



ORDNANCE SURVEY GB

OS MASTERMAP HIGHWAYS NETWORK – ROUTING AND ASSET MANAGEMENT INFORMATION™ – TECHNICAL SPECIFICATION

Version history

Version	Date	Description
1.0	03/2016	Initial release.
2.0	10/2016	Minor updates.
2.1	04/2017	Minor updates.
2.2	10/2017	Minor updates.
2.3	03/2021	Addition of Scottish Street information.
2.4	02/2022	Introduction of GeoPackage format to the product.
2.5	04/2022	Minor updates.

Purpose of this document

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

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I. Introduction

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

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

- OS MasterMap Highways Network – Roads
- OS MasterMap Highways Network – Routing and Asset Management Information
- OS MasterMap Highways Network – Paths

This technical specification covers the OS MasterMap Highways Network – Routing and Asset Management Information (from here, referred to as RAMI) product specification, providing a focus on the RAMI features. To use this product, you will have received the features which make up the Roads product. For further details on the Roads or Paths products, please see their respective Technical Specifications.

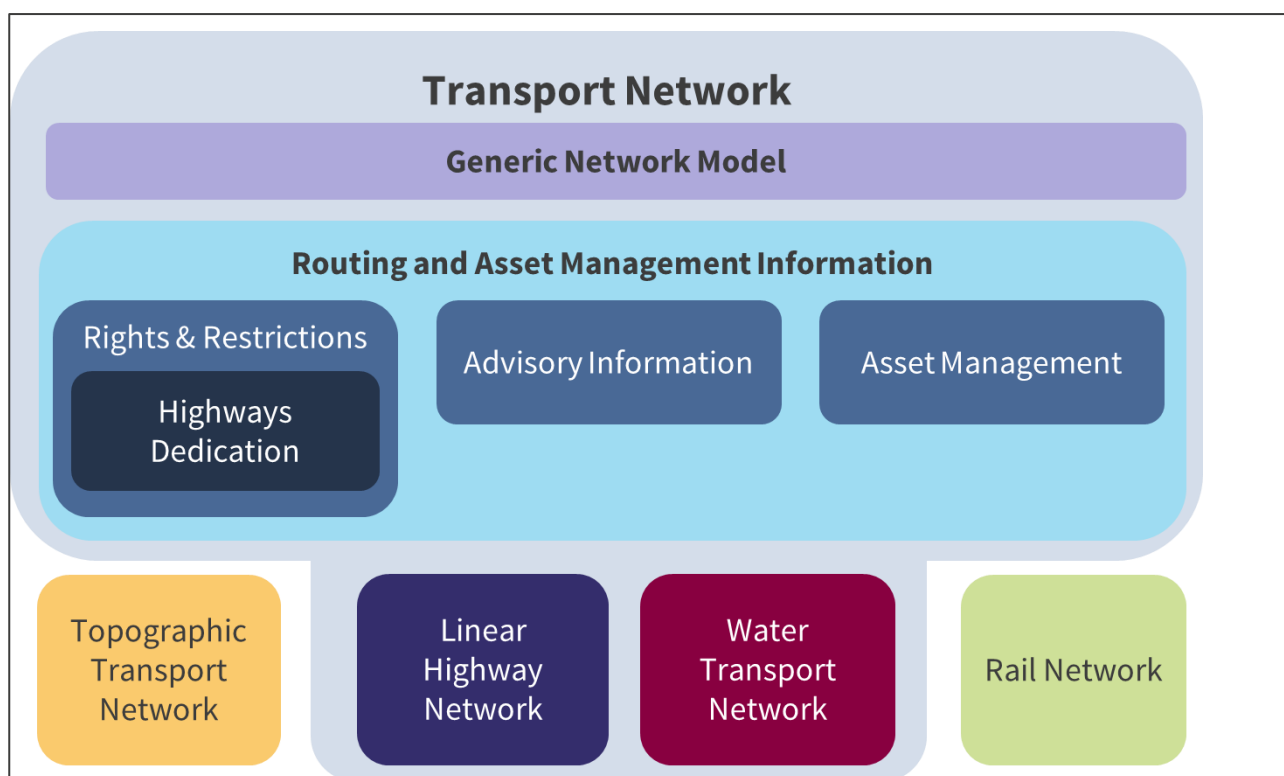


Figure I. The conceptual INSPIRE Transport Network Model

1.1 Identifiers

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

Identifiers shall be encoded in three properties in the data:

- **gml:id** – This feature identifier consists of the shorthand prefix namespace and local identifier which is used to uniquely identify and reference the feature within the dataset, for example, `osgb4000000009461245`.
- **gml:identifier** – This is a global feature identifier and can be used to identify and reference the feature within other datasets, for example, <http://data.os.uk/id/4000000009461245>.
- **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.

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

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

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

1.1.1 TOIDs

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

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

Examples

- **gml:id** – ‘`osgb4000000009461245`’
- **localId** – ‘`4000000009461245`’
- **identifier** - ‘`http://data.os.uk/4000000009461245`’

1.1.2 USRNs

USRNs are strings of up to twelve characters which consist 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)

Examples

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

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

1.1.3 Unique IDs

Unique IDs for Maintenance, Reinstatement, and Special Designation are strings of up to 17 characters which consist of two parts:

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

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

- LHA authority code
- ESU it references
- dedication code in the NSG

For example, esu4720_4280330430163_8, esu4720_4280340431456_11

Examples (given for both unique ID formats)

- gml:id – 'id_3700MA01862142' or 'esu4720_4280330430163_8'
- localId – '3700MA01862142' or 'esu4720_4280330430163_8'
- identifier - '<http://data.os.uk/3700MA01862142>' or 'https://data.os.uk/id/esu4720_4280330430163_8'

1.2 Available formats

OS MasterMap Highways Network– RAMI will be supplied in two formats: Geography Markup Language (GML 3.2.1) and GeoPackage. Both formats are compressed into a regular zip file (.zip).

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

1.3 Adherence to standards

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

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

1.3.1 Extending INSPIRE specification

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

1.4 Notation

1.4.1 UML diagram and table conventions

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

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

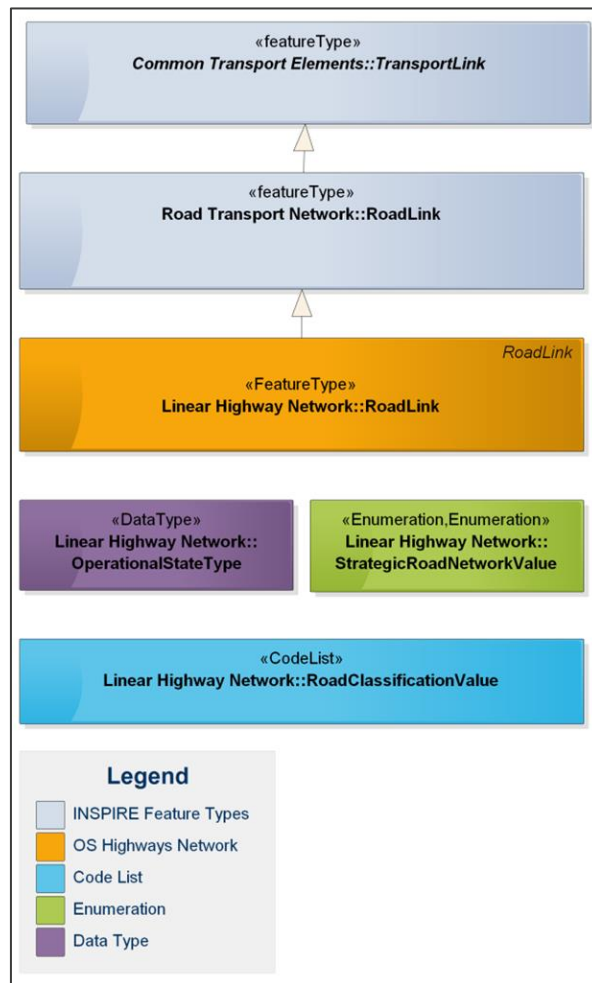


Figure 2. Colour conventions used in UML diagrams

I.4.2 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.

1.4.3 Stereotypes

The following stereotypes are used on UML elements:

Stereotype	UML Element	Description
<<ApplicationSchema>>	Package	Parent package containing sub-packages and elements that comprise part of the modular specification.
<<FeatureType>>	Class	A spatial object type. [ISO 19136].
<<Type>>	Class	A structured data type with identity.
<<DataType>>	Class	A structured data type without identity. [ISO/TS 19103].
<<Union>>	Class	A structured data type without identity where exactly one of the properties of the type is present in any instance.
<<Enumeration>>	Class	A fixed controlled set of values for a free text data type.
<<CodeList>>	Class	A controlled set of values for a free text data type that may be extended.
<<Voidable>>	Property	A property that is required but is either not currently captured (unknown) or is partially populated (unpopulated).
<<LifecycleInfo>>	Property	Property considered part of the life cycle information.

1.4.4 Constraints

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

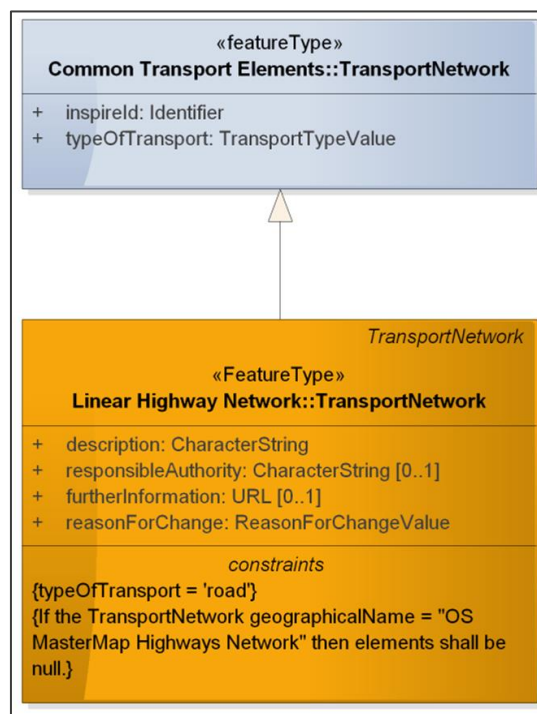


Figure 3. Representation of constraints in UML diagrams

1.4.5 Relationships and associations

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

- Generalisation/Specialisation – used to denote either:
 - An extension relationship. The target class represents the same real-world entity and is extending it to include additional properties not defined on the parent class.

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

Or:

- A sub typing relationship. The target class defines 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 – used to denote part-of relationships. Aggregations are used to describe loose part-of relationships. If the parent feature ceases to exist, then the part feature can continue to exist. For example, a Road Name may cease to exist, but the Road will still exist.

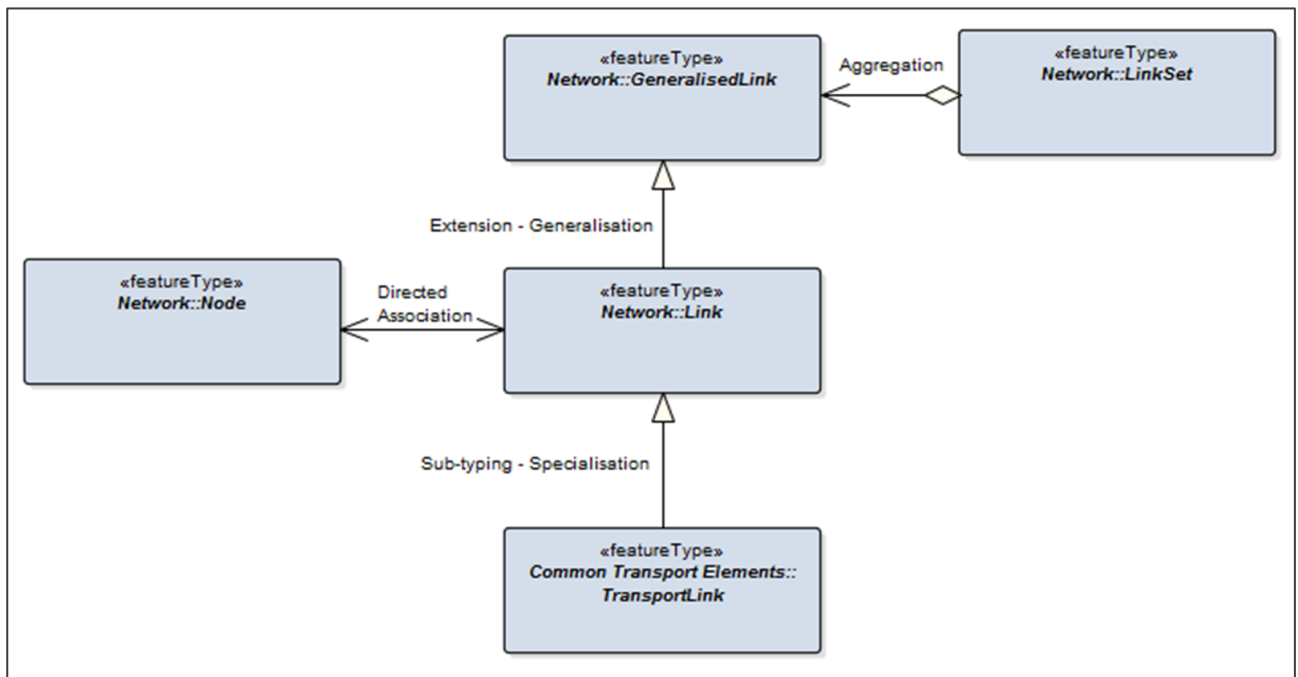


Figure 4. Relationships between feature types

2. Specification changes

There have been small enhancements to the OS MasterMap Highways Network Version 2.2 to enable the release of new features and functionality. This section will outline the main changes to the RAMI product. For changes to the [Roads](#) or [Paths](#) products, please see their respective Technical Specifications.

2.1 Features

- Added new feature type, [HighwayDedication](#), to denote dedications of highways as defined in the [Highway Act 1980](#) and [Countryside and Rights of Way Act 2000](#).
- Added new code list, [DedicationValue](#), for HighwayDedication features.

2.2 Code lists, data types, and enumerations

- **March 2021** – The [ReinstatementTypeValue](#) code list has been updated with four new values added to include Scottish codes.
- **March 2021** – The [SpecialDesignationTypeValue](#) code list has been updated with five new values added to include Scottish codes.
- The [NetworkReferenceLocation](#) has been further extended to accept additional geometry types, lines and polygons, in addition to start and end points. This affects *Maintenance*, *Reinstatement* and *Special Designation* and the information provided on their location for partial records.
- The [SpecialDesignationTypeValue](#) code list has been updated with multiple new values added.
- The [MaintenanceValue](#) enumeration has been updated with two values added.

2.3 Schema changes

- v2.1 RAMI schema is being released which will enable the code list and enumerations described above to be delivered.
- v1.0 Highways Dedication schema has been introduced which defines the Highways Dedication feature.

3. OS MasterMap Highways Network – Routing and Asset Management Information

The RAMI product contains the base road network and RAMI features, which reference back to the network. The base road network features are detailed in the Roads Technical Specification. The current specification focuses on RAMI.

