OS MasterMap

Highways Network

Roads

Ordnance Survey

OS MasterMap® Highways Network Version 2.2

Roads
Technical specification

Contents

V2.2 – 10/2017

Introduction

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Customer Service Centre
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If you are unfamiliar with any words or terms used and require clarification please refer to the glossary at the end of the document.

Chapter 1   Introduction

The OS MasterMap® Highways Network is the authoritative highway network for Great Britain. It brings together Ordnance Survey's large scale road content, the National Street Gazetteer (NSG) and the Trunk Road Street Gazetteer (TRSG). The current release of the product will only contain NSG and TRSG data for England and Wales.

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

- OS MasterMap Highways Network - Roads
- OS MasterMap Highways Network - Roads and Routing and Asset Management
- OS MasterMap Highways Network - Paths.

This technical specification will cover the OS MasterMap Highways Network - Roads (from here referred to as Road Network) product specification, for further details on Routing and Asset Management or Paths product specification please see their Technical Specifications.
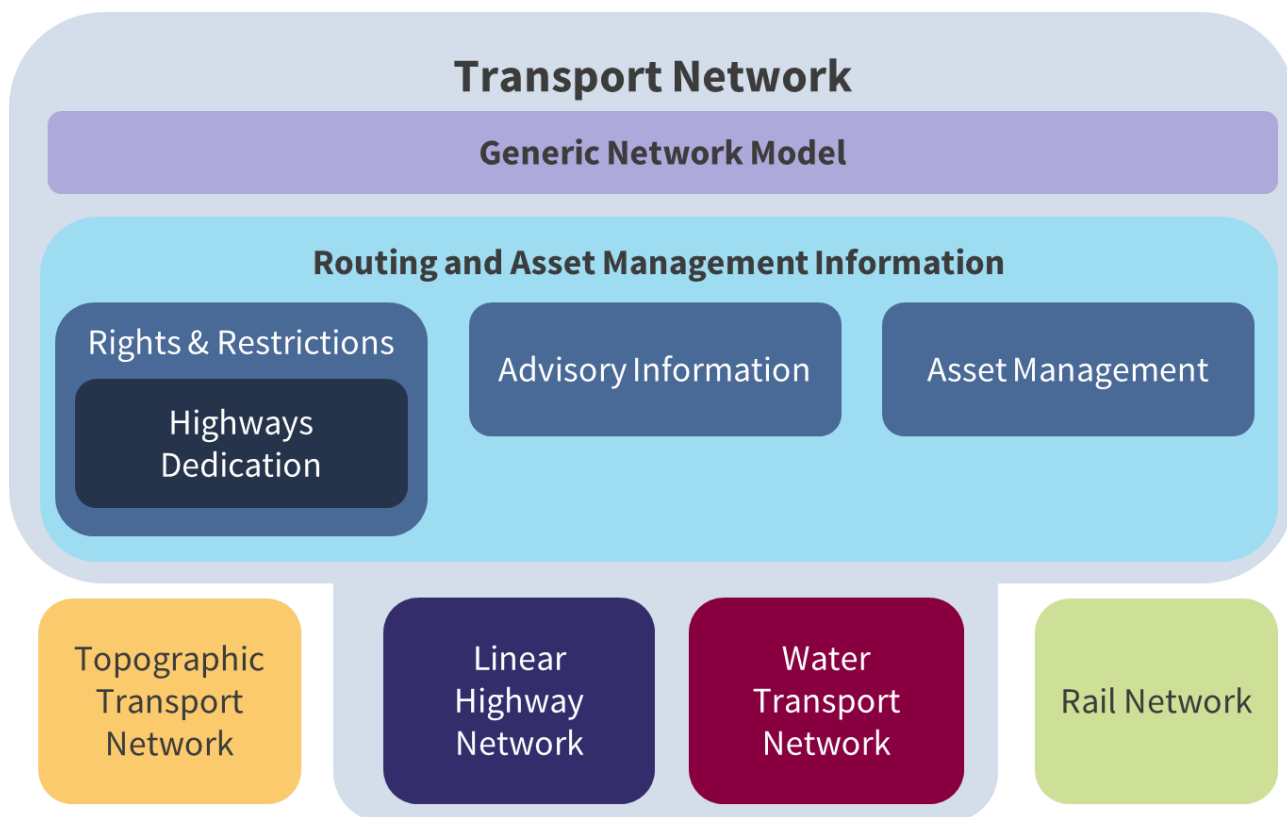
Figure 1: The conceptual INSPIRE Transport Network Model. OS MasterMap Highways will include the Linear Network, Routing and Asset Management Information and the Water Transport Network within the Generic Network Model.

Identifiers

All features that comprise the OS MasterMap Highways Network – 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, and Special Designation.

Identifiers shall be encoded in three properties in the data:

1. gml:id – this is 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 the same source as the 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.

TOIDs
TOIDs are strings of up to twenty characters which are comprised as 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)

Identifiers that are TOIDs manifest themselves as the following in the product:
- **gml:id** – 'osgb4000000009461245'
- **localId** – '4000000009461245'
- **identifier** - 'http://data.os.uk/4000000009461245'

USRNs
USRNs are strings of up to twelve characters which are comprised of two 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)

Identifiers that are USRNs manifest themselves as the following in the product:
- **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.

Unique IDs
Unique IDs for Maintenance, Reinstatement, Special Designation are strings of up to seventeen characters which are comprised of two parts:
- Namespace: this is either a HTTP URI (http://data.os.uk/) or shorthand prefix ('id_')
- Local identifier: 14 alpha numeric string

The ID for HighwayDedication is a string of up to 25 charactes comprised of the characters "esu" followed by three parts separated by "_":
- LHA authority code
- ESU it references
- dedication code in the NSG

e.g. esu4720_4280330430163_8, esu4720_4280340431456_11

Identifiers that are Unique IDs manifest themselves as the following in the product (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'

Available Formats

OS MasterMap Highways Network is supplied in GML 3.2.1.

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)

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.

Notation

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).

The data dictionary tables use orange for a feature type; blue for a code list; green for enumerations and purple for data types.
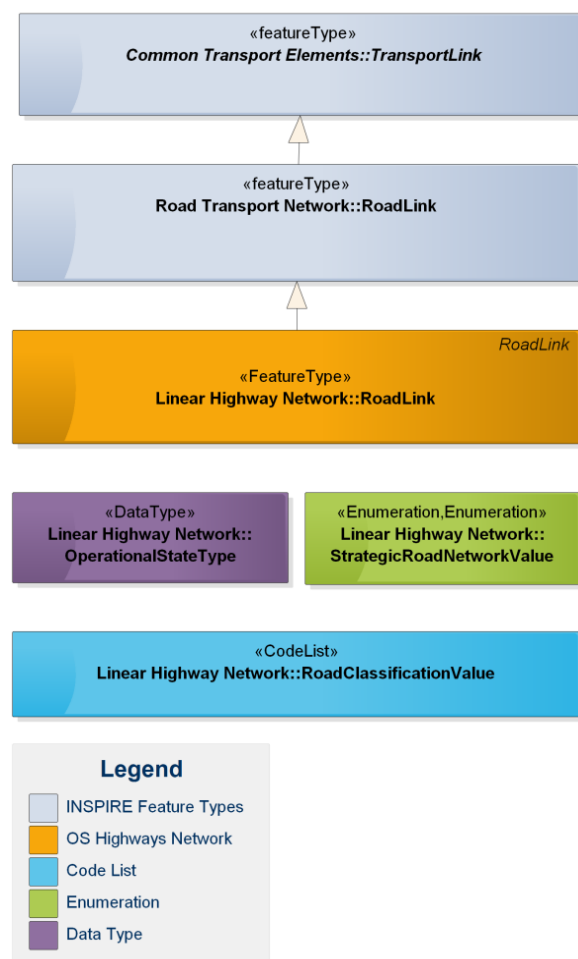
Figure 2: Colour conventions used in the UML diagrams within this Technical Specification

Lexical Conventions

- Class names are conceptually meaningful names (singular noun) in UpperCamelCase

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

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

- Property names (attributes and associations) are in lowerCamelCase

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.

Stereotype	UML Element	Description
<<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.

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.
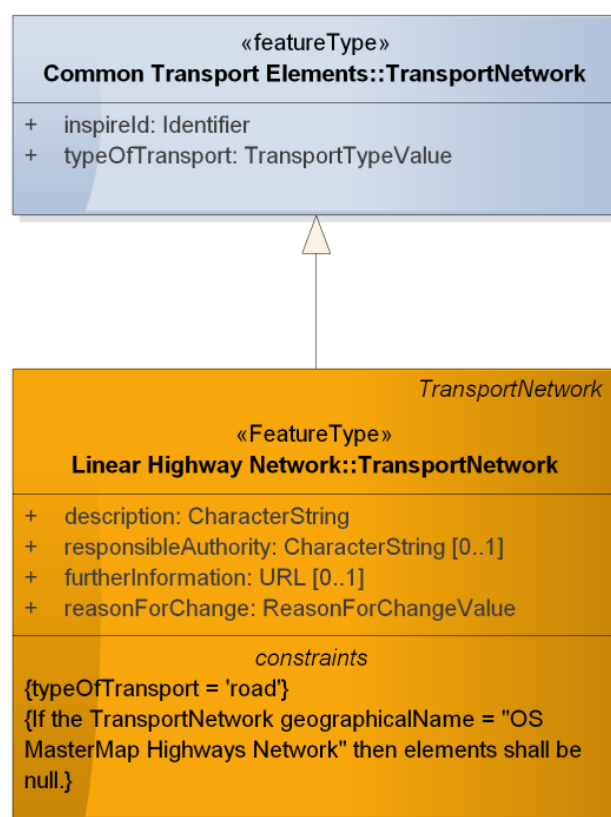
Figure 3: Diagram to show how constraints will be shown in the UML diagrams in this Technical Specification

