



Apollo 3.0

HDMAP Open*DRIVE* Format

2018.07.05

Table of Contents

CHANGE RECORD	错误! 未定义书签。
Preface	3
Specification	3
Conventions	3
<i>Coordinate System</i>	3
<i>Lane</i>	3
<i>Junction</i>	4
File Format	5
Enclosing Tag	5
Header Record	6
<i>Geo Reference Record</i>	7
Road Records	7
<i>Route View Record</i>	8
<i>Road Link Record</i>	11
<i>Road Lanes Record</i>	13
<i>Road Objects Record</i>	34
<i>Road Signals Record</i>	51
Junction Record	59
<i>Junction Outline Record</i>	60
<i>Connection Record</i>	61
<i>Junction Object Overlap Group Record</i>	62

Preface

The Apollo HDMap OpenDrive specification describes the general concepts and structure of the High-definition Map (HD Map) data storage format that can be used by autonomous vehicles.

Specification

The Apollo HDMap data format uses the Extensible Markup Language (XML) file format as the data organization. The Apollo HDMap expands the international OpenDRIVE specification, based on the practical requirements of the applications in the Apollo autonomous driving technology.

Conventions

The Apollo HDMap follows conventions for its coordinate system, lane references and junction notation.

Coordinate System

The Apollo HDMap uses *WGS 84* as the standard coordinate reference system to represent the latitude and longitude of objects.

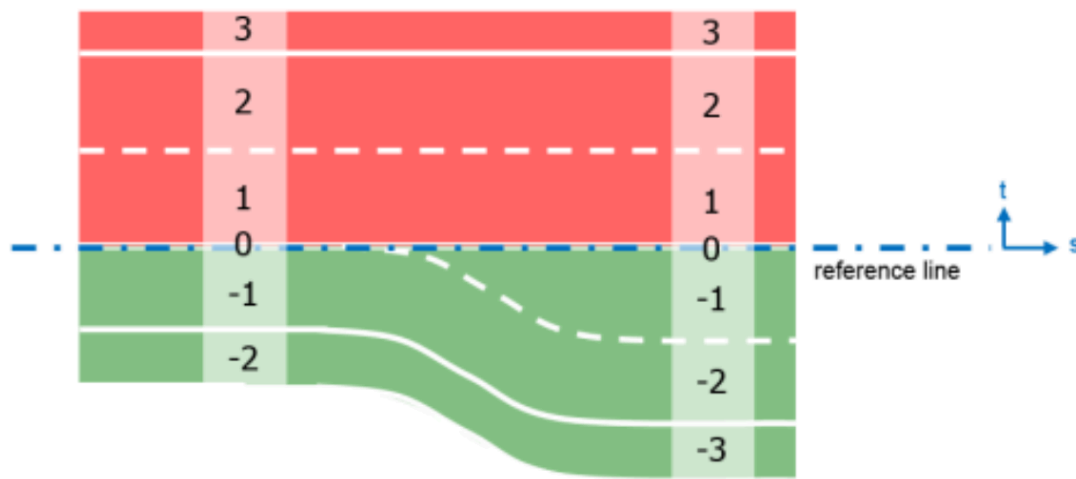
Lane

The road's reference line is stored in lane ID 0, and the other lanes store only one boundary of the current lane. For example, the lane on the right side of the reference line stores only the right boundary of the lane.

Lanes are identified by numbers that are:

- Unique (per lane section, see below)
- In sequence (i.e. without gaps)
- Start from 0 on the reference line
- Ascend to the left (positive t-direction)
- Descend to the right (negative t-direction)

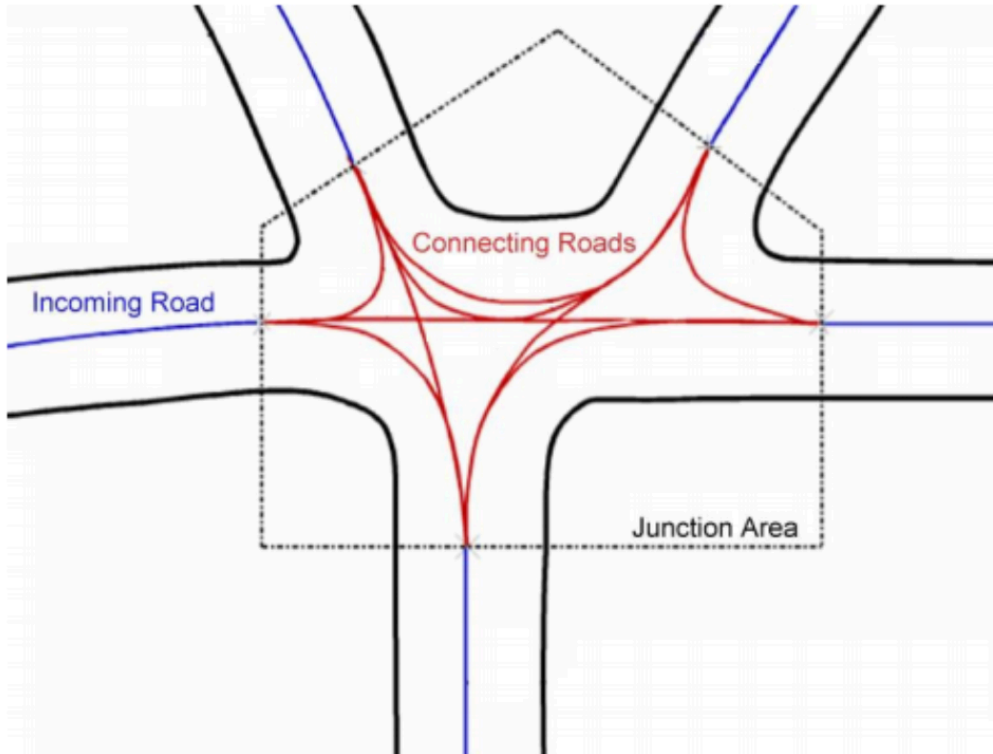
The total number of lanes is not limited. The reference line is defined as Lane 0 and its parent node must be a <center> node.



Junction

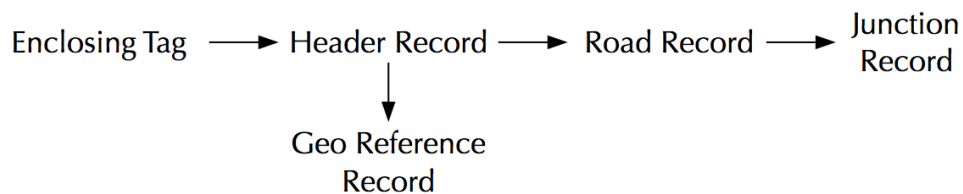
Junctions link incoming roads via paths (connecting roads) to outgoing roads.

