MapData (MAP) PROFILE

Colophon

Contents

1 Introduction

1.1 Purpose of this Document

This document provides the Dutch Profile for the MapData (MAP) message. It offers an interpretation of data elements and describes the use of them as extension to the standards.

1.2 MapData (MAP) Message

The MapData (MAP) message is used to convey many types of geographic road information. At the current time its primary use is to convey one or more intersection lane geometry maps within a single message. The map message content includes such items as complex intersection descriptions, road segment descriptions, high speed curve outlines (used in curve safety messages), and segments of roadway (used in some safety applications). A given single MapData message may convey descriptions of one or more geographic areas or intersections. The contents of this message involve defining the details of indexing systems that are in turn used by other messages to relate additional information (for example, the signal phase and timing via the Signal Phase and Timing (SPAT) message) to events at specific geographic locations on the roadway. The SPAT message is used to convey the current status of one or more signalized intersections. Along with the MapData message (which describes a full geometric layout of an intersection) the receiver of this message can determine the state of the signal phasing and when the next expected phase will occur.

1.3 Assumptions

The following standards have been used to prepare this profile.

- SAE J2735, Dedicated Short Range Communications (DSRC) Message Set Dictionary, March 2016
- ISO TS19091, Intelligent transport systems — Cooperative ITS — Using V2I and I2V communications for applications related to signalized intersections, 2016(E)
- ETSI 103 301, Intelligent Transport Systems (ITS); Vehicular Communications; Basic Set of Applications; Facilities layer protocols and communication requirements for infrastructure services, V1.1.1 (2016-11)
- ETSI TS102 894-2, Intelligent Transport Systems (ITS); Users and applications requirements; Part 2: Applications and facilities layer common data dictionary, V1.2.1 (2014-09)

1.4 Legend

Chapter 2 contains the actual profile describing how the data frames (DFs) and data elements (DEs) shall be used for the implementation of the MapData (MAP) message.

The description of the DFs and DEs can be found in aforementioned standards. The description of the DEs and DFs in this document build upon the descriptions in these standards.

The font style of the name of DEs and DFs indicates the status as defined in the standards:

- **Bold**: required by the standard;
- *Italic*: these are optional in the standard;
- <u>Underlined</u>: one of these can be chosen (OR);

The status in the profile is indicated in a separate column by means of one of the following labels:

- Mandatory. This DF or DE is mandatory in the standard and is thus always provided.
- Profiled. This DF or DE is mandatory in the profile although optional in the standard. It is therefore assumed that this DF or DE will always be provided.
- Conditional. This DF or DE is mandatory in specific conditions and not used in other conditions. The conditions are provided in the profile.
- Optional. This DF or DE is optional in the standard as well as in the profile.
- Used. This DF or DE is a choice in the standard and used in the profile. It is therefore assumed that this DF or DE can be provided.
- Not used. This DF or DE is optional or a choice in the standard but not used in the profile. The response to the use of this DF or DE is therefore not guaranteed.
- Future use. This DF or DE is not relevant for use cases currently in scope and therefore not profiled in the current version of the profile.
- Bold. Applies to attributes in an enumeration or bitstring and indicates the attribute shall be assigned if applicable. All non-bold attributes are optional.

1.5 Document history

Version	Date	Changes
0.1	22-03-2017	Document and table structure (Martijn Harmenzon)
0.2	27-03-2017	Contribution from Eric Koenders
0.3	04-04-2017	Review and contributions from Jaap Vreeswijk. First draft
0.4	11-04-2017	Version including comments WG meeting 7th of April
0.5	14-04-2017	Version including new comments from subWG
0.6	19-04-2017	Version including comments WG meeting 14th of April
0.7	26-04-2017	Version including comments WG meeting 21st of April
0.8	12-05-2017	Version with new comments, input WG meeting 12th of May
1.0	15-05-2017	Final version for broader review
1.0	23-05-2017	Minor textual changes
1.1	15-06-2017	Minor revisions which are tracked in Annex B + summary of MAP profile added in Annex A.
1.2	29-06-2017	Final revised version for approval

2 Map Data Message (MAP)

Standard			Profile		
Level	Field	Meaning	Status	Content	Value
Header container (ItsPduHeader - ETSI TS 102 894-2 V1.2.1)					
	protocol-Version	Version of the protocol.	Mandatory	A fixed number to identify the current version of the message contents.	1
	messageID	Indicates the type of message.	Mandatory	A number to identify MAP messages	5
	stationID	This is the ID of the station broadcasting the message.	Mandatory	A number consisting of the assembly of the RoadRegulatorID and the IntersectionID	Set by application.

Level 0: MapData					
0.1	*timestamp [MinuteOfTheYear]*	The MinuteOfTheYear data element expresses the number of elapsed minutes of the current year in the time system being used (typically UTC time).	Not Used	Because map data is static, the transmission latency is not relevant.	-
0.2	**msgIssueRevision [MsgCount]**	The msgIssueRevision data element is used to provide a revision related to the issued standard, to be able to identify the compatibility.	Mandatory	Other than the IntersectionGeometry, this element is used to indicate the revision number of the defining standard. 0 = ISO/TS 19091:2016(E)	0
0.3	*layerType [LayerType]*	The LayerType data element is used to uniquely identify the type of information to be found in a layer of a geographic map fragment such as an intersection.	Optional	This profile assumes that MapData is always used to describe intersections. In that case LayerType is intersectionData.	Set by application
0.4	*layerID [LayerID]*	The LayerID data element is used to uniquely identify the layers of a geographic map fragment such as an intersection. Used to identify the number of MapData messages needed to describe the complete topology.	Conditional	Mandatory in profile if two MapData messages are needed. Then the LayerID of the first is set to 21, and the second to 22. If the complete topology fits into one MapData message, this field is not used.	Set by application
0.5	*intersections [Intersection-GeometryList] (1..32)*	The IntersectionGeometry-List data frame consists of a list of Intersection-Geometry entries.	IntersectionGeometry A complete description of an intersection's roadway geometry and its allowed navigational paths (independent of any additional regulatory	Conditional	Mandatory in profile in case of intersection. The MapData message is always used to transfer the intersection topology. Therefore the geometry is mandatory. One IntersectionGeometry for each independent conflict area. That is:	See level 1

