

4.1.3 Carriageway network

4.1.3.1 Identification

Name : Carriageway network
Identifier : ViaNova.Dbdd.ConceptualSchema.CarriagewayNetwork

4.1.3.2 Description

In this schema a road network is described as network of carriageway.

The network of carriageways is modelled as a non-planar directed graph. See the schema Road network Geometry.

For a dual carriageway network a carriageway element is almost the same a GDF road element. However for technical reasons a GDF road element may be split into two or more carriageway elements.

Technical reasons for splitting a GDF road element into two or more carriageway elements are the following:

1. the number of lanes changes within a road element,
a carriage element simply consist of one or more parallel lane elements.
2. the road element crosses the border of administrative areas
a carriageway element lies always within only one administrative area.
3. the road element consists of two or more parallel carriageways (separated by a 'locked line').

A carriageway element consists of a list parallel lane elements numbered from the inside out.

A carriageway element may be part of a motorway element or motorway junction.

4.1.3.3 Conceptual schema

```
SCHEMA CARRIAGEWAYNETWORK;  
  
REFERENCE FROM ROADNETWORKGEOMETRY  
(Edge,  
TerminatingNode,  
IntermediateNode,  
Segment,  
Route,  
UpstreamRoutes);  
  
REFERENCE FROM LANENETWORK  
(LnElement);  
  
TYPE PlusMin = INTEGER;  
WHERE  
TwoValues : (self = -1) OR (self = 1);  
END_TYPE;  
  
TYPE Decimetre = INTEGER;  
END_TYPE;  
  
ENTITY CwElement  
SUBTYPE OF(Edge);  
RoadName : STRING;  
Lanes : LIST [1:?] OF LnElement;  
SubGdfIdentifier : INTEGER;  
GdfRoadElementId : INTEGER;  
HmDirection : PlusMin;  
SELF\Edge.startsAt : CwJunction;  
SELF\Edge.endsAt : CwJunction;  
SELF\Edge.continuingEdge : OPTIONAL CwElement;  
END_ENTITY;  
  
ENTITY CwJunction  
SUBTYPE OF(TerminatingNode);  
END_ENTITY;
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ENTITY CwIntermediateNode
  SUBTYPE OF(IntermediateNode);
  SELF\CwIntermediateNode.isCoincidentWith : CwElement;
END_ENTITY;

ENTITY HmPost
  SUBTYPE OF(CwIntermediateNode);
  HmLegend : Decimetre;
  WHERE
    isHectometre : (hmLegend mod 1000) = 0;
END_ENTITY;

ENTITY CwSegment
  SUBTYPE OF(Segment, CwRoute);
END_ENTITY;

ENTITY CwRoute
  SUBTYPE OF(Route);
  SELF\Route.endsAt      : CwIntermediateNode;
  SELF\Route.startsAt    : CwIntermediateNode;
  SELF\Route.alongEdges : LIST [1:?] OF CwElement;
END_ENTITY;

ENTITY CwUpstreamRoutes
  SUBTYPE OF(UpstreamRoutes);
  SELF\UpstreamRoutes.routes : SET [1:?] OF CwRoute;
END_ENTITY;

END_SCHEMA;

```

Schema 4-3 Carriageway network schema

4.1.3.4 Entity descriptions

The various entities together with some auxiliary definitions are described below.

Carriageway element

An edge between two nodes (carriageway junctions) in a carriageway network.

A carriageway element consists of a list on parallel lane elements numbered from the inside out. The road name is the same as used along the road. If no road name id assigned the so-called 'DVK-letter' will be used.

The GDF identifier is the identifier of the corresponding GDF road element or the one of which is carriageway element is a part of.

The GDF subidentifier is a positive number if the carriageway element is part of a subdivided GDF road element and zero if it corresponds to a complete road element.

Carriageway intermediate node

A node on an edge in a carriageway network.

Carriageway junction

A node in a carriageway network at which one or more edges (carriage elements) start or end.

Carriageway route

A route through a carriageway network. A route may encompass one or more carriageway edges and starts and ends with an intermediate node on the first and last edge respectively.

Carriageway segment

A route through a carriageway network where each next carriageway element is the continuing element of its predecessor.

Carriageway upstream routes

A set of routes through a carriageway network all ending in the same intermediate node.

Hm post

A hectometre post.

The hm legend contains the distance as written on the post but measured in decimetres.

An hm post is a subtype of an carriage intermediate node. So it has also a position on the carriageway element.

4.1.3.5 Type descriptions

The various types together with some auxiliary definitions are described below.

PlusMin

PlusMin indicates the direction of numbering of the hectometre posts is relation to the traffic direction. It is 1 if the are the same and -1 if not..

4.1.3.6 Integrity constraints

There are no integrity rules specified.

4.1.3.7 Other security aspects

There are no additional security requirements

4.1.3.8 Performance aspects

There are no additional performance requirements

4.1.3.9 Implementation aspects

There are no additional implementation requirements.

4.1.3.10 Abbreviations

Cw	Carriageway
GDF	Geographic Data Files (a CEN standard for the exchange of road data)
Ln	Lane
Mw	Motorway

4.1.3.11 References

See section 2 for a complete reference description.

[GDF]	Geographic Data Files CEN, version 3.0 draft, 12 October 1995
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