RAMI has been categorised into the following themes (Figure 5):

- **Rights and Restrictions:** Defines properties that restrict, regulate or prohibit the use of the network by traffic such as turn restrictions, or access and use restrictions which may affect the allowable route for users.
- **Advisory Information:** These provide additional information that may affect a driver's preferred choice of route or highlight potential hazards such as the presence of a toll, ford, or level crossing.
- **Asset Management:** Provides additional information to support the management of Highways Assets by Highways and Roads Authorities such as detailed physical characteristics relating to the asset (reinstatement), road maintenance responsibility, and whether it has any special designations

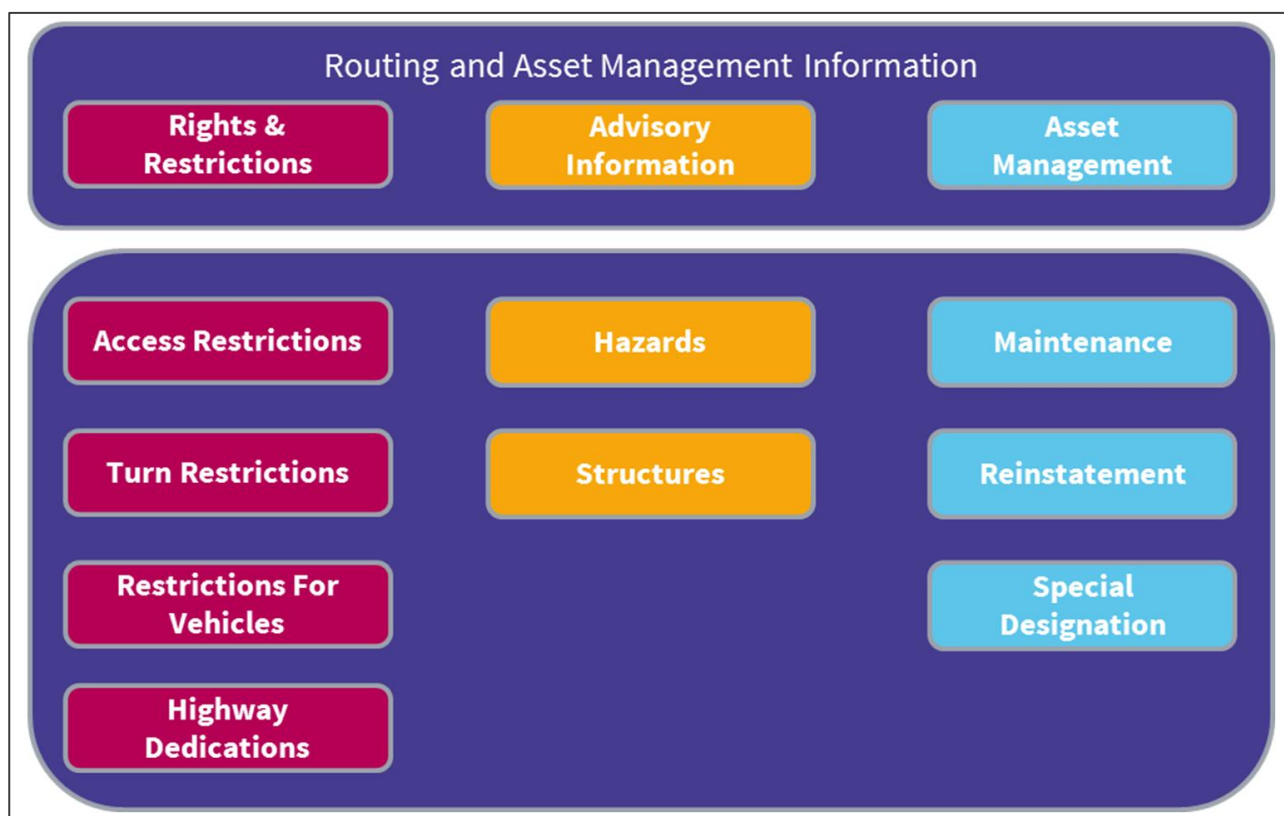


Figure 5. Overview of Routing and Asset Management Information

3.1 Network referencing

RAMI is related back to features in the OS MasterMap Highways Network – Roads product using Network Referencing, through the networkRef attribute. All RAMI features extend the INSPIRE NetworkProperty class (Figure 6). This allows several types of Network Referencing to relate the RAMI to the relevant feature:

- **Network Reference:** This is used to relate the information to a *Street*.
- **Node Reference:** This is used to relate the information to a *RoadNode*.
- **Link Reference:** This is used to relate the information to a complete *RoadLink*.
- **Multiple Link Reference:** This is used to relate the information to more than one complete *RoadLink*.
- **Point Reference:** This is used when the information is related to a specific point along a *RoadLink*.
- **Linear Reference:** This is used to relate the information to a specific section of a *RoadLink*. This type of referencing is not used in the RAMI specification.

The different types of Network Referencing all extend the INSPIRE Network Reference data type.

In the INSPIRE specification, the networkRef is a voidable field. For all features in the RAMI specification, the networkRef will never be voided.

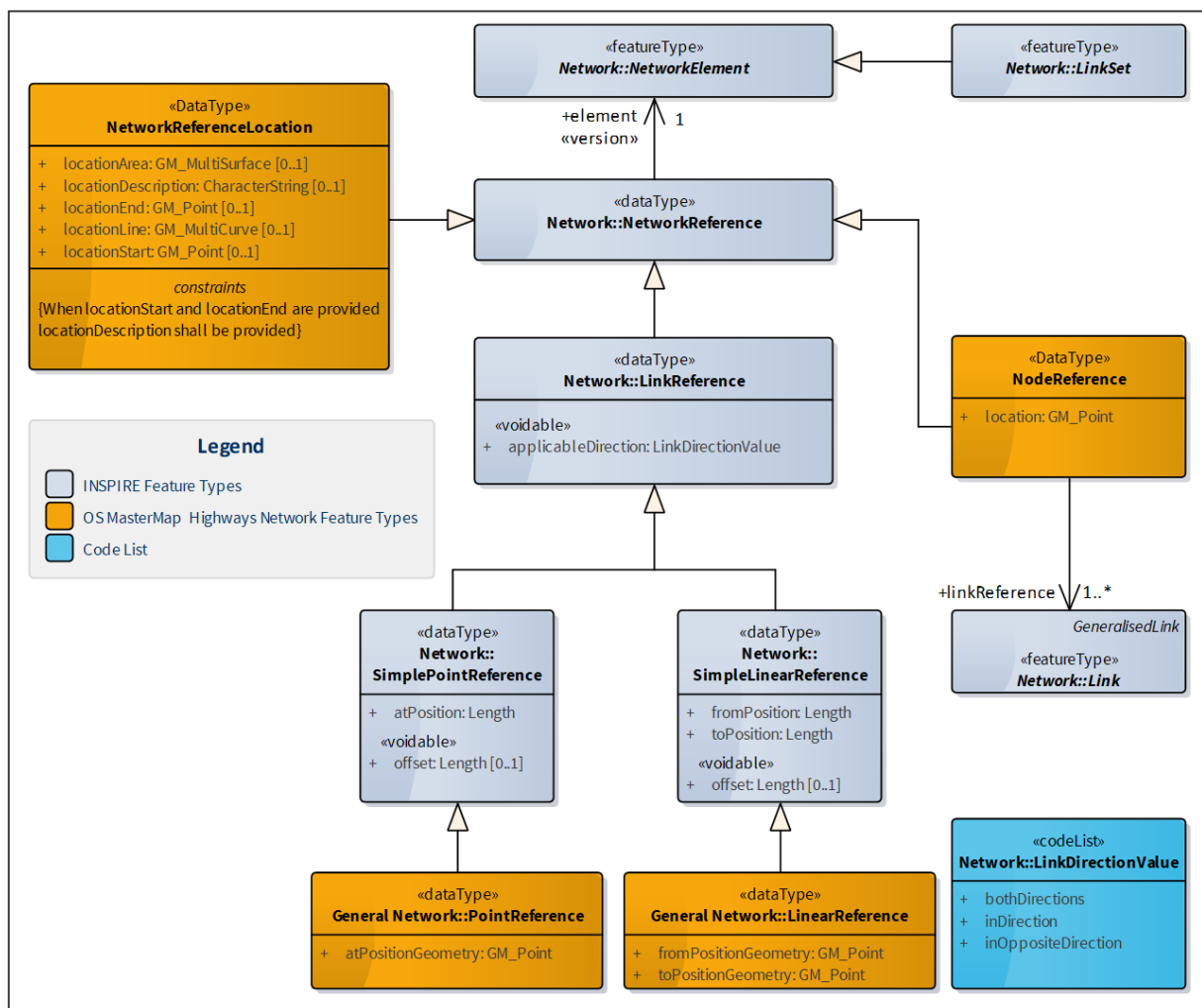


Figure 6. INSPIRE Network Referencing Model

3.1.1 Network Reference

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

The feature types which use the Network Reference Location are Maintenance, Reinstatement, Special Designation, and Highways Dedication.

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

3.1.2 Node Reference

When a feature in the RAMI specification occurs at a RoadNode a Node Reference will be provided. As a part of the networkRef an element attribute will be given which defines the id of the RoadNode. A location will be provided for Node References which will be the coordinates of the RoadNode the feature references. Finally, a linkReference will contain a reference to the id of the RoadLinks that are affected by the restriction. In most instances, this will be all the RoadLinks that start or end at the referenced RoadNode. However, when a RoadNode has a classification of Grade Separation, then it will only reference the RoadLinks that are at the same level as the feature. An example of this could be at a bridge with a height restriction. The height restriction will only impact the RoadLinks that are passing under the bridge. The RoadLinks which are travelling over the bridge are not impacted by the height restriction. Therefore, the NodeReference will provide a reference to the RoadLinks which are passing under the bridge and will not reference all RoadLinks which reference the RoadNode through the start or end node references.

The feature types which use a Node Reference are RestrictionForVehicles, Hazard, and Structure.

«DataType» NodeReference	
Attribute: element	INSPIRE
Definition: The identifier of the feature being referenced; this will always be the gml:id of a RoadNode.	
Multiplicity: [1]	Size: 20
Attribute: location	
Definition: The co-ordinates for the RoadNode the feature is referencing.	
Type: GM_Point	Multiplicity: [1]
Association: linkReference	
Definition: A reference to the RoadLink(s) that the feature effects.	
Multiplicity: 1..*	Size: 20

3.1.3 Link Reference

When a feature occurs along a complete single RoadLink, a Link Reference will be used. Geometry is not provided for these features. The direction along the RoadLink for which the feature applies is supplied through the applicableDirection. If the feature applies to the RoadLink, regardless of which direction you travel along it (for example, Traffic Calming), then the value will be both directions. If the feature applies to the RoadLink in a specific direction of travel (for example, a One-Way road), the direction will be given in relation to the digitisation of the RoadLink (the order of coordinates).

The feature types which use a Link Reference are TurnRestriction and Structure.

«DataType» LinkReference		
Attribute: element		INSPIRE
Definition: The identifier of the feature being referenced; this will always be the gml:id of a RoadLink.		
Multiplicity: [1]	Size: 20	
Attribute: applicableDirection <<voidable>>		INSPIRE
Definition: The direction of the RoadLink to which the reference applies in relation to the direction the link has been captured in.		
Type: LinkDirectionValue	Size: 21	Multiplicity: [1]

3.1.4 Multiple Link Reference

A Multiple Link Reference is the same as a Link Reference, except the feature will contain more than one link reference. This referencing will be used when a feature references multiple, complete RoadLinks, for example a No Turn. The order in which these features apply to the RoadLink is important to ensure the feature is being interpreted correctly and therefore the Link References in the product have been ordered to reflect this. In addition to the order, the direction will be provided in relation to the digitisation of the RoadLink and this is important in interpreting the feature. Geometry will not be provided for these features.

The feature types which use a Multiple Link Reference are TurnRestriction and Hazard.

3.1.5 Point Reference

For a feature that happens at a specific point, that is not coincident with a RoadNode, a Point Reference will be used which will reference a RoadLink. The Point Reference will give the location of the point, defined as a distance value in metres from the start of the RoadLink through the atPosition attribute. In addition, the location of the point will be given by a pair of coordinates which are snapped to the RoadLink, through the atPositionGeometry attribute. Finally, the direction along the RoadLink for which the feature applies is given through the applicableDirection. If the feature applies to the RoadLink regardless of which way you travel along it (for example, a Gate), the value will be both directions. If the feature applies to the RoadLink in a specific direction of travel (for example, an Access Restriction), the direction will be defined in relation to the digitisation of the RoadLink (the order of coordinates).

The feature types which use a Point Reference are AccessRestriction, RestrictionForVehicles, Hazard, and Structure.

«DataType» PointReference		
Attribute: element		INSPIRE
Definition: The identifier of the feature being referenced; this will always be the gml:id of a RoadLink.		
Multiplicity: [1]	Size: 20	
Attribute: applicableDirection <<voidable>>		INSPIRE
Definition: The direction of the RoadLink to which the reference applies in relation to the direction the link has been captured in.		
Type: LinkDirectionValue	Size: 21	Multiplicity: [1]
Attribute: atPosition <<voidable>>		INSPIRE
Definition: Position of the point, expressed as the distance from the start of the linear network element along its curve geometry.		
Type: Length	Multiplicity: [1]	
Attribute: atPositionGeometry		
Definition: The location geometry of the restriction, will be snapped to the RoadLink.		
Type: GM_Point	Multiplicity: [1]	

3.2 Common attribution

Each feature within the RAMI theme will have the following common attribution:

- gml:id, gml:identifier and inspireId
- beginLifespanVersion
- reasonForChange
- validFrom

Note: This is assigned a nilReason value unknown for most features.

3.3 Temporal properties

The RAMI product holds information on restrictions which apply to a temporal period. The different Temporal Properties have been categorised and the different categories are detailed below. In addition, they have been given a hierarchy within the RAMI product which is illustrated in Figure 7. Temporal Properties are applied to four Feature Types in RAMI: AccessRestrictions, HighwayDedication, TurnRestrictions and SpecialDesignation.

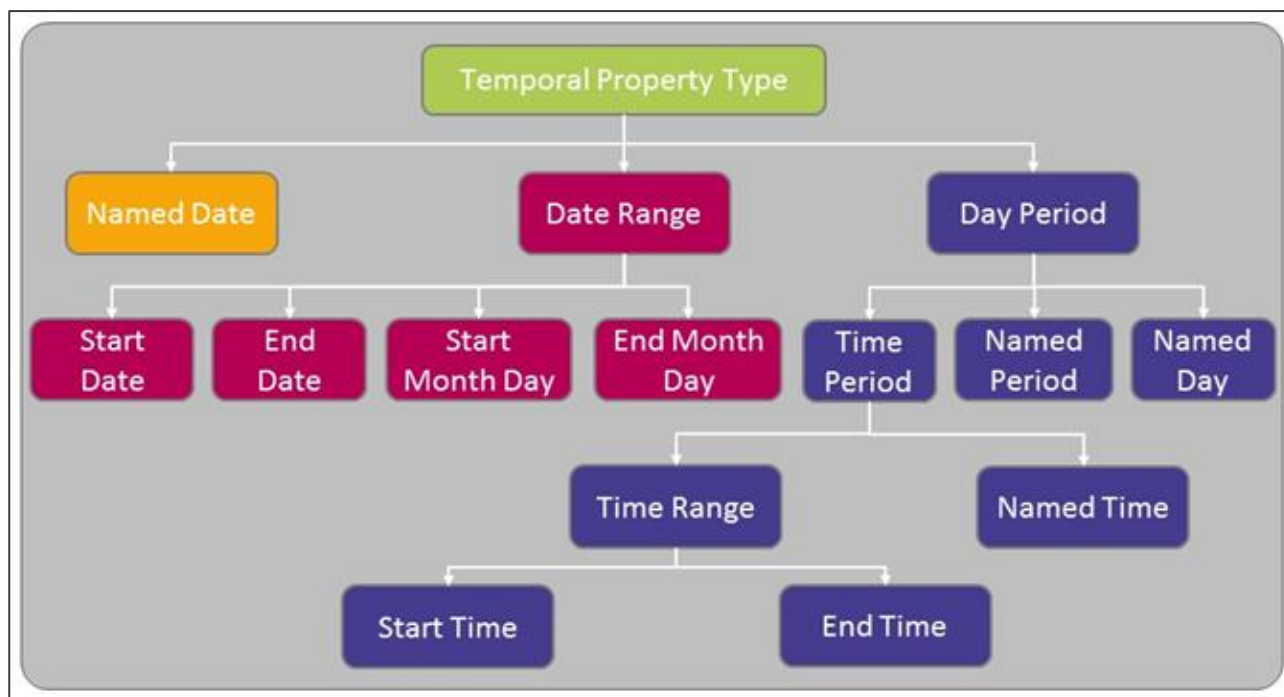


Figure 7. Temporal Properties structure

3.3.1 Named Date

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

3.3.2 Date Range

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

The StartDate and EndDate will always be used for Date Ranges for Special Designation features. These are formatted as YYYY-MM-DD, for example, 2016-09-20. The StartMonthDay and EndMonthDay will always be used for Access Restrictions and Turn Restrictions. These are formatted as --MM—DD, for example, --03—23.

3.3.3 Day Period

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

- **Named Day** – A restriction which applies to a specified day which is named, for example, Monday or Weekends.
- **Named Period** – A restriction which applies to a specified period which is named, for example, School Holidays.
- **Time Period** – A time period is made up of a further two properties:
 - **Named Time** – A restriction which applies to a specified time period which is named. That do not necessarily relate to the same time each day consistently across the country, for example, Peak Time.
 - **Time Range** – When a restriction applies between two specified times which will always have a start time and an end time. These data types are formatted as HH:MM:SS and will use the 24hr clock, for example, 16:30:00.

4. Rights and Restrictions

4.1 Overview

The Rights and Restrictions sub-theme includes properties that prohibit, restrict or regulate the use of the network by traffic. Rights and Restrictions are typically defined through legislation, including the **Traffic Regulation Order (TRO)** made under the [Road Traffic Regulation Act 1984](#).

The following types of rights and restrictions are in scope of the current product:

- Access Restrictions
- Turn Restrictions
- Restrictions For Vehicles (Height, Weight, Width and Length restrictions)
- Highways Dedications (indications of Rights of Way)

4.1.1 Simplification and priority of Rights and Restrictions

Rights and Restrictions features record the effect and nature of the real-world restriction or environmental factors. However, this is not always possible as restrictions may manifest in many different ways yet have the same effect.

For example, a single restriction may consist of a one-way street that has a no entry sign, no right/left turn sign and/or mandatory turn signs on the approach roads. This is represented in the simplest way by recording a one-way street. To ensure a level of consistency, a hierarchy is used when more than one restriction that has the same effect occurs at a given location. Only the restriction that has the highest priority will be captured.