Relationships and Associations

There are 3 key types of relationship defined between classes (Figure 4Figure 4):

- **Generalisation/Specialisation:** this is used to denote either:
  - o 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 shall the same name as the class it is extending.
  - o 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.
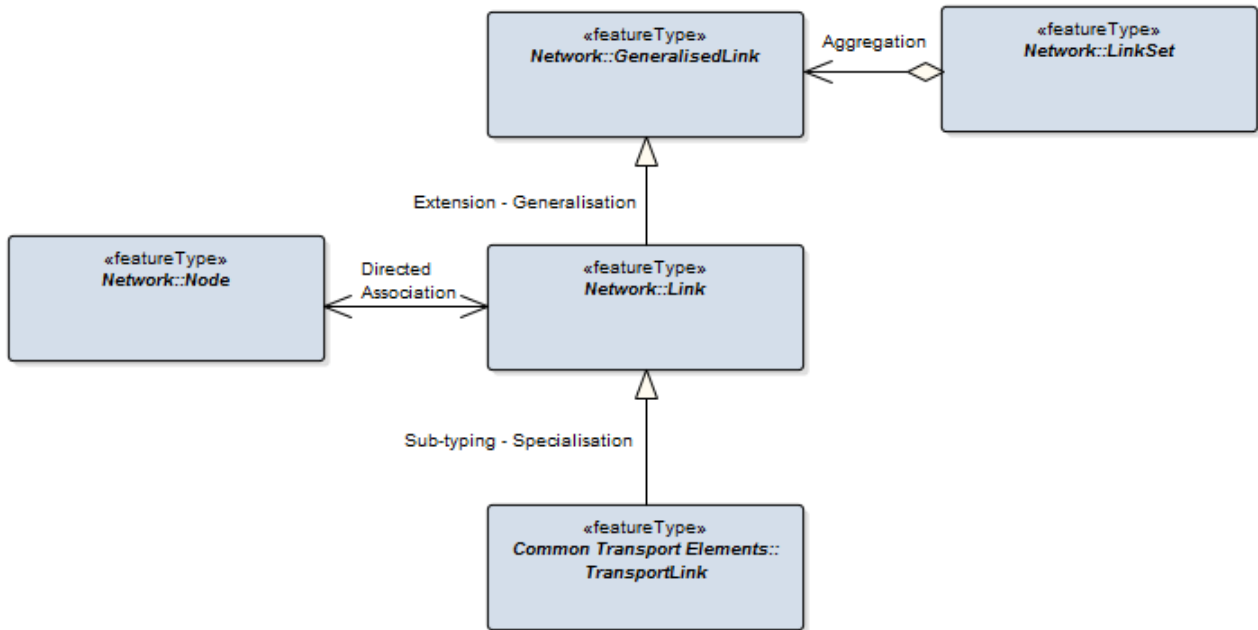
Figure 4: Relationships between Feature Types which will be used on the UML diagrams throughout this Technical Specification

Chapter 2   Specification Changes

There have been small enhancements to the OS MasterMap Highways Network. Version 2.2 has released new features into the product. This chapter will outline the main changes to the Road Network product. For changes to the Routing and Asset Management product, please see the Routing and Asset Management Technical Specification.

Features

- RoadJunction feature has been populated.
- RoadLink and RoadNode 'z' values have been enhanced to reduce discrepancies when the road passes over a structure, for example a bridge.

Code Lists, Data Types and Enumerations

- The "OperationalState" attribute on the Street features has introduced a new value, "Addressing Only", into the "OperationalStateValue" codelist.
- Corrected wrong multiplicity value for minimum width attribute within the "RoadWidthType" Data Type. This had the incorrect value of '1' this has been corrected to '0..1'.

Chapter 3   OS MasterMap Highways Network - Roads

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

1. **RoadLink** – A line segment representing the general alignment of the carriageway of the road.

2. **RoadNode** – A point connecting to at least one RoadLink, providing network connectivity.

3. **Road** – A Road defines the complete collection of references to RoadLink features defining the network topology which share the same road name and/or road classification number. For example, the A38 or Romsey Road.

4. **Street** – A Street defines a collection of references to RoadLink features that are contained within a single authority and are unique to a location (town/locality).

5. **RoadJunction** – A collection of RoadNodes that make up a named or numbered road junction.

6. **FerryLink -** A feature which represents a ferry route between two FerryNode's.

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

8. **FerryTerminal** A feature representing the point at which vehicle transfers from the ferry network to the road network or vice versa.

Figure 5 illustrates the relationship between the feature types.

OS MasterMap Highways Network has been built with the INSPIRE Transport Networks Data Specification as a basis. This has been extended to include the additional properties of required by BS 7666-1:2006 defined within the NSG to ensure that conformance to both INSPIRE and BS7666-1:2006 can be achieved.
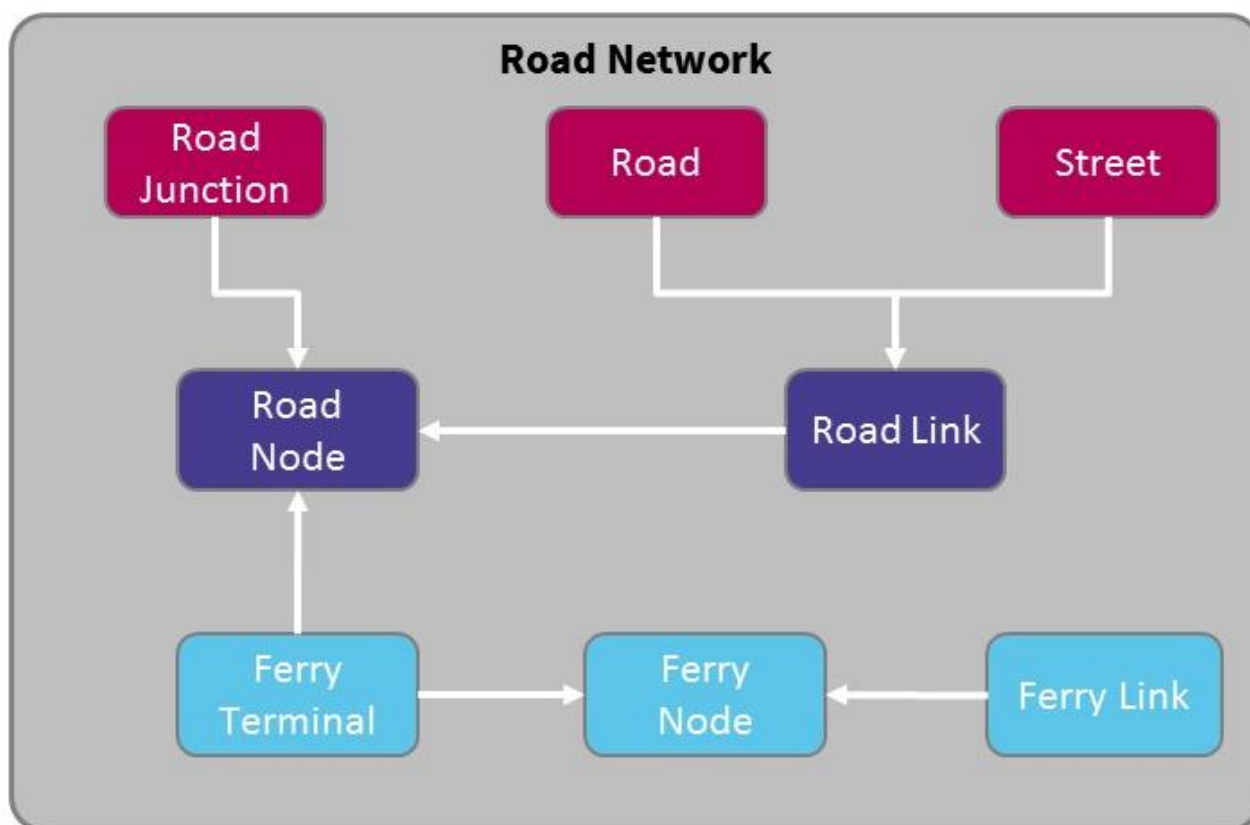
Figure 5: Illustration to show how the Road Network feature types relate to one another.

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".

RoadLink

Overview

A RoadLink is a linear spatial object that defines the geometry and connectivity of a road network between two points in the network. Road links can represent single carriageways, dual carriageways, slip roads, roundabouts and indicative trajectories across traffic squares. RoadLinks will be split for connectivity purposes (for example at junctions) and RoadNodes will connect the RoadLinks together. Each RoadLink will provide a reference to the RoadNodes at the start and end of the RoadLink.

RoadLinks will split where two links 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 RoadLink. The Grade Separation attribute will indicate where there is or is not a physical connection between the roads in the real world. Grade Separation will determine if a RoadLink is above another; if the two RoadLinks, when referencing the same RoadNode, have different value then it is not possible to move between them at that point.

The context diagram (Figure 6) shows how the RoadLink has been inherited from INSPIRE and the attribution held on the RoadLink.

