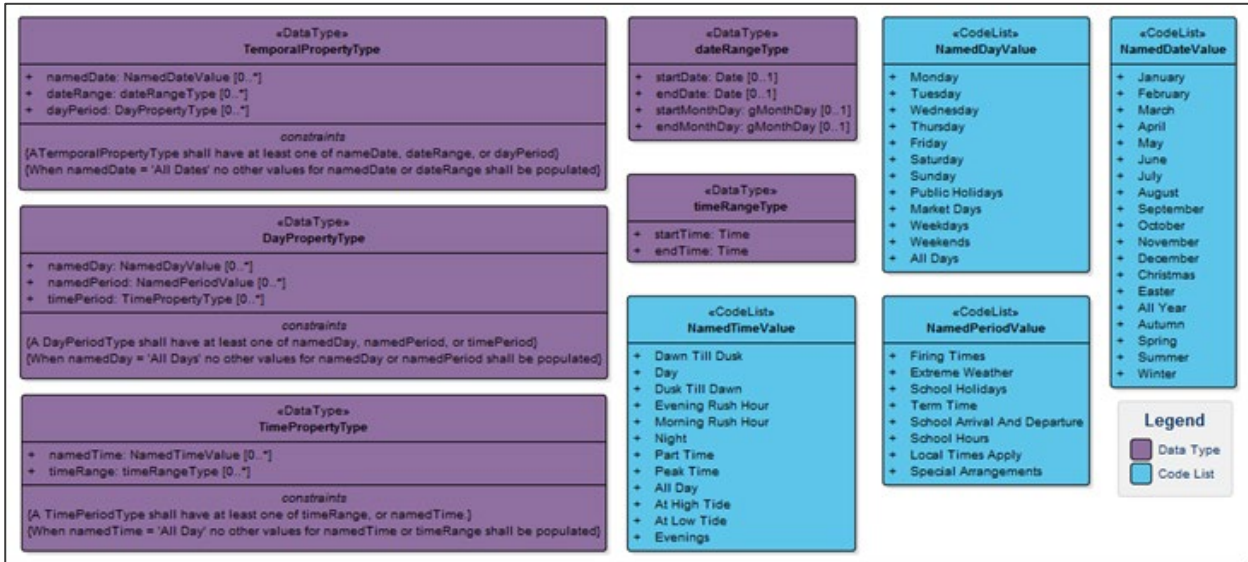
Figure 18: Temporal property structure

«DataType» TemporalPropertyType	
Definition: The time period which a restriction is in place.	
Constraints A TermporalPropertyType shall have at least one of namedDate, dateRange, or dayPeriod When namedDate = 'All Dates' no other values for namedDate or dateRange shall be populated	
Attribute: namedDate	
Definition: The named month or period this time interval applies.	
Type: NamedDateValue	Multiplicity: [0..*]
Attribute: dateRange	
Definition: The range of dates the time restriction is in place for.	
Type: DateRangeType	Multiplicity: [0..*]
Attribute: dayPeriod	
Definition: A restriction which applies on a specified day.	
Type: DayPropertyType	Multiplicity: [0..*]

3.17.8   DateRangeType

The "dateRange" attribute on the 'TemporalPropertyType' has a data type of "DateRangeType". The below table describes how this data type is constructed.

«DataType» DateRangeType	
Attribute: startDate	
Definition: The date which the restriction applies starts. This will be in the format YYYY-MM-DD.	
Type: Date	Multiplicity: [0..1]
Attribute: endDate	
Definition: The date which the restriction applies ends. This will be in the format YYYY-MM-DD.	
Type: Date	Multiplicity: [0..1]

3.17.9   DayPropertyType

The "dayPeriod" attribute on the 'TemporalPropertyType' has a data type of "DayPropertyType". The below table describes how this data type is constructed.

«DataType» DayPropertyType	
Constraints: A DayPropertyType shall have at least one of namedDay, namedPeriod, or timePeriod. When namedDay = 'All Days' no other values for namedDay or namedPeriod shall be populated.	
Attribute: namedDay	
Definition: The named day this restriction applies to.	
Type: NamedDayValue	Multiplicity: [0..*]
Attribute: namedPeriod	
Definition: The named period this restriction applies to.	
Type: NamedPeriodValue	Multiplicity: [0..*]
Attribute: timePeriod	
Definition: The period of time on the specified day which the restriction applies.	
Type: TimePropertyType	Multiplicity: [0..*]

3.17.10   TimePropertyType

The "timePeriod" attribute on the 'DayPropertyType' has a data type of "TimePropertyType". The below table describes how this data type is constructed.

«DataType» TimePropertyType	
Constraints A TimePropertyType shall have at least one of timeRange, or namedTime. When namedTime = 'All Day' no other values for namedTime or timeRange shall be populated	
Attribute: namedTime	
Definition: These are named time periods that do not relate to the same time each day	
Type: NamedTimeValue	Multiplicity: [0..*]
Attribute: timeRange	
Definition: The range of time which a restriction applies.	
Type: TimeRangeType	Multiplicity: [0..*]

3.17.11   TimeRangeType

The "timeRange" attribute on the 'TimePropertyType' has a data type of "TimeRangeType". The below table describes how this data type is constructed.

«DataType» timeRangeType	
Attribute: startTime	
Definition: The time the restriction begins	
Type: Time	Multiplicity: [1]
Attribute: endTime	
Definition: The time the restriction ends.	
Type: Time	Multiplicity: [1]

3.18   Code lists

3.18.1   ChangeValue

The 'reasonForChange' attribute is used across all features found within the OS MasterMap Highways Network. The table below describes the codes which will be used to populate this field and the description for each code.

Code List: ChangeValue	
https://www.ordnancesurvey.co.uk/xml/codelists/ChangeTypeValue.xml	
Code	**Description**
New	New feature has been added.
Modified Geometry	The geometry of the feature has been altered
Modified Attributes	One or more attribute properties have been altered
Modified Geometry and Attributes	Geometry and attribution properties have been altered
End of Life	The feature has been removed from Ordnance Survey's master database. This value will only be used with Change Only Update orders.

3.18.2   FormOfWayValue

The PathLink feature is attributed with a "formOfWay" property with the data type of FormOfWayValue. The following table describes the codes used to populate this field.

Code List: FormOfWayValue	
http://www.ordnancesurvey.co.uk/xml/codelists/FormOfWayTypeValue.xml	
Code	**Description**
Track	An unmade way created by the passage of vehicles.
Canal Path	A path which runs alongside a canal.
Footbridge	A structure that is built over a river, railway, road or ravine to permit the flow of pedestrians of cyclists.
Path With Ford	A path where all or parts run through an area where a river or stream crosses.
Path	A made surface for use by pedestrians
Path With Steps	A made path that includes an area using a series of raised areas which links surfaces at different heights.
Subway	A structure that is built under a road to permit the flow of pedestrians or cyclists.
Path With Level Crossing	A made path that includes all or part where a railway line intersects with the path at the same level.

3.18.3 SurfaceTypeValue

The PathLink feature is attributed with a "surfaceType" with a data type of "SurfaceTypeValue". The table below describes the codes used to populate this field and the description for each code.

Code List: SurfaceTypeValue	
http://www.os.uk/xml/codelists/highways/SurfaceTypeValue.xml	
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.
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 unbonded 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 have been employed as a mesh/grid or similar form; to allow vegetation to grow and water to drain through the surface.
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.

3.18.4 MatchStatusValue

The PathLink feature is attributed with a "matchStatus" with a data type of "MatchStatusValue". The table below describes the codes used to populate this field and the description for each code.