Restriction priority table	
Priority	Restriction
1	One Way
2	No Entry/Access Prohibited To/Access Limited To
3	Mandatory Turns
4	No Turn

Therefore, Rights and Restrictions primarily model the effect of any restriction in the simplest possible way and secondary to this is recording the real-world manifestation.

4.2 AccessRestriction

4.2.1 Overview

Access to a road or area by vehicles can be legally prohibited. Prohibited access restrictions are indicated by regulatory signs with a red circle or a no entry sign. In addition, access could be limited for use by particular classes of vehicle, these are indicated by regulatory signs with a blue circle. Access restrictions may also include exemptions to the restriction. The Access Restriction feature type comprises of these types of restrictions.

An Access Restriction will reference back to the Roads Product Network through Point Referencing. For more information on Point Referencing, see section 3.1.5.

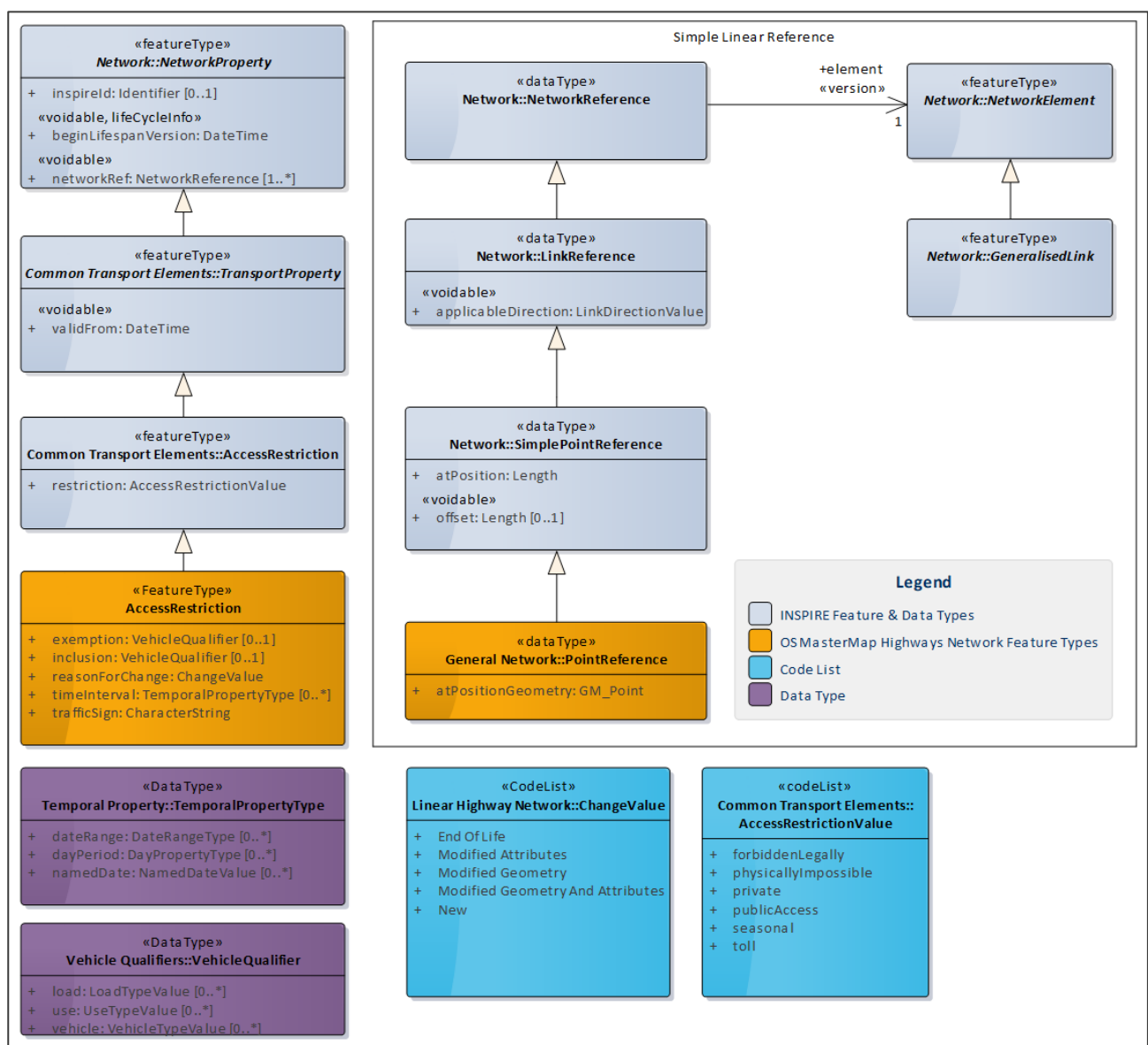


Figure 8. Context diagram for AccessRestriction

4.2.2 Attribution

«FeatureType» AccessRestriction		
Definition: A restriction based on vehicular access to a highway.		
Attribute: id		
Definition: Unique identifier, for AccessRestriction 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»		INSPIRE
Definition: Date and time at which this version of the spatial object was inserted or changed in the spatial data set.		
Note: The time part is always set to zero.		
Type: DateTime		Multiplicity: [1]
Attribute: networkRef «voidable»		INSPIRE
Definition: Spatial reference of the network-related property.		
Type: NetworkReference		Multiplicity: [1..*]
Attribute: validFrom «voidable»		INSPIRE
Definition: The time when the transport property started to exist in the real world.		
Note: The time part is always set to zero.		
Type: DateTime		Multiplicity: [1]
Attribute: restriction		INSPIRE
Definition: Nature of the access restriction.		
Type: AccessRestrictionValue	Size: 21	Multiplicity: [1]
Attribute: inclusion		
Definition: Types of vehicle or use that the restriction applies to.		
Type: VehicleQualifier		Multiplicity: [0..1]

«FeatureType» AccessRestriction		
Attribute: exemption		
Definition: Types of vehicle or use that are exempt from the restriction.		
Type: VehicleQualifier		Multiplicity: [0..1]
Attribute: timeInterval		
Definition: Time period to which the restriction applies.		
Type: TemporalPropertyType		Multiplicity: [0..*]
Attribute: trafficSign		
Definition: A description of the traffic sign indicating the restriction, for example, Access Limited to Buses.		
Type: CharacterString	Size: 120	Multiplicity: [1]
Attribute: reasonForChange		
Definition: The reason for a change made to a feature.		
Type: ChangeValue	Size: 32	Multiplicity: [1]

4.3 HighwayDedication

4.3.1 Overview

Highway dedication indicates which types of user have access to the given section of the Highway.

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

There can only be one Highway Dedication type applied to the geometry at any given date or time. It is likely that more than one Highway Dedication type applies to a section of Highway (i.e. a highway open to all vehicles will also have pedestrian way or footway access). The following table gives the order of priority where the highway dedications under each is inferred:

Table 1: Highway Dedication user priorities

Priority	Highway Dedication
1	Motorway*
2	All Vehicles
3	Byway open to All Traffic
4	Restricted Byway
5	Bridleway

Priority	Highway Dedication
6	Cycle track or Cycle way
7	Pedestrian way or Footpath

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

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

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

A Highway Dedication feature will reference back to the Path Network through Network Reference and will reference a RoadLink or Street Feature. For more information on Network References, see Section 3.1.1.

The Highway dedication feature type is not extended to Scotland because this information does not exist in the source local authority data.

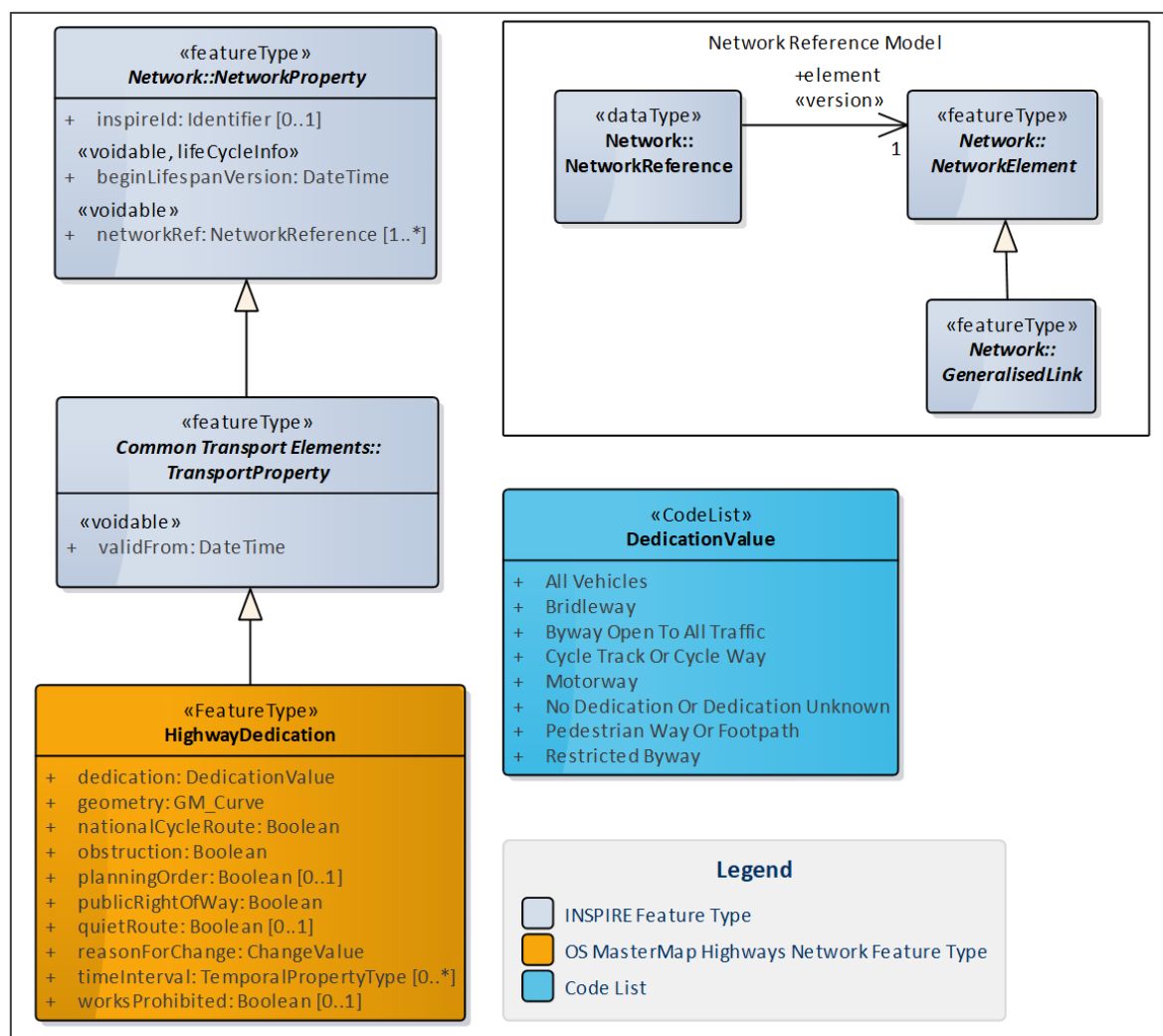


Figure 9. Context diagram: HighwayDedication

4.3.2 Attribution

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

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

4.4 TurnRestriction

4.4.1 Overview

A turn restriction is a restriction based upon a vehicle manoeuvre. This type of restriction includes prohibitive driving instructions, mandatory driving instructions and implicit restrictions. Prohibited instructions are indicated by road signs within a red circle, examples include No U Turn, No Right Turn or No Left Turn. These can include exceptions to the instruction and are typically elements like Except for Buses. Mandatory driving instructions are indicated by road signs within a blue circle or painted on the roadway such as Turn Right, Ahead Only and No Left Turn. Implicit restrictions occur where a turn is not signed as prohibited but would not be a normal manoeuvre. For example, where a road splits around a traffic island or at complex junctions where additional geometry has been captured to reflect the traffic flow. These are not differentiated from actual signed restrictions.

A Turn Restriction will reference back to the Roads product through Link References and Multiple Link References. For more information on these different types of Network References, see Section 3.1.

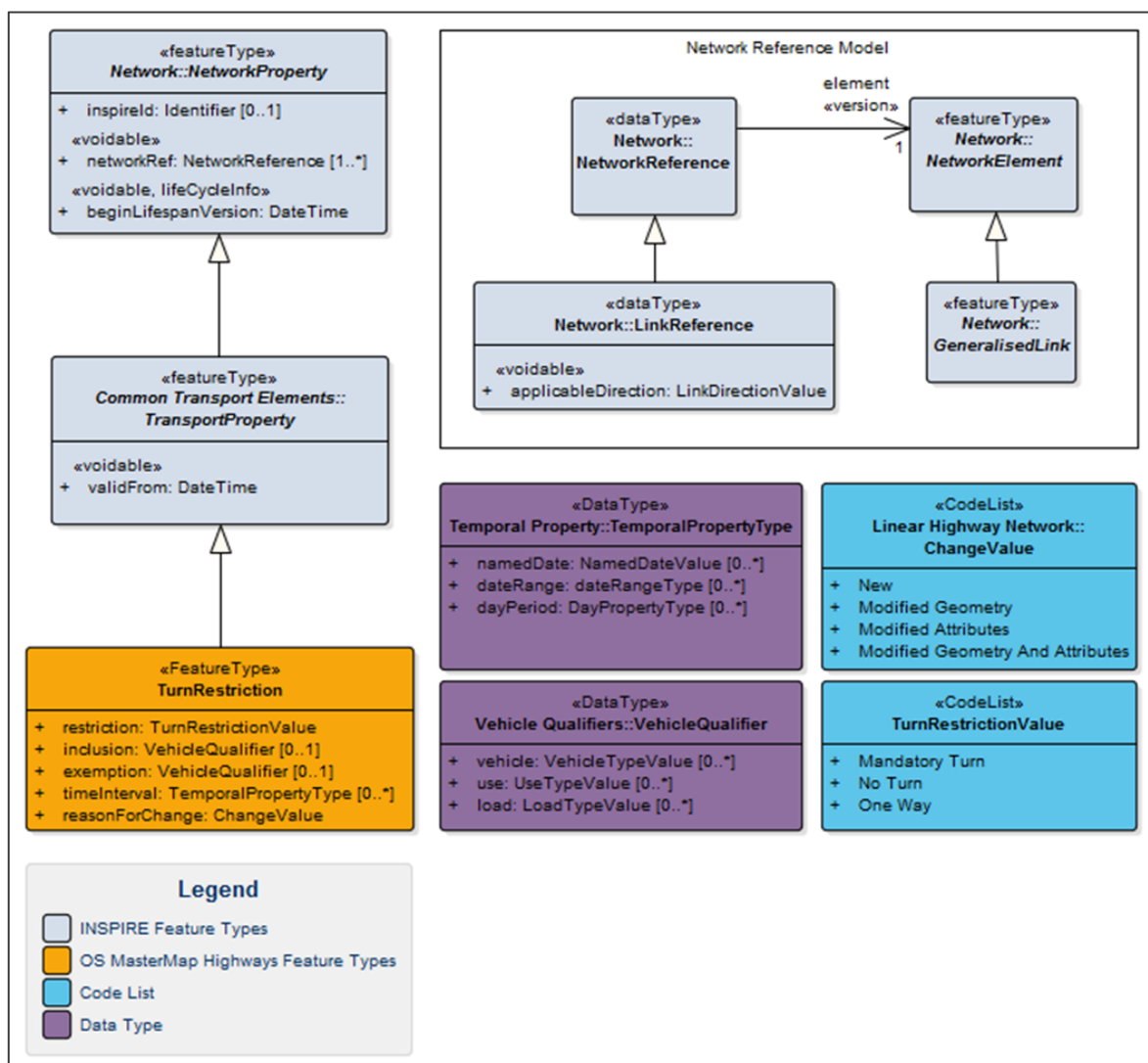


Figure 10.Context diagram: TurnRestriction

4.4.2 Attribution

«FeatureType» TurnRestriction		
Definition: A restriction on vehicular manoeuvre.		
Attribute: id		
Definition: Unique identifier, for TurnRestriction 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»		INSPIRE
Definition: Date and time at which this version of the spatial object was inserted or changed in the spatial data set.		
Note: The time part is always set to zero.		
Type: DateTime		Multiplicity: [1]
Attribute: networkRef «voidable»		INSPIRE
Definition: Spatial reference of the network-related property.		
Type: NetworkReference		Multiplicity: [1..*]
Attribute: validFrom «voidable»		INSPIRE
Definition: The time when the transport property started to exist in the real world.		
Note: The time part is always set to zero.		
Type: DateTime		Multiplicity: [1]
Attribute: restriction		
Definition: Type of turn constraint.		
Type: TurnRestrictionValue	Size: 34	Multiplicity: [1]
Attribute: inclusion		
Definition: Types of vehicle or use that the restriction applies to.		
Type: VehicleQualifier		Multiplicity: [0..1]

«FeatureType» TurnRestriction		
Attribute: exemption		
Definition: Types of vehicle or use that are exempt from the turn restriction.		
Type: VehicleQualifier		Multiplicity: [0..1]
Attribute: timeInterval		
Definition: Time period to which the restriction applies.		
Type: TemporalPropertyType		Multiplicity: [0..1]
Attribute: reasonForChange		
Definition: The reason for a change made to a feature.		
Type: ChangeValue	Size: 32	Multiplicity: [1]

4.5 RestrictionForVehicles

4.5.1 Overview

RestrictionForVehicles are constraints that apply to the vehicles based on their physical characteristics: height, weight, width and length. These are required to protect structures such as bridges and tunnels from damage, or to restrict/prohibit use by vehicles that exceed specific dimensions, usually for environmental reasons.