The figure below shows a complex junction scenario:



File Format

The Apollo HDMAP file format is depicted in the illustration below that shows the top-level structure.



Enclosing Tag

The overall enclosing tag of the file is:

delimiters: <OpenDRIVE>...<OpenDRIVE>

instances: 1

attributes: xmlns="http://www.opendrive.org"

Header Record

delimiters: <header>...</header>

parent: <OpenDRIVE>

instances: 1

attributes:

Name	Type	Unit	Value	Description
revMajor	ushort	-	1	Major revision number of OpenDRIVE format.
revMinor	ushort	-	0	Minor revision number of OpenDRIVE format.
name	string	-	-	Database name.
version	float	-	-	Version number of this database.
date	string	-	-	Time/date of database creation. Preference: YYYY-MM-DDThh:mm:ss

Name	Type	Unit	Value	Description
north	double	deg	[-90, 90]	Maximum value of y-coordinate.
south	double	deg	[-90, 90]	Minimum value of y-coordinate.
east	double	deg	[-180, 180]	Maximum value of x-coordinate.
west	double	deg	[-180, 180]	Minimum value of x-coordinate.
vendor	string	-	Baidu	Vendor name.

Geo Reference Record

The Geo Reference Record syntax is described below.

delimiters: <geoReference>...</geoReference >

parent: <header>

instances: 1

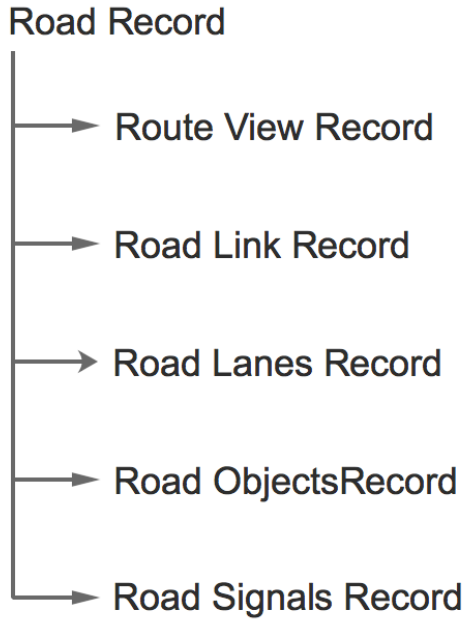
attributes: none

Example:

```
<geoReference>
  <![CDATA[+proj=longlat +ellps=WGS84 +datum=WGS84 +no_defs]]>
</geoReference>
```

Road Records

The illustration below shows the Road Record structure.



delimiters: <road>...<road>

parent: <OpenDRIVE>

instances: 1+

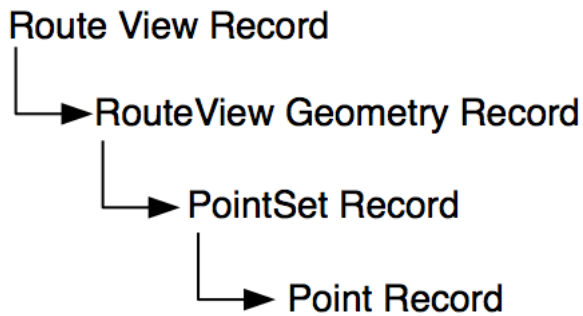
attributes:

Name	Type	Unit	Value	Description
name	string	-	-	Name of the road.
id	string	-	-	Unique ID within database.
junction	string	-	- -1	ID of the junction to which the road belongs as a connecting road (= -1 for none).

Route View Record

The Route View Record illustration below depicts the structural

hierarchy.



delimiters: <routeView>...</routeView>

parent: <road>

instances: 0...1

attributes: none

Route View Geometry Record

delimiters: <geometry>...</geometry>

parent: <routeView>

instances: 1+

attributes::

Name	Type	Unit	Value	Description
sOffset	double	m	[0, ∞[	Start position (s-coordinate).
x	double	deg	[-180, 180]	x-coordinate of start position.
y	double	deg	[-90, 90]	y-coordinate of start position.

Name	Type	Unit	Value	Description
z	double	m] $-\infty$, ∞ [z-coordinate of start position.
length	double	m	[0, ∞ [Length of the element.

PointSet Record

delimiters: `<pointSet>...</pointSet>`

parent: `<geometry>`

instances: 1

attributes: none

Point Record

delimiters: `<point.../>`

parent: `<pointSet>`

instances: 2+

attributes:

Name	Type	Unit	Value	Description
x	double	deg	[-180, 180]	x-coordinate of geometry.
y	double	deg	[-90, 90]	y-coordinate of geometry.
z	double	m] $-\infty$, ∞ [z-coordinate of geometry.

Road Link Record

The Road Link Record structural hierarchy is depicted in the illustration below.



delimiters: <link>...<link>

parent: <road>

instances: 0..1

attributes: none

Road Predecessor Record

delimiters: <predecessor.../>

parent: <link>

instances: 0+

attributes:

Name	Type	Unit	Value	Description
elementType	string	-	road junction	Type of the linked element, could be road or junction.

Name	Type	Unit	Value	Description
elementId	string	-	-	ID of the linked element
contactPoint	string	-	start end	Contact point of link on the linked element.

Road Successor Record

delimiters: <successor... />

parent: <link>

instances: 0+

attributes:

Name	Type	Unit	Value	Description
elementType	string	-	road junction	Linked element is either road or junction.
elementId	string	-	-	ID of the linked element
contactPoint	string	-	start end	Contact point of link on the linked element.

Road Neighbor Record

delimiters: <neighbor... />

parent: <link>

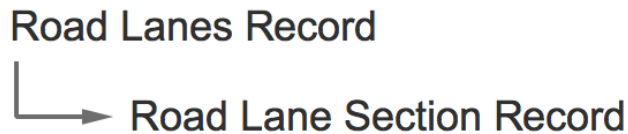
instances: 0+

attributes:

Name	Type	Unit	Value	Description
side	string	-	left right	Left or right side relative to the parent road.
elementId	string	-	-	ID of the linked road.
direction	string	-	same opposite	Direction of the linked road relative to the parent road.

