## Junction

Junctions are an instance of transnet:Junctions and are a subclass of TransportNode. These entities connect travellers from one TravelledWayLink to another, in particular serving a connection between one or more RoadLinks and is uniquely identified using ORN-provided IDs. Geospatial coordinates are linked using geo:Geometry pointing to a geo:asWKT. Each Junction participates in one or more ingress and egress relationships with RoadLinks, ensuring accurate topological representation of the network.

A diagram of a network

Description automatically generated

Although the shp file does not have any information around the junctions beside which junctions bound the element, all the necessary information regarding all junctions in the dataset are in a special ORN\_JUNCTIONS.csv file. And ID of the junction are specified in the csv along with its location, type, etc. (more on this below)

**Note:** All the CSV files had a data tag ORN\_ROAD\_NET\_ELEMENT\_ID, an Integer representing a system-generated identifier unique at the application level.

**All the following properties are for associated with the cdt:Junction class, which is a subclass of the Junction class in the TransportationNetwork ontology.**

|  |  |  |  |
| --- | --- | --- | --- |
| Data Provided by ORN\_JUNCTION.csv | | | |
| ORN Data Tag | ORN Data Description | Property | Value |
| JUNCTION\_ID | System-generated identifier, unique at the application level. | genprop:hasIdentifier | xsd:integer |
| LATITUDE\_DECIMAL\_DEGREES | The latitude in decimal degrees. | loc:hasLocation  These measurements are used to grab the geospatial coordinates (asWKT), filtered by Toronto bounds.  geo:Geometry | geo:asWKT |
| LONGITUDE\_DECIMAL\_DEGREES | The longitude in negative decimal degrees. |  |
| JUNCTION\_TYPE | The classification of a junction is based on the valency of the junction. The number of road elements or ferry connections joining at a junction is termed the valency of a junction. | cdt:junctionType | xsd:string |
| EXIT\_NUMBER | The number of an exit on or off a freeway, expressway or highway, assigned by an administrating body and is represented by a valid number or character | cdt:exitNumber | xsd:string |
| NATIONAL\_UUID | A unique national identifier assigned to a road net element, junction and selected event data such as Toll Point, Blocked Passage and Structure which are required to support the National Road Network (NRN). | cdt:nationUUID | xsd:string |
| EFFECTIVE\_DATETIME | Date/time the record was created or last modified in the source database. | cdt:effectiveDate | xsd:Date |

ORN\_Junction.csv: A unique national identifier assigned to a road net element, junction and selected event data such as Toll Point, Blocked Passage and Structure which are required to support the National Road Network (NRN).

|  |  |  |  |
| --- | --- | --- | --- |
| Data Provided by ORN\_ROAD\_NET\_ELEMENT.shp: | | | |
| ORN Data Tag | ORN Data Description | Property | Value |
| TO\_JCT | The end junction for a road element or ferry connection. | transnet:ingress | RoadLink |
| FROM\_JCT | The beginning junction for a road element or ferry connection. | transnet:egress | RoadLink |

## Road

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## RoadLink

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## RoadLink

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## RoadLink

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## Integration of ORN Data in TTL Generation

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## Custom Classes and Properties

The following custom classes and properties were introduced as part of the City Digital Twin project to extend the ISO/IEC 5087 ontologies.

|  |  |  |
| --- | --- | --- |
| Class | Property | Value |
| transnet:Junction | rdfs:subClassOf | cdt:Junction |
| cdt:Junction | cdt:junctionType | xsd:string |
| cdt:Junction | cdt:exitNumber | xsd:string |
| cdt:Junction | cdt:nationUUID | xsd:string |
| cdt:Junction | cdt:effectiveDate | xsd:Date |

…