RestrictionForVehicles has been extended to support the full definition of height, weight, width and length restrictions as defined in the UK to ensure that they can:

- Apply to specific vehicle types only
- Relate to a structure for which the restriction is designed to protect (for example, a Bridge)

A RestrictionForVehicles will reference back to the Roads product through either a Node Reference or a Point Reference. For more information on these different types of Network References, see Section 3.1.

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

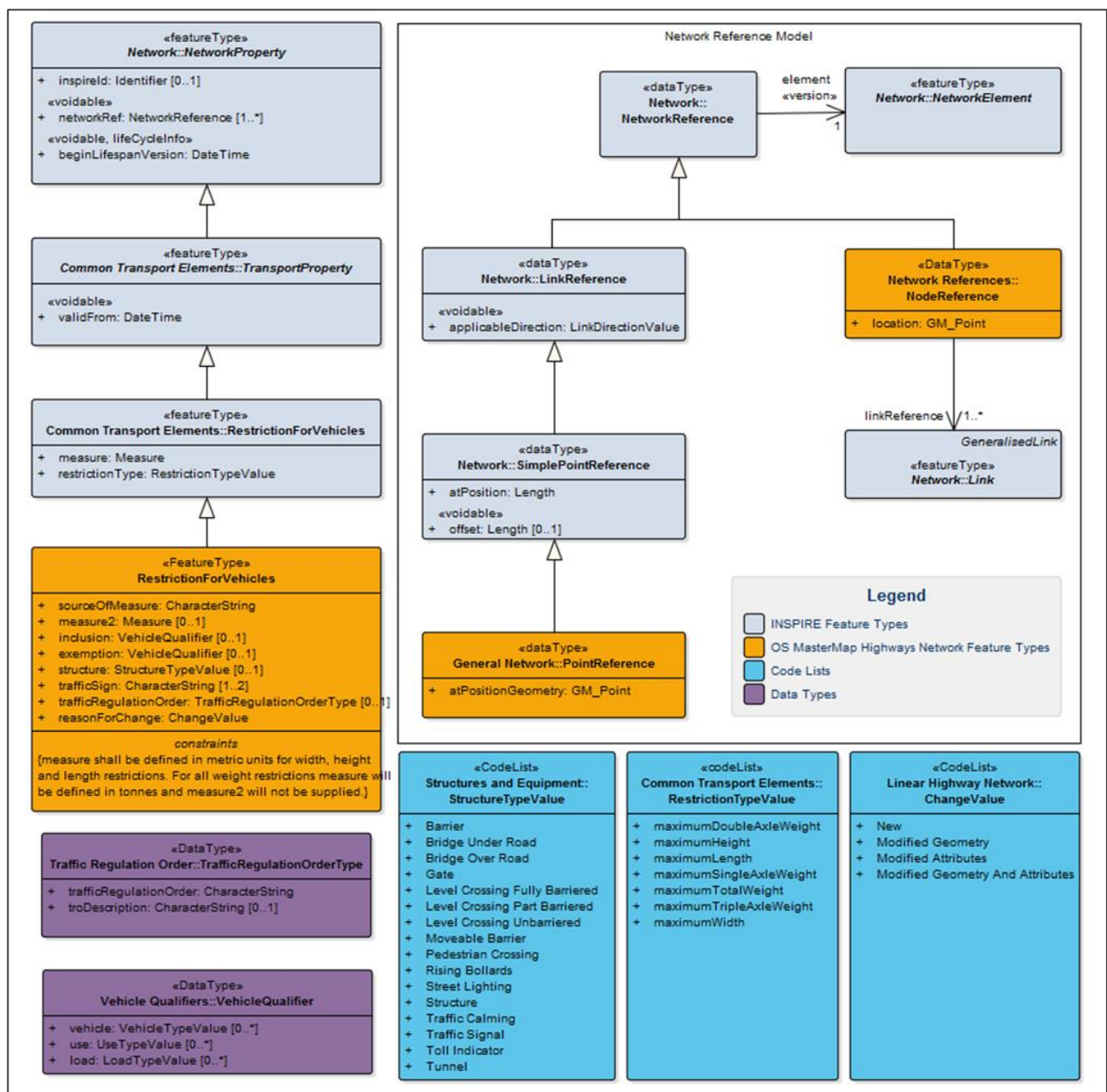


Figure 11. Context diagram: RestrictionForVehicles

4.5.2 Attribution

«FeatureType» RestrictionForVehicles		
Definition: Height, Weight, Width and Length restrictions (HWWL) for vehicles.		
Constraints:		
<ul style="list-style-type: none"> Measure shall be defined in metric units for width, height and length restrictions. For all weight restrictions, measure will be defined in tonnes and measure2 will not be supplied. 		
Attribute: id		
Definition: Unique identifier, for RestrictionForVehicle 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»		INSPIRE
Definition: Date and time at which this version of the spatial object was inserted or changed in the spatial data set.		
Note: The time part is always set to zero.		
Type: DateTime		Multiplicity: [1]
Attribute: networkRef «voidable»		INSPIRE
Definition: Spatial reference of the network-related property.		
Type: NetworkReference		Multiplicity: [1..*]
Attribute: validFrom «voidable»		INSPIRE
Definition: The time when the transport property started to exist in the real world.		
Note: The time part is always set to zero.		
Type: DateTime		Multiplicity: [1]
Attribute: measure		INSPIRE
Definition: The measure for the restriction which will be given in metres.		
Note: A Unit of Measure (uom) is provided as part of the attribute.		
Type: Measure	Size: 6,1	Multiplicity: [1]

«FeatureType» RestrictionForVehicles		
Attribute: restrictionType		INSPIRE
Definition: The type of restriction.		
Type: RestrictionTypeValue	Size: 26	Multiplicity: [1]
Attribute: sourceOfMeasure		
Definition: Indicates if the measure value is from a sign or has been converted from a different unit of measure.		
Type: CharacterString	Size: 10	Multiplicity: [1]
Attribute: measure2		
Definition: The measure for the restriction in imperial units and will be in inches. It will only be provided if the imperial restriction is present on the sign.		
Note: A Unit of Measure (uom) is provided as part of the attribute.		
Type: Measure	Size: 4	Multiplicity: [0..1]
Attribute: inclusion		
Definition: Vehicle types or uses that the restriction applies to.		
Type: VehicleQualifier		Multiplicity: [0..1]
Attribute: exemption		
Definition: Vehicle types or uses that are exemptions to the restriction.		
Type: VehicleQualifier		Multiplicity: [0..1]
Attribute: structure		
Definition: Description of the structure to which the restriction applies.		
Type: StructureTypeValue	Size: 40	Multiplicity: [0..1]
Attribute: trafficSign		
Definition: A description of the traffic sign indicating the restriction, for example, Maximum Height Restriction 6'-6".		
Type: CharacterString	Size: 120	Multiplicity: [1..2]
Attribute: trafficRegulationOrder		
Definition: Reference to the Traffic Regulation Order that formally created the restriction.		
Note: This is not currently populated.		
Type: TrafficRegulationOrderType	Size: 250	Multiplicity: [0..1]
Attribute: reasonForChange		
Definition: The reason for a change made to a feature.		

«FeatureType» RestrictionForVehicles		
Type: ChangeValue	Size: 32	Multiplicity: [1]

5. Advisory information

5.1 Overview

Advisory Information provides additional information relating to the highway that affects traffic movement such as:

- **Hazards:** These are locations which are dangerous, and caution should be taken to ensure safe travel. Examples include Fords and Dangerous Bends.
- **Structures:** These are built features which relate to the highway. Examples include Barriers, Bridges and Tunnels.

5.2 Hazard

5.2.1 Overview

These are locations which are hazardous, and caution should be taken to ensure safe travel. Hazards are usually signed using the warning sign through a red triangle.

A Hazard will reference back to the Roads product through a Node Reference, Point Reference or Multiple Link Reference. For more information on these different types of Network References, see Section 3.1.

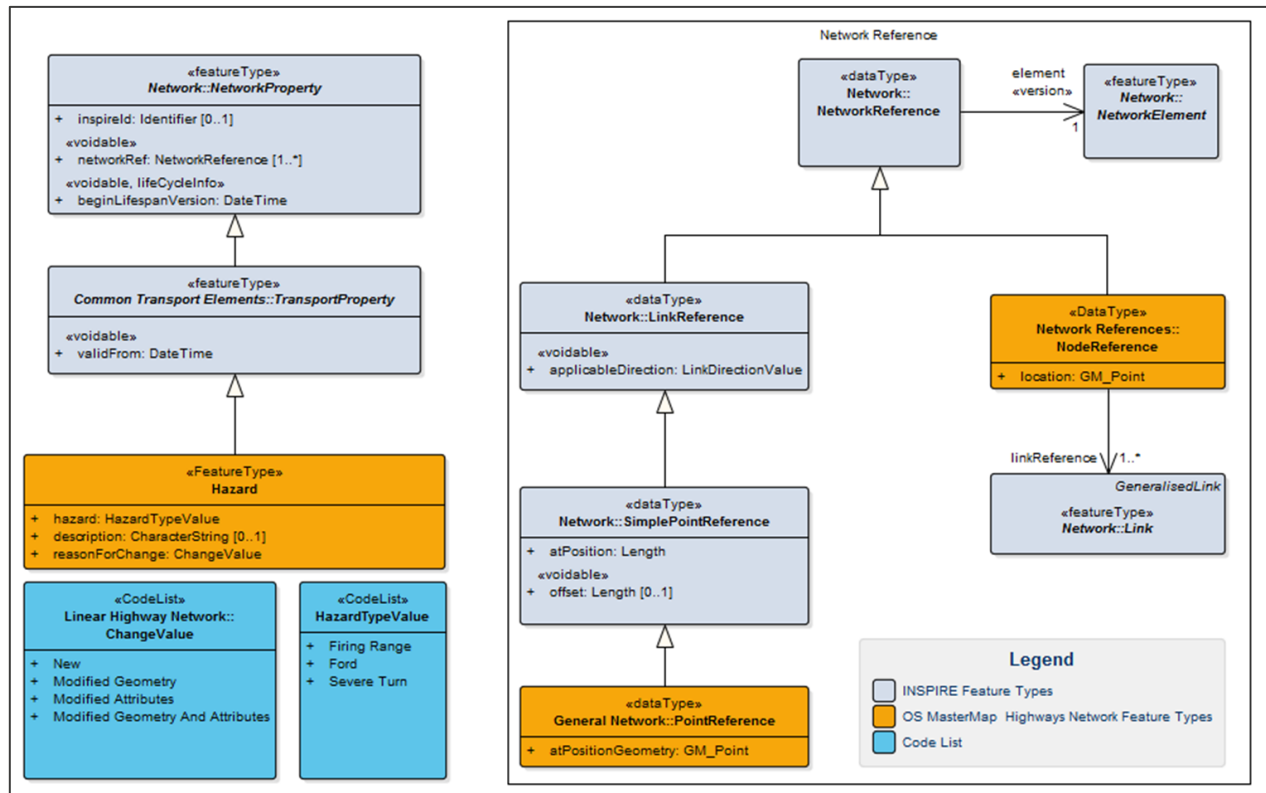


Figure 12.Context diagram: Hazard

5.2.2 Attribution

«FeatureType» Hazard		
Definition: A location where a threat is imposed and caution should be taken.		
Attribute: id		
Definition: Unique identifier, for Hazard 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»		INSPIRE
Definition: Date and time at which this version of the spatial object was inserted or changed in the spatial data set.		
Note: The time part is always set to zero.		
Type: DateTime		Multiplicity: [1]
Attribute: networkRef «voidable»		INSPIRE
Definition: Spatial reference of the network-related property.		
Type: NetworkReference		Multiplicity: [1..*]
Attribute: validFrom «voidable»		INSPIRE
Definition: The time when the transport property started to exist in the real world.		
Note: The time part is always set to zero.		
Type: DateTime		Multiplicity: [1]
Attribute: hazard		
Definition: Classification of the type of risk that applies that may impact choice of route or where caution should be observed.		
Type: HazardTypeValue	Size: 15	Multiplicity: [1]
Attribute: description		
Definition: Additional information describing the hazard.		
Type: CharacterString	Size: 50	Multiplicity: [0..1]

«FeatureType» Hazard

Attribute: reasonForChange

Definition: The reason for a change made to a feature.

Type: ChangeValue

Size: 32

Multiplicity: [1]

5.3 Structure

5.3.1 Overview

These indicate the location of key structures related to the highway network. These may be:

- **Barriers:** Structures or equipment constructed to control, obstruct or prevent passage or access
- **Bridges and Tunnels**
- **Crossings and Signals:** Equipment such as traffic signals, and locations that control the flow of traffic

A Structure will reference back to the Roads product through a Node Reference, Link Reference or Point Reference. For more information on these different types of Network References see Section 3.1.

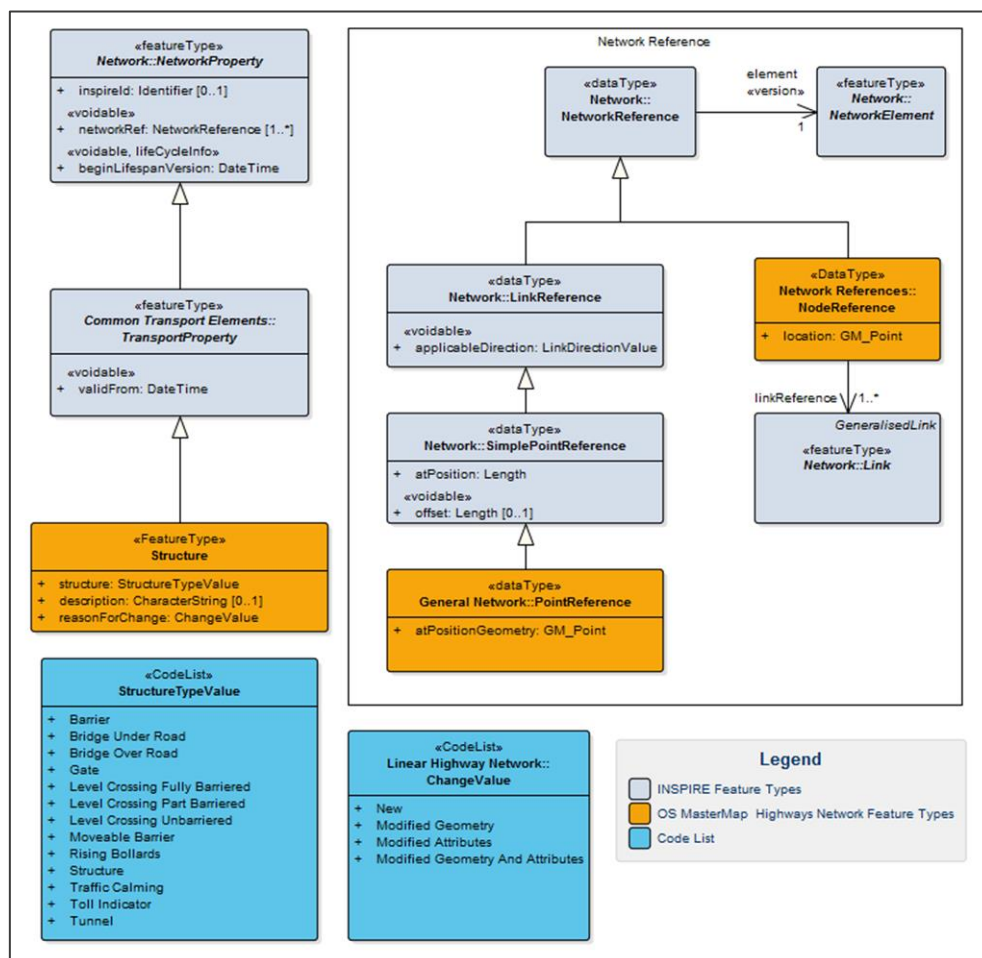


Figure 13.Context diagram: Structure

5.3.2 Attribution

«FeatureType» Structure		
Definition: A built feature with relation to the highway network.		
Attribute: id		
Definition: Unique identifier, for Structure 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»		INSPIRE
Definition: Date and time at which this version of the spatial object was inserted or changed in the spatial data set.		
Note: The time part is always set to zero.		
Type: DateTime		Multiplicity: [1]
Attribute: networkRef «voidable»		INSPIRE
Definition: Spatial reference of the network-related property.		
Type: NetworkReference		Multiplicity: [1..*]
Attribute: validFrom «voidable»		INSPIRE
Definition: The time when the transport property started to exist in the real world.		
Note: The time part is always set to zero.		
Type: DateTime		Multiplicity: [1]
Attribute: structure		
Definition: Type of built feature.		
Type: StructureTypeValue	Size: 39	Multiplicity: [1]
Attribute: description		
Definition: Additional information describing the structure.		
Type: CharacterString	Size: 50	Multiplicity: [0..1]

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

6. Asset management

6.1 Overview

Asset management information provides additional information describing the network to support its long-term operation and maintenance which has been sourced from the road or highways authorities. This includes Maintenance, Reinstatement and Special Designation.