Code List: MatchStatusValue	
http://www.ordnancesurvey.co.uk/xml/codelists/highways/MatchStatusValue.xml	
Value	**Description**
Matched	The RoadLink has been matched with an Elementary Street Unit from the NSG.
No Match	The RoadLink has not been matched with an Elementary Street Unit from the NSG which has been accepted.
Not Matched Awaiting Review	The RoadLink has not been matched with an Elementary Street Unit from the NSG and is waiting to be manually reviewed to identify if there is an Elementary Street Unit it should have been matched too.
Matched With Attribute Discrepancy	The RoadLink has been matched with an Elementary Street Unit from the NSG and there is a discrepancy between the attribution supplied by the NSG and information from OS.

3.18.5   ProvenanceSourceValue

The PathLink and Street feature are attributed with a "provenance" property with the data type of ProvenanceSourceValue. The following table identifies the codes used to populate this field.

Code List: ProvenanceSourceValue	
http://www.ordnancesurvey.co.uk/xml/codelists/highways/ProvenanceSourceValue.xml	
Value	**Description**
Highways England	The source for the geometry of the feature is Highways England
Local Highway Authority	The source for the geometry of the feature is Local Highways Authority
Ordnance Survey	The source for the geometry of the feature is Ordnance Survey
Transport Scotland	The source for the geometry of the feature is Transport Scotland
Welsh Government	The source for the geometry of the feature is Welsh Government
OS Urban And OS Height	Data captured to 0.5m planimetric accuracy and elevation obtained from drape of OS detailed height content.
OS Rural And OS Height	Data captured to 1.1m planimetric accuracy and elevation obtained from drape of OS detailed height content.
OS Moorland And OS Height	Data captured to 4.1m planimetric accuracy and elevation obtained from drape of OS detailed height content.
OS Urban And Interpolated OS Height	Data captured to 0.5m planimetric accuracy and elevation interpolated from OS detailed height content and other OS data.
OS Rural And Interpolated OS Height	Data captured to 1.1m planimetric accuracy and elevation interpolated from OS detailed height content and other OS data.
OS Moorland And Interpolated OS Height	Data captured to 4.1m planimetric accuracy and elevation interpolated from OS detailed height content and other OS data.
OS Urban And Low Confidence OS Height	Data captured to 0.5m planimetric accuracy, elevation obtained from drape of OS detailed height content but expected to be low quality.
OS Rural And Low Confidence OS Height	Data captured to 1.1m planimetric accuracy, elevation obtained from drape of OS detailed height content but expected to be low quality.
OS Moorland And Low Confidence OS Height	Data captured to 4.1m planimetric accuracy, elevation obtained from drape of OS detailed height content but expected to be low quality.

3.18.6 CycleFacilityValue

The "CycleFacilityType" data type is attributed with a "cycleFacility" property with the data type of "CycleFacilityValue". The following table describes the codes used to populate this field.

This value is provided from the National Street Gazetteer and Ordnance Survey data collection. Currently only "Unknown Type Of Cycle Route Along Footway" is available for population. The other values are for future use.

Code List: CycleFacilityValue	
http://www.ordnancesurvey.co.uk/xml/codelists/CycleFacilityValue.xml	
Value	**Description**
Marking Segregated Cycle Route Along Footway	A cycle way along a path shared with other users with segregation indicated by markings.
Physically Segregated Cycle Route Along Footway	A cycle way along a path shared with other users with segregation physically enforced by kerbs, posts, barriers or similar.
Shared Use Cycle Route Along Footway	A cycle way along a path shared with other users without any segregation.
Unknown Type Of Cycle Route Along Footway	A cycle way along a footway where the detailed nature is not known.
Signed Cycle Route	A route identified for cyclists along roads that is signed but does not have any significant infrastructure along the road such as road markings or kerbs. For example, Sustrans routes along quiet roads.

3.18.7 FormOfRoadNodeValue

The PathNode feature is attributed with a "formOfRoadNode" property with the data type of FormOfRoadNodeValue. The following table describes the codes used to populate this field.

The code list has been inherited from INSPIRE and is not extendable.

Code List: FormOfRoadNodeValue	
http://inspire.ec.europa.eu/codelist/FormOfRoadNodeValue/	
Code	**Description**
junction	Three or more road links intersect at the node.
pseudo node	Exactly two links connect to the node.
road end	Only one link connects to the node. It signifies the end of a path.

3.18.8   RoadNodeClassificationValue

The PathNode feature is attributed with a "classification" property with the data type of RoadNodeClassificationValue. The following table describes the codes used to populate this field.

Code List: RoadNodeClassificationValue
Additional classification of the road node.
For example, if a node represents a roundabout it may also be classified as a mini roundabout.
http://www.ordnancesurvey.co.uk/xml/codelists/highways/RoadNodeClassificationValue.xml

Code	Description
Grade Separation	A node which represents where there is a difference in physical level of either two PathLinks, or a PathLink and a RoadLink, and in the real world they do not meet and split here.

3.18.9   OperationalStateValue

Street is attributed with an "operationalState" with a data type of "OperationalStateType". This data type has the attribute of 'state' with a data type of "OperationalStateValue". The table below describes the codes which will be used to populate this field and the description for each code.

Code List: OperationalStateValue
http://www.ordnancesurvey.co.uk/xml/codelists/highways/OperationalStateValue.xml

Code	Description
Prospective	Plans have been submitted for development, but construction has not commenced.
Under Construction	Construction has commenced but the road cannot be used.
Open	Open
Temporarily Closed	The way has been temporarily closed for a specified reason under Road Traffic Regulation Act 1984 Section 14 1(b): • streetworks • likelihood of danger to public • Litter clearing or cleaning (duty imposed by section 89(1)(a) or (2) of the Environmental Protection Act 1990 (litter clearing and cleaning) to be discharged) *Note: The operationalState shall only be set to Temporarily Closed when the duration of the closure is intended to last more than 4 weeks.*
Permanently Closed	A Street that has been permanently blocked up according to a Stopping Up Order Constraint: If the Street operationalState = Permanently Closed then the endLifespanVersion shall be set.
Addressing Only	A street which has been created for addressing purposes of the Local Land and Property Gazetteer (LLPG).

3.18.10 StreetTypeValue

The Street feature is attributed with a "streetType" property with the data type of StreetTypeValue. The following table describes the codes used to populate this field.

Code List: StreetStateTypeValue
http://www.ordnancesurvey.co.uk/xml/codelists/highways/StreetTypeValue.xml

Code	Description
Designated Street Name	Officially named street
Officially Described Street	Officially described street
Numbered Street	Officially numbered street
Unofficial Street Name	Unofficial local name for a street
Street for addressing purposes only	A street which has been created for addressing purposes of the Local Land and Property Gazetteer (LLPG).

3.18.11 ConnectionTypeValue

The FerryTerminal feature is attributed with a "type" property with the data type of ConnectionTypeValue. The following table describes the codes used to populate this field.

The code list has been inherited from INSPIRE and is not extendable.

Code List: ConnectionTypeValue
Types of connections between different networks.
http://inspire.ec.europa.eu/codelist/ConnectionTypeValue

Code	Description
intermodal	Connection between two network elements in different transport networks that use a different transport mode. The connection represents a possibility for the transported media (people, goods, etc.) to change from one transport mode to another.

3.18.12 FormOfWaterwayNodeValue

The FerryNode feature is attributed with a "formOfWaterwayNode" property with the data type of FormOfWaterwayNode Value. The following table describes the codes used to populate this field.