Standard				Profile		
Level	Field	Meaning		Status	Content	Value
			restrictions that may apply over time or from user classification).		• If controlled: having own stop lines and signal heads for all conflicting directions. • Lanes between conflict areas are not connecting-lanes (volgrichting) of another intersection.	
0.6	*roadSegments [RoadSegmentList] (1..32)*	The RoadSegmentList data frame consists of a list of RoadSegment entries.	RoadSegment The RoadSegment data frame is a complete description of a RoadSegment including its geometry and its allowed navigational paths (independent of any additional regulatory restrictions that may apply over time or from user classification) and any current disruptions such as a work zone or incident event.	Future Use		See level 2
0.7	*dataParameters [DataParameters]*	The DataParameters data frame is used to provide basic (static) information on how a map fragment was processed or determined.		Mandatory	-	-
			processMethod	Not used	-	
			processAgency	Mandatory	Used to indicate the creator of the MapData.	Set by application
			lastCheckedDate	Mandatory	Used to indicate the date the source data was last checked.	Set by application
			geoidUsed	Not used	-	
0.8	*restrictionList [RestrictionClassList] (1..254)*	The RestrictionClassList data frame is used to enumerate a list of user	RestrictionClassAssignment The RestrictionClass-Assignment data frame is	Conditional	When restrictions are used within the intersection topology their restriction classes must be defined here.	See level 3

Standard				Profile		
Level	Field	Meaning		Status	Content	Value
		classes which belong to a given assigned index.	used to assign (or bind) a single RestrictionClassID data element to a list of all user classes to which it applies. A collection of these bindings is conveyed in the RestrictionClassList data frame in the MAP message to travelers. The established index is then used in the lane object of the MAP message, in the ConnectTo data frame, to qualify to whom a signal group ID applies when it is sent by the SPAT message about a movement.			
	regional [REGION.Reg-MapData]	The element is used for additional "regional information", as defined in ISO/PDTS 19091.		Not Used	The European extension 'MapData-addGrpC' defines the 3D location of the signal heads. This is not used.	-

Level 1: IntersectionGeometryList → IntersectionGeometry						
1.1	*name [Descriptive-Name]*	The DescriptiveName data element is used to provide a human readable and recognizable name for the IntersectionGeometry data frame.		Profiled	Mandatory in Dutch profile as opposed to standard. Human readable and recognizable for road authority. Maximum 63 characters. Shorter is better.	Set by application
1.2	**id [Intersection-ReferenceID]**	The IntersectionReference-ID is a globally unique value set, consisting of an optional RoadRegulatorID and a required IntersectionID assignment, providing an unique	*region [RoadRegulatorID]* The RoadRegulatorID data element is a globally unique identifier assigned to a regional authority.	Profiled	Mandatory in Dutch profile as opposed to standard. For each road operator a number is provide in: https://www.rijkswaterstaat.nl/apps/geoservices/rwsnl/searchdata.php?wegbeheerder	Set by application

Standard				Profile		
Level	Field	Meaning		Status	Content	Value
		mapping to the intersection MAP.	**id [IntersectionID]** The IntersectionID is used within a region to uniquely define an intersection within that country or region.	Mandatory	The identifier shall be defined by the road operator.	Set by application
1.3	**revision [MsgCount]**	The MsgCount data element is used to provide a sequence number within a stream of messages with the same DSRCmsgID and from the same sender. Depending on the application the sequence number may change with every message or may remain fixed during a stream of messages when the content within each message has not changed from the prior message sent.		Mandatory	The revision number must be increased by 1 each time the MapData of this intersection changes. The revision numbers of SPAT and MAP much be the same as an indication that the right MAP version is used.	Set by application
1.4	**refPoint [Position3D]**	The Position3D data frame provides a precise location in the WGS-84 coordinate system, from which short offsets may be used to create additional data using a flat earth projection centred on this location.		Mandatory	Serves to decode the offsets, the centre of an intersection (conflict area) is used.	See level 12
1.5	*laneWidth [LaneWidth]*	The LaneWidth data element conveys the width of a lane in units of 1 cm.		Mandatory	Mandatory in profile as opposed to standard. The default lane width is 3 meters.	300
1.6	*speedLimits [SpeedLimitList] (1..9)*	The SpeedLimitList data frame consists of a list of SpeedLimit entries.	RegulatorySpeedLimit The RegulatorySpeedLimit data frame is used to convey a regulatory speed about a lane, lanes, or roadway segment.	Profiled	Mandatory in profile as opposed to standard. The global speed limit used within this intersection. Can be overridden on GenericLane level. If one limit applies to all vehicles, only one value is used, with SpeedLimitType set to vehicleMaxSpeed. An additional value may be used for other types.	See level 4
1.7	**[laneSet] LaneList (1..255)**	The LaneList data frame consists of a list of GenericLane entries.	GenericLane The GenericLane data frame is used for all types of lanes, e.g. motorized	Mandatory	All lanes relevant for traffic shall be described, also lanes without a SignalGroup. The 'multipleLanesTreatedAsOneLane' as part of LaneSharing shall not be used. Only	See level 5

Standard				Profile		
Level	Field	Meaning		Status	Content	Value
		vehicle lanes, crosswalks, medians. The GenericLane describes the basic attribute information of the lane.			lanes fully independent from the intersection (e.g. parallel road) may be excluded.	
1.8	*preemptPriorityData [PreemptPriorityList] (1..32)*	The PreemptPriorityList data frame consists of a list of RegionalSignalControl-Zone entries.	SignalControlZone	Not Used	Not defined yet in the standards.	-
1.9	*regional [REGION.Reg-IntersectionGeometry]*	The element is used for additional "regional information", as defined in ISO/PDTS 19091.		Not used	No extension are defined in standard.	-