Road Lanes Record

The Road Lanes Record hierarchical structure is depicted below.



delimiters: <lanes>...</lanes>

parent: <road>

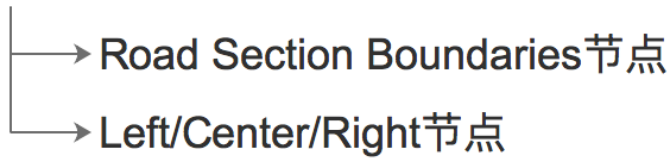
instances: 1

attributes: none

Road Lane Section Record

The Road Lane Section Record hierarchical structure is depicted in the illustration below.

Road Lane Section节点



delimiters: <laneSection>...</laneSection>

parent: <lanes>

instances: 1+

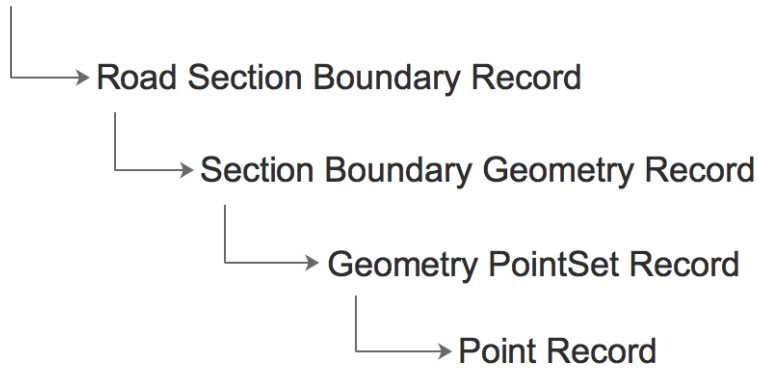
attributes:

Name	Type	Unit	Value	Description
singleSide	string	-	true false	If the bi-direction road shares the same reference line. true: the bi-direction road shares the same lane section. false: the road in opposite directions has different lane sections.

Road Section Boundaries

The Road Section Boundaries Record hierarchical structure is depicted in the illustration below.

Road Section Boundaries Record



delimiters: <boundaries>...<boundaries>

parent: <laneSection>

instances: 1

attributes: none

Section Boundary

delimiters: <boundary>...<boundary>

parent: <boundaries>

instances: 1+

attributes:

Name	Type	Unit	Value	Description
type	string	-	leftBoundary rightBoundary	Type of the boundary.

Section Boundary Geometry

delimiters: <geometry>...</geometry>

parent: <boundary>

instances: 1
attributes: none

Geometry PointSet Record

delimiters: <pointSet>...</pointSet>
parent: <geometry>
instances: 1
attributes: none

Point Record

delimiters: <point.../>
parent: <pointSet>
instances: 2+
attributes:

Name	Type	Unit	Value	Description
x	double	deg	[-180, 180]	x-coordinate of the point.
y	double	deg	[-90, 90]	y-coordinate of the point.
z	double	m	]-∞, ∞[	z-coordinate of the point.

Left / Center / Right Records

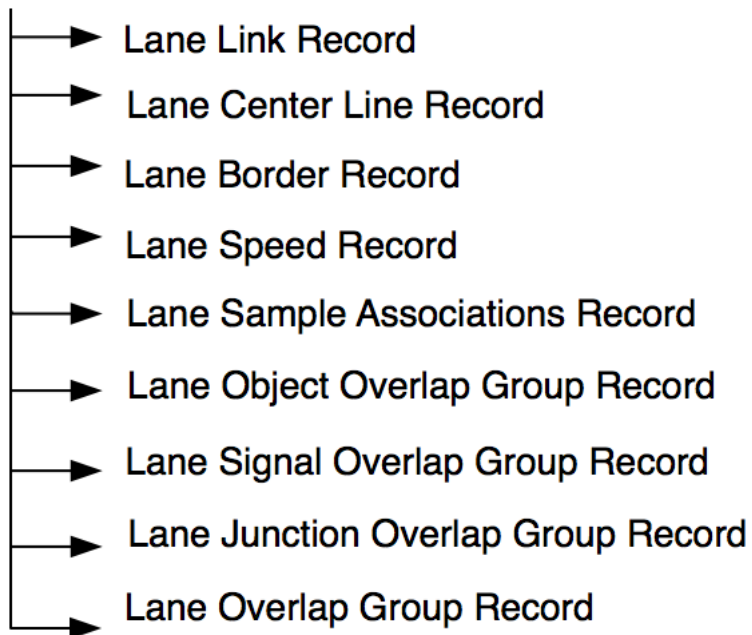
The Left/Center/Right Records have one sub-record, Lane Record, which consists of several sub-hierarchical record layers. The Lane Record syntax is:

delimiters: <left>...</left>
<center>...</center>
<right>...</right>
parent: <laneSection>
instances: 1
attributes: none

Lane Record

The Lane Record hierarchical structure is illustrated below, followed by its syntax and the subsequent sub-records syntax and hierarchies.

Lane Record



delimiters: <lane>... <lane/>
parent: <left> / <center> / <right>
instances: 1+

attributes:

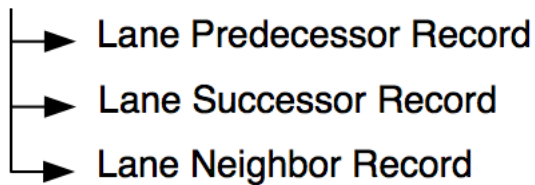
Name	Type	Unit	Value	Description
id	int	-	]- ∞, ∞[	ID of the lane (according to convention).
uid	string	-	-	Unique id of the lane.
type	string	-	none driving biking parking through onRamp offRamp connectingRamp shoulder entrance exit parallel emergencyParkingStrip divisionZone	Type of the lane.
direction	string	-	forward backward	Direction of the lane

Name	Type	Unit	Value	Description
			bidirection	relative to the sequence of point set.
turnType	string	-	noTurn leftTurn rightTurn uTurn	Turn type of the parent lane.

Lane Link Record

The Lane Link Record hierarchical structure is illustrated below.

Lane Link Record



delimiters: <link>... </ link>

parent: <lane>

instances: 0..1

attributes: none

Lane Predecessor Record

delimiters: <predecessor.../>

parent: <link>

instances: 0+

attributes:

Name	Type	Unit	Value	Description
id	string	-	-	uid of the link lane.