Figure 6: Context Diagram: RoadLink

Attributes

«FeatureType» RoadLink		
Definition: A feature that represents a part or all of a highway.		
Constraints: • If the roadClassification is either Motorway, A Road or B Road then roadClassificationNumber shall not be null.		
Attribute: id		
Definition: Unique identifier, for RoadLink 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 «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 section of road.		
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]
Attribute: roadClassification		
Definition: The official designated importance of a road that provides an indication of its expected usage and importance.		
Type: RoadClassificationValue	**Size**: 21	**Multiplicity**: [1]
Attribute: routeHierarchy		
Definition: A classification of the road designed to give the most appropriate route.		
Type: RoadFunctionValue	**Size**: 32	**Multiplicity**: [1]
Attribute: formOfWay		

Definition: A description of the road based on its nature or use.		
Type: FormOfWayTypeValue	**Size**: 42	**Multiplicity**: [1]

Attribute: trunkRoad		
Definition: States if the RoadLink forms part of the Trunk Road network		
Type: Boolean	**Size**: 5	**Multiplicity**: [1]

Attribute: primaryRoute		
Definition: States if the RoadLink forms part of the Primary Route network		
Type: Boolean	**Size**: 5	**Multiplicity**: [1]

Attribute: roadClassificationNumber		
Definition: The official road number assigned by the appropriate authority. Note that this includes at least one letter. For example 'A329(M)'		
Type: CharacterString	**Size**: 10	**Multiplicity**: [0..1]

Attribute: roadName		
Definition: The name of the road the feature is part of. When a RoadLink is referenced by a Street with a streetStateType of Designated Street Name this is the name used else the name is from Road.		
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 road 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: operationalState		
Definition: Indicator identifying the construction status of the road		
Type: OperationalStateValue	**Size**: 19	**Multiplicity**: [1]

Attribute: provenance		
Definition: The origin and derivation of the three dimensional geometry of the RoadLink.		
Type: ProvenanceSourceValue	**Size**: 23	**Multiplicity**: [1]

Attribute: directionality		
Definition: Indication of the direction of traffic flow.		
Type: LinkDirectionValue	**Size**: 21	**Multiplicity**: [1]

Attribute: length		
Definition: The calculated two-dimensional length of the RoadLink 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]

Attribute: matchStatus		
Definition: Indicates whether the feature has been matched to a feature in the NSG.		
Type: MatchStatusValue	**Size**: 39	**Multiplicity**: [1]

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: roadStructure		
Definition: Identifies if this section of road passes through or over a physical structure.		
Type: RoadStructureValue	**Size**: 14	**Multiplicity**: [0..1]
Attribute: cycleFacility		
Definition: Identifies if the RoadLink has facilities for a cyclist.		
Type: CycleFacilityType		**Multiplicity**: [0..1]
Attribute: roadWidth		
Definition: An indication of the width of the road carriageway as recorded in the OS MasterMap Topography layer, this must not be used to identify whether individual vehicles can use a route.		
Type: RoadWidthType		**Multiplicity**: [0..1]
Attribute: numberOfLanes		
Definition: The number of lanes along a RoadLink.		
Note: Values not populated in this release.		
Type: NumberOfLanesType		**Multiplicity**: [0..4]
Attribute: elevationGain		
Definition: The elevation gain is calculated from three-dimensional geometry to define the total ascent experienced when passing along a RoadLink feature. The value is expressed both with and against the coordinate order.		
Type: ElevationGainType		**Multiplicity**: [0..1]
Association: formsPartOf		
Definition: Identifier of the Road or Street to which the RoadLink 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 road.		
Multiplicity: 1..*	**Size**: 20	

RoadNode

Overview

A point spatial object that is used to break up the road network for connectivity. The road network splits for the following circumstances:

- The location where an attribute recorded on the road link changes for example its name or form
- The intersection or crossing of Roads (including bridges, flyovers and tunnels where there is no connectivity)
- The start/end of a Road
- Where a One Way Routing feature starts or ends
- Where a tunnel starts or ends

The context diagram (Figure 7) shows how the RoadNode has been inherited from INSPIRE and the attribution held on the RoadNode.
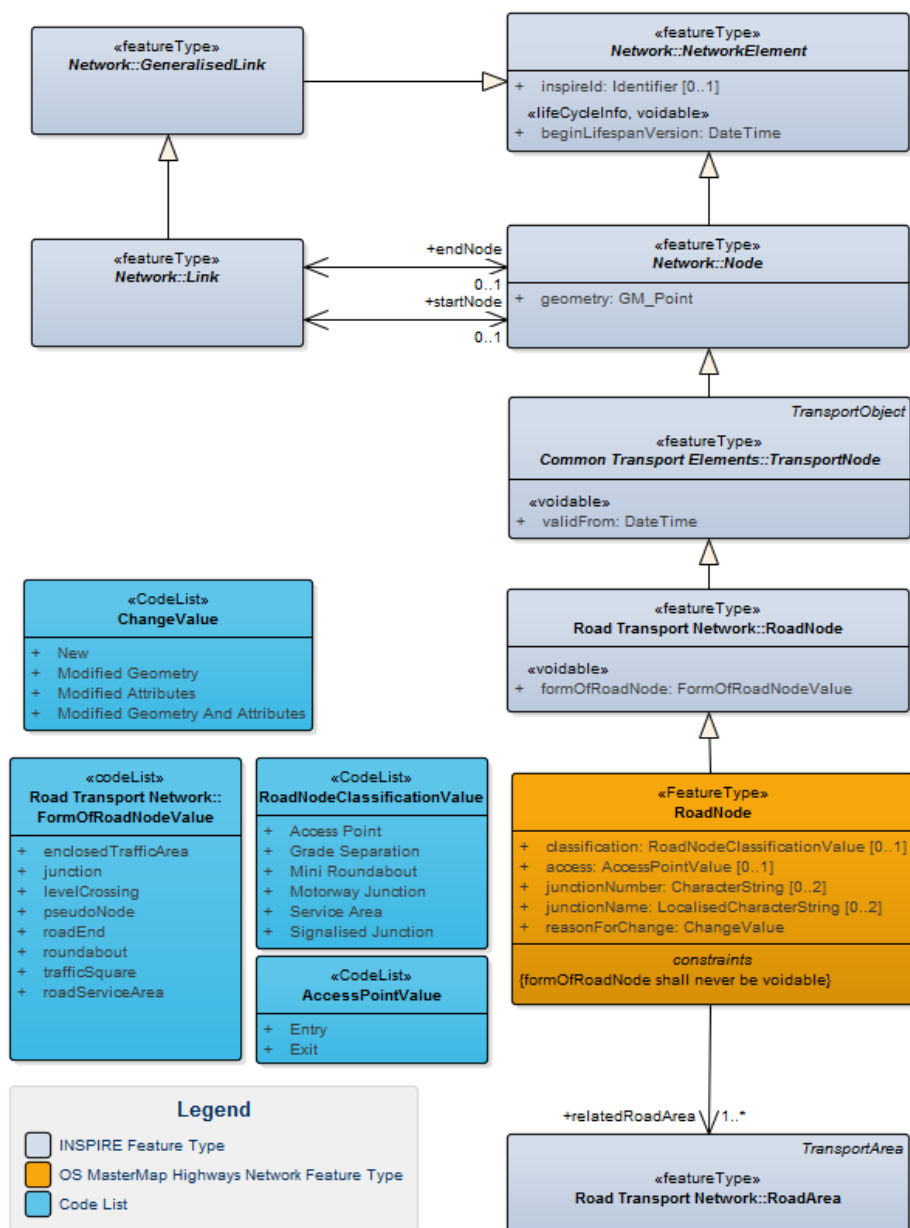

Figure 7: Context Diagram: RoadNode

Attributes

«FeatureType» RoadNode		
Definition: A point representing either the start/end of a road, the connectivity between two or more roads or where one of the recorded attributes changes along a road.		
Constraints: • formOfRoadNode shall never be voidable		
Attribute: id		
Definition: Unique identifier, for RoadNode 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: 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: geometry		INSPIRE
Definition: The three dimensional location of the node. For nodes representing grade separated intersections the elevation is of the lower road		
Type:GM_Point		**Multiplicity**: [1]
Attribute: formOfRoadNode «voidable»		INSPIRE
Definition: Description of the function of a road node in the road transport network.		
Type:FormOfRoadNodeValue	**Size**: 21	**Multiplicity**: [1]
Attribute: classification		
Definition: Further specialisation of the form of road node.		
Type: RoadNodeClassificationValue	**Size**: 19	**Multiplicity**: [0..1]
Attribute: access		
Definition: Point where vehicles can either exit or enter a controlled-access highway.		
Note: Values not populated in the initial release.		
Type: AccessPointValue	**Size**: 5	**Multiplicity**: [0..1]
Attribute: junctionName		
Definition: The name of any junction that the node represents part of.		
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: junctionNumber		
Definition: The number of any motorway junction that the node represents part of, for example M3 J12.		
Type: CharacterString	**Size**: 30	**Multiplicity**: [0..2]
Attribute: reasonForChange		
Definition: The reason for a change made to a feature.		
Type: ChangeValue	**Size**: 32	**Multiplicity**: [1]
Association: relatedRoadArea		
Definition: Reference to the topographic representation(s) of the same part of the road.		
Multiplicity: 1..*	**Size**: 20	

