# Road Ontology Documentation

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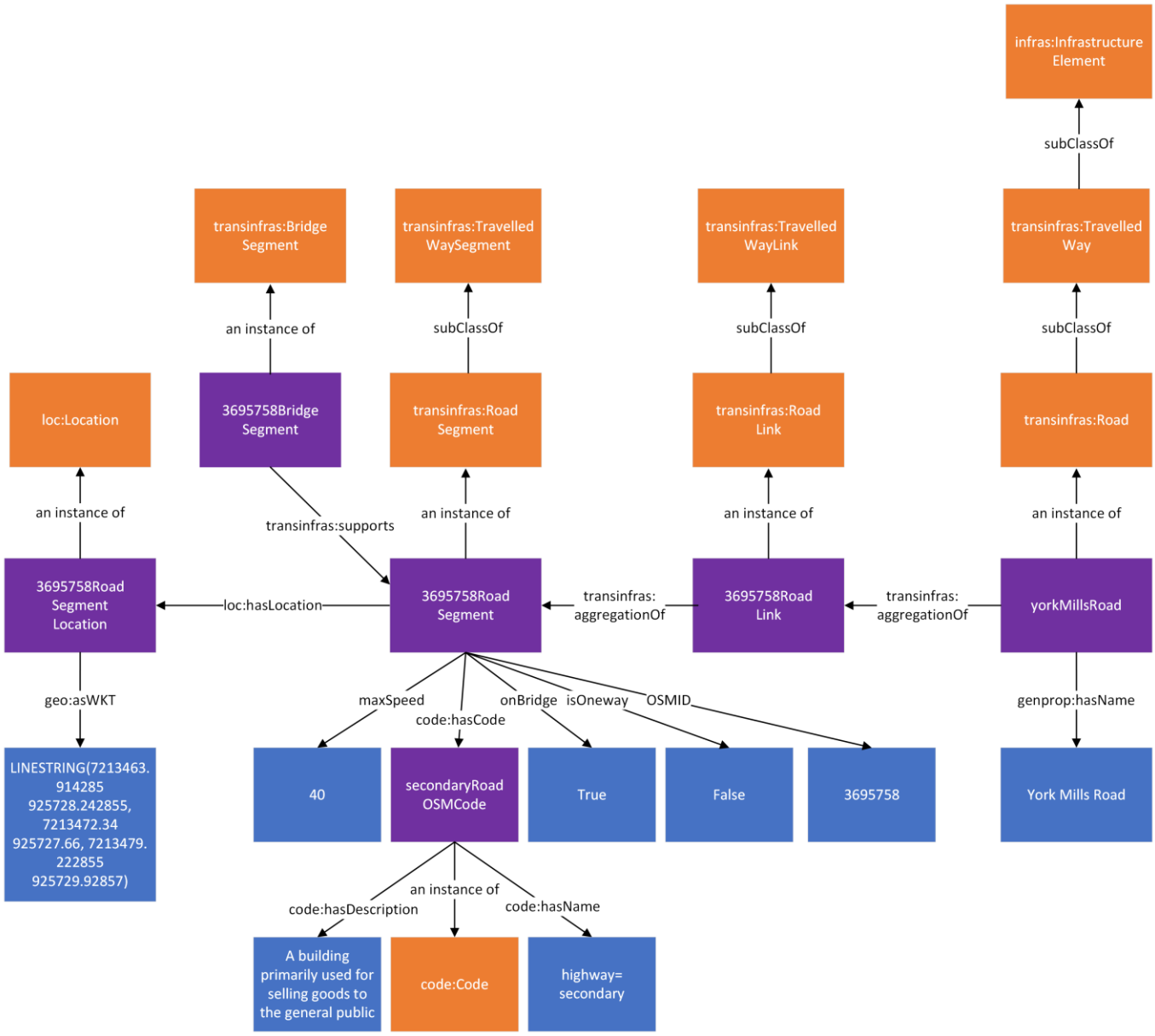
## Introduction

This is a basic ontology for representing road data using the Transportation Infrastructure pattern from ISO/IEC 5087-2. An instance of a road (e.g. yorkMillsRoad as seen in the diagram below) is defined as an instance of the Road class from ISO/IEC 5087-2 and can be linked to the name of the road using the hasName property. A Road can be represented as an aggregation of RoadLinks using the aggregationOf property from ISO/IEC 5087-2. Similarly, RoadLinks can also be represented as an aggregation of RoadSegments using the aggregationOf property from ISO/IEC 5087-2. RoadSegments can then be linked to their Location instance using the hasLocation property where the geospatial information is represented as a WKT value using the asWKT property. RoadSegments may also have a maxSpeed property that indicates the speed limit, an OSMType property which indicates the type of the road using the categories from OpenStreetMap, an onBridge property which indicates whether the road is located on a bridge, an isOneway property which indicates whether the road is a one way road, and an OSMID property that indicates the road's unique identifier that is used by OpenStreetMap. A list of the key properties is shown below:

- **transinfras:aggregationOf**: Identifies the smaller RoadLinks or RoadSegments that a Road may be decomposed into
- **genProp:hasName**: Indicates the name of an entity
- **loc:hasLocation**: Identifies the Location instance that represents the entity's geospatial location
- **geo:asWKT**: Indicates the geospatial information of an entity using the WKT (well-known text) representation of geometry
- **maxSpeed**: Indicates the speed limit of the road
- **code:hasCode**: Links to a Code instance that represents the classification system used by OpenStreetMap
- **onBridge**: Indicates whether the road is on a bridge
- **isOneway**: Indicates whether the road is a one-way road
- **OSMID**: Indicates the unique identifier that is used by OpenStreetMap

A diagram of the ontology using yorkMillsRoad as an example can be found below. Orange boxes represent classes, purple boxes represent instances, and blue boxes represent literals.




Namespace prefixes used:

- code: https://standards.iso.org/iso-iec/5087/-2/ed-1/en/ontology/Code/
- genprop: https://standards.iso.org/iso-iec/5087/-1/ed-1/en/ontology/GenericProperties/
- geo: http://www.opengis.net/ont/geosparql#
- infras: https://standards.iso.org/iso-iec/5087/-2/ed-1/en/ontology/Infrastructure/
- transinfras: https://standards.iso.org/iso-iec/5087/-2/ed-1/en/ontology/TransportationInfrastructure/
- loc: https://standards.iso.org/iso-iec/5087/-1/ed-1/en/ontology/SpatialLoc/

The following table shows the key classes and properties:

| Class | Property | Value Restriction |
|---|---|---|
| transinfras:Road | rdfs:subClassOf | transinfras:TraveledWay |
| | transinfras:aggregationOf | transinfras:RoadLink |
| | genProp:hasName | only xsd:string |
| transinfras:RoadLink | transinfras:aggregationOf | transinfras:RoadSegment |
| transinfras:RoadSegment | loc:hasLocation | only loc:Location |
| | maxSpeed | only xsd:string |
| | code:hasCode | only code:Code |
| | onBridge | only xsd:string |
| | isOneway | only xsd:string |
| | OSMID | only xsd:integer |
| transinfras:BridgeSegment | transinfras:supports | only transinfras:RoadSegment |
| loc:Location | geo:asWKT | only xsd:string |
| code:Code | code:hasName | only xsd:string |
| | code:hasDescription | only xsd:string |