The code list has been inherited from INSPIRE and is not extendable.

Code List: FormOfWaterwayNode Value
Function of a Waterway Node in the water transport network.
http://inspire.ec.europa.eu/codelist/FormOfWaterwayNodeValue

Code	Description
water terminal	The location where goods are transhipped.

3.18.13   DedicationValue

The HighwayDedication feature has the field 'dedication' which has the value populated from 'DedicationValue'. The table below identifies the codes used to populate this field and a description for each code.

These codes conform to the legal categories of highway as defined in the Highway Act 1980 and Countryside and Rights of Way Act 2000, with the exception of "No Dedication Or Dedication Unknown".

Dedications indicate the legal access status for a given feature only, no indication as to its physical accessibility is made in this attribute.

Code List: DedicationValue http://www.ordnancesurvey.co.uk/xml/codelists/highways/HighwayDedicationValue.xml	
Code	**Description**
Byway Open To All Traffic	A Byway with rights for all vehicles
Pedestrian Way Or Footpath	A Way for pedestrians only. Also known as a Pedestrian Way or Walkway. Excludes Footway.
Cycle Track or Cycle Way	Cycle Track: A highway for cyclists and pedestrians which is maintainable at public expense. Cycle Way: Any Way designed for the use of cycles and from which other wheeled traffic is excluded.
All Vehicles	Highway open for all vehicles
Restricted Byway	Highway with rights for pedestrians, horse riders, cyclists and horse-drawn vehicles, but not for mechanically propelled vehicles.
Bridleway	A highway with rights of passage for pedestrians, cyclists and horse riders only.
Motorway	The commonest type of Special Road which is restricted to two classes of vehicles
No Dedication Or Dedication Unknown	A Highway Dedication type that is currently unknown and is still under investigation, or Has been proven to have no public rights of access

3.18.14   ReinstatementTypeValue

The Reinstatement feature type has the property 'reinstatementType' which has the type 'ReinstatementTypeValue'. The table below identifies the codes used to populate this field.

Code List: ReinstatementTypeValue Reinstatement as defined in the SROH codes of practice. http://www.os.uk/xml/codelists/highways/ReinstatementTypeValue.xml	
Codes	**Descriptions**
Carriageway Type 0	The carriageway has a limiting capacity between 30 and 125 Million Standard Axles
Carriageway Type 1	The carriageway has a limiting capacity between 10 and 30 Million Standard Axles
Carriageway Type 2	The carriageway has a limiting capacity between 2.5 and 10 Million Standard Axles
Carriageway Type 3	The carriageway has a limiting capacity between 0.5 and 2.5 Million Standard Axles
Carriageway Type 4	The carriageway has a limiting capacity up to 0.5 Million Standard Axles
Carriageway Type 6	The carriageway has a capacity over 125 Million Standard Axles
High Amenity Footway	Routes which have been constructed maintained and surfaced to a high standard.
High Duty Footway	Routes used by an exceptionally large number of pedestrians and/or cyclists
Other Footways	Neither high duty nor high amenity.
No designation information held by Street Authority	There is no reinstatement information.

3.18.15   SpecialDesignationTypeValue

The SpecialDesignation feature has property field 'designationType' which has the type allocated from 'SpecialDesignationTypeValue'. The table below identifies the codes used to populate this field and a description for each code.

'SpecialDesignationTypeValue' coverage varies between LHAs and the individual codes. While coverage for statutory designations is good overall, coverage for some may be sporadic and inconsistent.

Code List: SpecialDesignationTypeValue	
Designation of highways that are subject to special controls when undertaking street or road works http://www.ordnancesurvey.co.uk/xml/codelists/highways/SpecialDesignationTypeValue.xml	
Code	**Description**
Protected Street	Statutory designation which restricts the placement of apparatus by a street or road works undertaker.
Special Engineering Difficulty	Statutory designation relating to streets or parts of streets associated with structures, or streets of extraordinary construction.
Traffic Sensitive Street	Statutory designation that restricts street works to be undertaken during period of high traffic.
Lane Rental	Indication that Street is part of a Lane Rental scheme. Section 74A of NRSWA enables highway authorities, with the approval of the Secretary of State, to charge street works undertakers a daily charge for each day during which their works occupy the highway – commonly referred to as "lane rental" schemes.
Event Information	Indication that this Street has an event planned.
Drainage And Flood Risk	Optional designation that provides details of areas that are susceptible to drainage and flood risk.
Emergency Services Routes	Optional designation that alerts the Works Promoter if there is a need to keep the emergency services informed of proposed works and progress
Environmentally Sensitive Areas	Optional designation that identifies information about the local environment. This includes environmentally sensitive areas, such as sites of specific scientific interest and ancient monuments, or specially cultivated areas containing shrubs, plants or bulbs which shall be reinstated using the same or similar species
HGV Approved Routes	Optional designation that allows Works Promoters to consider the impact on HGVs of restricted traffic flow or alerts the Works Promoter that wide vehicles are commonplace.
Level Crossing Safety Zone	Optional designation and mainly created by a Railway Operator. It identifies an area around a level crossing where, if occupied to carry out works, there is a risk of traffic obstructing the crossing.
Local Considerations	Optional designation that should be used to inform the Works Promoter of any special schemes that may impact working, for example, noise levels.
Parking Bays And Restrictions	Optional designation that provides details of streets with parking meters, residents parking bays and parking restrictions such as yellow lines, red routes, and other permanent parking restrictions.

Code List: SpecialDesignationTypeValue	
Designation of highways that are subject to special controls when undertaking street or road works http://www.ordnancesurvey.co.uk/xml/codelists/highways/SpecialDesignationTypeValue.xml	
Code	**Description**
Pedestrian Crossings, Traffic Signals And Traffic Sensors	Optional designation that captures streets that have signalled controlled pedestrian crossings and permanent traffic signals or any Traffic Sensors in the highway.
Pipelines And Specialist Cables	Optional designation that is created by the Local Highway Authority on behalf of the private sector oil or gas pipeline owner. This designation should be treated as a reminder to consult further, not as an absolute indicator of the nature of the pipeline or cable.
Priority Lanes	Optional designation that allows the Local Highway Authority to identify the location of bus lanes, and Cycle Routes in the street.
Proposed Special Engineering Difficulty	Optional designation used to identify new streets or assets of extraordinary construction. One typical use is to identify the location of a designation during any consultation period. On conclusion of the consultation period this feature will typically become a 'Special Engineering Difficulty'.
Special Event	Optional designation that provides early awareness of special events to Work Promoters to enable them to consider any actions that they may need to take to avoid any works taking place on the street during the time(s) of the Special Event.
Speed Limits	Optional designation that provides information about the speed limit applicable for the street. Only speed limits (signed or as per the legal order) over 40mph are recorded as standard with some LHAs providing 30mph speed limits as well. This data is intended to be used for planning of traffic management and works safety measures.
Strategic Route	Optional designation that is used by Local Highway Authorities to identify Strategic Routes, such as the Primary Route Network. Strategic Routes are identified by the Highways Agency, TfL in London and the South Wales Trunk Road Agent (SWTRA) and North & Mid Wales Trunk Road Agent (NMWTRA) in Wales.
Street Lighting	Optional designation that helps Works Promoters to carry out works in the evenings and at nights by providing relevant information about Street lighting. It is particularly useful for when Part night lighting where a council has a policy of turning lights off during specific hours.
Streets Subject To Early Notification Of Immediate Activities	Optional designation that enables street authorities to designate streets that are particularly vulnerable to traffic. Work Promoters are required to provide early warning of activities to the authority immediately after the activity has commenced.
Structures	Optional designation used by asset owners to identify the existence of a structure that has not been designated as an SED. In cases where this identifies a Bridge, Works Promoters should regard it as a reminder that under Section 88 they must consult the Bridge Authority prior to serving Notices.