Road

Overview
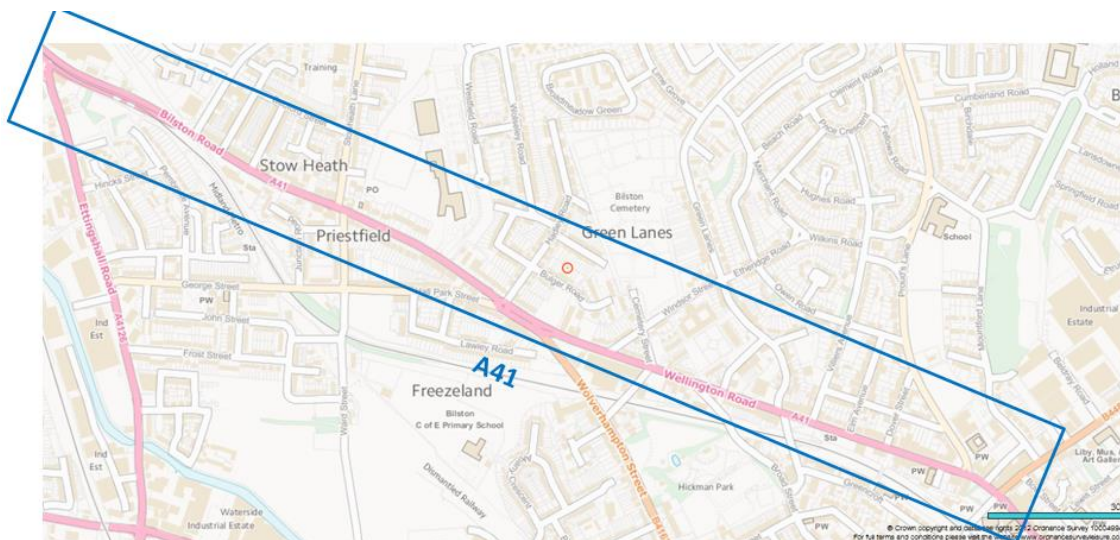
Figure 8: A Road feature for the A41
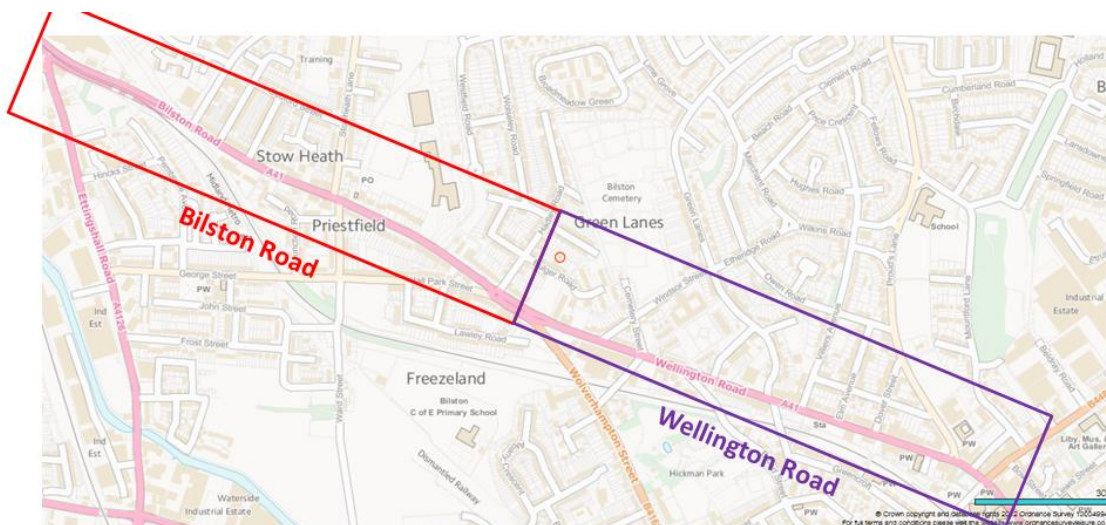
Figure 9: Two Road features covering the two named thoroughfares which make up the A41

A Road feature is a link set which represents a collection of RoadLink features used primarily by motorised vehicles that share the same name (e.g. Bilston Road) or classification number (e.g. A41). A Road will reference the complete collection of RoadLink features irrespective of which authority boundary it falls within. The feature will include Motorways, A Roads, B Roads and Named Thoroughfares (roads), as illustrated in Figure 8 and Figure 9.

The link set may not be contiguous across junctions or where a classified road consists of separate sections, which may be separated by some considerable distance. In addition, the same RoadLink feature may be referenced by multiple Road features.

The context diagram (Figure 10) shows how the Road has been inherited from INSPIRE and the attribution held on the Road.

Figure 10: Context Diagram: Road

Attributes

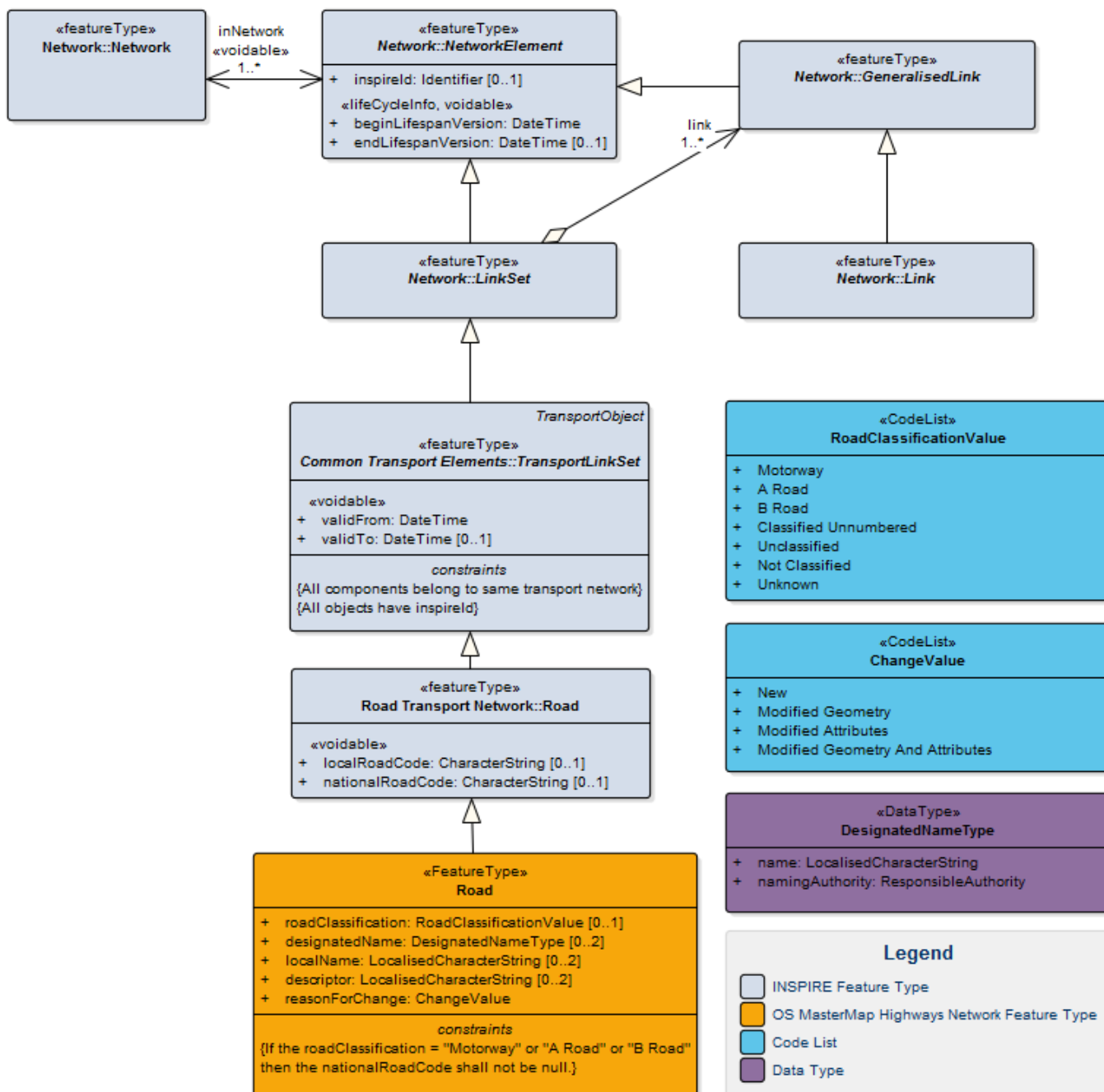| «FeatureType» Road		
Definition: A compound feature that represents a road with a name or number. This may be a classified road, such as the A38, or a named road such as Romsey Road. This references a collection of RoadLinks.		
Constraints: • If the roadClassification = "Motorway" or "A Road" or "B Road" then the nationalRoadCode shall not be null.		
Attribute: id		
Definition: Unique identifier, for Road 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: localRoadCode «voidable» INSPIRE		
Definition: Identification code assigned to the road by the local road authority.		
Type:CharacterString	**Size**: 10	**Multiplicity**: [0..1]
Attribute: nationalRoadCode «voidable» INSPIRE		
Definition: The national number of the road.		
Type:CharacterString	**Size**: 10	**Multiplicity**: [0..1]
Attribute: roadClassification		
Definition: The national classification of the road.		
Type: RoadClassificationValue	**Size**: 21	**Multiplicity**: [0..1]
Attribute: designatedName		
Definition: Official name assigned to the highway by a designated Street Naming Authority.		
Note: On the Road feature this will always be the OS name.		

Type: DesignatedNameType		**Multiplicity**: [0..2]
Attribute: reasonForChange		
Definition: The reason for a change made to a feature.		
Type: ChangeValue	**Size**: 32	**Multiplicity**: [1]
Aggregation: link		INSPIRE
Definition: The reference to the RoadLink features which builds up the Road feature.		
Multiplicity: 1..*	**Size**: 20	

Street

Overview

A Street feature extends and specialises the Road feature (Figure 11) and can represent a road or track. A Street feature is populated from the National Street Gazetteer and will exist regardless of whether an Elementary Street Unit geometry has been matched to at least one RoadLink. A Street includes aggregated geometry.

- if any of the Street's ESUs have been matched to a RoadLink(s) then the aggregated geometry of the RoadLink(s) will be provided.

- if none of the Street's ESUs have been matched to a RoadLink then the aggregated geometry of the Elementary Street Unit(s) will be provided.

The provenance of this geometry can be identified through the "geometryProvenance" attribute. 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 RoadLink can be referenced by multiple Street features.

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

- **USRN**: the identifier of a Street is being assigned by the Street Naming and Numbering authority who shall assign the Street a Unique Street Reference Number (USRN)

- **Street Type**: The type of Gazetteer record for which the USRN relates.