Lane Successor Record

delimiters: <successor.../>

parent: <link>

instances: 0+

attributes:

Name	Type	Unit	Value	Description
id	string	-	-	uid of the link lane

Lane Neighbor Record

delimiters: <neighbor.../>

parent: <link>

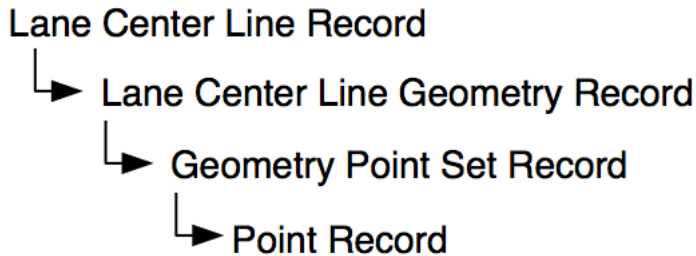
instances: 0+

attributes:

Name	Type	Unit	Value	Description
id	string	-	-	uid of the link lane.
side	string	-	left right	Left or right side relative to the parent lane.
direction	string	-	same opposite	Direction of the linked road relative to the parent lane.

Lane Center Line Record

The Lane Center Line Record hierarchical structure is depicted below.



delimiters: `<centerLine>...</centerLine>`

parent: `<lane>`

instances: 1

attributes: none

Lane Center Line Geometry Record

delimiters: `<geometry>...</geometry>`

parent: `<centerLine>`

instances: 1+

attributes:

Name	Type	Unit	Value	Description
sOffset	double	m	[0, ∞[	Start position in s-coordinate.
x	double	deg	[-180, 180]	x-coordinate of start position.
y	double	deg	[-90, 90]	y-coordinate of start position.
z	double	m	]-∞, ∞[	z-coordinate of start

Name	Type	Unit	Value	Description
				position.
length	double	m	[0, ∞[	Length of the element.

Geometry Point Set Record

delimiters: <pointSet>...</pointSet>

parent: <geometry>

instances: 1

attributes: none

Point Record

delimiters: <point.../>

parent: <pointSet>

instances: 2+

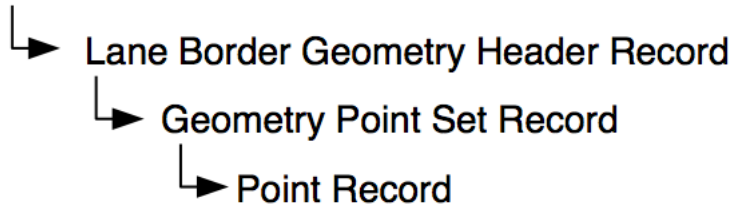
attributes:

Name	Type	Unit	Value	Description
x	double	deg	[-180, 180]	x-coordinate of the point.
y	double	deg	[-90, 90]	y-coordinate of the point.
z	double	m	]-∞, ∞[	z-coordinate of the point.

Lane Border Record

The Lane Border Record hierarchical structure is depicted below.

Lane Border Record



delimiters: <border >...</border>

parent: <lane>

instances: 1

attributes:

Name	Type	Unit	Value	Description
virtual	string	-	FALSE TRUE	Identify whether the lane boundary exists in real world

Lane Border Geometry Header Record

delimiters: <geometry>...</geometry>

parent: <border>

instances: 1+

attributes:

Name	Type	Unit	Value	Description
sOffset	double	m	[0, ∞[	Start position in s-coordinate.
x	double	deg	[-180,	x-coordinate of start position.

Name	Type	Unit	Value	Description
			180]	
y	double	deg	[-90, 90]	y-coordinate of start position.
z	double	m	]-∞, ∞[	z-coordinate of start position.
length	double	m	]-∞, ∞[	Length of the element.

Geometry Point Set Record

delimiters: <pointSet>...</pointSet>

parent: <geometry>

instances: 1

attributes: none

Point Record

delimiters: <point.../>

parent: <pointSet>

instances: 2+

attributes:

Name	Type	Unit	Value	Description
x	double	deg	[-180, 180]	x-coordinate of the point.
y	double	deg	[-90, 90]	y-coordinate of the point.
z	double	m	]-∞, ∞[	z-coordinate of the

Name	Type	Unit	Value	Description
				point.

Lane Border Types Record

The Lane Border Types Record has one sub-record, Lane Border Type. Syntax for both records is described below.

delimiters: `<borderTypes>...</borderTypes>`

parent: `<border>`

instances: 1+

attributes:

Name	Type	Unit	Value	Description
sOffset	double	m	[0, ∞[	Start position in s-coordinate relative to the start point of the lane border.
eOffset	double	m	[0, ∞[	End position in s-coordinate relative to the start point of the lane border.

Lane Border Type Record

delimiters: `<borderType>...</borderType>`

parent: `<borderTypes>`

instances: 1+

attributes:

Name	Type	Unit	Value	Description
------	------	------	-------	-------------

Name	Type	Unit	Value	Description
type	string	-	none solid broken solidSolid solidBroken brokenSolid brokenBroken curb guardrail barrier	Type of the lane border.
color	string	-	none white yellow orange blue	Color of the lane border.

Lane Speed Record

The Lane Speed Record has no sub-records. It's delimiters, parent, instances and attributes are described below.

delimiters: <speed .../>

parent: <lane>

instances: 0...1

attributes:

Name	Type	Unit	Value	Description
min	double	km/h	[0, ∞[	min allowed speed.
max	double	km/h	[0, ∞[	max allowed speed.

Lane Sample Associations Record

The Lane Sample Associations Record has one sub-record, Lane Sample Association. Syntax for both records is described below.

delimiters: <sampleAssociations>

parent: <lane>

instances: 0...1

attributes: none

Lane Sample Association Record

delimiters: <sampleAssociation ...>

parent: <sampleAssociations>

instances: 1+

attributes:

Name	Type	Unit	Value	Description
sOffset	double	m	[0, ∞[	Start position in s-coordinate relative to the start point of the center line.
leftWidth	double	m	[0, ∞[	Distance of the central point to closest left

Name	Type	Unit	Value	Description
				boundary.
rightWidth	double	m	[0, ∞[	Distance of the central point to closest right boundary.

Road Sample Associations Record

The Road Sample Associations Record has one sub-record, Road Sample Association. Syntax for both records is described below.

delimiters: <roadSampleAssociations>

parent: <lane>

instances: 0...1

attributes: none

Road Sample Association Record

delimiters: <sampleAssociation ...>

parent: <sampleAssociations>

instances: 1+

attributes:

Name	Type	Unit	Value	Description
sOffset	double	m	[0, ∞[	Start position in s-coordinate relative to the start point of the center line.
leftWidth	double	m	[0, ∞[	Distance of the

Name	Type	Unit	Value	Description
				central point to closest left Road boundary.
rightWidth	double	m	[0, ∞[	Distance of the central point to closest right Road boundary.