<table>
<tr><th colspan="2">Code List: SpecialDesignationTypeValue
Designation of highways that are subject to special controls when undertaking street or road works
http://www.ordnancesurvey.co.uk/xml/codelists/highways/SpecialDesignationTypeValue.xml</th></tr>
<tr><th>Code</th><th>Description</th></tr>
<tr><td>Transport Authority Critical Apparatus</td><td>Optional designation that provides details of transport authority apparatus critical to operations of that authority which if damaged or if interrupted could disrupt or temporarily stop services (for example, HV cables to a rail network).</td></tr>
<tr><td>Unusual Traffic Layout</td><td>Optional designation that provides details of where the layout of existing traffic signs, road markings, studs or verge markers is not in accordance with the Traffic Signs Manual.</td></tr>
<tr><td>Winter Maintenance Route</td><td>Optional designation that helps determine the relative importance a route is given by a Local Highway Authority for clearing and treatment during the winter months.</td></tr>
</table>

3.19   Enumerations

3.19.1   MaintenanceValue

The Maintenance feature type has the property 'maintenanceResponsibility' which has the type 'MaintenanceValue'. The table below identifies the codes used to populate this field and a description for each code.

MaintenanceValue	
Code	**Description**
Maintainable At Public Expense	The highway is maintained at public expense by a responsible highways authority.
Prospectively Maintainable At Public Expense	An application has been submitted to maintain the highway at public expense.
Not maintained at public expense	The highway is not maintained at public expense.
Maintenance Responsibility Is To Another Highway Authority	A National Highway Authority or a Regional Highway Authority is responsible for maintaining the highway.
Street Outside Scope Of EToN	A Street which exists for National Land Property Gazetteer purposes only and is not identifiable as a street on the ground.

4.   How does the product fit together?

OS MasterMap Highways Network – Paths is a relational product. This results in there being relationships between different feature types. This section summarises how the different feature types relate to one another, and which attributes are the primary and foreign keys.

The below table identifies how the feature types relate to one another and which attributes are the primary and foreign keys. This is also represented diagrammatically in Figure 19; the attribute at the arrowhead is the primary key and the attribute at the base of the arrow is the foreign key.

| Source Feature Information		Destination Feature Information	
Feature Type	Foreign Key Attribute	Feature Type	Primary Key Attribute
PathLink	startNode	PathNode	id
PathLink	endNode	PathNode	id
PathLink	relatedRoadArea	TopographicArea	TOID
PathLink	formsPartOf	Path	id
PathLink	formsPartOf	Street	id
ConnectingLink	pathNode	PathNode	id
ConnectingLink	connectingNode	ConnectingNode	id
ConnectingNode	roadLink	RoadLink	id
Path	link	PathLink	id
Street	link	PathLink	id
FerryTerminal	element	PathNode	id
FerryTerminal	element	FerryNode	id
FerryTerminal	refToFunctionalSite	FunctionalSite	id
FerryLink	startNode	FerryNode	id
FerryLink	endNode	FerryNode	id
Maintenance	element	Street	id
Reinstatement	element	Street	id
SpecialDesignation	element	Street	id
HighwayDedication	element	Street	id
HighwayDedication	element	RoadLink	id
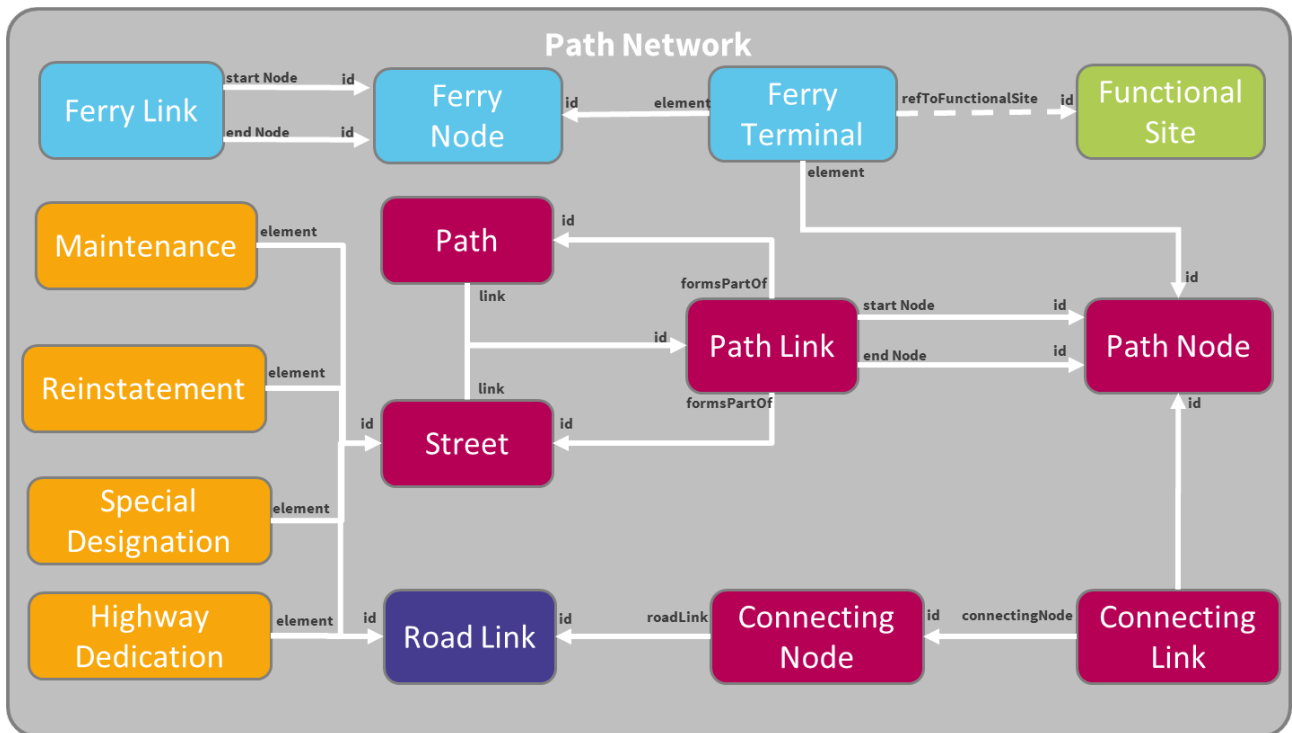
Figure 19: OS MasterMap Highways Network – Paths: relational model

5.   Change-Only Update (COU)

The OS MasterMap Highways Network – Paths can be ordered as either Full Supply or Change-Only Update (COU). The GeoPackage and vector tiles files are full GB coverage so are not available as a COU. The GML structures for Full Supply and COU are different. The differences are fundamentally the open and closing tags which will have an impact on how you choose to load the product. Examples of the different opening and closing tags can be found in Annex A: GML examples. If a customer wishes to move their order from Full Supply to COU then they will need to receive an initial supply and apply the COU file to an initial supply. The COU should not be applied to a Full Supply order.