Level 2: RoadSegmentList → RoadSegment						
2.1	*name [Descriptive-Name]*	The DescriptiveName data element is used to provide a human readable and recognizable name for the RoadSegment data frame.		Future Use	For application at intersections, the RoadSegmentList is not used.	-
2.2	**id [RoadSegment-ReferenceID]**	The RoadSegmentReferenceID data frame is used to convey the RoadSegmentID which is unique to a given road segment of interest, and also the RoadRegulatorID assigned to the region in which it is operating (when required).	*region [RoadRegulatorID]* The RoadRegulatorID is a globally unique identifier assigned to an entity responsible for assigning Intersection IDs in the region over which it has such authority.	Future Use	For application at intersections, the RoadSegmentList is not used.	-
			id [RoadSegmentID] The RoadSegmentID is used to uniquely define a section of roadway within a country or region.	Future Use	For application at intersections, the RoadSegmentList is not used.	-

Standard				Profile		
Level	Field	Meaning		Status	Content	Value
2.3	**revision [MsgCount]**	The MsgCount data element is used to provide a sequence number within a stream of messages with the same DSRCmsgID and from the same sender. Depending on the application the sequence number may change with every message or may remain fixed during a stream of messages when the content within each message has not changed from the prior message sent.		Future Use	For application at intersections, the RoadSegmentList is not used.	-
2.4	**refPoint [Position3D]**	The Position3D data frame provides a precise location in the WGS-84 coordinate system, from which short offsets may be used to create additional data using a flat earth projection centered on this location.		Future Use	For application at intersections, the RoadSegmentList is not used.	-
2.5	*laneWidth [LaneWidth]*	The LaneWidth data element conveys the width of a lane.		Future Use	For application at intersections, the RoadSegmentList is not used.	-
2.6	*speedLimits [SpeedLimitList] (1..9)*	The SpeedLimitList data frame consists of a list of SpeedLimit entries.	RegulatorySpeedLimit The RegulatorySpeedLimit data frame is used to convey a regulatory speed about a lane, lanes, or roadway segment.	Future Use	For application at intersections, the RoadSegmentList is not used.	-
2.7	**roadLaneSet [RoadLaneSetList] (1..255)**	The RoadLaneSetList data frame consists of a list of GenericLane entries used to describe a segment of roadway.	GenericLane The GenericLane data frame is used for all types of lanes, e.g. motorized vehicle lanes, crosswalks, medians. The GenericLane describes the basic attribute information of the lane.	Future Use	For application at intersections, the RoadSegmentList is not used.	-
2.8	*regional [REGION.Reg-RoadSegment]*	The element is used for additional "regional information", as defined in ISO/PDTS 19091.		Future Use	For application at intersections, the RoadSegmentList is not used. No extensions are defined in the standard.	-

Level 3: RestrictionClassList → RestrictionClassAssignment

Standard			Profile		
Level	Field	Meaning	Status	Content	Value
3.1	**id** **[RestrictionClassID]**	The RestrictionClass data element defines an intersection-unique value to convey data about classes of users. The mapping used varies with each intersection and is defined in the MAP message if needed. The defined mappings found there are used to determine when a given class is meant. The typical use of this element is to map additional movement restrictions or rights (in both the MAP and SPAT messages) to special classes of users (trucks, high sided vehicles, special vehicles etc.). There is the general presumption that in the absence of this data, any allowed movement extends to all users.	Mandatory	A number is defined for each restriction class required for the intersection.	Set by application Starts at 0
3.2	**users** **[Restriction-** **UserTypeList]** **(1..16)**	The RestrictionUserTypeList data frame consists of a list of RestrictionUserType entries.	Conditional	Lists all users where this RestrictionClass applies to. For example busses and taxis.	See level 12

Level 4/11: SpeedLimitList → RegulatorySpeedLimit					
4.1	**type** **[SpeedLimitType]**	The SpeedLimitType data element relates the type of speed limit to which a given speed refers.	Mandatory	Types: • unknown, • maxSpeedInSchoolZone, • maxSpeedInSchoolZoneWhenChildrenArePresent, • maxSpeedInConstructionZone, • vehicleMinSpeed, • **vehicleMaxSpeed,** • vehicleNightMaxSpeed, • truckMinSpeed, • truckMaxSpeed, • truckNightMaxSpeed, • vehiclesWithTrailersMinSpeed, • vehiclesWithTrailersMaxSpeed, • vehiclesWithTrailersNightMaxSpeed Only vehicleMaxSpeed is mandatory, all other types are optional.	Set by application

Standard			Profile		
Level	Field	Meaning	Status	Content	Value
4.2	**speed [Velocity]**	This data element represents the velocity of an object, typically a vehicle speed or the recommended speed of travel along a roadway, expressed in unsigned units of 0.02 meters per second. When used with motor vehicles it may be combined with the transmission state to form a data frame for use.	Mandatory	The maximum speed in m/s in units of 0.02 m/s.	Set by application

Level 5: LaneList → GenericLane					
5.1	**laneID [LaneID]**	The LaneID data element conveys an assigned index that is unique within an intersection. It is used to refer to that lane by other objects in the intersection map data structure. Lanes may be ingress (inbound traffic) or egress (outbound traffic) in nature, as well as barriers and other types of specialty lanes.	Mandatory	Each lane gets a unique number within the intersection. It is tempting to use the Dutch lane numbering scheme here, but the value is limited to 255. Therefore LaneIDs typically are numbered continuously starting at 1, but other methods are permitted as long as not additional meaning is put on the number which cannot be guaranteed.	Set by application Start at 1
5.2	*name [DescriptiveName]*	The DescriptiveName data element is used to provide a human readable and recognizable name for the GenericLane data frame.	Profiled	Mandatory in profile as opposed to standard. By default the number of signal head is used, otherwise (incl. egress lanes) a random name/number can be used. In case multiple signal heads serve one lane, the vehicle signal head is used.	Set by application
5.3	*ingressApproach [ApproachID]*	The ApproachID data element is used to relate the index of an approach, either ingress or egress within the subject lane.	Profiled	Mandatory in profile for ingress lanes as opposed to standard. Number used to group all approaching lanes of an arm into one group. This value is used to find all other lanes of an arm when driving on one of them, for example before the road fans out. Cycling and pedestrians lanes crossing an approach have the same ApproachID as the approach they cross (therefore should be excluded to find all vehicle driving lanes).	Start at 1. Identical to Arm number (start East with 1 and increase clockwise).
5.4	*egressApproach [ApproachID]*	The ApproachID data element is used to relate the index of an approach, either ingress or egress within the subject lane.	Profiled	Mandatory in profile for egress lanes as opposed to standard.	Start at 1. Identical to Arm number