Lane Object Overlap Group Record

The Lane Object Overlap Group Record has one sub-record, Object Reference Record. Syntax for both records is described below.

delimiters: `<objectOverlapGroup>...</objectOverlapGroup>`

parent: `<lane>`

instances: 0...1

attributes: none

Object Reference Record

delimiters: `<objectReference.../>`

parent: `<objectOverlapGroup>`

instances: 1+

attributes:

Name	Type	Unit	Value	Description
id	string	-	-	ID of the object overlapped with the lane.
startOffset	double	m	[0, ∞[	The start offset of

Name	Type	Unit	Value	Description
				the overlap relative to the first point of the center line.
endOffset	double	m	[0, ∞[	The end offset of the overlap relative to the first point of the center line.

Lane Signal Overlap Group Record

The Lane Signal Overlap Group Record has one sub-record, Signal Reference Record. Syntax for both records is described below.

delimiters: `<signalOverlapGroup>...</signalOverlapGroup>`

parent: `<lane>`

instances: 0...1

attributes: none

Signal Reference Record

delimiters: `<signalReference.../>`

parent: `<signalOverlapGroup>`

instances: 1+

attributes:

Name	Type	Unit	Value	Description
id	string	-	-	ID of the signal overlapped with

Name	Type	Unit	Value	Description
				the parent lane
startOffset	double	m	[0, ∞[	The start offset of the overlap relative to the first point of the lane center line.
endOffset	double	m	[0, ∞[	The end offset of the overlap relative to first point of the lane center line.

Lane Junction Overlap Group Record

The Lane Junction Overlap Group Record has one sub-record, Junction Reference Record. Syntax for both records is described below.

delimiters: <junctionOverlapGroup>...</junctionOverlapGroup>

parent: <lane>

instances: 0...1

attributes: none

Junction Reference Record

delimiters: <junctionReference.../>

parent: <junctionOverlapGroup>

instances: 1+

attributes:

Name	Type	Unit	Value	Description
-------------	-------------	-------------	--------------	--------------------

Name	Type	Unit	Value	Description
id	string	-	-	ID of the junction overlapped with the parent lane
startOffset	double	m	[0, ∞[	The start offset overlap relative to first center point along the lane center curve.
endOffset	double	m	[0, ∞[	The end offset of the overlap relative to the first point of the lane center curve.

Lane Overlap Group Record

The Lane Overlap Group Record has one sub-record, Lane Reference Record. Syntax for both records is described below.

delimiters: `<laneOverlapGroup>...</laneOverlapGroup>`

parent: `<lane>`

instances: 0...1

attributes: none

Lane Reference Record

delimiters: `<laneReference.../>`

parent: `<laneOverlapGroup>`

instances: 1+

attributes:

Name	Type	Unit	Value	Description
roadId	string	-	-	ID of the road overlapped with the parent lane
laneSectionId	int	-	[0, ∞[	ID of the lane section overlapped with the parent lane
laneId	int	-	] -∞, ∞[	ID of the lane overlapped with the parent lane
startOffset	double	m	[0, ∞[	The start offset of the overlap relative to the first point of the lane center line.
endOffset	double	m	[0, ∞[	The end offset of the overlap relative to the first point of the lane center line.
isMerge	string	-	true false	Lanes' cross type: true - lanes cross in a confluent way. false - lanes cross in a non-confluent way.

Road Objects Record

The objects record is the container for all objects along a road. It has one sub-record, Object. The syntax for both records is described below. See each Object record for depictions of its specific sub-record hierarchy, based on value.

delimiters: <objects>...</objects>

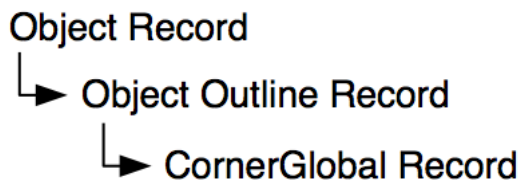
parent: <road>

instances: 0...1

attributes: none

Object Record – crosswalk

For the value crosswalk, the Object Record hierarchical structure is depicted below.



delimiters: <object>...</object>

parent: <objects>

instances: 0+

attributes:

Name	Type	Unit	Value	Description
type	string	-	crosswalk	Type of object
id	string	-	-	Unique ID within

Name	Type	Unit	Value	Description
				database

Object Outline Record

delimiters: <outline>...</outline>

parent: <object>

instances: 1

attributes: none

CornerGlobal Record

delimiters: <cornerGlobal .../>

parent: <outline>

instances: 3+

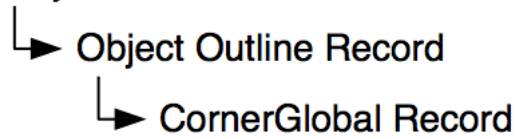
attributes:

Name	Type	Unit	Value	Description
x	double	deg	[-180, 180]	x-coordinate of the corner.
y	double	deg	[-90, 90]	y-coordinate of the corner.
z	double	m	]-∞, ∞[	z-coordinate of the corner.

Object Record – clearArea

For the value clearArea, the Object Record hierarchical structure is depicted below.

Object Record



delimiters: <object>...</object>

parent: <objects>

instances: 0+

attributes:

Name	Type	Unit	Value	Description
type	string	-	clearArea	Type of object.
id	string	-	-	Unique ID within database.

Object Outline Record

delimiters: <outline>...</outline>

parent: <object>

instances: 1

attributes: none

CornerGlobal Record

delimiters: <cornerGlobal .../>

parent: <outline>

instances: 3+

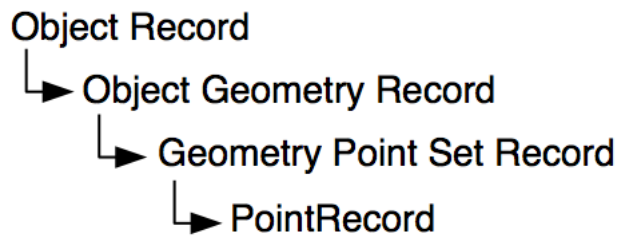
attributes:

Name	Type	Unit	Value	Description
------	------	------	-------	-------------

Name	Type	Unit	Value	Description
x	double	deg	[-180, 180]	x coordinate of the corner.
y	double	deg	[-90, 90]	y coordinate of the corner.
z	double	m	]-∞, ∞[	z coordinate of the corner.