5.1   Full Supply

When an order for Full Supply is placed, the product will contain all features for the customer's area of interest. When a product refresh is ordered, for this type of order, the supply will contain all the features for the area of interest which will include features that have not changed. This supply mechanism will not explicitly identify which features are new, have been modified or have been removed. This can still be identified by querying the reasonForChange and the beginLifespanVersion attribute.

5.2   Change-Only Update supply

When an order is placed for COU, the first order received will be an initial supply. Initial supply refers to the first order that a customer takes of OS MasterMap Highways Network under the COU order type. An initial supply contains all features for the complete area covered by the order, and every feature will be an "insert". Updates, which contain the latest changes to the features are sent out automatically.

Following the initial order, a COU will be supplied, at the selected update schedule of the customer. COU only contains new features, new versions of features and information about deleted features. A feature can be deleted from the customer's holdings for two reasons; the feature has been deleted and the id will no longer exist in the product, or the feature has moved outside of the customer's area of interest but still exists in the national product and therefore could be reinstated in a customer's holdings. To identify the difference between the two deletes the reasonForChange can be used. If the value is "end of life" then this feature has been permanently deleted whilst any other change value would indicate the feature has moved outside of the holdings and could be reinstated in future. Any feature within the area of interest that has not undergone any change will not be supplied.

The features within the initial supply and COU are provided as transactions. A transaction identifies if the feature is new, modified or removed from the product. The three types of transactions are:

1. <os:insert>
    These are features which have been newly inserted into the product or the customer's area of interest since the last product supply.

1. <os:replace>
    These are features which have had either a geometry change or an attribute change since the last product supply. The whole feature will be supplied, not just the changed attributes. The recommended action would be to completely replace the feature which currently exists in the customer's holdings.

2. <os:delete>
    These are features which have ceased to exist in the last product release or have moved out of the

customer's area of interest. Features which have been deleted will be supplied with the entire feature's attribution. These features should be removed from the customer's live data holding.

The initial supply will contain an insert transaction for all features in the customer's holdings. The following COU supplies will have insert and replace transactions in one GML file and deleted features will be supplied in a separate file. Where a delete file has been supplied, this must be loaded before the file containing inserted and replaced features. There are examples of the different types of transactions in Annex A: GML examples.

6. Supply format

OS MasterMap Highways Network– Paths is supplied in three formats: Geography Markup Language (GML 3.2.1), GeoPackage and vector tiles. All formats are compressed into a regular zip file (.ZIP).

7. GML overview

This section describes how OS MasterMap Highways Network is defined in GML. An understanding of XML (Extensible Mark-up Language) and XML schema is required.

7.1 GML

GML is an XML grammar for expressing geographic features. GML serves as a modelling language for geographic systems as well as an open interchange format for geographic transactions on the Internet.

More information can be found on the Open Geospatial Consortium (OGC®).
http://www.opengeospatial.org/standards/gml

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

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

7.2   Schema overview and location

XML schemas are used to define and validate the format and content of GML. The GML 3.2 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 Path Network uses the following application schemas; **LinearHighwayNetwork.xsd, HighwaysWaterTransportNetwork.xsd, RoutingAndAssetManagement.xsd** and **OSProducts.xsd** which are referenced by the data.

- The **LinearHighwaysNetwork.xsd** defines the features which make up the Path Network. Therefore, it imports the INSPIRE transport network road application schema.

- The **HighwaysWaterTransportNetwork.xsd** defines the features which make up the Ferry Network. Therefore, it imports the INSPIRE transport network water application schema.

- The **RoutingAndAssetManagement.xsd** defines the asset management features of the Path Network. Through the INSPIRE schemas both the **LinearHighwayNetwork.xsd HighwaysWaterTransportNetwork.xsd and the RoutingAndAssetManagement.xsd** import the GML 3.2 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.

- The **OSProducts.xsd** defines the feature collection and feature members. In addition, this application schema will define the transactions used for a Change Only Update supply.

The Linear Highway Network schema document defines the http://namespaces.os.uk/mastermap/highwayNetwork/2.0 namespace, this is defined in the XSD at: http://www.os.uk/xml/schema/highwaysnetwork/2.0/linearhighwaynetwork.xsd. The Highways Water Transport Network schema document defines the http://namespaces.os.uk/mastermap/highwaysWaterTransportNetwork/1.0 namespace. This is defined in the XSD at: https://www.os.uk/xml/schema/highwaysnetwork/1.0/HighwaysWaterTransportNetwork.xsd. The RAMI schema document defines the http://namespaces.os.uk/mastermap/routingAndAssetManagement/2.1 namespace. This is defined in the XSD at: http://www.os.uk/xml/schema/highwaysnetwork/2.1/RoutingAndAssetManagement.xsd

The Highways Dedication schema document defines the http://namespaces.os.uk/mastermap/highwayDedication/1.0 namespace. This is defined in the XSD at: https://www.ordnancesurvey.co.uk/xml/schema/highwaysnetwork/1.0/HighwayDedication.xsd

The application schema uses the following XML namespaces, for which definitions are available here:

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 in to XML http://www.w3.org/TR/xmlschema-1/
xlink	http://www.w3.org/1999/xlink	http://www.w3.org/1999/xlink.xsd
net	http://inspire.ec.europa.eu/schemas/net/4.0	http://inspire.ec.europa.eu/schemas/net/4.0/Network.xsd
tn	http://inspire.ec.europa.eu/schemas/tn/4.0	http://inspire.ec.europa.eu/schemas/tn/4.0/CommonTransportElements.xsd
tn-ro	http://inspire.ec.europa.eu/schemas/tn-ro/4.0	http://inspire.ec.europa.eu/schemas/tn-ro/4.0/RoadTransportNetwork.xsd
tn-w	http://inspire.ec.europa.eu/schemas/tn-w/4.0	http://inspire.ec.europa.eu/schemas/tn-w/4.0/WaterTransportNetwork.xsd
os	http://namespaces.os.uk/product/1.0	http://www.ordnancesurvey.co.uk/xml/schema/product/1.0/OSProduct.xsd
network	http://namespaces.os.uk/mastermap/generalNetwork/2.0	https://www.ordnancesurvey.co.uk/xml/schema/network/2.0/generalNetwork.xsd
highway	http://namespaces.os.uk/mastermap/highwayNetwork/2.0	http://www.os.uk/xml/schema/highwaysnetwork/2.0/LinearHighwayNetwork.xsd
ram	http://namespaces.os.uk/mastermap/routingAndAssetManagement/2.1	http://www.os.uk/xml/schema/highwaysnetwork/2.1/RoutingAndAssetManagement.xsd
hwtn	http://namespaces.os.uk/mastermap/highwaysWaterTransportNetwork/1.0	http://www.os.uk/xml/schema/highwaysnetwork/v1/HighwaysWaterTransportNetwork.xsd
dedication	http://namespaces.os.uk/mastermap/highwayDedication/1.0	https://www.ordnancesurvey.co.uk/xml/schema/highwaysnetwork/1.0/HighwayDedication.xsd

8. GeoPackage overview

OS MasterMap Highways Network – Paths is supplied as one GeoPackage file for GB. 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.

8.1 Attribute naming differences between GML and GeoPackage and 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. Please note not all GML attributes have been mapped to GeoPackage. In the tables below a greyed-out box with an asterisk (*) marks a GeoPackage attribute that is not mapped from a GML attribute.