Standard				Profile		
Level	Field	Meaning		Status	Content	Value
					Cycling and pedestrian lanes which overlap an ingress and egress approach, have both ApproachID's assigned.	(start East with 1 and increase clockwise).
5.5	**laneAttributes [LaneAttributes]**	The LaneAttributes data frame holds all of the constant attribute information of any lane object (as well as denoting the basic lane type itself) within a single structure. Constant attribute information are those values which do not change over the path of the lane, such as the direction of allowed travel. Other lane attribute information can change at or between each node.	**directionalUse [LaneDirection]** The LaneDirection data element is used to denote the allowed direction of travel over a lane object. By convention, the lane object is always described from the stop line outwards away from the intersection. Therefore, the ingress direction is from the end of the path to the stop line and the egress direction is from the stop line outwards.	Mandatory	Set according to the layout of the intersection. Do not use both ways (ingress and egress) for vehicle lanes; this can be used for pedestrians or bidirectional bicycle paths. Bitstring (size = 2), with bits as defined: Ingresspath (0) Egresspath (1)	Set by application
			sharedWith [LaneSharing]The LaneSharing data element is used to denote the presence of other user types (travel modes) who have an equal right to access and use the lane. The typical use is to alert the user of the MAP data that additional traffic of another mode may be present in the same spatial lane.	Mandatory	To be filled according to the allowed traffic. With bits as defined: overlappingLaneDescriptionProvided (0) ~~multipleLanesTreatedAsOneLane (1)~~ -- not permitted in profile as all lanes shall be described. otherNonMotorizedTrafficTypes (2) individualMotorizedVehicleTraffic (3) busVehicleTraffic (4) taxiVehicleTraffic (5) pedestriansTraffic (6) cyclistVehicleTraffic (7) trackedVehicleTraffic (8)	Set by application

Standard				Profile		
Level	Field	Meaning		Status	Content	Value
					~~pedestrianTraffic (9)~~ use 6 instead (error)	
			laneType [LaneTypeAttributes] The LaneTypeAttributes data frame is used to hold attribute information specific to a given lane type. It is typically used in the LaneAttributes data frame as part of an overall description of a lane object.	Mandatory	To be filled according to the allowed traffic.	See level 6
			regional [REGION.Reg-LaneAttributes] The element is used for additional "regional information".	Not Used	The element is used for additional "regional information", as defined in ISO/PDTS 19091.	-
5.6	*maneuvers [AllowedManeuvers]*	The AllowedMovements data element relates the allowed (possible) maneuvers from a lane, typically a motorized vehicle lane. It should be noted that in practice these values may be further restricted by vehicle class, local regulatory environment and other changing conditions.		Not Used	Use the AllowedManeuvers from ConnectingLane instead because this allows to specify the maneuvers related to a signal head.	-
5.7	**nodeList [NodeListXY]**	The NodeListXY data structure provides the sequence of signed offset node point values for determining the Xs and Ys (and possibly Width or Zs when present), using the then current Position3D object to build a path for the centreline of the subject lane type. Each X,Y	**nodes [NodeSetXY] (2..63)** The NodeSetXY data frame consists of a list of Node entries using XY offsets. A lane made up of two or more XY node points and	Used Mandatory	Each lane is described by a list of nodes, starting at the stop line (or closest to the intersection for egress lanes). The length of each lane is subject to the following rules: • Lanes of different intersections may not overlap. • Lanes may not run over the conflict zone of a controlled intersection (use a ConnectionTrajectory instead). • Ingress lanes must be at least 300 m and at best 1000 m long, except when	See level 7

Standard			Profile		
Level	Field	Meaning	Status	Content	Value
		point is referred to as a Node Point. The straight line paths between these points are referred to as Segments.	any attributes defined in those nodes.		violating the rules above or when the lane ends. • Egress lanes must be at least 100 m long, except when violating the rules above or when the lane ends. Note: an ingress lane may be connected to an ingress lane of another intersection. In that case, the ingress lane of the other intersection must continue to the conflict area of the current intersection. • Only pedestrian lanes must be several meters long, equal to the width of the sidewalk or island. • When lanes fan out, the lane before the fan out must be the through traffic lane (i.e. the main road) (in most cases the straight direction). Simple lanes can be adequately described with only two node points, while lanes with curvature may require more points. The center line obtained when connecting the nodes must never differ more than $1/4^{th}$ of the lanewidth from the actual center line of the lane. However, the 2nd node must be perpendicular to the stop line to allow for correct map-matching.	
			computed [ComputedLane] The ComputedLane data frame is used to contain information needed to compute one lane from another (hence the name). The new lane is expressed	Not used	The chance lanes have exactly the same shape is very small, except for multi-lane roads. Moreover, all lanes shall described individually (also see row 1.7).	See level 8