Object Record – speedBump

For the value speedBump, the Object Record hierarchical structure is depicted below.



delimiters: <object>...</object>

parent: <objects>

instances: 0+

attributes:

Name	Type	Unit	Value	Description
type	string	-	speedBump	Type of object.
id	string	-	-	Unique ID within database.

Object Geometry Record

delimiters: <geometry>...</geometry>

parent: <object>

instances: 1

attributes: none

Geometry Point Set Record

delimiters: <pointSet>...</pointSet>

parent: <geometry>

instances: 1

attributes: none

Point Record

delimiters: <point.../>

parent: <pointSet>

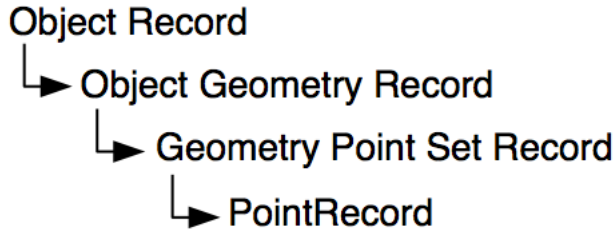
instances: 2+

attributes:

Name	Type	Unit	Value	Description
x	double	deg	[-180, 180]	x-coordinate of the point.
y	double	deg	[-90, 90]	y-coordinate of the point.
z	double	m	]-∞, ∞[	z-coordinate of the point.

Object Record – stopLine

For the value stopLine, the Object Record hierarchical structure is depicted below.



delimiters: <object>...</object>

parent: <objects>

instances: 0+

attributes:

Name	Type	Unit	Value	Description
type	string	-	stopLine	Type of object.
id	string	-	-	Unique ID within database.

Object Geometry Record

delimiters: <geometry>...</geometry>

parent: <object>

instances: 1

attributes: none

Geometry PointSet Record

delimiters: <pointSet>...</pointSet>

parent: <geometry>

instances: 1

attributes: none

Point Record

delimiters: <point.../>

parent: <pointSet>

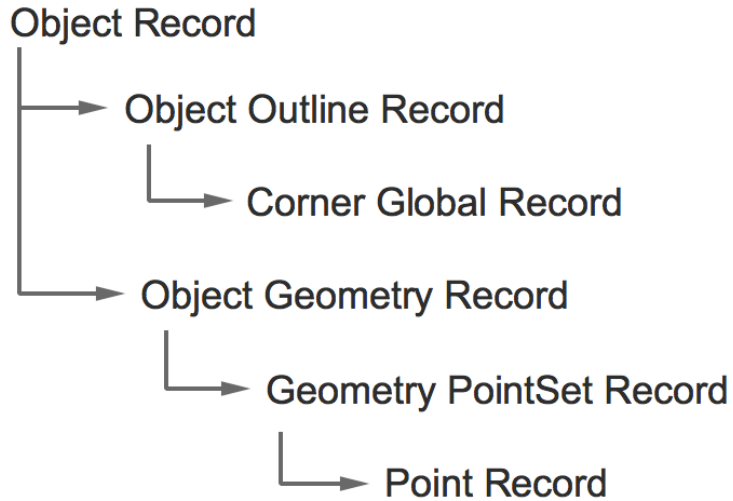
instances: 2+

attributes:

Name	Type	Unit	Value	Description
x	double	deg	[-180, 180]	x-coordinate of the point.
y	double	deg	[-90, 90]	y-coordinate of the point.
z	double	m	]-∞, ∞[	z-coordinate of the point.

Object Record – roadmark

For the value roadmark, the Object Record hierarchical structure is depicted below.



delimiters: <object>...</object>

Parent: <objects>

instances: 0+

attributes:

Name	Type	Unit	Value	Description
type	string	-	roadMark	Type of object
subtype	string	-	roadCharacters arrow shadeAreaMarking	The sub type of the roadmark.
id	string	-	-	Unique ID within database.

Object Outline Record

delimiters: <outline>...</outline>

parent: <object>

instances: 1

attributes: none

CornerGlobal Record

delimiters: <cornerGlobal .../>

parent: <outline>

instances: 3+

attributes:

Name	Type	Unit	Value	Description
x	double	deg	[-180, 180]	x-coordinate of the corner.
y	double	deg	[-90, 90]	y-coordinate of the corner.
z	double	m	]-∞, ∞[	z-coordinate of the corner.

Object Geometry Record

delimiters: <geometry>...</geometry>

parent: <object>

instances: 1

attributes: none

Geometry PointSet Record

delimiters: <pointSet>...</pointSet>

parent: <geometry>

instances: 1

attributes: none

Point Record

delimiters: <point.../>

parent: <pointSet>

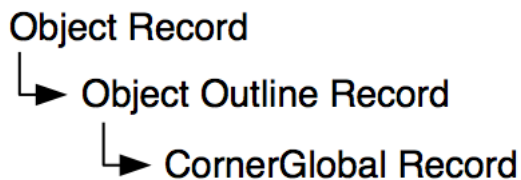
instances: 2+

attributes:

Name	Type	Unit	Value	Description
x	double	deg	[-180, 180]	x-coordinate of the geometry.
y	double	deg	[-90, 90]	y-coordinate of the geometry.
z	double	m	]-∞, ∞[	z-coordinate of the geometry.

Object Record – pole

The Object Record hierarchical structure is depicted below followed by its syntax.



delimiters: <object>...</object>

parent: <objects>

instances: 0+

attributes:

Name	Type	Unit	Value	Description
type	string		pole	Type of object.
subtype	string	-	baseStation camera sign	Subtype of object.
id	string	-	-	Unique ID within database.

Object Outline Record

delimiters: <outline>...</outline>

parent: <object>

instances: 1

attributes: none

Corner Global Record

delimiters: <cornerGlobal .../>

parent: <outline>

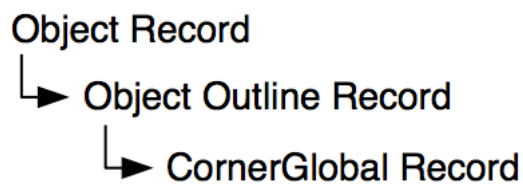
instances: 3+

attributes:

Name	Type	Unit	Value	Description
x	double	deg	[-180, 180]	x-coordinate of the corner.
y	double	deg	[-90, 90]	y-coordinate of the corner.
z	double	m	]-∞, ∞[	z-coordinate of the corner.

Object Record – gantry

The hierarchical structure for the Object Record, with the value gantry, is depicted below, followed by its sub-records.



delimiters: <object>...</object>

parent: <objects>

instances: 0+

attributes:

Name	Type	Unit	Value	Description
type	string	-	gantry	Type of object.
id	string	-	-	Unique ID within database.