8.1.1 connecting_link

GML attribute	GeoPackage attribute
*	Fid
gml_id	Toid
identifier	identifier
identifier_codeSpace	identifier_code_space
localId	local_id
namespace	namespace
beginLifespanVersion	begin_lifespan_version
reasonForChange	reason_for_change
reasonForChange_codeSpace	reason_for_change_code_space
inNetwork_href	in_network
*	geometry
fictitious	fictitious
connectingNode_href	connecting_node
pathNode_href	path_node

8.1.2   connecting_node

GML attribute	GeoPackage attribute
*	fid
gml_id	toid
identifier	identifier
identifier_codeSpace	identifier_code_space
localId	local_id
namespace	namespace
beginLifespanVersion	begin_lifespan_version
reasonForChange	reason_for_change
reasonForChange_codeSpace	reason_for_change_code_space
inNetwork_href	in_network
*	geometry
roadLink_href	road_link

8.1.3   ferry_link

GML attribute	GeoPackage attribute
*	fid
gml_id	toid
identifier	identifier
identifier_codeSpace	identifier_code_space
localId	local_id
namespace	namespace
beginLifespanVersion	begin_lifespan_version
*	geometry
fictitious	fictitious
validFrom	valid_from
vehicularFerry	vehicular_ferry
routeOperator	route_operator
reasonForChange	reason_for_change
reasonForChange_codeSpace	reason_for_change_code_space
inNetwork_href	in_network
startNode	start_node
endNode	end_node

8.1.4   ferry_node

GML attribute	GeoPackage attribute
*	fid
gml_id	toid
identifier	identifier
identifier_codeSpace	identifier_code_space
localId	local_id
namespace	namespace
beginLifespanVersion	begin_lifespan_version
*	geometry
validFrom	valid_from
formOfWaterwayNode	form_of_waterway_node
formOfWaterwayNode_href	form_of_waterway_node_href
reasonForChange	reason_for_change
reasonForChange_codeSpace	reason_for_change_code_space
inNetwork_href	in_network

8.1.5   ferry_terminal

GML attribute	GeoPackage attribute
*	id
gml_id	toid
identifier	identifier
identifier_codeSpace	identifier_code_space
localId	local_id
namespace	namespace
beginLifespanVersion	begin_lifespan_version
type	type
ferryTerminalName	ferry_terminal_name
ferryTerminalNameLang	ferry_terrminal_name_lang
ferryTerminalCode	ferry_terminal_code
reasonForChange	reason_for_change
reasonForChange_codeSpace	reason_for_change_code_space
inNetwork_href	in_network
refToFunctionalSite	ref_to_functional_site

GML attribute	GeoPackage attribute
elementId	element_id
elementRole	element_role

8.1.6 highway_dedication

GML attribute	GeoPackage attribute
*	fid
gml_id	toid
identifier	identifier
identifier_codeSpace	identifier_code_space
localId	local_id
namespace	namespace
beginLifespanVersion	begin_lifespan_version
networkRef_title	network_ref_title
networkRef	network_ref
validFrom	valid_from
reasonForChange	reason_for_change
reasonForChange_codeSpace	reason_for_change_code_space
inNetwork_href	in_network
dedication	dedication
dedication_codeSpace	dedication_code_space
startDate	start_date
endDate	end_date
namedDay	named_day
namedDay_codeSpace	named_day_code_space
startTime	start_time
endTime	end_time
publicRightOfWay	public_right_of_way
nationalCycleRoute	national_cycle_route
quietRoute	quiet_route
obstruction	obstruction
planningOrder	planning_order
worksProhibited	works_prohibited
*	geometry

8.1.7 maintenance

GML attribute	GeoPackage attribute
*	id
gml_id	unique_id
identifier	identifier
identifier_codeSpace	identifier_code_space
localId	local_id
namespace	namespace
beginLifespanVersion	begin_lifespan_version
networkRef_title	network_ref_title
networkRef	network_ref
validFrom	valid_from
maintenanceResponsibility	maintenance_responsibility
maintenanceAuthority	maintenance_authority
maintenanceAuthorityId	maintenance_authority_id
partialReference	partial_reference
highwayAuthority	highway_authority
highwayAuthorityId	highway_authority_id
reasonForChange	reason_for_change
reasonForChange_codeSpace	reason_for_change_code_space

8.1.8 path

GML attribute	GeoPackage attribute
*	id
gml_id	toid
identifier	identifier
identifier_codeSpace	identifier_code_space
localId	local_id
namespace	namespace
beginLifespanVersion	begin_lifespan_version
validFrom	valid_from
reasonForChange	reason_for_change
reasonForChange_codeSpace	reason_for_change_code_space
inNetwork_href	in_network

GML attribute	GeoPackage attribute
pathName	path_name
pathNameLang	path_name_lang
link	link

8.1.9   path_link

GML attribute	GeoPackage attribute
*	Fid
gml_id	toid
identifier	identifier
identifier_codeSpace	identifier_code_space
localId	local_id
namespace	namespace
beginLifespanVersion	begin_lifespan_version
*	geometry
fictitious	fictitious
validFrom	valid_from
reasonForChange	reason_for_change
reasonForChange_codeSpace	reason_for_change_code_space
inNetwork_href	in_network
formOfWay	form_of_way
formOfWay_codeSpace	form_of_way_codespace
pathName	path_name
pathNameLang	path_name_lang
alternateName	alternate_name
alternateNameLang	alternate_name_lang
provenance	provenance
provenance_codeSpace	provenance_code_space
surfaceType	surface_type
surfaceType_codeSpace	surface_type_code_space
cycleFacility	cycle_facility
cycleFacility_codeSpace	cycle_facility_code_space
cycleFacility_wholeLink	cycle_facility_whole_link
matchStatus	match_status
matchStatus_codeSpace	match_status_code_space

GML attribute	GeoPackage attribute
length	length
length_uom	length_uom
alternateId	alternate_id
alternateIdScheme	alternate_id_scheme
startGradeSeparation	start_grade_separation
endGradeSeparation	end_grade_separation
elevationGainInDirection	elevation_gain_in_direction
elevationGainInDirection_uom	elevation_gain_in_direction_uom
elevationGainInOppositeDirection	elevation_gain_in_opposite_direction
elevationGainInOppositeDirection_uom	elevation_gain_in_opposite_direction_uom
formsPartOf	forms_part_of
formsPartOfRole	forms_part_of_role
startNode	start_node
endNode	end_node
relatedRoadArea	related_road_area

8.1.10   path_node

GML attribute	GeoPackage attribute
*	fid
gml_id	toid
identifier	identifier
identifier_codeSpace	identifier_code_space
localId	local_id
namespace	namespace
beginLifespanVersion	begin_lifespan_version
*	geometry
validFrom	valid_from
formOfRoadNode	form_of_road_node
formOfRoadNode_href	form_of_road_node_href
reasonForChange	reason_for_change
reasonForChange_codeSpace	reason_for_change_code_space
inNetwork_href	in_network

GML attribute	GeoPackage attribute
classification	classification
classification_codeSpace	classification_code_space

8.1.11 reinstatement

GML attribute	GeoPackage attribute
*	id
gml_id	unique_id
identifier	identifier
identifier_codeSpace	identifier_code_space
localId	local_id
namespace	namespace
beginLifespanVersion	begin_lifespan_version
networkRef	network_ref
validFrom	valid_from
reinstatementType	reinstatement_type
reinstatementType_codeSpace	reinstatement_type_code_space
partialReference	partial_reference
reasonForChange	reason_for_change
reasonForChange_codeSpace	reason_for_change_code_space

8.1.12 special_designation

GML attribute	GeoPackage attribute
*	id
gml_id	unique_id
identifier	identifier
identifier_codeSpace	identifier_code_space
localId	local_id
namespace	namespace
beginLifespanVersion	begin_lifespan_version
networkRef	network_ref
validFrom	valid_from
validTo	valid_to
designation	designation