Standard				Profile		
Level	Field	Meaning		Status	Content	Value
			as an X,Y offset from the first point of the source lane. Any attribute information found within the node of the source lane list cannot be changed and must be reused. A lane path computed by translating the data defined by another lane			
5.8	*connectsTo [ConnectsToList] (1..16)*	The ConnectsToList data structure is used in the generic lane descriptions to provide a sequence of other defined lanes to which each lane connects beyond its stop point.	Connection The Connection data structure is used in the ConnectsToList data frame to provide data about how the stop line at the end of a single lane connects to another lane beyond its stop point.	Profiled	Mandatory in profile as opposed to standard, for ingress lanes with a signal group. • Each ingress lane of an intersection must be connected to an egress lane of the current intersection *or* an ingress lane of the (another) intersection. • All egress lanes of the intersection should be described, either as egress lane of the current intersection OR as ingress lane of another intersection if this intersection is described within the same MAP. • It is not allowed to connect to ingress lanes of another section which is not described in this MAP. • Pedestrian lanes are defined as bi-directional ingress lanes, the Connection connects to the ingress lane at the other side of the road.	See level 9
5.9	*overlays [OverlayLaneList] (1..5)*	The OverlayLaneList data frame is a sequence of lane IDs which refers to lane objects that overlap or	LaneID The LaneID data element conveys an assigned index that is unique within an	Not used	Out of scope.	-

Standard				Profile		
Level	Field	Meaning		Status	Content	Value
		overlay the current lane's spatial path.	intersection. It is used to refer to that lane by other objects in the intersection map data structure. Lanes may be ingress (inbound traffic) or egress (outbound traffic) in nature, as well as barriers and other types of specialty lanes.			

5.10	*Regional [REGION.Reg-GenericLane] (1..4)*	The element REGION.Reg-GenericLane is used for additional "regional information", as defined in ISO/PDTS 19091.		Conditional	Mandatory in case of curved connection trajectory, otherwise not used.
					
					'ConnectionTrajectory-addGrpC' can be used to describe the path across the conflict area of the intersection.
					
					ConnectionTrajectory-addGrpC ::= SEQUENCE {
					nodes [NodeSetXY],
					-- As defined in row 5.7.
					connectionID [LaneConnectionID]
					-- Desired extension (not used in this
					-- version of the profile)
					...
					}
						-

Level 6: LaneTypeAttributes						
6.1	vehicle [LaneAttributes-Vehicle]	The LaneAttributes-Vehicle data element relates specific properties found in a vehicle lane type. This data element provides a means to denote that the use of a lane is restricted to certain vehicle types.		Used	Containing attributes of vehicle lane type. • **isVehicleRevocableLane (0)** • **isVehicleFlyOverLane (1)** • **hovLaneUseOnly (2)** • **restrictedToBusUse (3)**	Set by application

Standard			Profile		
Level	Field	Meaning	Status	Content	Value
				• **restrictedToTaxiUse (4)** • **restrictedFromPublicUse (5)** • hasIRbeaconCoverage (6) • **permissionOnRequest (7)**	
6.2	crosswalk [LaneAttributes-Crosswalk]	The LaneAttributes-Crosswalk data element relates specific properties found in a crosswalk lane type.	Used	Containing attributes of crosswalk lane type. • crosswalkRevocableLane (0) • **bicyleUseAllowed (1)** • isXwalkFlyOverLane (2) – dan beschrijven we die niet • fixedCycleTime (3) • biDirectionalCycleTimes (4) • hasPushToWalkButton (5) • **audioSupport (6)** • **rfSignalRequestPresent (7)** • unsignalizedSegmentsPresent (8)	Set by application
6.3	bikeLane [LaneAttributes-Bike]	The LaneAttributes-Bike data element relates specific properties found in a bicycle lane type.	Used	Containing attributes of bike lane type. • bikeRevocableLane (0) • **pedestrianUseAllowed (1)** • isBikeFlyOverLane (2) • fixedCycleTime (3) • biDirectionalCycleTimes (4) • **isolatedByBarrier (5)** • unsignalizedSegmentsPresent (6)	Set by application
6.4	sideWalk [LaneAttributes-Sidewalk]	The LaneAttributes-Sidewalk data element relates specific properties found in a sidewalk lane type.	Not Used	Containing attributes of sidewalk lane type. Sidewalks are not considered in the profile.	Set by application
6.5	median [LaneAttributes-Barrier]	The LaneAttributes-Barrier data element relates specific properties found in a Barrier or Median lane type (a type of lane object used to separate traffic lanes).	Not Used	Containing attributes of barrier lane type. Barriers are not considered in the profile.	Set by application
6.6	striping [LaneAttributes-Striping]	The LaneAttributes-Striping data element relates specific properties found in various types of ground striping lane types. This includes various types of painted lane ground striping and iconic information needs to convey information in a complex intersection. Typically, this consists of visual guidance for drivers to assist them to	Not Used	Containing attributes of striping lane type. Striping is not considered in the profile.	Set by application

Standard			Profile		
Level	Field	Meaning	Status	Content	Value
		connect across the intersection to the correct lane. Such markings are typically used with restraint and only under conditions when the geometry of the intersection makes them more beneficial than distracting.			
6.7	trackedVehicle [LaneAttributesTracked Vehicle]	The LaneAttributes-TrackedVehicle data element relates specific properties found in a tracked vehicle lane types (trolley and train lanes). The term "rail vehicle" can be considered synonymous. In this case, the term does not relate to vehicle types with tracks or treads.	Used	Containing attributes of tracked vehicle lane type. • spec-RevocableLane (0) • spec-commuterRailRoadTrack (1) • **spec-lightRailRoadTrack (2)** -- i.e. - tram • **spec-heavyRailRoadTrack (3)** -- i.e. train • **spec-otherRailType (4)** -- i.e. trolleybus	Set by application
6.8	parking [LaneAttributes-Parking]	The LaneAttributes-Parking data element relates specific properties found in a vehicle parking lane type.	Not Used	Containing attributes of parking lane type. Parking is not considered in the profile.	Set by application

Level 7: NodeSetXY → NodeXY						
7.1	**delta [NodeOffsetPointXY]**	The NodeOffsetPointXY data frame presents a structure to hold different sized data frames for a single node point in a lane.	node-XY1 [Node-XY-20b] A 20-bit node type with offset values from the last point in X and Y. Node is within 5.11m of last node.	Used	Applied as appropriate, subject to distance to previous node point.	Set by application.
			node-XY2 [Node-XY-22b] A 22-bit node type with offset values from the last point in X and Y. Node is within 10.23m of last node.	Used	Applied as appropriate, subject to distance to previous node point.	Set by application.
			node-XY3	Used	Applied as appropriate, subject to distance to previous node point.	Set by application.