6.2 Maintenance

6.2.1 Overview

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

Note: Maintenance responsibility is not an indication of ownership.

A Maintenance feature will reference back to the Roads product through Network Reference and will reference a Street Feature. Features which are a partial reference will provide a Network Reference Location. For more information on Network References, see Section 3.1.

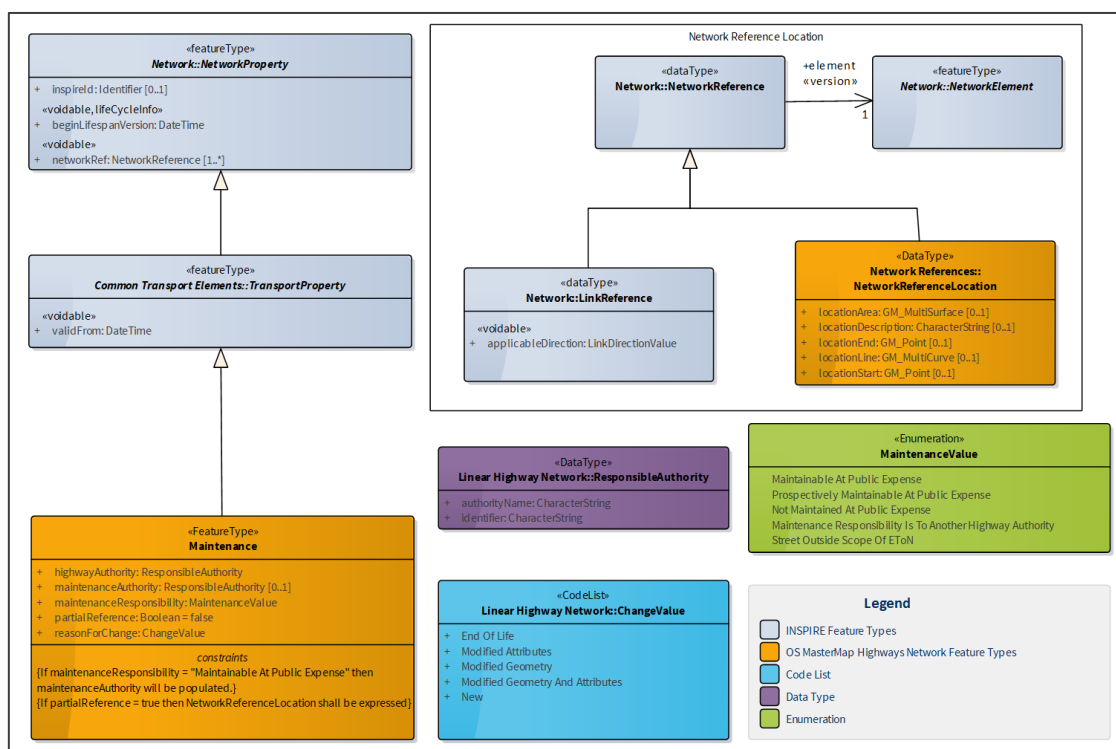


Figure 14.Context diagram: Maintenance

6.2.2 Attribution

«FeatureType» Maintenance		
Definition: Indication of whether the highway is maintained by a Highways Authority, Local Highways Authority, Road Authority or privately.		
Constraints:		
<ul style="list-style-type: none"> If maintenanceResponsibility = Maintainable At Public Expense, then maintenanceAuthority will be populated. If partialReference = true, then NetworkReferenceLocation shall be expressed. 		
Attribute: id		
Definition: Unique identifier		
Type: CharacterString	Size: 17	Multiplicity: [1]
Attribute: identifier		
Definition: Uniform Resource Identifier		
Type: CharacterString	Size: 35	Multiplicity: [1]
Attribute: inspireId		INSPIRE
Definition: External object identifier of the spatial object.		
Type: Identifier		Multiplicity: [0..1]
Attribute: beginLifespanVersion «voidable»		INSPIRE
Definition: Date and time at which this version of the spatial object was inserted or changed in the spatial data set.		
Note: The time part is always set to zero.		
Type: DateTime		Multiplicity: [1]
Attribute: networkRef «voidable»		INSPIRE
Definition: Spatial reference of the network-related property.		
Type: NetworkReference		Multiplicity: [1..*]
Attribute: validFrom «voidable»		INSPIRE
Definition: The time when the transport property started to exist in the real world.		
Note: The time part is always set to zero.		
Type: DateTime		Multiplicity: [1]
Attribute: maintenanceResponsibility		
Definition: Indication of whether the highway is maintainable at public expense.		
Type: MaintenanceValue	Size: 44	Multiplicity: [1]

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

6.3 Reinstatement

6.3.1 Overview

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

A Reinstatement feature will reference back to the Road Network through a Network Reference and will reference a Street Feature. Features which are a partial reference will provide a Network Reference Location. For more information on Network References see Section 3.1.

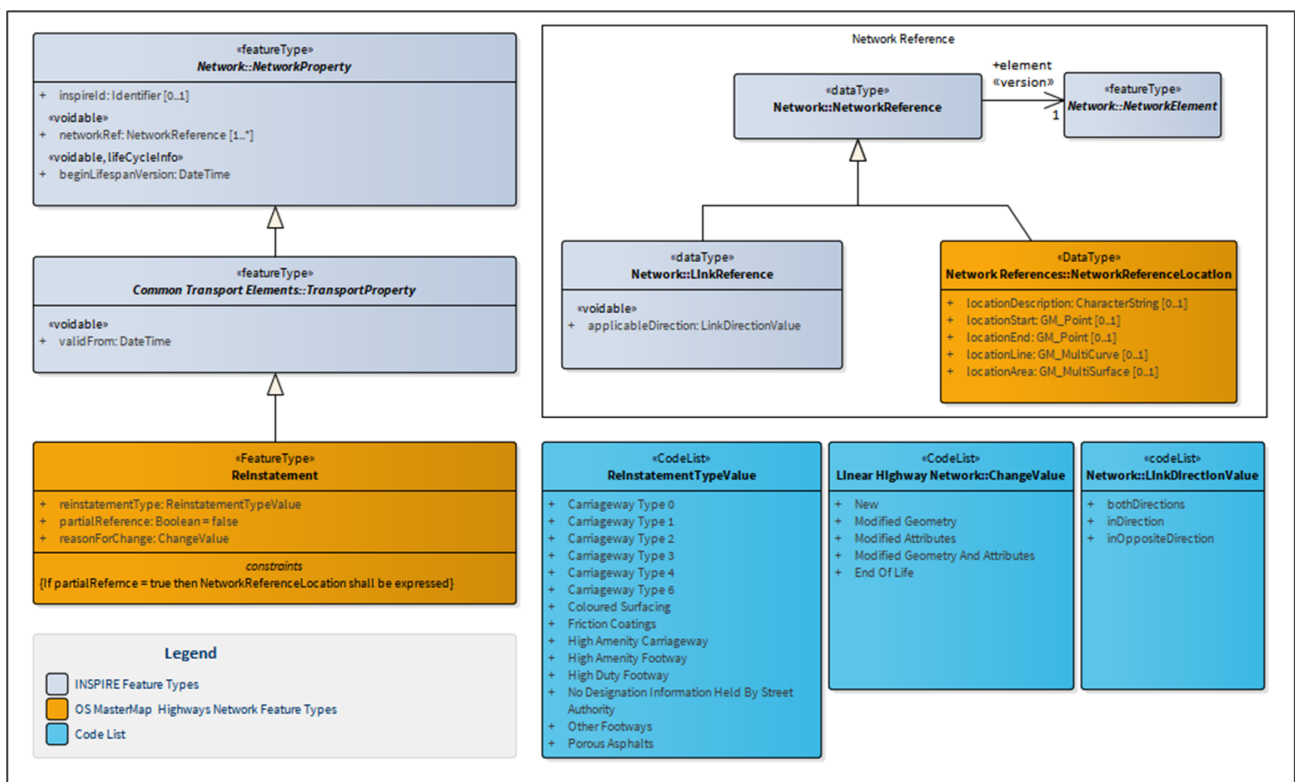


Figure 15.Context diagram: Reinstatement

6.3.2 Attribution

«FeatureType» Reinstatement		
Definition: The standard to which the highway must be restored to following street works.		
Constraints:		
<ul style="list-style-type: none"> If partialReference = true, then NetworkReferenceLocation shall be expressed. 		
Attribute: id		
Definition: Unique identifier		
Type: CharacterString	Size: 17	Multiplicity: [1]
Attribute: identifier		
Definition: Uniform Resource Identifier		
Type: CharacterString	Size: 35	Multiplicity: [1]
Attribute: inspireId		INSPIRE
Definition: External object identifier of the spatial object.		
Type: Identifier		Multiplicity: [0..1]
Attribute: beginLifespanVersion «voidable»		INSPIRE
Definition: Date and time at which this version of the spatial object was inserted or changed in the spatial data set.		
Note: The time part is always set to zero.		
Type: DateTime		Multiplicity: [1]
Attribute: networkRef «voidable»		INSPIRE
Definition: Spatial reference of the network-related property.		
Type: NetworkReference		Multiplicity: [1..*]
Attribute: validFrom «voidable»		INSPIRE
Definition: The time when the transport property started to exist in the real world.		
Note: The time part is always set to zero.		
Type: DateTime		Multiplicity: [1]
Attribute: reinstatementType		
Definition: Reinstatement as defined in the Specification for Reinstatement of Opening in Highways codes of practice in England and Wales and the Specification for the Reinstatement of Openings in Roads in Scotland.		
Type: ReinstatementTypeValue	Size: 51	Multiplicity: [1]
Attribute: partialReference		

«FeatureType» Reinstatement		
Definition: Flag to indicate that the maintenance feature partially references a Street.		
Type: Boolean	Size: 5	Multiplicity: [1]
Attribute: reasonForChange		
Definition: The reason for a change made to a feature.		
Type: ChangeValue	Size: 32	Multiplicity: [1]

6.4 Special Designation

6.4.1 Overview

Special Designations are statutory and advisory designations that can be applied to protect a highway when street or road works are to be undertaken. A Special Designation feature will reference back to the Roads product through Network Reference and will reference a Street Feature. Features which are a partial reference will provide a Network Reference Location. For more information on Network References see Section 3.1.

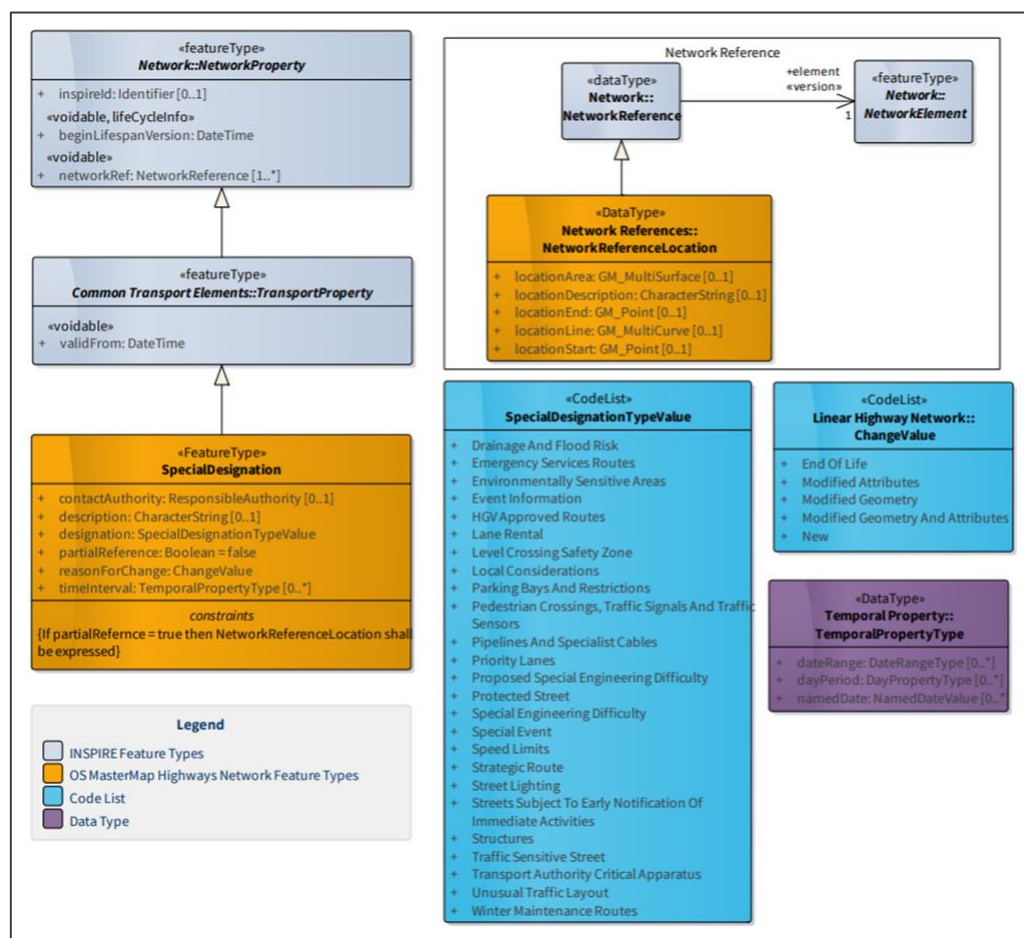


Figure 16.Context diagram: SpecialDesignation

6.4.2 Attribution

«FeatureType» SpecialDesignation		
Definition: A description applied to a highway to protect it during Street or Road Works.		
Constraints:		
<ul style="list-style-type: none"> If partialReference = true, then NetworkReferenceLocation shall be expressed. 		
Attribute: id		
Definition: Unique identifier		
Type: CharacterString	Size: 17	Multiplicity: [1]
Attribute: identifier		
Definition: Uniform Resource Identifier		
Type: CharacterString	Size: 35	Multiplicity: [1]
Attribute: inspireId		INSPIRE
Definition: External object identifier of the spatial object.		
Type: Identifier		Multiplicity: [0..1]
Attribute: beginLifespanVersion «voidable»		INSPIRE
Definition: Date and time at which this version of the spatial object was inserted or changed in the spatial data set.		
Note: The time part is always set to zero.		
Type: DateTime		Multiplicity: [1]
Attribute: networkRef «voidable»		INSPIRE
Definition: Spatial reference of the network-related property.		
Type: NetworkReference		Multiplicity: [1..*]
Attribute: validFrom «voidable»		INSPIRE
Definition: The time when the transport property started to exist in the real world.		
Note: The time part is always set to zero.		
Type: DateTime		Multiplicity: [1]
Attribute: validTo «voidable»		INSPIRE
Definition: The time from which the transport property no longer exists in the real world.		
Note: The time part is always set to zero.		
Type: DateTime		Multiplicity: [0..1]

«FeatureType» SpecialDesignation		
Attribute: designation		
Definition: Type of Special Designation.		
Type: SpecialDesignationTypeValue	Size: 65	Multiplicity: [1]
Attribute: description		
Definition: Additional information describing the special designation.		
Type: CharacterString	Size: 250	Multiplicity: [0..1]
Attribute: timeInterval		
Definition: Time period to which the restriction applies.		
Type: TemporalPropertyType		Multiplicity: [0..1]
Attribute: contactAuthority		
Definition: Highway authority to be contacted for further consultation about the special designation.		
Type: ResponsibleAuthority		Multiplicity: [0..1]
Attribute: partialReference		
Definition: Flag to indicate that the maintenance feature partially references a Street.		
Type: Boolean	Size: 5	Multiplicity: [1]
Attribute: reasonForChange		
Definition: The reason for a change made to a feature.		
Type: ChangeValue	Size: 32	Multiplicity: [1]

7. Data types, code lists, and enumerations

7.1 Data types

7.1.1 TemporalPropertyType

SpecialDesignations, TurnRestrictions, and AccessRestrictions have a property of *timeInterval* which has the type of *TemporalPropertyType*. The following table describes this data type, while Figure 17 illustrates the type's hierarchal structure.