GML attribute	GeoPackage attribute
designation_codeSpace	designation_code_space
description	description
startDate	start_date
endDate	end_date
namedDay	named_day
namedDay_codeSpace	named_day_code_space
startTime	start_time
endTime	end_time
contactAuthority	contact_authority
contactAuthorityId	contact_authority_id
partialReference	partial_reference
reasonForChange	reason_for_change
reasonForChange_codeSpace	reason_for_change_code_space

8.1.13   street

GML attribute	GeoPackage attribute
*	fid
gml_id	usrn
identifier	identifier
identifier_codeSpace	identifier_code_space
localId	local_id
namespace	namespace
beginLifespanVersion	begin_lifespan_version
validFrom	valid_from
descriptor	descriptor
descriptorLang	descriptor_lang
designatedName	designated_name
namingAuthorityId	naming_authority_id
namingAuthority	naming_authority
localName	local_name
localNameLang	local_name_lang
localRoadCode	local_road_code
reasonForChange	reason_for_change
reasonForChange_codeSpace	reason_for_change_code_space

GML attribute	GeoPackage attribute
inNetwork_href	in_network
streetType	street_type
streetType_codeSpace	street_type_code_space
operationalState	operational_state
operationalState_codeSpace	operational_state_code_space
operationalStateTimePeriodId	operational_state_time_period_id
operationalStateBeginPosition	operational_state_begin_position
operationalStateEndPosition	operational_state_end_position
locality	locality
localityLang	locality_lang
town	town
townLang	town_lang
administrativeArea	administrative_area
administrativeAreaLang	administrative_area_lang
responsibleAuthority	responsible_authority
responsibleAuthorityId	responsible_authority_id
geometryProvenance	geometry_provenance
geometryProvenance_codeSpace	geometry_provenance_code_space
*	geometry
gssCode	gss_code
gssCode_role	gss_code_role
link_href	link

9.   Vector tiles overview

OSMM Highways Network – Paths 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).

9.1   Vector tiles schema

The vector tiles schema is detailed in the following tables. 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.

		Zoom level		
Layer	**Attribute**	**0 to 13**	**14**	**15**
connecting_link	toid	N	Y	Y

		Zoom level		
Layer	**Attribute**	**0 to 13**	**14**	**15**
connecting_node	toid	N	Y	Y

		Zoom level		
Layer	**Attribute**	**0 to 13**	**14**	**15**
ferry_link	toid	N	Y	Y
	vehicular_ferry	N	Y	Y
	route_operator	N	Y	Y

		Zoom level		
Layer	**Attribute**	**0 to 13**	**14**	**15**
ferry_node	toid	N	Y	Y
	form_of_waterway_node	N	Y	Y
	ferry_terminal_name	N	Y	Y
	ferry_terminal_name_lang	N	Y	Y
	ferry_terminal_code	N	Y	Y

Layer	Attribute	Zoom level		
		0 to 13	14	15
highway_dedication	toid	N	Y	Y
	dedication	N	Y	Y
	start_date	N	Y	Y
	end_date	N	Y	Y
	named_day	N	Y	Y
	named_day_code_space	N	Y	Y
	start_time	N	Y	Y
	end_time	N	Y	Y
	public_right_of_way	N	Y	Y
	national_cycle_route	N	Y	Y
	quiet_route	N	Y	Y
	obstruction	N	Y	Y
	planning_order	N	Y	Y
	works_prohibited	N	Y	Y

Layer	Attribute	Zoom level		
		0 to 13	14	15
path_link	toid	N	Y	Y
	form_of_way	N	Y	Y
	path_name	N	Y	Y
	alternate_name	N	Y	Y
	surface_type	N	Y	Y
	cycle_facility	N	Y	Y
	cycle_facility_whole_link	N	Y	Y
	length	N	Y	Y

Layer	Attribute	Zoom level		
		0 to 13	14	15
path_node	toid	N	Y	Y
	form_of_way	N	Y	Y
	path_name	N	Y	Y
	alternate_name	N	Y	Y
	surface_type	N	Y	Y
	cycle_facility	N	Y	Y
	cycle_facility_whole_link	N	Y	Y
	length	N	Y	Y

Layer	Attribute	Zoom level		
		0 to 13	14	15
street	usrn	N	Y	Y
	designated_name	N	Y	Y
	responsible_authority	N	Y	Y

9.2 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 not all GML attributes have been mapped to vector tile attributes.

9.2.1 connecting_link

GML attribute	Vector tiles attribute
gml_id	toid

9.2.2 connecting_node

GML attribute	Vector tiles attribute
gml_id	toid

9.2.3   ferry_link

GML attribute	Vector tiles attribute
gml_id	toid
vehicularFerry	vehicular_ferry
routeOperator	route_operator

9.2.4   ferry_node

GML attribute	Vector tiles attribute
gml_id	toid
formOfWaterwayNode	form_of_waterway_node
ferryTerminalName	ferry_terminal_name
ferryTerminalNameLang	ferry_terminal_name_lang
ferryTerminalCode	ferry_terminal_code

9.2.5   highway_dedication

GML attribute	Vector tiles attribute
gml_id	toid
dedication	dedication
startDate	start_date
endDate	end_date
namedDay	named_day
namedDay_codeSpace	named_day_code_space
startTime	start_time
endTime	end_time
publicRightOfWay	public_right_of_way
nationalCycleRoute	national_cycle_route
quietRoute	quiet_route
obstruction	obstruction
planningOrder	planning_order
worksProhibited	works_prohibited

9.2.6   path_link

GML attribute	Vector tiles attribute
gml_id	toid
formOfWay	form_of_way
pathName	path_name
alternateName	alternate_name
surfaceType	surface_type
cycleFacility	cycle_facility
cycleFacility_wholeLink	cycle_facility_whole_link
length	length

9.2.7   path_node

GML attribute	Vector tiles attribute
gml_id	toid
formOfRoadNode	form_of_road_node
classification	classification

9.2.8   street

GML attribute	Vector tiles attribute
gml_id	Usrn
designatedName	designated_name
responsibleAuthority	responsible_authority

Annex A: GML examples

This annex provides examples of the different GML structure for Full Supply orders and COU orders and the transactions within.

Full Supply

An example of the Full Supply GML including the opening and closing tags:

```
<os:FeatureCollection>
<os:FeatureMember>
<highway:RoadNode gml:id="osgb5000005193042483">
 <gml:identifier
codeSpace="http://inspire.jrc.ec.europa.eu/ids">http://data.os.uk/id/5000005193042483</gml:identifier>
<net:beginLifespanVersion>2017-01-13T00:00:00.000</net:beginLifespanVersion>
<net:inspireId>
        <base:Identifier>
          <base:localId>5000005193042483</base:localId>
          <base:namespace>http://data.os.uk/</base:namespace>
        </base:Identifier>
     </net:inspireId>
     <net:inNetwork xlink:href="#OSHighwayNetwork"/>
     <net:geometry>
       <gml:Point srsName="urn:ogc:def:crs:EPSG::27700" gml:id="LOCAL_ID_6">
         <gml:pos>611319.332 231278.275</gml:pos>
       </gml:Point>
     </net:geometry>
     <tn:validFrom nilReason="unknown" xsi:nil="true"/>
     <tn-ro:formOfRoadNode xlink:title="junction"
xlink:href="http://inspire.ec.europa.eu/codelist/FormOfRoadNodeValue/junction"/>
     <highway:reasonForChange
codeSpace="http://www.os.uk/xml/codelists/ChangeTypeValue.xml">New</highway:reasonForChange>
     <highway:relatedRoadArea xlink:href="#osgb5000005193041468"/>
   </highway:RoadNode>
</os:FeatureMember >
</os:FeatureCollection >
```