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

- **Responsible Authority:** reference to the authority who 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 geographic identifier (i.e. USRN).
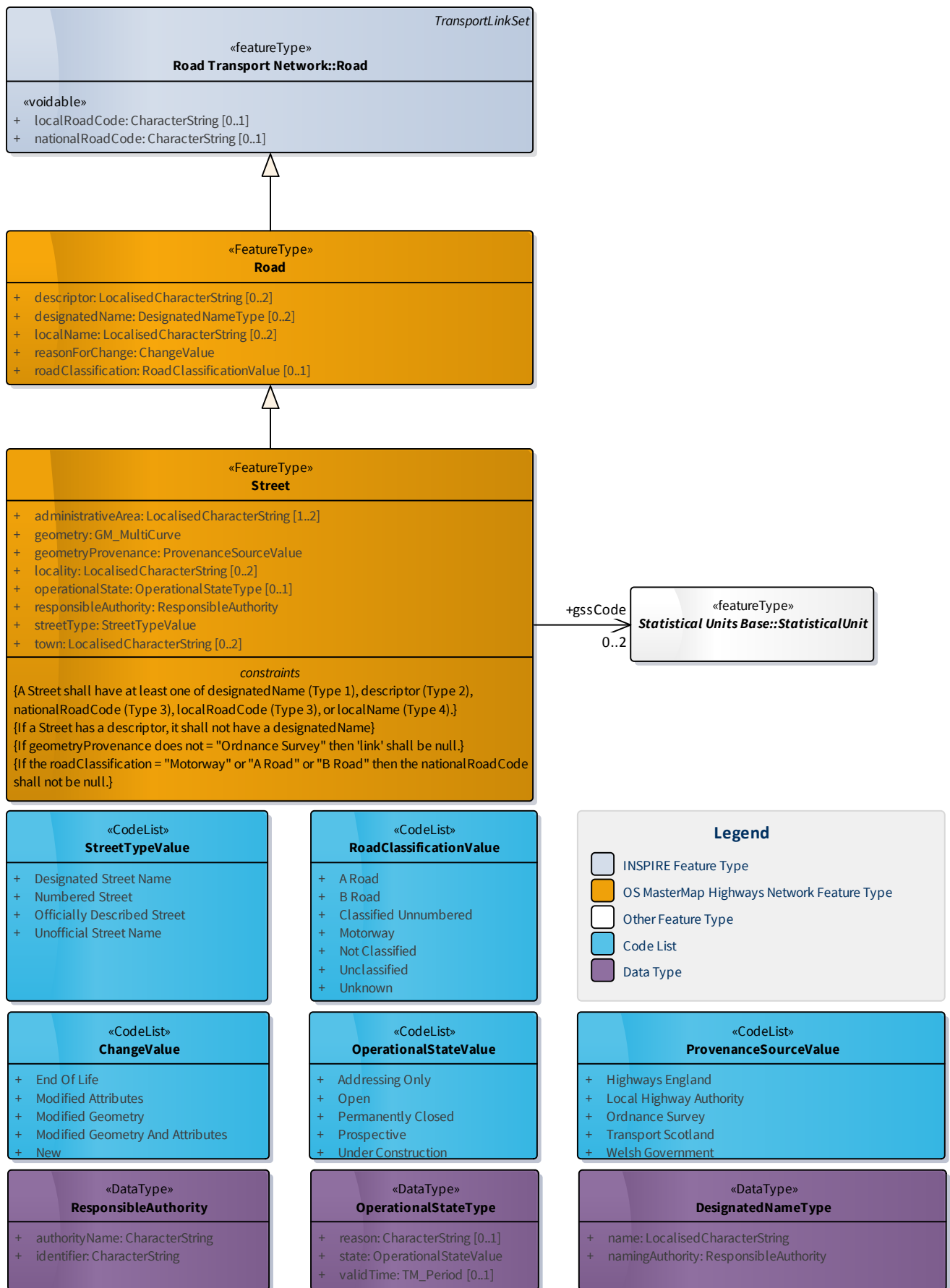
Figure 11: Context Diagram: Street

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), localRoadCode (Type 3), or localName (Type 4).
- If a Street has a descriptor, it shall not have a designatedName.
- If geometryProvenance does not = "Ordnance Survey" then 'link' shall be null.
- If the roadClassification = "Motorway" or "A Road" or "B Road" then the nationalRoadCode shall not be null.

Attribute: id		
Definition: Unique identifier, for Street the characters "USRN" appended with the USRN e.g. USRN12345678		
Type: CharacterString	**Size**: 12	**Multiplicity**: [1]

Attribute: identifier		
Definition: Uniform Resource Identifier		
Type: CharacterString	**Size**: 29	**Multiplicity**: [1]

Attribute: inspireId		INSPIRE
Definition: External object identifier of the spatial object.		
Note: This is the USRN from the NSG or TRSG.		
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: 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: localRoadCode «voidable»		INSPIRE
Definition: Identification code assigned to the road by the local road authority.		
Note: This is only used for classified unnumbered roads.		
Type:CharacterString	**Size**: 120	**Multiplicity**: [0..1]

Attribute: nationalRoadCode «voidable»		INSPIRE
Definition: The national number of the road.		
Type:CharacterString	**Size**: 10	**Multiplicity**: [0..1]

Attribute: designatedName	
Definition: Official name assigned to the highway by theStreet 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: 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: reasonForChange		
Definition: The reason for a change made to a feature.		
Type: ChangeValue	**Size**: 32	**Multiplicity**: [1]

Attribute: roadClassification		
Definition: The national classification of the road.		
Type: RoadClassificationValue	**Size**: 21	**Multiplicity**: [0..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**: [0..1]

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	**Size:** 23	**Multiplicity**: [1]

Attribute: geometry

Definition: The aggregated geometry of either the matched RoadLinks or the Elementary Street Units.	
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 <<voidable>>	INSPIRE
Definition: The reference to the RoadLink features which builds up the Street feature. Where the Street has not been matched to a RoadLink this attribute will be voided.	
Multiplicity: 1..*	**Size**: 20

RoadJunction

Overview

A RoadJunction feature is a collection of RoadNode features that share the same road junction name or number. The collection of RoadNodes will include all RoadNodes that constitute part of a "slip road" or other link between two or more crossing road features (Figure 12). A RoadNode could be referenced by multiple RoadJuntion features.

Motorway Junctions will be populated completely, other junctions are being supplied as data is improved for future releases.

Figure 12: Collection of RoadNodes making up a Road Junction (highlighted red). RoadLinks representing the slip road are highlighted red for clarification only.

The context diagram (Figure 13) shows how the RoadJunction feature relates back to the Network Elements.
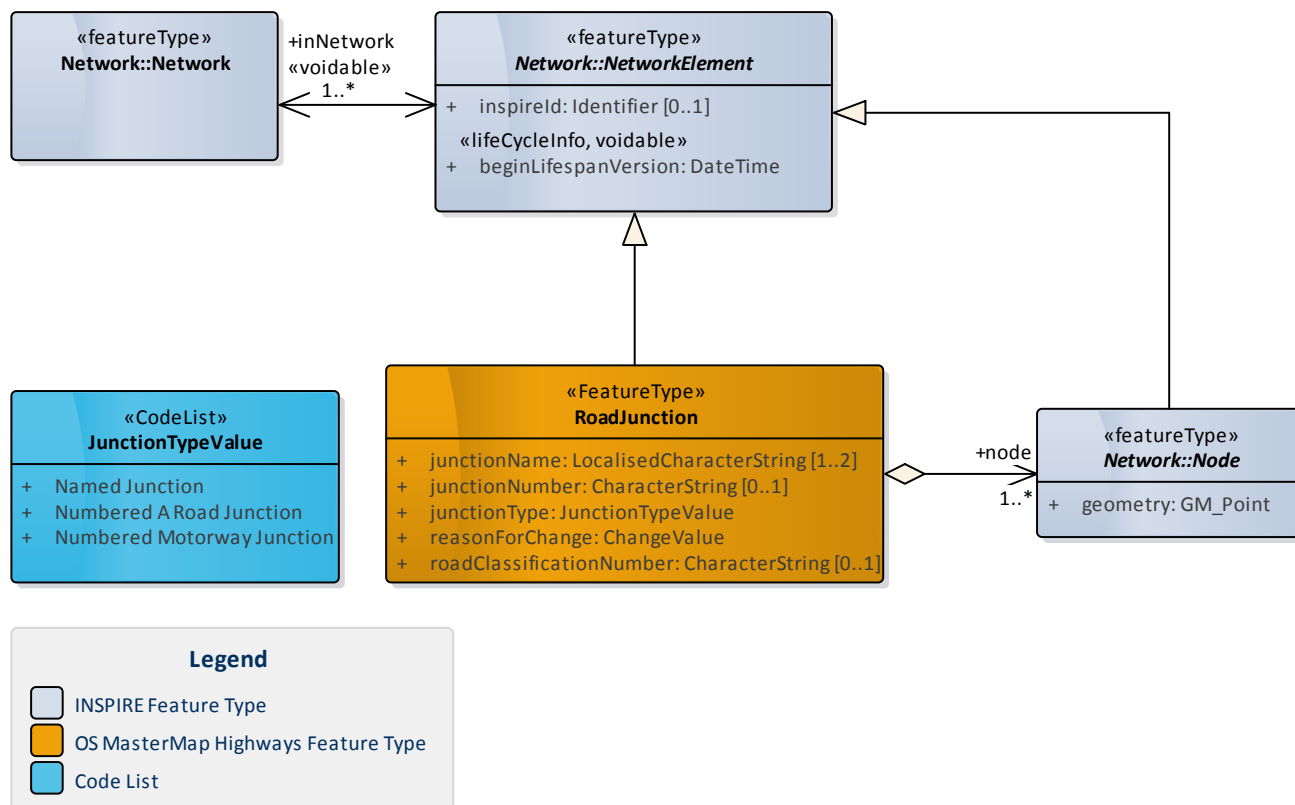
Figure 13: Context Diagram: RoadJunction

Attributes

«FeatureType» RoadJunction		
Definition: A compound feature that represents a road junction with a name or number.		
Attribute: id		
Definition: Unique identifier, for RoadJunction 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 «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: reasonForChange		
Definition: The reason for a change made to a feature.		
Type: ChangeValue	**Size**: 32	**Multiplicity**: [1]
Attribute: junctionType		

Definition: A classification for the Road Junction.		
Type: JunctionTypeValue	**Size**: 26	**Multiplicity**: [1]
Attribute: junctionName		
Definition: The name of the junction. For numbered junctions, this will provide a description of the junction, for example, M6 Junction 6.		
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**: [1..2]
Attribute: roadClassificationNumber		
Definition: The official road number assigned by the appropriate authority. For example, M6.		
Type: CharacterString	**Size**: 5	**Multiplicity**: [0..1]
Attribute: junctionNumber		
Definition: The number of the junction. For example, 6.		
Type: CharacterString	**Size**: 3	**Multiplicity**: [0..1]
Association: node		
Definition: The reference to the RoadNode features which builds up the RoadJunction feature.		
Multiplicity: 1..*	**Size**: 20	

FerryLink

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 both terminals are within Great Britain, and there is a timetabled service which is available to the public. Ferry routes with a terminal outside of Great Britain are not captured, for example Dover to Calais, or where the service is not available to the public.