Standard				Profile		
Level	Field	Meaning		Status	Content	Value
		[Node-XY-24b] A 24-bit node type with offset values from the last point in X and Y. Node is within 20.47m of last node.				
		node-XY4 [Node-XY-26b] A 26-bit node type with offset values from the last point in X and Y. Node is within 40.96m of last node.		Used	Applied as appropriate, subject to distance to previous node point.	Set by application.
		node-XY5 [Node-XY-28b] A 28-bit node type with offset values from the last point in X and Y. Node is within 81.91m of last node.		Used	Applied as appropriate, subject to distance to previous node point.	Set by application.
		node-XY6 [Node-XY-32b] A 32-bit node type with offset values from the last point in X and Y. Node is within 327.67m of last node.		Used	Applied as appropriate, subject to distance to previous node point.	Set by application.
		node-LatLon [Node-LLmD-64b] A 64-bit node type with lat-long values expressed in standard SAE one tenth of a micro degree. May only		Used	Applied as appropriate, subject to distance to previous node point.	Set by application

Standard				Profile		
Level	Field	Meaning		Status	Content	Value
			be used if the offset is more than 327.67 m from the previous point.			
			regional [REGION.Reg-NodeOffsetPointXY]	Not used	The element is used for additional "regional information", as defined in ISO/PDTS 19091. No extensions are defined in the standard.	-
7.2	*attributes [NodeAttributeSetXY]*	The NodeAttributeSetXY is a data frame used to convey one or more changes in the attribute set which occur at the node point at which it is used.	*localNode [NodeAttributeXYList] (1..8)* The NodeAttributeXYList data frame consists of a list of NodeAttributeXY entries. Attribute states which pertain to this node point.	Conditional	Mandatory in profile as opposed to standard, if applicable. Up to 8 node attributes can be described: (0)reserved **(1)stopline** (2)roundedCapStyleA (3)roundedCapStyleB **(4)mergePoint** **(5)divergePoint** (6)downstreamStopLine (7)downstreamStartNode **(8)closedToTraffic** (9)safeIsland (10)curbPresentAtStepOff (11)hydrantPresent Desired extension (not used in this version of the profile): **(12)yield**	Set by application
			disabled [SegmentAttributeXYList] (1..8) The disabled data frame consists of a list of SegmentAttribute-XY entries. Attribute states	Conditional	Mandatory in profile as opposed to standard, if applicable. Up to 8 segment attributes can be described: (0)reserved **(1)doNotBlock** **(2)whiteLine** -- only few metres upstream stop line **(3)mergingLaneLeft** **(4)mergingLaneRight**	Set by application

Standard				Profile		
Level	Field	Meaning		Status	Content	Value
		which are disabled at this node point.			(5)curbOnLeft (6)curbOnRight (7)loadingzoneOnLeft (8)loadingzoneOnRight **(9)turnOutPointOnLeft** **(10)turnOutPointOnRight** -- 9/10: in case a lane overlaps with a conflict area caused by a small side road (11)adjacentParkingOnLeft (12)adjacentParkingOnRight **(13)adjacentBikeLaneOnLeft** **(14)adjacentBikeLaneOnRight** -- 13/14: in case of shared lane but with marked bicycle part. **(15)sharedBikeLane** **(16)bikeBoxInFront** -- 16: typical use OFOS (17)transitStopOnLeft **(18)transitStopOnRight** **(19)transitStopInLane** **(20)sharedWithTrackedVehicle** **(21)safeIsland** (22)lowCurbsPresent (23)rumbleStripPresent (24)audibleSignalingPresent (25)adaptiveTimingPresent (26)rfSignalRequestPresent (27)partialCurbIntrusion **(28)taperToLeft** **(29)taperToRight** **(30)taperToCenterLine** -- 28-30 shall only be used with merging point (not diverging points). (31)parallelParking (32)headInParking	

Standard				Profile		
Level	Field	Meaning		Status	Content	Value
			(33)freeParking (34)timeRestrictionsOnParking (35)costToPark (36)midBlockCurbPresent (37)unEvenPavementPresent			
			enabled *[SegmentAttributeXYList]* *(1..8)* The enabled data frame consists of a list of SegmentAttribute-XY entries. Attribute states which are enabled at this node point and which remain enabled until disabled or the lane ends.	Conditional	Mandatory in profile as opposed to standard, if applicable. Up to 8 segment attributes can be described. See previous.	Set by application
			data *[LaneDataAttributeList]* *(1..8)* The LaneDataAttributeList data frame consists of a list of LaneDataAttribute entries. Attributes which require an additional data values some of these are local to the node point, while others persist with the provided values until changed and this is indicated in each entry.	Conditional	Mandatory in profile as opposed to standard, if applicable. Only used to indicate speedLimits, if they are different than the global speed limit of the Intersection.	See level 10
			dWidth *[Offset-B10]*	Conditional	Mandatory in profile as opposed to standard, if applicable considering step size of 25 cm. The current lane width is defined	Set by application.