«DataType» TemporalPropertyType		
Definition: The time period which a restriction is in place.		
Constraints:		
<ul style="list-style-type: none"> A TemporalPropertyType shall have at least one of namedDate, dateRange, or dayPeriod. When namedDate = All Dates, no other values for namedDate or dateRange shall be populated. 		
Attribute: namedDate		
Definition: The named month or period this time interval applies.		
Type: NamedDateValue	Size: 10	Multiplicity: [0..*]
Attribute: dateRange		
Definition: The range of dates the time restriction is in place for.		
Type: DateRangeType		Multiplicity: [0..*]
Attribute: dayPeriod		
Definition: A restriction which applies on a specified day.		
Type: DayPropertyType		Multiplicity: [0..*]

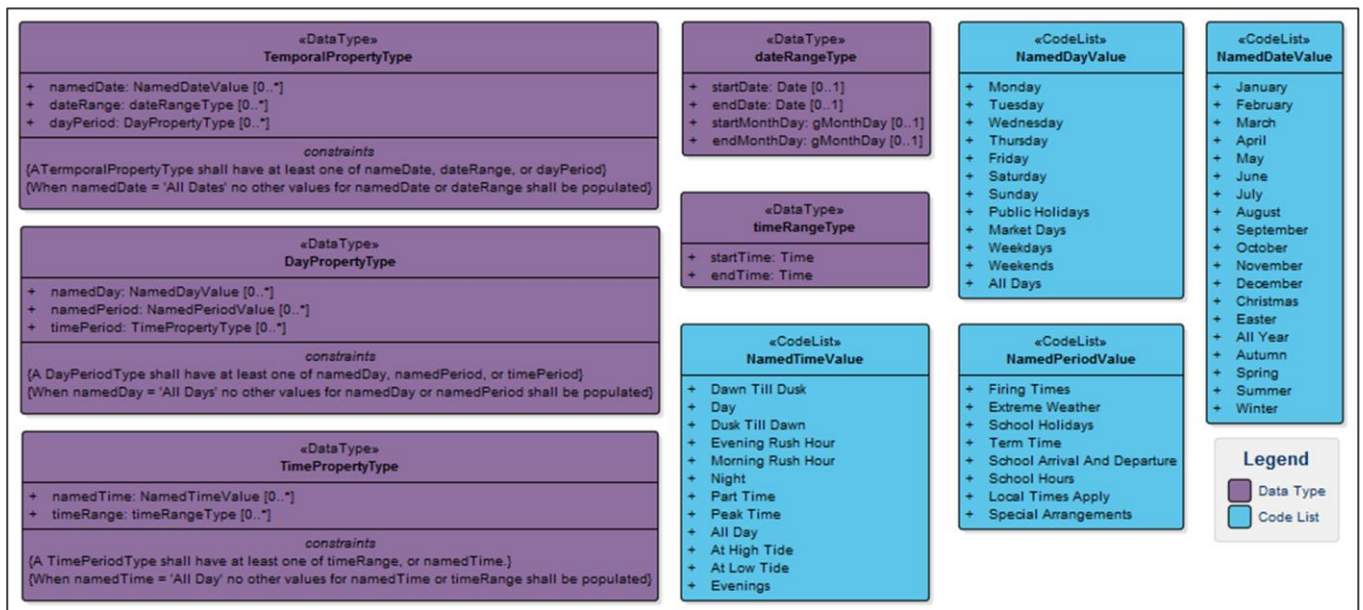


Figure 17.Components of the TemporalPropertyType

7.1.2 DateRangeType

The *dateRange* attribute on the *TemporalPropertyType* has a data type of *DateRangeType*. The following table describes how this data type is constructed.

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

7.1.3 DayPropertyType

The *dayPeriod* attribute on the *TemporalPropertyType* has a data type of *DayPropertyType*. The following table describes how this data type is constructed.

«DataType» DayPropertyType		
Constraints:		
<ul style="list-style-type: none"> A DayPropertyType shall have at least one of namedDay, namedPeriod, or timePeriod. When namedDay = All Days, no other values for namedDay or namedPeriod shall be populated. 		
Attribute: namedDay		
Definition: The named day this restriction applies.		
Type: NamedDayValue	Size: 15	Multiplicity: [0..*]
Attribute: namedPeriod		
Definition: A specified period which the restriction applies.		
Type: NamedPeriodValue	Size: 28	Multiplicity: [0..*]
Attribute: timePeriod		
Definition: The period of time on the specified day which the restriction applies.		
Type: TimePropertyType		Multiplicity: [0..*]

7.1.4 TimePropertyType

The *timePeriod* attribute on the *DayPropertyType* has a data type of *TimePropertyType*. The following table describes how this data type is constructed.

«DataType» TimePropertyType		
Constraints:		
<ul style="list-style-type: none"> A TimePropertyType shall have at least one of timeRange, or namedTime. When namedTime = All Day, no other values for namedTime or timeRange shall be populated. 		
Attribute: namedTime		
Definition: These are named time periods that do not relate to the same time each day		
Type: NamedTimeValue	Size: 17	Multiplicity: [0..*]
Attribute: timeRange		
Definition: The range of time which a restriction applies.		
Type: TimeRangeType		Multiplicity: [0..*]

7.1.5 TimeRangeType

The *timeRange* attribute on the *TimePropertyType* has a data type of *TimeRangeType*. The following table describes how this data type is constructed.

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

7.1.6 TrafficRegulationOrderType

The *RestrictionForVehicles* feature contains the data type *TrafficRegulationOrderType*. The following table describes the attribution that makes up the data type.

Note: This will not be populated in the current product offering.

«DataType» TrafficRegulationOrderType	
Definition: Traffic management controls which highway authorities apply to their roads.	
Attribute: trafficRegulationOrder	
Definition: Reference to the Traffic Regulation Order that formally created the restriction.	
Type: CharacterString	Multiplicity: [1]
Attribute: troDescription	
Definition: Description of restriction defined in the Traffic Regulation Order.	
Type: CharacterString	Multiplicity: [0..1]

7.1.7 VehicleQualifier

Each feature type in the *Rights and Restrictions* sub theme contain the attributes *inclusion* and *exemption*, which are of data type *VehicleQualifier*. The following table describes this data type, while Figure 18 illustrates what it is made up of.

«DataType» VehicleQualifier		
Definition: Types and uses of vehicles that a restriction can apply to or restrict		
Attribute: vehicle		
Definition: List of vehicles exempt from the restriction.		
Type: VehicleTypeValue	Size: 38	Multiplicity: [0..*]
Attribute: use		
Definition: List of uses exempt from the restriction.		
Type: UseTypeValue	Size: 30	Multiplicity: [0..*]
Attribute: load		
Definition: List of loads considered to be dangerous and exempt from the restriction.		
Type: LoadTypeValue	Size: 16	Multiplicity: [0..*]

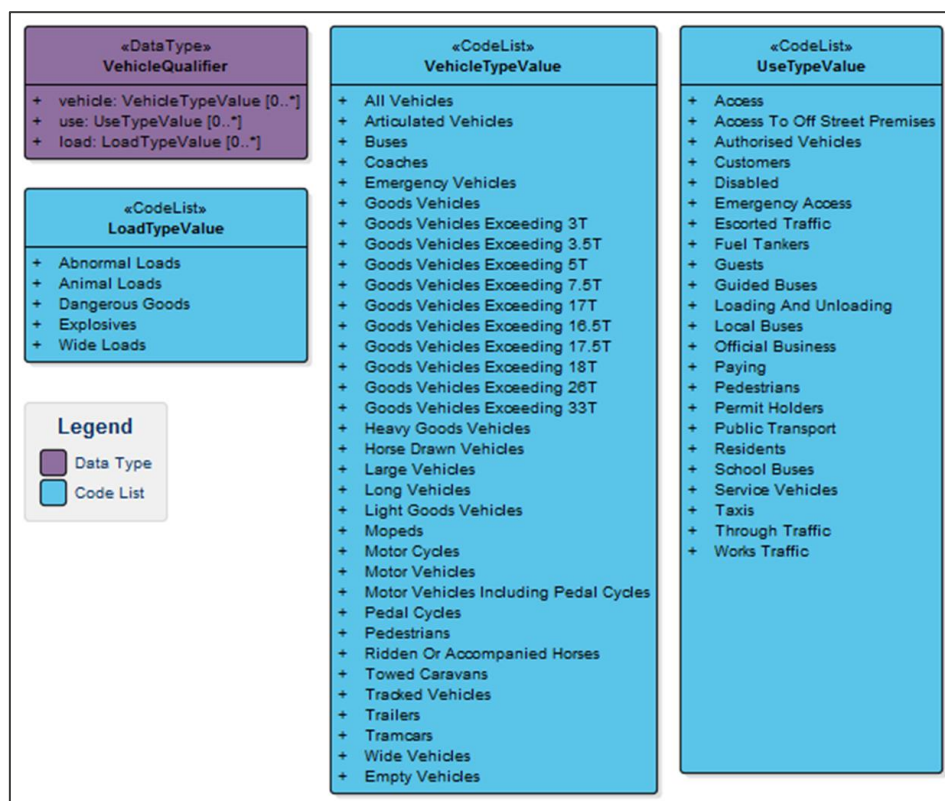


Figure 18.Components in the VehicleQualifier

7.1.8 ResponsibleAuthority

The Maintenance and SpecialDesignation feature types are made up with the *ResponsibleAuthority* feature type. The following table illustrates what attribution makes up this data type.

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

7.1.9 Identifier

The Identifier is an INSPIRE data type and its elements make up the *inspireId* attribute which can be found across all feature type 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]

7.2 Code lists

7.2.1 ChangeValue

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

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

7.2.2 UseTypeValue

The *UseTypeValue* is used to describe exceptions to a specific use, for example, no entry except for access. This code list is used for the property 'use' within the data type *VehicleQualifier*. The following table lists the codes which can be found.

Code List: UseTypeValue https://www.ordnancesurvey.co.uk/xml/codelists/highways/UseTypeValue.xml	
Codes	
Access	Official Business
Access To Off Street Premises	Paying
Authorised Vehicles	Permit Holders
Customers	Public Transport
Disabled	Residents
Emergency Access	School Buses
Escorted Traffic	Service Vehicles
Fuel Tankers	Taxis
Guests	Through Traffic

Code List: UseTypeValue	
https://www.ordnancesurvey.co.uk/xml/codelists/highways/UseTypeValue.xml	
Codes	
Guided Buses	Works Traffic
Loading And Unloading	–
Local Buses	–

7.2.3 VehicleTypeValue

The *VehicleTypeValue* is used to describe exceptions to specific vehicles, for example no access, except for buses. This code list is used for the property 'vehicle' within the data type *VehicleQualifier*. The following table lists the codes which can be found.

Code List: VehicleTypeValue	
https://www.ordnancesurvey.co.uk/xml/codelists/highways/VehicleTypeValue.xml	
Codes	
All Vehicles	Horse Drawn Vehicles
Articulated Vehicles	Large Vehicles
Buses	Light Goods Vehicles
Coaches	Long Vehicles
Emergency Vehicles	Mopeds
Goods Vehicles	Motor Cycles
Goods Vehicles Exceeding 3T	Motor Vehicles
Goods Vehicles Exceeding 3.5T	Motor Vehicles Including Pedal Cycles
Goods Vehicles Exceeding 5T	Pedal Cycles
Goods Vehicles Exceeding 7.5T	Pedestrians
Goods Vehicles Exceeding 16.5T	Ridden Or Accompanied Horses
Goods Vehicles Exceeding 17T	Towed Caravans
Goods Vehicles Exceeding 17.5T	Tracked Vehicles
Goods Vehicles Exceeding 18T	Trailers
Goods Vehicles Exceeding 26T	Tramcars
Goods Vehicles Exceeding 33T	Wide Vehicles
Heavy Goods Vehicles	Empty Vehicles

7.2.4 LoadTypeValue

The *LoadTypeValue* is used to describe exceptions to specific loads a vehicle may carry. This code list is used for the property 'load' within the data type *VehicleQualifier*. The following table lists the codes which can be found.

Code List: LoadTypeValue	
https://www.ordnancesurvey.co.uk/xml/codelists/highways/LoadTypeValue.xml	
Code	Description
Abnormal Loads	A vehicle which is carrying an unusually large weight, or which has an unusually large width or length.
Animal Loads	A vehicle which is carrying livestock and animals.
Dangerous Goods	A substance which could harm people, living organisms, property or the environment.
Explosives	A substance which can explode
Wide Loads	A vehicle which is wide.

7.2.5 NamedDateValue

The *NamedDateValue* is used to name specific dates a restriction may apply. This code list is used for the property 'namedDate' within the data type *TemporalPropertyType*. The following table lists the codes which can be found.

Code List: NamedDateValue	
http://www.ordnancesurvey.co.uk/xml/codelists/highways/NamedDateValue.xml	
Value	Description
January	This is the month of January.
February	This is the month of February.
March	This is the month of March.
April	This is the month of April.
May	This is the month of May.
June	This is the month of June
July	This is the month of July.
August	This is the month of August
September	This is the month of September.
October	This is the month of October.
November	This is the month of November.

Code List: NamedDateValue	
http://www.ordnancesurvey.co.uk/xml/codelists/highways/NamedDateValue.xml	
Value	Description
December	This is the month of December.
Christmas	This is a holiday season in December.
Easter	This is a holiday season in March or April which varies each year.
All Year	Applies throughout the entire year.
Autumn	This is the season of Autumn, usually by the months September, October and November.
Spring	This is the season of Spring, covered by March, April and May.
Summer	This is the season of Summer, covered by June, July and August.
Winter	This is the season of Winter covered by December, January and February.

7.2.6 NamedDayValue

The *NamedDayValue* is used to name specific days a restriction may apply. This code list is used for the property 'namedDay' within the data type *DayPropertyType*. The following table lists the codes which can be found.

Code List: NamedDayValue	
http://www.ordnancesurvey.co.uk/xml/codelists/highways/NamedDayValue.xml	
Value	Description
Monday	This is the day of Monday.
Tuesday	This is the day of Tuesday.
Wednesday	This is the day of Wednesday.
Thursday	This is the day of Thursday.
Friday	This is the day of Friday.
Saturday	This is the day of Saturday.
Sunday	This is the day of Sunday.
Public Holidays	A holiday established by law.
Market Days	The day which a market is regularly held.
Weekdays	A time interval which occurs during the working week, Monday to Friday.
Weekends	A time interval which occurs over the non-working days, Saturday and Sunday.
All Days	Applies to every day of the week.

7.2.7 NamedPeriodValue

The *NamedPeriodValue* is used to name specific periods when a restriction may apply. This code list is used for the property 'namedPeriod' within the data type *DayPropertyType*. The following table lists the codes which can be found.

Code List: NamedPeriodValue	
http://www.ordnancesurvey.co.uk/xml/codelists/highways/NamedPeriodValue.xml	
Value	Description
Firing Times	A period when the activities of defence forces make it unsafe.
Extreme Weather	A period when weather conditions are dangerous.
School Holidays	A period when schools are closed.
Term Time	A period when schools are open.
School Arrival And Departure	The time when pupils will be arriving for the start of the school day and the end of the school day.
School Hours	The period of the day when schools are open.
Local Times Apply	A time which varies locally.
Special Arrangements	

7.2.8 NamedTimeValue

The *NamedTimeValue* is used to name specific time periods when a restriction may apply. This code list is used for the property 'namedTime' within the data type *TimePropertyType*. The following table lists the codes which can be found.

Code List: NamedTimeValue	
http://www.ordnancesurvey.co.uk/xml/codelists/highways/NamedTimeValue.xml	
Value	Description
Dawn Till Dusk	Time period between dawn and dusk. Dawn is the time that marks the beginning of the twilight before sunrise. Dusk is the darkest stage of twilight in the evening.
Day	A twenty-four-hour period, from 00:00–23:59.
Dusk Till Dawn	Time period between dusk and dawn. Dawn is the time that marks the beginning of the twilight before sunrise. Dusk is the darkest stage of twilight in the evening.
Evening Rush Hour	A busy part of the day where people are travelling usually after work, in the evening.

Code List: NamedTimeValue http://www.ordnancesurvey.co.uk/xml/codelists/highways/NamedTimeValue.xml	
Value	Description
Morning Rush Hour	A busy part of the day where people are travelling usually before work, in the morning.
Night	The period from sunset to sunrise.
Part Time	For only some of the time.
Peak Time	A time when a lot of people are using the same service.
All Day	Applies to the entire day.
At High Tide	When the tide is at its highest level.
At Low Tide	When the tide is at its lowest level.
Evenings	The period of time at the end of the day.

7.2.9 AccessRestrictionValue

The AccessRestriction feature type has a property of 'restriction', which has the type AccessRestrictionValue. The following table describes the codes which will be used to populate this field and the description for each code.

This is an INSPIRE code list which cannot be extended.

Code List: AccessRestrictionValue Types of access restrictions for a transport element. http://inspire.ec.europa.eu/codelist/AccessRestrictionValue/	
Code	Description
Forbidden legally	Access to the transport element is forbidden by law.
Physically impossible	Access to the transport element is physically impossible due to the presence of barriers or other physical obstacles.
Private	Access to the transport element is restricted because it is privately owned.
Public access	The transport element is open to public access.
Seasonal	Access to the transport element depends on the season.
Toll	Access to the transport element is subject to toll.