The context diagram (Figure 14) shows how the FerryLink has been inherited from INSPIRE, the attribution held on the FerryLink and how it relates to the other Ferry components.

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**: [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.		
Type: Boolean	**Size**: 5	**Multiplicity**: [1]
Attribute: routeOperator		
Definition: The URL of 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	

FerryNode

Overview

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

The context diagram (Figure 14) shows how the FerryNode has been inherited from INSPIRE, the attribution held on the FerryNode and how it relates to the other Ferry components.

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]

FerryTerminal

Overview

The ferry and road network elements are linked together through a FerryTerminal feature. A FerryTerminal is a logical connection between the two networks and therefore there is no geometry supplied with these features. They will reference one RoadNode and one FerryNode. The FerryTerminals will also provide a reference to the OS MasterMap Site feature.

The context diagram (Figure 14) shows how the FerryTerminal has been inherited from INSPIRE, the attribution held on the FerryTerminal and how it relates to the other Ferry components.

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, forFerryTerminal 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.		
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 NaPTAN 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	
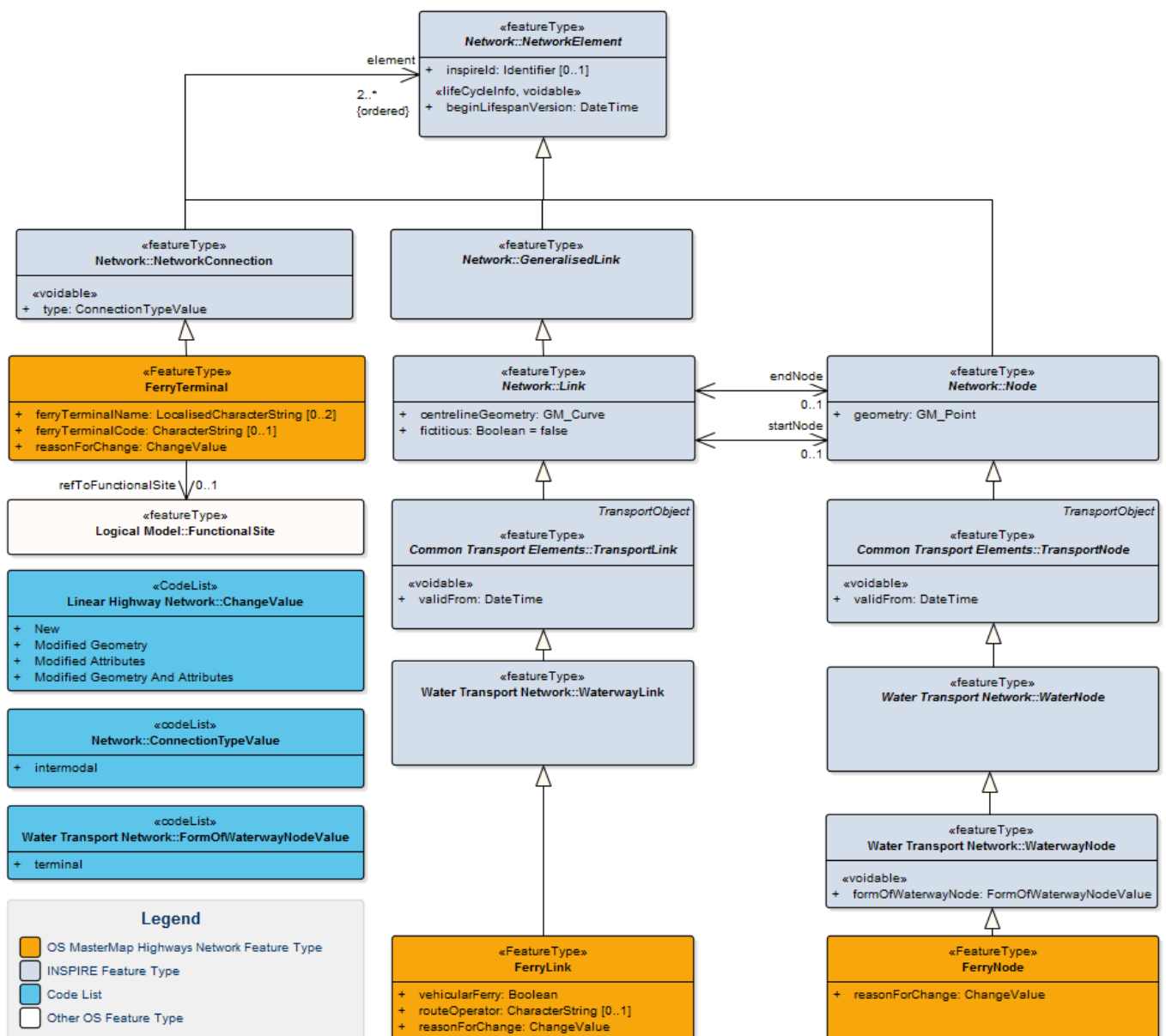
Figure 14: Context Diagram: FerryLink, FerryNode and FerryTerminal

Data Types

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]

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 e.g. Under Construction as reported by the highway authority.		
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: When a street has been closed a short description of the reason for closure.		
Type: CharacterString	**Size**: 120	**Multiplicity**: [0..1]

DesignatedNameType

RoadLink, Road and Street 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 local authority that assigned the designatedName.		
Type: ResponsibleAuthority		**Multiplicity**: [1]

ResponsibleAuthority

RoadLink and Street are attributed with "designatedName" and Street is attributed with a "responsibleAuthority" with a data type of "ResponsibleAuthority". The attribution of this data type is detailed below.

«DataType» ResponsibleAuthority		
Definition: The authority responsible for the street naming and numbering or maintenance.		
Attribute: identifier		
Definition: The 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]

CycleFacilityType

A RoadLink 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	**Size:** 45	**Multiplicity**: [1]
Attribute: wholeLink		
Definition: Identifies if the facility applies to entirety of the link.		
Type: Boolean	**Size:** 5	**Multiplicity**: [1]

ElevationGainType

A RoadLink is 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]

NumberOfLanesType

A RoadLink could be attributed with "numberOfLanes" with a data type of "NumberOfLanesType". The attribution of this data type is detailed below.

Note: The "numberOfLanes" attribute is not being populated in the initial product releases.

«DataType» NumberOfLanesType		
Attribute: numberOfLanes		
Definition: The number of lanes represented.		
Type: Integer		**Multiplicity**: [1]
Attribute: direction		
Definition: Indicates which direction the number of lanes is valid for.		
Type: LinkDirectionValue	**Size:** 21	**Multiplicity**: [0..1]
Attribute: minMaxNumberOfLanes		
Definition: Indicates if the number of lanes is counted as minimum or maximum value.		
Type: MinMaxLaneValue	**Size:** 7	**Multiplicity**: [0..1]

RoadWidthType

A RoadLink could be attributed with "roadWidth" with a data type of "RoadWidthType". The attribution of this data type is detailed below.

This value is based upon the Topographic Area features supplied in OS MasterMap Topography Layer and must not be used to indicate if a vehicle of a specific width can use a particular section of road.

«DataType» RoadWidthType	
Attribute: averageWidth	
Definition: The average width of the road carriageway.	
Type: Measure	**Multiplicity**: [1]
Attribute: minimumWidth	
Definition: The minimum width of the topographic area feature the RoadLink is representing.	
Type: Measure	**Multiplicity**: [0..1]
Attribute: confidenceLevel	
Definition: Records the original capture specification for the OS MasterMap Topography layer feature used to indicate the width of the carriageway. This provides an indication of the confidence that can be placed in the value provided.	
Type: RoadWidthConfidenceLevelValue **Size:** 27	**Multiplicity**: [1]

Code Lists

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 Surveys master database. This value will only be used with Change Only Update orders.

RoadClassificationValue

Road classification is used by government to ensure that there is a feasible, logical road network throughout the country. Road classifications are set to take into account the traffic management goals and road categorisation approach of the Local Highway Authority (LHA) in England and Wales. Currently in Scotland only Motorway, A Road and B Road classifications are provided.

RoadLink, Road and Street features are attributed with a "roadClassification" with a data type of "RoadClassificationValue". The table below describes the codes which will be used to populate this field and the description for each code.

Code List: RoadClassificationValue
https://www.ordnancesurvey.co.uk/xml/codelists/RoadClassificationValue.xml

Code	Description
Motorway	A multi-carriageway public road connecting important cities.
A Road	A major road intended to provide large-scale transport links within or between areas.
B Road	A road intended to connect different areas, and to feed traffic between A roads and smaller roads on the network.
Classified Unnumbered	Smaller roads intended to connect together unclassified roads with A and B roads, and often linking a housing estate or a village to the rest of the network. NOTE 1: A Street may be assigned a local classification number by the Local Highways Authority.
Unclassified	Roads intended for local traffic. NOTE 1: These may be designated Unofficial local road classifications. For example: D, E, F and G roads.
Not Classified	Roads that have not been assigned a road classification at national or local level by a designation authority.
Unknown	The classification of the road is unknown because the RoadLink is not a Motorway, A or B road and the RoadLink has not been matched to the National Street Gazetteer.