Standard				Profile		
Level	Field	Meaning		Status	Content	Value
			A value added to the current lane width at this node and from this node onwards.		on the top level (default 3 meters). The actual lane width is to be rounded in steps of 25 cm and then added to the default 3 meters here. E.g. a lane width of 338 cm results in a dWidth of 50 cm.	
			dElevation [Offset-B10] A value added to the current Elevation (i.e. the elevation at the previous node) which applies at this node and from this node onwards.	Conditional	The current elevation is defined on the top level as part of the reference position. Mandatory if the road gradient, compared to the previous node, is more than 2%, which is considered the minimum gradient which affects the road capacity.	Set by application.
			regional [REGION.Reg-NodeAttributeSetXY]	Not used	The element is used for additional "regional information", as defined in ISO/PDTS 19091. 'Control-addGrpC', allows to specify public transport specific points (sign-in, sign-out etc.; PtvRequestType). This is not used because cooperative intersections should track the public transport vehicles continuously.	-

Level 8: NodeSetXY → ComputedLane						
8.1	**referenceLaneId [LaneID]**	The LaneID data element conveys an assigned index that is unique within an intersection. It is used to refer to that lane by other objects in the intersection map data structure. Lanes may be ingress (inbound traffic) or egress (outbound traffic) in nature, as well as barriers and other types of specialty lanes.		Not used	ComputedLane is not used in the profile.	-
8.2	**offsetXaxis**	A path X offset value for translations of the path's points when creating translated lanes. The	small [DrivenLineOffsetSm] The DrivenLineOffsetSmall	Not used	ComputedLane is not used in the profile.	-

Standard				Profile		
Level	Field	Meaning		Status	Content	Value
		values found in the reference lane are all offset based on the X and Y values from the coordinates of the reference lane's initial path point.	data element is an integer value expressing the offset in a defined axis from a reference lane number from which a computed lane is offset. The measurement is taken from the reference lane center line to the new center line, independent of any width values.			
			large [DrivenLineOffsetLg] The DrivenLineOffsetLarge data element is an integer value expressing the offset in a defined axis from a reference lane number from which a computed lane is offset. The measurement is taken from the reference lane center line to the new center line, independent of any width values.			
8.3	**offsetYaxis**	A path X offset value for translations of the path's points when creating translated lanes. The values found in the reference lane are all offset based on the X and Y values from the coordinates of the reference lane's initial path point.	small [DrivenLineOffsetSm] The DrivenLineOffsetSmall data element is an integer value expressing the offset in a defined axis from a reference lane number from which a computed lane is offset. The measurement is taken from the reference	Not used	ComputedLane is not used in the profile.	-

Standard			Profile		
Level	Field	Meaning	Status	Content	Value
		lane center line to the new center line, independent of any width values. <u>large</u> <u>[DrivenLineOffsetLg]</u> The DrivenLineOffsetLarge data element is an integer value expressing the offset in a defined axis from a reference lane number from which a computed lane is offset. The measurement is taken from the reference lane center line to the new center line, independent of any width values.			
8.4	*rotateXY* *[Angle]*	The data element Angle is used to describe an angular measurement in units of degrees. This data element is often used as a heading direction when in motion.	Not used	ComputedLane is not used in the profile.	-
8.5	*scaleXaxis* *[Scale-B12]*	Value for translations or zooming of the path's points. The values found in the reference lane are all expanded or contracted based on the X and Y and width values from the coordinates of the reference lane's initial path point. The Z axis remains untouched.	Not used	ComputedLane is not used in the profile.	-
8.6	*scaleYaxis* *[Scale-B12]*	Value for translations or zooming of the path's points. The values found in the reference lane are all expanded or contracted based on the X and Y and width values from the coordinates of the reference lane's initial path point. The Z axis remains untouched.	Not used	ComputedLane is not used in the profile.	-
8.7	*regional* *[REGION.Reg-ComputedLane]*	The element is used for additional "regional information", as defined in ISO/PDTS 19091.	Not used	Subject to ISO/PDTS 19091. No extensions are defined in the standard.	-

Level 9: ConnectsToList → Connection

Standard				Profile		
Level	Field	Meaning		Status	Content	Value
9.1	**connectingLane [ConnectingLane]**	The ConnectingLane data frame ties a single lane to a single maneuver needed to reach it from another lane. It is typically used to connect the allowed maneuver from the end of a lane to the outbound lane so that these can be mapped to the SPAT message to which both lanes apply.	**lane [LaneID]** The LaneID data element conveys an assigned index that is unique within an intersection. It is used to refer to that lane by other objects in the intersection map data structure. Lanes may be ingress (inbound traffic) or egress (outbound traffic) in nature, as well as barriers and other types of specialty lanes.	Mandatory	LaneID expresses the lane the current lane connects to. If IntersectionReferenceID is filled, the lane belongs to another intersection.	Set by application
			maneuver [AllowedManeuvers] The AllowedManeuvers data element relates the allowed (possible) maneuvers from a lane, typically a motorized vehicle lane.	Profiled	Mandatory in profile as opposed to standard. Used to describe the allowed movements related to the signal head. SignalGroupID and Restrictions apply to this movement only. • **maneuverStraightAllowed (0)** • **maneuverLeftAllowed (1)** • **maneuverRightAllowed (2)** • **maneuverUTurnAllowed (3)** • maneuverLeftTurnOnRedAllowed (4) • maneuverRightTurnOnRedAllowed (5) • maneuverLaneChangeAllowed (6) • maneuverNoStoppingAllowed (7) • **yieldAllwaysRequired (8)** • goWithHalt (9) • caution (10) • reserved1 (11)	Set by application
9.2	*remoteIntersection [Intersection-ReferenceID]*	The IntersectionReference-ID is a globally unique value set, consisting of an	*region [RoadRegulatorID]*	Profiled	IntersectionReferenceID is mandatory if the ConnectingLane is part another intersection.	Set by application