7.2.10 DedicationValue

The HighwayDedication feature has the field ‘dedication’, which has the value populated from *DedicationValue*. The following table identifies the codes used to populate this field and a description for each code. These codes conform to the legal categories of highway as defined in the Highway Act 1980 and Countryside and Rights of Way Act 2000, with the exception of *No Dedication Or Dedication Unknown*. Dedications indicate the legal access status for a given feature only; no indication as to its physical accessibility is made in this attribute.

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

7.2.11 TurnRestrictionValue

The TurnRestriction feature type has the property ‘restriction’, which has the type *TurnRestrictionValue*. The following table identifies the codes used to populate this field and a description for each code.

Code List: TurnRestrictionValue	
http://www.ordnancesurvey.co.uk/xml/codelists/highways/TurnRestrictionValue.xml	
Codes	
Mandatory Turn	One Way
No Turn	–

7.2.12 RestrictionTypeValue

The RestrictionForVehicles feature type has the property 'restrictionType', which has the type RestrictionTypeValue. The following table identifies the codes used to populate this field and a description for each code.

This is an INSPIRE code list and cannot be extended.

Code List: RestrictionTypeValue Possible restrictions on vehicles that can access a transport element. http://inspire.ec.europa.eu/codelist/RestrictionTypeValue/	
Code	Description
Maximum double axle weight	The maximum weight per double axle of a vehicle allowed at a transport element. Note: This value applies to wheeled vehicles only.
Maximum height	The maximum height of a vehicle which can pass under another object.
Maximum length	The maximum length of a vehicle allowed at a transport element.
Maximum single axle weight	The maximum weight per single axle of a vehicle allowed at a transport element. Note: This value applies to wheeled vehicles only.
Maximum total weight	The maximum total weight of a vehicle allowed at a transport element.
Maximum triple axle weight	The maximum weight per triple axle of a vehicle allowed at a transport element. Note: This value applies to wheeled vehicles only.
Maximum width	The maximum width of a vehicle allowed on a transport element.

7.2.13 HazardTypeValue

The Hazard feature type has the property 'hazard', which has the type *HazardTypeValue*. The following table identifies the codes used to populate this field.

Code List: HazardTypeValue http://www.ordnancesurvey.co.uk/xml/codelists/highways/HazardTypeValue.xml	
Code	Description
Firing Range	A sign indicating a highway which may have access and use restrictions applied when the Ministry of Defence is active on the site.
Ford	Location where the highway passes through a watercourse which passes over and/or along the carriageway. Note: the watercourse may be permanent or temporary.
Severe Turn	A manoeuvre that by virtue of the geometry of the joining roads is difficult or dangerous to perform. An angle of less than 50 degrees is considered severe.

7.2.14 StructureTypeValue

The Structure and RestrictionForVehicles feature type has the property 'structure', which has the type *StructureTypeValue*. The following table identifies the codes used to populate this field.

Code List: StructureTypeValue	
http://www.ordnancesurvey.co.uk/xml/codelists/highways/StructureTypeValue.xml	
Code	Description
Barrier	A barrier that can be moved horizontally or vertically to allow access.
Bridge Over Road	The representation of a bridge or structure.
Bridge Under Road	The representation of a bridge passing over an obstruction that is not another road.
Gate	A moveable barrier, hinged at one end, that moves through the horizontal plane to control access.
Level Crossing On Route Fully Barriered	A railway intersects with the road network and rail or road vehicles are controlled by warning signs, lights and fully gated barriers.
Level Crossing On Route Part Barriered	A railway intersects with the road network and rail or road vehicles are controlled by warning signs, lights and part gated barriers.
Level Crossing On Route Unbarriered	A railway intersects with the road network and rail or road vehicles are controlled by warning signs, lights and no gated barriers.
Moveable Barrier	A barrier that can be moved horizontally or vertically to allow access.
Pedestrian Crossing	A place dedicated to pedestrians to cross the road.
Rising Bollards	A bollard that that can be retracted/hinged to allow access.
Structure	A structure over the road.
Toll Indicator	An indication that there is a charge payable to use the highway.
Traffic Calming	A physical feature on the road surface designed to slow down the flow of traffic.
Tunnel	A road which passes underground or water.

7.2.15 ReinstatementTypeValue

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

Code List: ReinstatementTypeValue http://www.ordnancesurvey.co.uk/xml/codelists/highways/ReinstatementTypeValue.xml	
Codes	Descriptions
Carriageway Type 0	The carriageway has a limiting capacity between 30 and 125 Million Standard Axles.
Carriageway Type 1	The carriageway has a limiting capacity between 10 and 30 Million Standard Axles.
Carriageway Type 2	The carriageway has a limiting capacity between 2.5 and 10 Million Standard Axles.
Carriageway Type 3	The carriageway has a limiting capacity between 0.5 and 2.5 Million Standard Axles.
Carriageway Type 4	The carriageway has a limiting capacity up to 0.5 Million Standard Axles.
Carriageway Type 6	The carriageway has a capacity over 125 Million Standard Axles. This code is not used in Scotland.
Coloured Surfacing	Where the carriageway is treated in a special coloured coating. This code is not used in England and Wales.
Friction Coatings	Where the carriageway is treated in a special friction coating. This code is not used in England and Wales.
High Amenity Carriageway	Where the carriageway is surfaced in special materials such as setts and block paving. This code is not used in England and Wales.
High Amenity Footway	Where a footway, footpath or cycle track which have been constructed maintained and surfaced to a high standard with special materials such as setts and block paving.
High Duty Footway	Routes used by an exceptionally large number of pedestrians and/or cyclists. In Scotland, this is defined as where the two-way traffic, pedestrian and/or cyclist is greater than 22 persons per minute.
Other Footways	Neither high duty nor high amenity.
No designation information held by Street Authority	Private streets where there is no reinstatement information.
Porous Asphalts	Where the carriageway is constructed with special porous asphalts. This code is not used in England and Wales.

7.2.16 SpecialDesignationTypeValue

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

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

Code List: SpecialDesignationTypeValue Designation of highways that are subject to special controls when undertaking street or road works http://www.ordnancesurvey.co.uk/xml/codelists/highways/SpecialDesignationTypeValue.xml	
Code	Description
Protected Street	Statutory designation which restricts the placement of apparatus by a street or road works undertaker.
Special Engineering Difficulty	Statutory designation relating to streets or parts of streets associated with structures, or streets of extraordinary construction.
Traffic Sensitive Street	Statutory designation that restricts street works to be undertaken during period of high traffic.
Lane Rental	Indication that Street is part of a Lane Rental scheme. Section 74A of NRSWA enables highway authorities, with the approval of the Secretary of State, to charge street works undertakers a daily charge for each day during which their works occupy the highway – commonly referred to as lane rental schemes. This code is not used in Scotland.
Event Information	Indication that this Street has an event planned. This code is not used in Scotland.
Drainage And Flood Risk	Optional designation that provides details of areas that are susceptible to drainage and flood risk. This code is not used in Scotland.
Emergency Services Routes	Optional designation that alerts the Works Promoter if there is a need to keep the emergency services informed of proposed works and progress. This code is not used in Scotland.
Environmentally Sensitive Areas	Optional designation that identifies information about the local environment. This includes environmentally sensitive areas, such as sites of specific scientific interest and ancient monuments, or specially cultivated areas containing shrubs, plants or bulbs which shall be reinstated using the same or similar species. In Scotland, these are designations not made by Roads Authorities which place restrictions on activities, for which permission subject to conditions may or may not be granted, which can be carried out within or adjacent to the designated area. Consequently, any streets which pass through such designated areas are covered by any restrictions imposed by the designation.
Hazardous Material	Indication of hazardous materials that could be exposed or disturbed when roads are excavated or planed, for example, coal tar. This code is not used in England and Wales.

Code List: SpecialDesignationTypeValue

Designation of highways that are subject to special controls when undertaking street or road works
<http://www.ordnancesurvey.co.uk/xml/codelists/highways/SpecialDesignationTypeValue.xml>

Code	Description
HGV Approved Routes	Optional designation that allows Works Promoters to consider the impact on HGVs of restricted traffic flow or alerts the Works Promoter that wide vehicles are commonplace. This code is not used in Scotland.
Level Crossing Safety Zone	Optional designation created by a Railway Operator, Network Rail or a Roads Authority. It identifies an area around a level crossing where, if occupied to carry out works, there is a risk of traffic obstructing the crossing.
Local Considerations	Optional designation that should be used to inform the Works Promoter of any special schemes that may impact working, for example, noise levels. This code is not used in Scotland.
Parking Bays And Restrictions	Optional designation that provides details of streets with parking meters, residents parking bays and parking restrictions such as yellow lines, red routes, and other permanent parking restrictions. This code is not used in Scotland.
Pedestrian Crossings, Traffic Signals And Traffic Sensors	Optional designation that captures streets that have a pedestrian crossing, permanent traffic signals or traffic sensors. For Scotland, this code also includes Loop in Road Surface. Loops include traffic signal detectors, vehicle counting and ice detection cables that are generally close to the surface of the road.
Pipelines And Specialist Cables	Optional designation that is created by the Local Highway Authority on behalf of the private sector oil or gas pipeline owner. This designation should be treated as a reminder to consult further, not as an absolute indicator of the nature of the pipeline or cable. For Scotland, this code also includes Apparatus at Shallow Depth which details apparatus placed at a shallower than recommended depth.
Priority Lanes	Optional designation that allows the Local Highway Authority to identify the location of bus lanes, and Cycle Routes in the street. This code is not used in Scotland.
Proposed Special Engineering Difficulty	Optional designation used to identify new streets or assets of extraordinary construction. One typical use is to identify the location of a designation during any consultation period. On conclusion of the consultation period this feature will typically become a Special Engineering Difficulty (SED). This code is not used in Scotland.
Road Trees	These are trees that the Roads Authority are responsible for, which grow near or within the road boundary (including the verge, footway, etc.). This code is not used in England and Wales.
Service Strips	These are areas, usually found in housing developments, abutting shared use surfaces and should be of 2m width, where the services to the housing are located. This code is not used in England and Wales.
Special Event	Optional designation that provides early awareness of special events to Work Promoters to enable them to consider any actions that they may need to take to avoid any works taking place on the street during the time(s) of the Special Event. This code is not used in Scotland.

Code List: SpecialDesignationTypeValue

Designation of highways that are subject to special controls when undertaking street or road works
<http://www.ordnancesurvey.co.uk/xml/codelists/highways/SpecialDesignationTypeValue.xml>

Code	Description
Speed Limits	Optional designation that provides information about the speed limit applicable for the street. Only speed limits (signed or as per the legal order) over 40mph are recorded as standard with some LHAs providing 30mph speed limits as well. This data is intended to be used for planning of traffic management and works safety measures. This code is not used in Scotland.
Strategic Route	Optional designation that is used by Local Highway Authorities to identify Strategic Routes, such as the Primary Route Network. Strategic Routes are identified by the Highways Agency, TfL in London and the South Wales Trunk Road Agent (SWTRA) and North & Mid Wales Trunk Road Agent (NMWTRA) in Wales. This code is not used in Scotland.
Street Lighting	Optional designation that helps Works Promoters to carry out works in the evenings and at nights by providing relevant information about Street lighting. It is particularly useful for when Part night lighting where a council has a policy of turning lights off during specific hours. This code is not used in Scotland.
Streets Subject To Early Notification Of Immediate Activities	Optional designation that enables street authorities to designate streets that are particularly vulnerable to traffic. Work Promoters are required to provide early warning of activities to the authority immediately after the activity has commenced. This code is not used in Scotland.
Structures	For England and Wales, this is an optional designation used by asset owners to identify the existence of a structure that has not been designated as an SED. In cases where this identifies a Bridge, Works Promoters should regard it as a reminder that under Section 88 they must consult the Bridge Authority prior to serving Notices. For Scotland, this includes over-bridges and under-bridges as well as other structures including retaining walls, gantries, pipelines and cellars.
Traffic Calming Features	Traffic Calming Features include islands, build-outs, cushions, raised tables etc. This code is not used in England and Wales.
Traffic Sensitive Side Road When Temp Traffic Control is Employed	A traffic sensitivity designation applied to the first 50m (or complete length, whichever is shorter) of an adjoining street that has a junction with that traffic sensitive street. This code is used where road works on the adjoining street could cause delays on the traffic sensitive route. This code is not used in England and Wales.
Transport Authority Critical Apparatus	Optional designation that provides details of transport authority apparatus critical to operations of that authority which if damaged or if interrupted could disrupt or temporarily stop services (for example, HV cables to a rail network). This code is not used in Scotland.
Unusual Traffic Layout	Optional designation that provides details of where the layout of existing traffic signs, road markings, studs or verge markers is not in accordance with the Traffic Signs Manual. This code is not used in Scotland.

Code List: SpecialDesignationTypeValue

Designation of highways that are subject to special controls when undertaking street or road works
<http://www.ordnancesurvey.co.uk/xml/codelists/highways/SpecialDesignationTypeValue.xml>

Code	Description
Winter Maintenance Route	Optional designation that helps determine the relative importance a route is given by a Local Highway Authority for clearing and treatment during the winter months. This code is not used in Scotland.

7.2.17 LinkDirectionValue

Features which use either Point Referencing, Link Referencing or Multiple Link Referencing will include an applicableDirection attribute. The LinkDirectionValue code list are the codes used to populate this attribute.

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.

7.3 Enumerations

7.3.1 MaintenanceValue

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

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

8. How the product fits together

OS MasterMap Highways Network – RAMI is a relational product. This results in there being relationships between different feature types. This section summarises how the different feature types relate to one another, and which attributes are the primary and foreign keys for the RAMI feature. For information on the Roads features, please see the *Roads Technical Specification*.

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

Source Feature Information		Destination Feature Information	
Feature Type	Foreign Key Attribute	Feature Type	Primary Key Attribute
AccessRestriction	element	RoadLink	id
TurnRestriction	element	RoadLink	id
RestrictionForVehicles	element	RoadLink	id
RestrictionForVehicles	element	RoadNode	id
RestrictionForVehicles	linkReference	RoadLink	id
Hazard	element	RoadLink	id
Hazard	element	RoadNode	id
Hazard	linkReference	RoadLink	id
Structure	element	RoadLink	id
Structure	element	RoadNode	id
Structure	linkReference	RoadLink	id
Maintenance	element	Street	id
Reinstatement	element	Street	id
SpecialDesignation	element	Street	id
HighwayDedication	element	Street	id
HighwayDedication	element	RoadLink	id

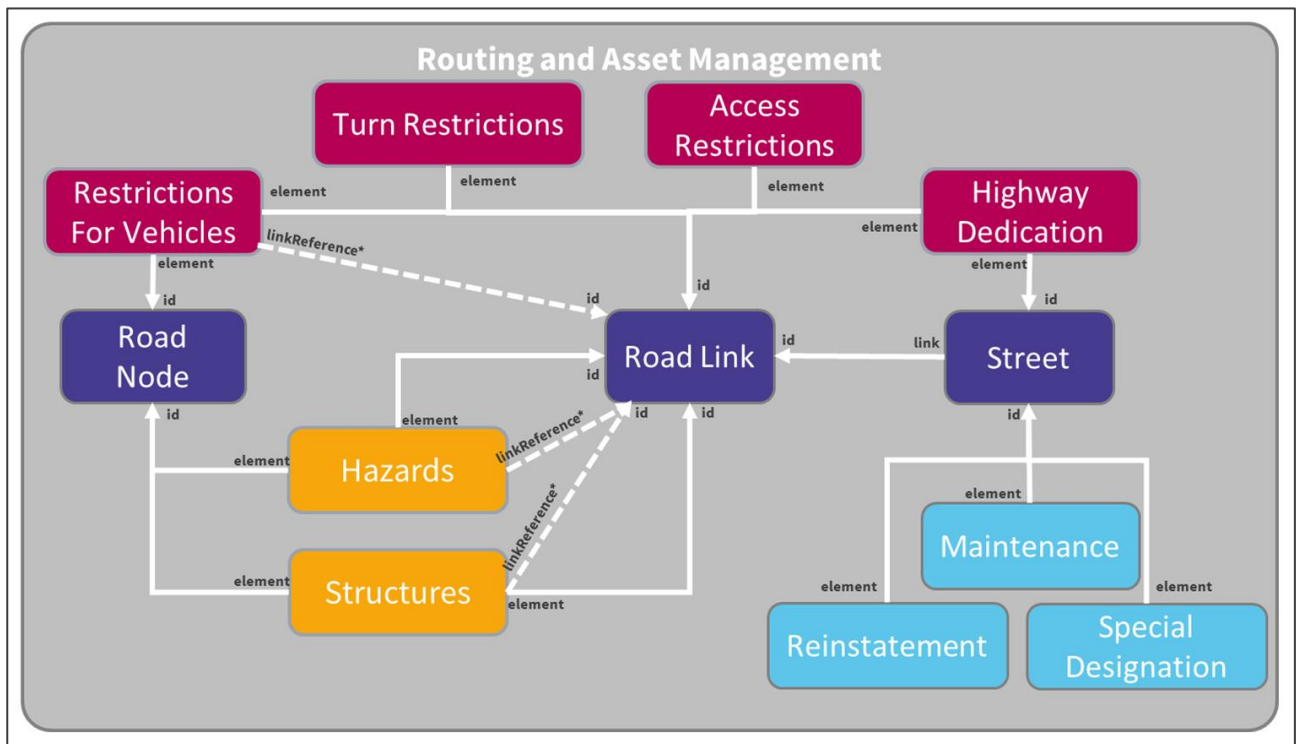


Figure 19.OS MasterMap Highways Network – Routing and Asset Management Information relational model

9. COU

The OS MasterMap Highways Network – RAMI can be ordered as either full supply or change-only update (COU). The GML structure for full supply and COU is different. The differences are fundamentally the open and closing tags which will have an impact on how you choose to load the product. Examples of the different opening and closing tags can be found in [Annex A: GML examples](#). If a customer wishes to move their order from full supply to COU, then they will need to receive an initial supply and apply the COU file to an initial supply. The COU should not be applied to a full supply order.