RoadFunctionValue

The RoadLink feature is attributed with a "routeHierarchy" with a data type of "RoadFunctionValue". The table below describes the codes used to populate this field and the description for each code. In addition, INSPIRE provides an attribute "Functional Road Class" which identifies the importance of the role that the road performs in the road network. Therefore, these values have been mapped to the INSPIRE values.

Code List: RoadFunctionValue https://www.ordnancesurvey.co.uk/xml/codelists/RoadFunctionValue.xml		
Code	**Description**	**Functional Road Class**
Motorway	A multi-carriageway public road connecting important cities.	mainRoad
A Road Primary	A major road intended to provide the principal link between the most significant destinations in the country, as defined by the DfT, and that is currently classified by the DfT as an A Road.	firstClass
A Road	A major road intended to provide large-scale transport links within or between areas.	secondClass
B Road Primary	A major road intended to provide the principal link between the most significant destinations in the country, as defined by the DfT, and that is currently classified by the DfT as a B Road.	firstClass
B Road	A road intended to connect different areas, and to feed traffic between A roads and smaller roads on the network.	thirdClass
Minor Road	A public road that provides interconnectivity to higher classified roads or leads to a point of interest.	fourthClass
Local Road	A public road that provides access to land and/or houses, usually named with addresses. Generally, not intended for through traffic.	fifthClass
Local Access Road	A road intended for the start or end of a journey, not intended for through traffic but will be openly accessible.	sixthClass
Restricted Local Access Road	A road intended for the start or end of a journey, not intended for through traffic and will have a restriction on who can use it.	seventhClass

Secondary Access Road	A road that provides alternate/secondary access to property or land not intended for through traffic.	ninthClass
Restricted Secondary Access Road	A road that provides alternate/secondary access to property or land, not intended for through traffic and will have a restriction on who can use it.	ninthClass

MatchStatusValue

The RoadLink 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
https://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.

OperationalStateValue

RoadLink is attributed with "operationalState" with a data type of "OperationslStateValue" and 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 attributes with the data type "OperationalStateValue".

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).

ProvenanceSourceValue

The RoadLink and Street feature is attributed with a 'provenance' property with the data type of ProvenanceSourceValue. The following table describes the codes used to populate this field.

Code List: ProvenanceSourceValue
https://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 1.1 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.

RoadStructureValue

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

Code List: RoadStructureValue

https://www.ordnancesurvey.co.uk/xml/codelists/RoadStructureValue.xml	
Code	**Description**
Road In Tunnel	A road which passes underground or water.
Road On Bridge	A road that passes over a river, railway, road or ravine on a structure. Not Currently used.

LinkDirectionValue

The RoadLink feature is attributed with a "directionality" property and the "NumberOfLanesType" data type has "direction" with the data type of LinkDirectionValue. 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: LinkDirectionValue	
List of values for directions relative to a link	
http://inspire.ec.europa.eu/codelist/LinkDirectionValue/	
Code	**Description**
both directions	In both directions.
in direction	In direction of the link.
in opposite direction	In the opposite direction of the link.

FormOfWayValue

The RoadLink 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**
Single Carriageway	A road consisting of one carriageway with traffic in one or both directions. There may be more than one lane in any particular direction
Dual Carriageway	A road consisting of two separate carriageways with separate flow directions. The carriageways are partitioned by physical features, such as a barrier and/or verge.
Slip Road	A road that provides exit from or entry to another road.
Roundabout	A method of controlling traffic flow by allowing vehicles from a particular direction priority.
Service Road	Road running parallel to and connecting to a road with a relatively high connectivity function, which is especially designed to enable access from the connecting roads to roads with a low connectivity function in its vicinity.
Enclosed Traffic Area	Area with no internal structure of legally defined driving directions. At least two roads are connected to the area, for example, a car park.
Traffic Island Link At Junction	Where an island that is over 8m^2 exists in the middle of a road on the approaches to a junction, the road link is split around it.
Traffic Island Link	Where an island that is over 8m^2 exists in the middle of a road, the road link is split around it
Entrance Way	Link that provides entry to a site (e.g. Car Park, Hospital, Police Station or Ambulance Station)
Entrance Or Exit Way	Link that provides access in both directions (entry and exit) to a site (e.g. Car Park, Hospital, Police Station, or Ambulance Station)

Exit Way	Link that provides exit from a site (e.g. Car Park, Hospital, Police Station or Ambulance Station)
Layby	An area at the side of the road where vehicles can stop on an ad hoc basis usually for a short time.
Track	An unmade way for a vehicle.
Guided Busway	A specially constructed or modified route for passenger road vehicles that have been built or adapted to be steered by external means. Typically, along guided busways, a raised kerb acts upon small wheels protruding from the sides of the modified vehicle. This classification is only for the specific cases where buses run along specifically designed tracks or channels that remove the need for steering.
Shared Use Carriageway	Roads that have been altered for use principally by pedestrians but may provide some access for certain types of vehicle.

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. Currently only "Unknown Type Of Cycle Route Along Road" is available for population. The other values are for future use.

Code List: CycleFacilityValue https://www.ordnancesurvey.co.uk/xml/codelists/highways/CycleFacilityType.xml	
Value	**Description**
Advisory Cycle Lane Along Road	A cycle way along a road carriageway where motorised vehicles are allowed to drive or park. Does not require a Traffic Regulation Order. Normally indicated by road markings consisting of a broken line.
Mandatory Cycle Lane Along Road	A cycle way along a road carriageway where motorised vehicles are prohibited from driving or parking. Requires a Traffic Regulation Order to prohibit the use by vehicles. Normally indicated by road markings consisting of a solid line.
Physically Segregated Cycle Lane Along Road	A cycle way along a road carriageway that has been physically separated by kerbs, posts, barriers or similar.
Unknown Type Of Cycle Route Along Road	A cycle way along a road carriageway 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

RoadWidthConfidenceLevelValue

The "RoadWidthType" data type is attributed with a "confidenceLevel" property with the data type of "RoadWidthConfidenceLevelValue". The following table describes the codes used to populate this field.

Code List: RoadWidthConfidenceLevelValue http://www.ordnancesurvey.co.uk/xml/codelists/highways/RoadWidthConfidenceLevelValue.xml	
Value	**Description**

OS Urban And Full Extent	Data captured to 0.5m planimetric accuracy and entire link within relevant Topographic Area
OS Rural And Full Extent	Data captured to 1.1m planimetric accuracy and entire link within relevant Topographic Area
OS Moorland And Full Extent	Data captured to 4.1m planimetric accuracy and entire link within relevant Topographic Area
OS Urban And Part Extent	Data captured to 0.5m planimetric accuracy and part of link not within relevant Topographic Area
OS Rural And Part Extent	Data captured to 1.1m planimetric accuracy and part of link not within relevant Topographic Area
OS Moorland And Part Extent	Data captured to 4.1m planimetric accuracy and part of link not within relevant Topographic Area

FormOfRoadNodeValue

The RoadNode 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**
enclosed traffic area	The road node is situated inside and/or represents an enclosed traffic area. A traffic area is an area with no internal structure of legally defined driving directions. At least two roads are connected to the area.
junction	Three or more road links intersect at the road node.
level crossing	A railway crosses a road on the same level at the position of the road node.
pseudo node	Exactly two road links connect to the road node.
road end	Only one road link connects to the road node. It signifies the end of a road.
roundabout	The road node represents or is a part of a roundabout.
traffic square	The road node is situated inside and/or represents a traffic square. A traffic square is an area (partly) enclosed by roads which is used for non-traffic purposes and which is not a roundabout.
road service area	Surface annexed to a road and devoted to offer particular services for it.

RoadNodeClassificationValue

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

It is possible for a RoadNode to have more than one RoadNodeClassificationValue, in these rare instances the value is highest value in the table below is applied.

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.	
https://www.ordnancesurvey.co.uk/xml/codelists/highways/RoadNodeClassificationValue.xml	
Code	**Description**

Grade Separation	A RoadNode which represents where there is a difference in physical level of the two RoadLinks and in the real world they do not meet and split here.
Mini Roundabout	A road junction where the effects of a roundabout on traffic flow are recreated by use of a delineated circular area of road markings or surface changes.
Motorway Junction	A named intersection where a vehicle gains access or exits the motorway

AccessPointValue

The RoadNode feature is attributed with an "access" property with the data type AccessPointValue. The following table describes the codes used to populate this field.

Not currently populated.

Code List: AccessPointValue	
Description of whether the junction acts as an exit or entry point onto a controlled-access highway. https://www.ordnancesurvey.co.uk/xml/codelists/highways/AccessPointValue.xml	
Code	**Description**
Entry	The junction facilitates entry onto the adjoining link.
Exit	The junction facilitates exit from the link.

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: StreetTypeValue	
https://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).

JunctionTypeValue

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

Code List: JunctionTypeValue	
http://www.ordnancesurvey.co.uk/xml/codelists/highways/JunctionTypeValue.xml	
Value	**Description**
Named Junction	A Road Junction that is officially named. For example, Gravelly Hill.
Numbered Motorway Junction	A Road Junction that is part of a Road classified as Motorway.
Numbered A Road Junction	A Road Junction that is part of a Road classified as A Road.

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.

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.

Enumeration

MinMaxLaneValue

The "NumberOfLanesType" data type is attributed with a "minMaxNumberOfLanes" property with the data type of "MinMaxLaneValue". The following table describes the codes used to populate this field.

The enumeration has been inherited from INSPIRE and is not extendable.

Not currently populated.

MinMaxLaneValue http://inspire.ec.europa.eu/enumeration/MinMaxLaneValue	
Value	**Description**
Maximum	The number of lanes is the maximum value for a given part of the road network.
Minimum	The number of lanes is the minimum value for a given part of the road network.