Object Outline Record

delimiters: <outline>...</outline>

parent: <object>

instances: 1

attributes: none

CornerGlobal Record

delimiters: <cornerGlobal .../>

parent: <outline>

instances: 3+

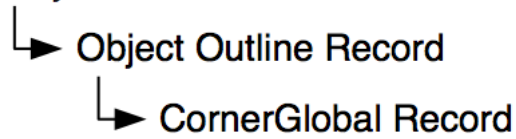
attributes:

Name	Type	Unit	Value	Description
x	double	deg	[-180, 180]	x-coordinate of the corner.
y	double	deg	[-90, 90]	y-coordinate of the corner.
z	double	m	$]-\infty, \infty[$	z-coordinate of the corner.

Object Record – ledMessage

The hierarchical structure for the Object Record, with the value ledMessage, is depicted below, followed by its sub-records.

Object Record



delimiters: <object>...</object>

parent: <objects>

instances: 0+

attributes:

Name	Type	Unit	Value	Description
type	string	-	ledMessage	Type of object.
id	string	-	-	Unique ID within database.

Object Outline Record

delimiters: <outline>...</outline>

parent: <object>

instances: 1

attributes: none

CornerGlobal Record

delimiters: <cornerGlobal .../>

parent: <outline>

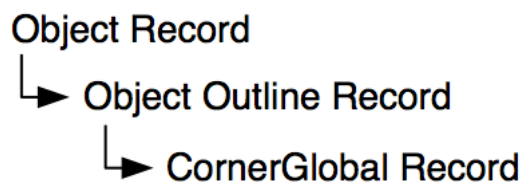
instances: 3+

attributes:

Name	Type	Unit	Value	Description
x	double	deg	[-180, 180]	x-coordinate of the corner.
y	double	deg	[-90, 90]	y-coordinate of the corner.
z	double	m	$]-\infty, \infty[$	z-coordinate of the corner.

Object Record – road sign

The hierarchical structure for the Object Record, with the value road sign, is depicted below, followed by its sub-records.



delimiters: <object>...</object>

parent: <objects>

instances: 0+

attributes:

Name	Type	Unit	Value	Description
type	string	-	roadSign	Type of object.
subtype	string		speedLimit noOvertake guidePost	The subtype of object.
id	string	-	-	Unique ID

Name	Type	Unit	Value	Description
				within database.

Object Outline Record

delimiters: <outline>...</outline>

parent: <object>

instances: 1

attributes: none

CornerGlobal Record

delimiters: <cornerGlobal .../>

parent: <outline>

instances: 3+

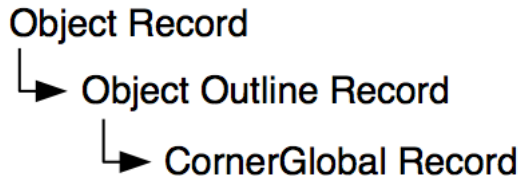
attributes:

Name	Type	Unit	Value	Description
x	double	deg	[-180, 180]	x-coordinate of the corner.
y	double	deg	[-90, 90]	y-coordinate of the corner.
z	double	m	]-∞, ∞[	z-coordinate of the corner.

Object Record— overpass

The hierarchical structure for the Object Record, with the value overpass,

is depicted below, followed by its sub-records.



delimiters: <object>...</object>

parent: <objects>

instances: 0+

attributes:

Name	Type	Unit	Value	Description
type	string	-	overpass	Type of object.
id	string	-	-	Unique ID within database.

Object Outline Record

delimiters: <outline>...</outline>

parent: <object>

instances: 1

attributes: none

CornerGlobal Record

delimiters: <cornerGlobal .../>

parent: <outline>

instances: 3+

attributes:

Name	Type	Unit	Value	Description
x	double	deg	[-180, 180]	x-coordinate of the corner.
y	double	deg	[-90, 90]	y-coordinate of the corner.
z	double	m	]-∞, ∞[	z-coordinate of the corner.

Object Record - parking space

Object Record

↳ Object Outline Record

↳ CornerGlobal Record

delimiters: <object>...</object>

parent: <objects>

instances: 0+

attributes:

Name	Type	Unit	Value	Description
type	string	-	parkingSpace	Type of object
id	string	-	-	Unique ID within database
heading	double	deg	[-180, 180]	Direction of parking space

Object Outline Record

delimiters: <outline>...</outline>

parent: <object>

instances: 1

attributes: none

CornerGlobal Record

delimiters: <cornerGlobal .../>

parent: <outline>

instances: 3+

attributes:

Name	Type	Unit	Value	Description
x	double	deg	[-180, 180]	x-coordinate of the corner.
y	double	deg	[-90, 90]	y-coordinate of the corner.
z	double	m	]-∞, ∞[	z-coordinate of the corner.

Road Signals Record

The Road Signals Record syntax is explained below its hierarchical structure illustration and is followed by its sub-records.



delimiters: `<signals>...</signals>`

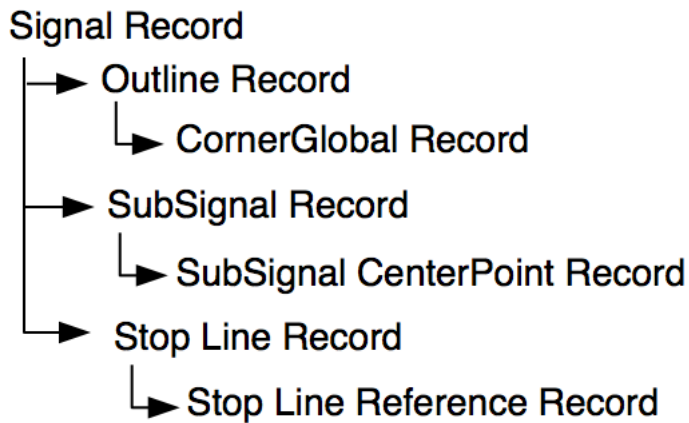
parent: `<road>`

instances: `0...1`

attributes: `none`

Traffic Lights Record

Traffic Lights Record syntax is explained below the Outline Record hierarchical structure illustration.



delimiters: `<signal>...</signal>`

parent: `<signals>`

instances: `0+`

attributes:

Name	Type	Unit	Value	Description
id	string	-	-	Unique ID of the signal within the database.
type	string		trafficLight	Type of the signal.
layoutType	string		unknown mix2Vertical mix2Horizontal mix3Vertical mix3Horizontal single	Type of the traffic light layout.