9.1 Full supply

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

9.2 COU supply

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

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

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

- <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

- <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.

- <os:delete>

These are features which have ceased to exist in the last product release or have moved out of the customer's area of interest. Features which have been deleted will be supplied with the entire feature's attribution. These features should be removed from the customer's live data holding.

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

10. Supplied formats

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

11. GML overview

This section describes how OS MasterMap is defined in GML. An understanding of XML (Extensible Markup Language) and XML schema is required.

11.1 GML

GML is an XML grammar for expressing geographic features. GML serves as a modelling language for geographic systems as well as an open interchange format for geographic transactions on the Internet. More information can be found on the Open Geospatial Consortium (OGC): <http://www.opengeospatial.org/standards/gml>.

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

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

11.2 Schema overview and location

XML schemas are used to define and validate the format and content of GML. The GML 3.2 specification provides a set of schemas that define the GML feature constructs and geometric types. These are designed to be used as a basis for building application-specific schemas, which define the data content.

The OS MasterMap Highways Network RAMI product uses the following application schemas, which are referenced by the data:

- RoutingAndAssetManagement.xsd
- GeneralNetwork.xsd
- OSProducts.xsd

The **RoutingAndAssetManagement.xsd** defines the features which make up the RAMI features. Therefore, it imports the INSPIRE transport network road application schema.

The **GeneralNetwork.xsd** defines how the RAMI features reference back to the network. Therefore, it imports the INSPIRE network application schema. Through the INSPIRE schemas, both the RoutingAndAssetManagement.xsd and GeneralNetwork.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 COU supply.

The RAMI schema document defines the <http://namespaces.os.uk/mastermap/routingAndAssetManagement/2.1> namespace; this is defined in the XSD at: <http://www.os.uk/xml/schema/highwaysnetwork/2.1/RoutingAndAssetManagement.xsd>.

The General Network schema document defines the <http://namespaces.os.uk/mastermap/generalNetwork/2.0> namespace; this is defined in the XSD at: <https://www.ordnancesurvey.co.uk/xml/schema/network/2.0/generalNetwork.xsd>.

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

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

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

Prefix	Namespace identifier	Definition available at
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

12. GeoPackage overview

OS MasterMap Highways Network – RAMI is supplied as one GeoPackage file for GB. GeoPackage (*.gpkg) is an open, standards-based data format, as is defined by the Open Geospatial Consortium (OGC). It is designed to be a lightweight format that can contain large amounts of varied and complex data in a single, easy to distribute and ready to use file.

GeoPackage can be used in most GIS software in its native format without translation. GeoPackage attribute names are not limited in length. A GeoPackage file has no size limit, and it supports raster, vector, and database formats, making it a highly versatile solution.

12.1 Attribute naming differences between GML and GeoPackage formats

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

The GML contains an attribute which describes the geometry of the feature; this is not applicable for a GeoPackage file as they are separated by their geometry. Please note not all GML attributes have been mapped to GeoPackage. In the tables below, a greyed-out box with an asterisk (*) marks a GeoPackage attribute that is not mapped from a GML attribute.

12.1.1 access_restriction

GML attribute	GeoPackage attribute
*	fid
gml_id	toid
identifier	identifier
localId	local_id
beginLifespanVersion	begin_lifespan_version
element	element
applicableDirection	applicable_direction
atPosition	at_position
geometry	geometry
validFrom	valid_from
restriction	restriction
inclusionload	inclusion_load
inclusionuse	inclusion_use
inclusionvehicle	inclusion_vehicle

GML attribute	GeoPackage attribute
exemptionload	exemption_load
exemptionuse	exemption_use
exemptionvehicle	exemption_vehicle
trafficSign	traffic_sign
reasonForChange	reason_for_change
namedDate	named_date
startDate	start_date
endDate	end_date
startMonthDay	start_month_day
endMonthDay	end_month_day
namedDay	named_day
namedPeriod	named_period
namedTime	named_time
startTime	start_time
endTime	end_time

12.1.2 highway_dedication

GML attribute	GeoPackage attribute
*	fid
gml_id	unique_id
identifier	identifier
localId	local_id
beginLifespanVersion	begin_lifespan_version
element	net_ref_element
title	net_ref_title
validFrom	valid_from
reasonForChange	reason_for_change
dedication	dedication
publicRightOfWay	public_right_of_way
nationalCycleRoute	national_cycle_route
quietRoute	quiet_route
obstruction	obstruction
planningOrder	planning_order

GML attribute	GeoPackage attribute
worksProhibited	works_prohibited
geometry	geometry
namedDate	named_date
startDate	start_date
endDate	end_date
startMonthDay	start_month_day
endMonthDay	end_month_day
namedDay	named_day
namedPeriod	named_period
namedTime	named_time
startTime	start_time
endTime	end_time

12.1.3 turn_restriction

GML attribute	GeoPackage attribute
*	id
gml_id	toid
identifier	identifier
localId	local_id
beginLifespanVersion	begin_lifespan_version
linkrefapplicabledirection	link_ref_element
applicableDirection	link_ref_applicable_direction
validFrom	valid_from
restriction	restriction
inclusionload	inclusion_load
inclusionuse	inclusion_use
inclusionvehicle	inclusion_vehicle
exemptionload	exemption_load
exemptionuse	exemption_use
exemptionvehicle	exemption_vehicle
reasonForChange	reason_for_change
namedDate	named_date
startDate	start_date

GML attribute	GeoPackage attribute
endDate	end_date
startMonthDay	start_month_day
endMonthDay	end_month_day
namedDay	named_day
namedPeriod	named_period
namedTime	named_time
startTime	start_time
endTime	end_time

12.1.4 restriction_for_vehicles

GML attribute	GeoPackage attribute
*	fid
gml_id	toid
identifier	identifier
localId	local_id
beginLifespanVersion	begin_lifespan_version
pointrefelement	element
noderefelement	element
pointrefapplicabledirection	applicable_direction
pointrefatposition	at_position
pointrefgeometry	geometry
noderefgeometry	geometry
noderefinkreference	link_reference
validFrom	valid_from
measure	measure
uom	uom
restrictionType	restriction_type
sourceOfMeasure	source_of_measure
measure2	measure2
uom2	uom2
inclusionload	inclusion_load
inclusionuse	inclusion_use
inclusionvehicle	inclusion_vehicle

GML attribute	GeoPackage attribute
exemptionload	exemption_load
exemptionuse	exemption_use
exemptionvehicle	exemption_vehicle
structure	structure
trafficSign	traffic_sign
reasonForChange	reason_for_change

12.1.5 hazard_point

GML attribute	GeoPackage attribute
*	fid
gml_id	toid
identifier	identifier
localId	local_id
beginLifespanVersion	begin_lifespan_version
pointrefelement	point_ref_element
pointrefapplicabledirection	point_ref_applicable_direction
pointrefatposition	point_ref_at_position
pointrefgeometry	geometry
noderefgeometry	geometry
noderefelement	node_ref_element
nodereflinkreference	node_ref_link_reference
validFrom	valid_from
hazard	hazard
description	description
reasonForChange	reason_for_change

12.1.6 hazard

GML attribute	GeoPackage attribute
*	id
gml_id	toid
identifier	identifier
localId	local_id
beginLifespanVersion	begin_lifespan_version
linkrefelement	link_ref_element
linkrefapplicabledirection	link_ref_applicable_direction
validFrom	valid_from
hazard	hazard
description	description
reasonForChange	reason_for_change

12.1.7 structure_point

GML attribute	GeoPackage attribute
*	fid
gml_id	toid
identifier	identifier
localId	local_id
beginLifespanVersion	begin_lifespan_version
pointrefelement	point_ref_element
pointrefapplicabledirection	point_ref_applicable_direction
pointrefatposition	point_ref_at_position
pointrefgeometry	geometry
noderefgeometry	geometry
noderefelement	node_ref_element
noderefinkreference	node_ref_link_reference
validFrom	valid_from
structure	structure
description	description
reasonForChange	reason_for_change

12.1.8 structure

GML attribute	GeoPackage attribute
*	Id
gml_id	Toid
identifier	Identifier
localId	local_id
beginLifespanVersion	begin_lifespan_version
linkrefelement	link_ref_element
linkrefapplicabledirection	link_ref_applicable_direction
validFrom	valid_from
structure	Structure
description	description
reasonForChange	reason_for_change

12.1.9 maintenance

GML attribute	GeoPackage attribute
*	id
gml_id	unique_id
identifier	identifier
localId	local_id
beginLifespanVersion	begin_lifespan_version
netRef_element	netref_element
validFrom	valid_from
maintenanceResponsibility	maintenance_responsibility
maintenanceAuthority	maintenance_authority
maintenanceAuthorityId	maintenance_authority_id
partialReference	partial_reference
highwayAuthority	highway_authority
highwayAuthorityId	highway_authority_id
reasonForChange	reason_for_change

12.1.10 maintenance_point

GML attribute	GeoPackage attribute
*	fid
gml_id	unique_id
identifier	identifier
localId	local_id
beginLifespanVersion	begin_lifespan_version
netRef_element	netref_element
netRef_locationDescription	netref_location_description
*	geometry
validFrom	valid_from
maintenanceResponsibility	maintenance_responsibility
maintenanceAuthority	maintenance_authority
maintenanceAuthorityId	maintenance_authority_id
partialReference	partial_reference
highwayAuthority	highway_authority
highwayAuthorityId	highway_authority_id
reasonForChange	reason_for_change

12.1.11 maintenance_line

GML attribute	GeoPackage attribute
*	fid
gml_id	unique_id
identifier	identifier
localId	local_id
beginLifespanVersion	begin_lifespan_version
netRef_element	netref_element
netRef_locationDescription	netref_location_description
*	geometry
validFrom	valid_from
maintenanceResponsibility	maintenance_responsibility
maintenanceAuthority	maintenance_authority

GML attribute	GeoPackage attribute
maintenanceAuthorityId	maintenance_authority_id
partialReference	partial_reference
highwayAuthority	highway_authority
highwayAuthorityId	highway_authority_id
reasonForChange	reason_for_change

12.1.12 maintenance_area

GML attribute	GeoPackage attribute
*	fid
gml_id	unique_id
identifier	identifier
localId	local_id
beginLifespanVersion	begin_lifespan_version
netRef_element	netref_element
netRef_locationDescription	netref_location_description
*	geometry
validFrom	valid_from
maintenanceResponsibility	maintenance_responsibility
maintenanceAuthority	maintenance_authority
maintenanceAuthorityId	maintenance_authority_id
partialReference	partial_reference
highwayAuthority	highway_authority
highwayAuthorityId	highway_authority_id
reasonForChange	reason_for_change

12.1.13 reinstatement

GML attribute	GeoPackage attribute
*	id
gml_id	unique_id
identifier	identifier
localId	local_id
beginLifespanVersion	begin_lifespan_version
netRef_element	netref_element
validFrom	valid_from
reinstatementType	reinstatement_type
partialReference	partial_reference
reasonForChange	reason_for_change

12.1.14 reinstatement_point

GML attribute	GeoPackage attribute
*	fid
gml_id	unique_id
identifier	identifier
localId	local_id
beginLifespanVersion	begin_lifespan_version
netRef_element	netref_element
netRef_locationDescription	netref_location_description
*	geometry
validFrom	valid_from
reinstatementType	reinstatement_type
partialReference	partial_reference
reasonForChange	reason_for_change

12.1.15 reinstatement_line

GML attribute	GeoPackage attribute
*	fid
gml_id	unique_id
identifier	identifier
localId	local_id
beginLifespanVersion	begin_lifespan_version
netRef_element	netref_element
netRef_locationDescription	netref_location_description
*	geometry
validFrom	valid_from
reinstatementType	reinstatement_type
partialReference	partial_reference
reasonForChange	reason_for_change

12.1.16 reinstatement_area

GML attribute	GeoPackage attribute
*	fid
gml_id	unique_id
identifier	identifier
localId	local_id
beginLifespanVersion	begin_lifespan_version
netRef_element	netref_element
netRef_locationDescription	netref_location_description
*	geometry
validFrom	valid_from
reinstatementType	reinstatement_type
partialReference	partial_reference
reasonForChange	reason_for_change

12.1.17 special_designation

GML attribute	GeoPackage attribute
*	id
gml_id	unique_id
identifier	identifier
localId	local_id
beginLifespanVersion	begin_lifespan_version
netRef_element	netref_element
validFrom	valid_from
validTo	valid_to
designation	designation
description	description
contactAuthority	contact_authority
contactAuthorityId	contact_authority_id
partialReference	partial_reference
reasonForChange	reason_for_change
namedDate	named_date
startDate	start_date
endDate	end_date
startMonthDay	start_month_day
endMonthDay	end_month_day
namedDay	named_day
namedPeriod	named_period
namedTime	named_time
startTime	start_time
endTime	end_time

12.1.18 special_designation_point

GML attribute	GeoPackage attribute
*	fid
gml_id	unique_id
identifier	identifier
localId	local_id
beginLifespanVersion	begin_lifespan_version
netRef_element	netref_element
netRef_locationDescription	netref_location_description
*	geometry
validFrom	valid_from
validTo	valid_to
designation	designation
description	description
contactAuthority	contact_authority
contactAuthorityId	contact_authority_id
partialReference	partial_reference
reasonForChange	reason_for_change
namedDate	named_date
startDate	start_date
endDate	end_date
startMonthDay	start_month_day
endMonthDay	end_month_day
namedDay	named_day
namedPeriod	named_period
namedTime	named_time
startTime	start_time
endTime	end_time

12.1.19 special_designation_line

GML attribute	GeoPackage attribute
*	fid
gml_id	unique_id
identifier	identifier
localId	local_id
beginLifespanVersion	begin_lifespan_version
netRef_element	netref_element
netRef_locationDescription	netref_location_description
*	geometry
validFrom	valid_from
validTo	valid_to
designation	designation
description	description
contactAuthority	contact_authority
contactAuthorityId	contact_authority_id
partialReference	partial_reference
reasonForChange	reason_for_change
namedDate	named_date
startDate	start_date
endDate	end_date
startMonthDay	start_month_day
endMonthDay	end_month_day
namedDay	named_day
namedPeriod	named_period
namedTime	named_time
startTime	start_time
endTime	end_time

12.1.20 special_designation_area

GML attribute	GeoPackage attribute
*	fid
gml_id	unique_id
identifier	identifier
localId	local_id
beginLifespanVersion	begin_lifespan_version
netRef_element	netref_element
netRef_locationDescription	netref_location_description
*	geometry
validFrom	valid_from
validTo	valid_to
designation	designation
description	description
contactAuthority	contact_authority
contactAuthorityId	contact_authority_id
partialReference	partial_reference
reasonForChange	reason_for_change
namedDate	named_date
startDate	start_date
endDate	end_date
startMonthDay	start_month_day
endMonthDay	end_month_day
namedDay	named_day
namedPeriod	named_period
namedTime	named_time
startTime	start_time
endTime	end_time

Annex A: GML examples

This annex includes examples of the different GML structures for full supply orders and change-only update (COU) orders and the transactions within.

Full supply

An example of the full supply GML, including the opening and closing tags:

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

COU

An example of the change-only update (COU) GML, including opening and closing tags and the different types of transactions:

<os:Transaction>

<os:insert>

```
<highway:RoadNode gml:id="osgb5000005193042483">
  <gml:identifier
codeSpace="http://inspire.jrc.ec.europa.eu/ids">http://data.os.uk/id/5000005193042483</gml:identifier>
  <net:beginLifespanVersion>2017-01-13T00:00:00.000</net:beginLifespanVersion>
  <net:inspireId>
    <base:Identifier>
      <base:localId>5000005193042483</base:localId>
      <base:namespace>http://data.os.uk/</base:namespace>
    </base:Identifier>
  </net:inspireId>
  <net:inNetwork xlink:href="#OSHHighwayNetwork"/>
  <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="#OSHHighwayNetwork"/>
  <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>
```