Chapter 4   How the product fits together?

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

The below tables identifies how the feature types relate to one another and which attributes are the primary and foreign keys. This is also represented diagrammatically in **Error! Reference source not found.**, the attribute at the arrow head 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**
RoadLink	startNode	RoadNode	id
RoadLink	endNode	RoadNode	id
RoadLink	relatedRoadArea	TopographicArea	TOID
RoadLink	formsPartOf	Road	id
RoadLink	formsPartOf	Street	id
RoadNode	relatedRoadArea	TopographicArea	TOID
Road	link	RoadLink	id
Street	link	RoadLink	id
RoadJunction	node	RoadNode	id
FerryTerminal	element	RoadNode	id
FerryTerminal	element	FerryNode	id
FerryTerminal	refToFunctionalSite	FunctionalSite	id
FerryLink	startNode	FerryNode	id
FerryLink	endNode	FerryNode	id
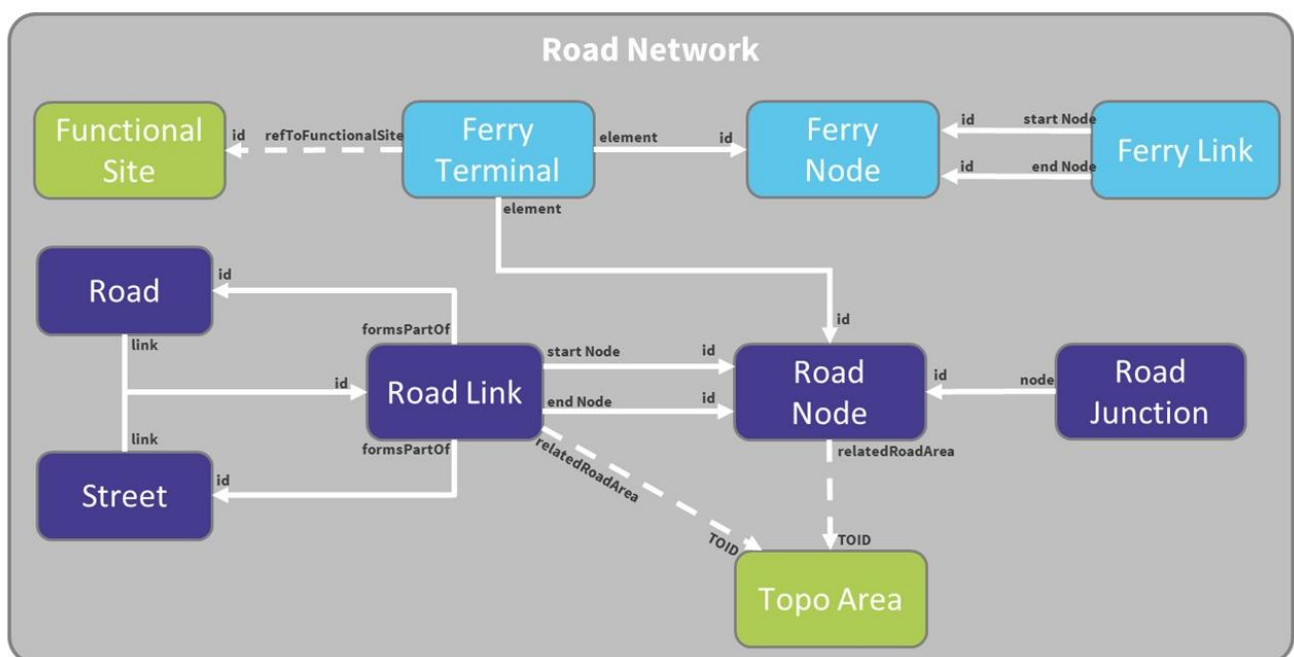
Figure 15: OS MasterMap Highways Network - Roads relational model. Base of the arrow is the foreign key attribute and the arrow head is the primary key attribute.

Chapter 5   Change Only Update (COU)

The OS MasterMap Highways Network – Roads can be ordered as either Full Supply or Change Only Update. The GML structure 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 B. 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.

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.

Change Only Update supply

When an order is placed for COU the first ordere 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 automatically sent out.

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 customers 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 customers 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.

2.   <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.

3.   <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 customers 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 in Annex B of the different types of transactions.

Chapter 6   Supply format

The OS MasterMap Highways Network product is supplied in GML version 3.2.1. This chapter describes how OS MasterMap Highways Network is defined in GML. An understanding of XML (Extensible Mark-up Language) and XML schema is required.

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.

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 Road Network uses the following application schemas; **LinearHighwayNetwork.xsd, HighwaysWaterTransportNetwork.xsd and OSProducts.xsd** which are referenced by the data. The LinearHighwaysNetwork.xsd defines the features which make up the Road 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. Through the INSPIRE schemas both the **LinearHighwayNetwork.xsd and HighwaysWaterTransportNetwork.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: http://www.os.uk/xml/schema/highwaysnetwork/1.0/linearhighwaynetwork.xsd.

 The application schema uses the following XML namespaces, for which definitions are available as given 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

Annexe A   Product and service performance report form

Ordnance Survey welcomes feedback from its customers about OS MasterMap Highways Network

If you would like to share your thoughts with us, please print a copy of this form and when completed post or fax it to the address below.

Your name: ....

Organisation: ....

Address: ....

....

....

Postcode: ....

Phone: ....

Fax: ....

Email: ....

Quotation or order reference: ....

Please record your comments or feedback in the space below. We will acknowledge receipt of your form within three (3) working days and provide you with a full reply or a status report within 21 working days.

If you are posting this form, please send it to:

OS MasterMap Highways Network, Product Manager, Ordnance Survey, Adanac Drive, SOUTHAMPTON, SO16 0AS.

If you wish to return it by fax, please dial 023 8005 6159.

Any personal information that you supply with this report form will be used by Ordnance Survey only in the improvement of its products and services. It will not be made available to third parties.

Annexe B GML Examples

Examples of the different GML structure for Full Supply orders and Change Only Update 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>

```xml
        <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>
```
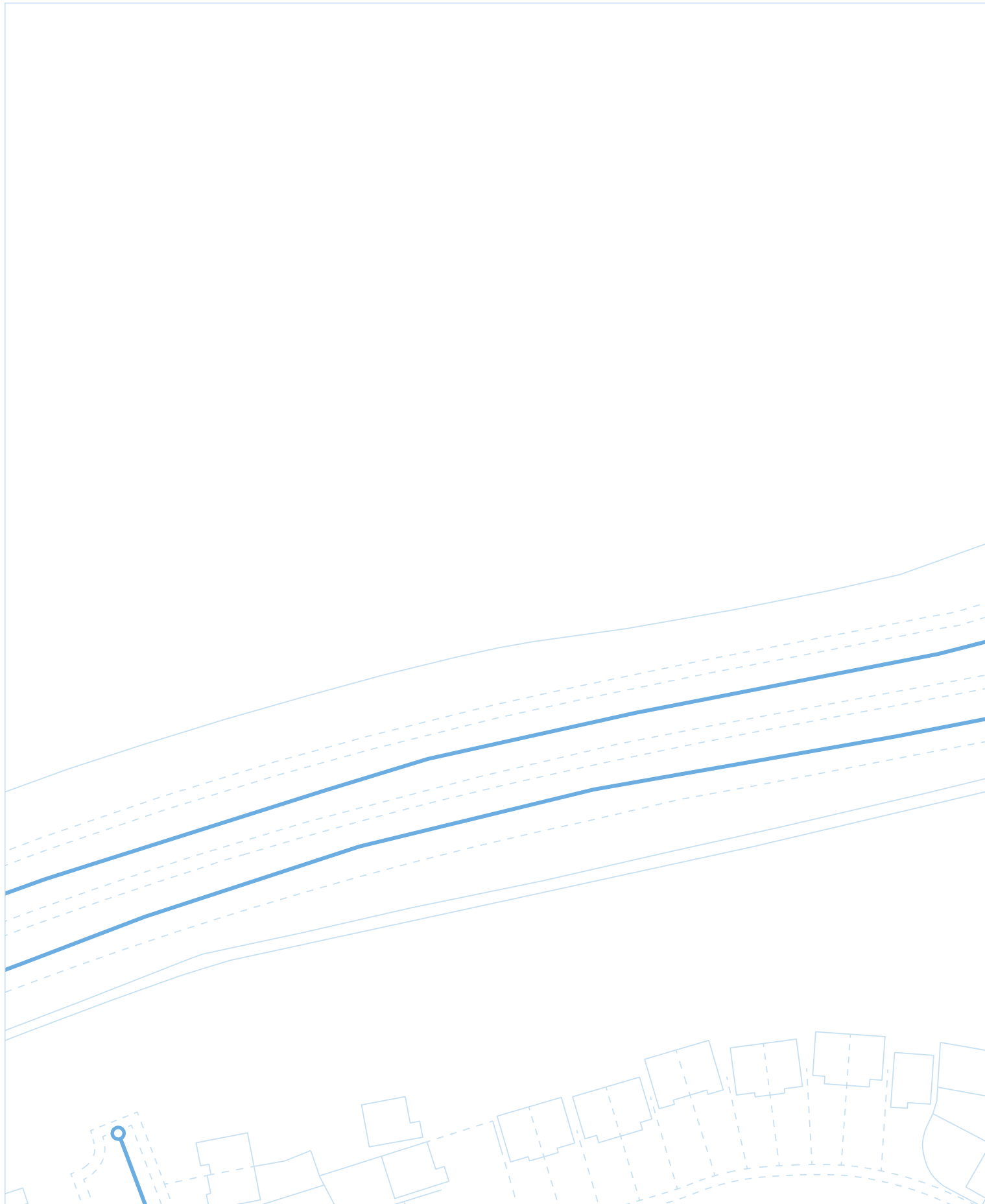
</os:delete>

</os:Transaction>

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