Outline Record

delimiters: `<outline>...</outline>`

parent: `<signal>`

instances: 1

attributes: none

CornerGlobal Record

delimiters: `<cornerGlobal .../>`

parent: `<outline>`

instances: 3+

attributes:

Name	Type	Unit	Value	Description
x	double	deg	[-180, 180]	x-coordinate of the corner.
y	double	deg	[-90, 90]	y-coordinate of the corner.
z	double	m	]-∞, ∞[	z-coordinate of the corner.

SubSignal Record

delimiters: <subsignal>...</subsignal>

parent: <signal>

instances: 1+

attributes:

Name	Type	Unit	Value	Description
id	string	-	-	ID of the subsignal, unique ID within the traffic light.
type	string	-	unknown circle arrowLeft arrowRight arrowForward arrowLeftAndForward	Type of subsignal.

Name	Type	Unit	Value	Description
			arrowRightAndForward arrowUTurn	

SubSignal CenterPoint Record

delimiters: <centerPoint.../>

parent: <subsignal>

instances: 1

attributes:

Name	Type	Unit	Value	Description
x	double	m	[-180, 180]	x-coordinate of the center point.
y	double	m	[-90, 90]	y-coordinate of the center point.
z	double	m	]-∞, ∞[	z-coordinate of the center point.

Stop Line Record

delimiters: <stopline> </stopline>

parent: <signal>

instances: 1

attributes: none

Stop Line Reference Record

delimiters: <objectReference.../>

parent: <stopline>

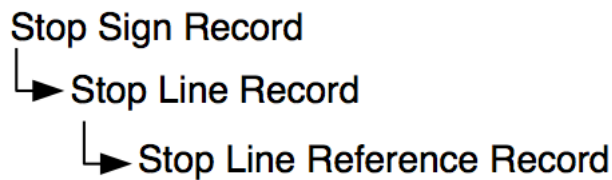
instances: 1+

attributes:

Name	Type	Unit	Value	Description
id	string	-	-	ID of the stop line.

Stop Sign Record

Stop Sign Record syntax is explained below the Stop Sign Record hierarchical structure illustration.



delimiters: <signal>...</signal>

parent: <signals>

instances: 0+

attributes:

Name	Type	Unit	Value	Description
id	string	-	-	Unique ID of the signal.
type	string	-	stopSign	Type of signal.

Stop Line Record

delimiters: <stopline>...</stopline>

parent: <signal>
 instances: 1
 attributes: none

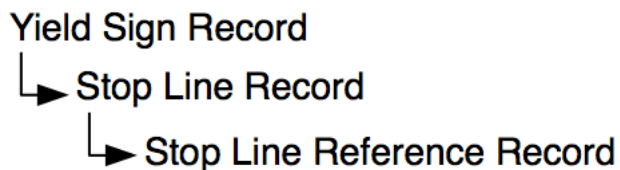
Stop Line Reference Record

delimiters: <objectReference.../>
 parent: <stopline>
 instances: 1+
 attributes:

Name	Type	Unit	Value	Description
id	string	-	-	ID of the stopline.

Yield Sign Record

Yield Sign Record syntax is explained below the Yield Sign Record hierarchical structure illustration.



delimiters: <signal>...</signal>
 parent: <signals>
 instances: 1+
 attributes:

Name	Type	Unit	Value	Description
------	------	------	-------	-------------

Name	Type	Unit	Value	Description
id	string	-	-	Unique ID of the signal.
type	string	-	yieldSign	Type of signal.

Stop Line Record

delimiters: <stopline></stopline>

parent: <signal>

instances: 1

attributes: none

Stop Line Reference Record

delimiters: <objectReference.../>

parent: <stopline>

instances: 1+

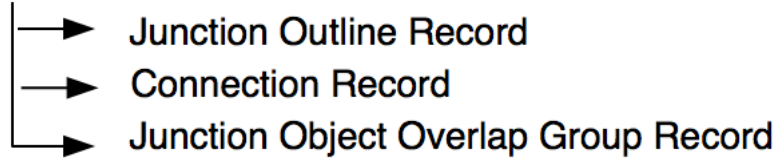
attributes:

Name	Type	Unit	Value	Description
id	string	-	-	ID of the stopline.

Junction Record

Junction Record syntax is explained below the Junction Record hierarchical structure illustration.

Junction Record



delimiters: `<junction>...</junction>`

parent: `<OpenDRIVE>`

instances: 0+

attributes:

Name	Type	Unit	Value	Description
id	string	-	-	Unique ID within database.

Junction Outline Record

Junction Outline Record has one sub-record, CornerGlobal Record. The syntax for both is described below.

delimiters: `<outline>...</outline>`

parent: `<junction>`

instances: 1

attributes: none

CornerGlobal Record

delimiters: `<cornerGlobal .../>`

parent: `<outline>`

instances: 3+

attributes:

Name	Type	Unit	Value	Description
x	double	deg	[-180, 180]	x-coordinate of the corner.
y	double	deg	[-90, 90]	y-coordinate of the corner.
z	double	m	]-∞, ∞[	z-coordinate of the corner.

Connection Record

The connection record provides information about a single connection within a junction and has one sub-record, Junction Lane Link Record. The syntax for both records is described below.

delimiters: <connection>...</connection>

parent: <junction>

instances: 1+

attributes:

Name	Type	Unit	Value	Description
id	string	-	-	Unique ID within the junction.
incomingRoad	string	-	-	ID of the incoming road.
connectingRoad	string	-	-	ID of the connecting

Name	Type	Unit	Value	Description
				road.
contactPoint	string	-	start end	Contact point on the connecting road.

Junction Lane Link Record

The junction lane link record provides information about the lanes that are linked between the incoming road and the connecting road.

delimiters: `<laneLink.../>`

parent: `<connection>`

instances: 1+

attributes:

Name	Type	Unit	Value	Description
from	int	-	]-∞, ∞[	ID of the incoming lane.
to	int	-	-]-∞, ∞[	ID of the connecting lane.

Junction Object Overlap Group Record

Junction Object Overlap Group Record has one sub-record, Object Reference Record. The syntax for both is described below.

delimiters: `<objectOverlapGroup>...</objectOverlapGroup>`

parent: `<junction>`

instances: 0+

attributes: none

Object Reference Record

delimiters: <objectReference.../>

parent: <objectOverlapGroup>

instances: 1+

attributes:

Name	Type	Unit	Value	Description
id	string	-	-	ID of the object.