Change Only Update

An example of the Change Only Update GML including opening and closing tags and the different types of transactions:

```
<os:Transaction>
<os:insert>
<highway:RoadNode gml:id="osgb5000005193042483">
     <gml:identifier
codeSpace="http://inspire.jrc.ec.europa.eu/ids">http://data.os.uk/id/5000005193042483</gml:identifier>
     <net:beginLifespanVersion>2017-01-13T00:00:00.000</net:beginLifespanVersion>
     <net:inspireId>
```

```
      <base:Identifier>
        <base:localId>5000005193042483</base:localId>
        <base:namespace>http://data.os.uk/</base:namespace>
      </base:Identifier>
    </net:inspireId>
    <net:inNetwork xlink:href="#OSHighwayNetwork"/>
    <net:geometry>
      <gml:Point srsName="urn:ogc:def:crs:EPSG::27700" gml:id="LOCAL_ID_6">
        <gml:pos>611319.332 231278.275</gml:pos>
      </gml:Point>
    </net:geometry>
    <tn:validFrom nilReason="unknown" xsi:nil="true"/>
    <tn-ro:formOfRoadNode xlink:title="junction"
xlink:href="http://inspire.ec.europa.eu/codelist/FormOfRoadNodeValue/junction"/>
    <highway:reasonForChange
codeSpace="http://www.os.uk/xml/codelists/ChangeTypeValue.xml">New</highway:reasonForChange>
    <highway:relatedRoadArea xlink:href="#osgb5000005193041468"/>
  </highway:RoadNode>
</os:insert>
<os:replace>
<highway:RoadNode gml:id="osgb4000000003855390">
    <gml:identifier
codeSpace="http://inspire.jrc.ec.europa.eu/ids">http://data.os.uk/id/4000000003855390</gml:identifier>
    <net:beginLifespanVersion>2016-08-21T00:00:00.000</net:beginLifespanVersion>
    <net:inspireId>
      <base:Identifier>
        <base:localId>4000000003855390</base:localId>
        <base:namespace>http://data.os.uk/</base:namespace>
      </base:Identifier>
    </net:inspireId>
    <net:inNetwork xlink:href="#OSHighwayNetwork"/>
    <net:geometry>
      <gml:Point srsName="urn:ogc:def:crs:EPSG::27700" gml:id="LOCAL_ID_2497055">
        <gml:pos>398309.376 865124.714</gml:pos>
      </gml:Point>
    </net:geometry>
    <tn:validFrom nilReason="unknown" xsi:nil="true"/>
    <tn-ro:formOfRoadNode xlink:title="junction"
xlink:href="http://inspire.ec.europa.eu/codelist/FormOfRoadNodeValue/junction"/>
    <highway:reasonForChange
codeSpace="http://www.os.uk/xml/codelists/ChangeTypeValue.xml">New</highway:reasonForChange>
    <highway:relatedRoadArea xlink:href="#osgb1000002063990526"/>
  </highway:RoadNode>
</os:replace>
<os:delete>
<highway:RoadNode gml:id="osgb4000000003334901">
    <gml:identifier
codeSpace="http://inspire.jrc.ec.europa.eu/ids">http://data.os.uk/id/4000000003334901</gml:identifier>
    <net:beginLifespanVersion>2017-01-13T00:00:00.000</net:beginLifespanVersion>
    <net:inspireId>
      <base:Identifier>
        <base:localId>4000000003334901</base:localId>
        <base:namespace>http://data.os.uk/</base:namespace>
```

```
        </base:Identifier>
      </net:inspireId>
      <net:endLifespanVersion>2017-01-13T00:00:00.000</net:endLifespanVersion>
      <net:inNetwork xlink:href="#OSHighwayNetwork"/>
      <net:geometry>
        <gml:Point srsName="urn:ogc:def:crs:EPSG::27700" gml:id="LOCAL_ID_0">
          <gml:pos>215328.243 943956.030</gml:pos>
        </gml:Point>
      </net:geometry>
      <tn:validFrom nilReason="unknown" xsi:nil="true"/>
      <tn-ro:formOfRoadNode xlink:title="road end"
xlink:href="http://inspire.ec.europa.eu/codelist/FormOfRoadNodeValue/roadEnd"/>
      <highway:reasonForChange codeSpace="http://www.os.uk/xml/codelists/ChangeTypeValue.xml">End
Of Life</highway:reasonForChange>
      <highway:relatedRoadArea xlink:href="#osgb9999"/>
    </highway:RoadNode>
</os:delete>
<os:delete>
<highway:RoadNode gml:id="osgb4000000003336706">
      <gml:identifier
codeSpace="http://inspire.jrc.ec.europa.eu/ids">http://data.os.uk/id/4000000003336706</gml:identifier>
      <net:beginLifespanVersion>2017-02-17T00:00:00.000</net:beginLifespanVersion>
      <net:inspireId>
        <base:Identifier>
          <base:localId>4000000003336706</base:localId>
          <base:namespace>http://data.os.uk/</base:namespace>
        </base:Identifier>
      </net:inspireId>
      <net:endLifespanVersion>2017-02-17T00:00:00.000</net:endLifespanVersion>
      <net:inNetwork xlink:href="#OSHighwayNetwork"/>
      <net:geometry>
        <gml:Point srsName="urn:ogc:def:crs:EPSG::27700" gml:id="LOCAL_ID_16">
          <gml:pos>287295.241 935655.346</gml:pos>
        </gml:Point>
      </net:geometry>
      <tn:validFrom nilReason="unknown" xsi:nil="true"/>
      <tn-ro:formOfRoadNode xlink:title="junction"
xlink:href="http://inspire.ec.europa.eu/codelist/FormOfRoadNodeValue/junction"/>
      <highway:reasonForChange
codeSpace="http://www.os.uk/xml/codelists/ChangeTypeValue.xml">Modified
Geometry</highway:reasonForChange>
      <highway:relatedRoadArea xlink:href="#osgb1000000288453345"/>
    </highway:RoadNode>
</os:delete>
</os:Transaction>
```

Annex B: Product support links

Guides

You can find additional information and documentation about the product on the ['OS MasterMap Highways Network Technical Information' page on the OS website](https://www.ordnancesurvey.co.uk/products/os-mastermap-highways-network-roads#technical) (https://www.ordnancesurvey.co.uk/products/os-mastermap-highways-network-roads#technical):

We recommend that you read the following guides:

- *OS MasterMap Highways Network – Product Guide*

- *OS MasterMap Highways Network – Getting Started Guide*

- *OS MasterMap Highways Network – Roads – Technical Specification*

- *OS MasterMap Highways Network – Routing and Asset Management Information – Technical Specification*

- *Getting Started with GeoPackage*

- *Getting Started with Vector Tiles*

- *Guide to Routing for the Public Sector*

Stylesheets

Predefined stylesheets for OS MasterMap Highways Network are available for download from the [Ordnance Survey OS-MasterMap-Highways-Network-stylesheets GitHub repository](https://github.com/OrdnanceSurvey/OS-MasterMap-Highways-Network-stylesheets) (https://github.com/OrdnanceSurvey/OS-MasterMap-Highways-Network-stylesheets).

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