Standard				Profile		
Level	Field	Meaning		Status	Content	Value
		optional RoadRegulatorID and a required IntersectionID assignment, providing an unique mapping to the intersection MAP.	The RoadRegulatorID data element is a globally unique identifier assigned to a regional authority.		RoadRegulatorID is mandatory in profile as opposed to standard.	
			id [IntersectionID] The IntersectionID is used within a region to uniquely define an intersection within that country or region.	Mandatory	If the lane connects to another intersection the IntersectionID is mandatory.	Set by application
9.3	*signalGroup [SignalGroupID]*	The SignalGroupID data element is an index used to map between the internal state of one or more signal controllers and a common numbering system that can represent all possible combinations of active states (movements and phases). All possible movement variations are assigned a unique value within the intersection. The SignalGroupID data element is used to match the signal group send by the SPAT message for this lane/maneuver.		Conditional	Mandatory if the lane is controlled by a signal. Please note that the range for the SignalGroupID is such that the common Dutch number scheme could contain too high numbers. Therefore SignalGroupIDs must be numbered continuously starting at 1 (see SPAT profile).	Set by application
9.4	*userClass [RestrictionClassID]*	The RestrictionClass data element defines an intersection-unique value to convey data about classes of users. The typical use of this element is to map additional movement restrictions or rights (in both the MAP and SPAT messages) to special classes of users (trucks, high sided vehicles, special vehicles etc.).		Conditional	Mandatory if Connection or AdvisorySpeed (SPaT) is valid for a specific class only, for example public transport.	Set by application
9.5	*connectionID [LaneConnectionID]*	The LaneConnectionID data entry is used to state a connection index for a lane to lane connection. It is used to relate this connection and any dynamic clearance data sent in the SPAT.		Mandatory	Mandatory in profile as opposed to standard. Can be used to uniquely identify one connection, for example to support a priority request. To each Connection a unique (within intersection) LaneConnectionID must be	Set by application

Standard			Profile		
Level	Field	Meaning	Status	Content	Value
				added, only Connections with the same manoeuvre and SignalGroup can have the same LaneConnectionID. LaneConnectionIDs must be numbered continuously, starting at 0.	

Level 10: LaneDataAttributeList → LaneDataAttribute					
10.1	pathEndPointAngle [DeltaAngle]	The DeltaAngle data element provides the final angle used in the last point of the lane path. Used to "cant" the stop line of the lane.	Not used	Too detailed for day-1 use.	-
10.2	laneCrownPointCenter [RoadwayCrownAngle]	The RoadwayCrownAngle data element relates the gross tangential angle of the roadway surface with respect to the local horizontal axis and is measured at the indicated part of the lane. Its typical use is to relate data used in speed warning and traction calculations for the lane segment or roadway segment in which the measurement is taken.	Not used	Too detailed for day-1 use.	-
10.3	laneCrownPointLeft [RoadwayCrownAngle]	The RoadwayCrownAngle data element relates the gross tangential angle of the roadway surface with respect to the local horizontal axis and is measured at the indicated part of the lane. Its typical use is to relate data used in speed warning and traction calculations for the lane segment or roadway segment in which the measurement is taken.	Not used	Too detailed for day-1 use.	-
10.4	laneCrownPointRight [RoadwayCrownAngle]	The RoadwayCrownAngle data element relates the gross tangential angle of the roadway surface with respect to the local horizontal axis and is measured at the indicated part of the lane. Its typical use is to relate data used in speed warning and traction calculations for the lane segment or roadway segment in which the measurement is taken.	Not used	Too detailed for day-1 use.	-
10.5	laneAngle [MergeDiverge-NodeAngle]	The angle at which another lane path meets the current lanes at the node point. Typically found in the node	Not used	Too detailed for day-1 use.	-

Standard				Profile		
Level	Field	Meaning		Status	Content	Value
		attributes and used to describe the angle of the departing or merging lane.				
10.6	speedLimits [SpeedLimitList] (1..9)	The SpeedLimitList data frame consists of a list of SpeedLimit entries.	RegulatorySpeedLimit	Profiled	Mandatory if speed limit differs from the general speed limit defined at top level (e.g. for side road as opposed to main road).	See level 4/11
10.7	regional [REGION.Reg-LaneDataAttribute]	The element is used for additional "regional information", as defined in ISO/PDTS 19091.		Not used	No extensions are defined in the standards. Desired extensions: maxVehicleHeight [VehicleHeight] – type as defined in J2735. maxVehicleWeight [VehicleMass] – type as defined in J2735.	-

Level 11: RestrictionUserTypeList → RestrictionUserType						
11.1	basicType [RestrictionAppliesTo]	The RestrictionAppliesTo data element provides a short list of common vehicle types which may have one or more special movements at an intersection, i.e. the movement is restricted to the indicated types only. In general, these movements are not visible to other traffic with signal heads, but the SPAT data reflects the state of the movement. Various restricted movements at an intersection can be expressed using this element to indicate where the movement applies.		Used	Out of a set of most commonly used types: (0)none **(1)equippedTransit (2)equippedTaxis (3)equippedOther (4)emissionCompliant (5)equippedBicycle (6)weightCompliant (7)heightCompliant (8)pedestrians (9)slowMovingPersons (10)wheelchairUsers (11)visualDisabilities (12)audioDisabilities (13)otherUnknownDisabilities**	Set by application
11.2	regional [REGION.Reg-RestrictionUserType]	The element is used for additional "regional information", as defined in ISO/PDTS 19091.		Used	'RestrictionUserType-addGrpC' can be used to set EmissionType as a user restriction, i.e. the restricted users are allowed to use a movement or lane. Emission types are euro1…euro6.	Set by application

Standard			Profile		
Level	Field	Meaning	Status	Content	Value
				Desired extension (not used in this version of the profile): fuelType [FuelType] – type as defined in J2735.	

Level 12: Position3D					
12.1	**lat** **[Latitude]**	The geographic latitude of an object, expressed in 1/10th integer micro degrees, as a 31 bit value, and with reference to the horizontal datum then in use. The value 900000001 shall be used when unavailable.	Mandatory		Set by application
12.2	**long** **[Longitude]**	The geographic longitude of an object, expressed in 1/10th integer micro degrees, as a 32-bit value, and with reference to the horizontal datum then in use. The value 1800000001 shall be used when unavailable.	Mandatory		Set by application
12.3	*elevation* *[Elevation]*	The data element represents the geographic position above or below the reference ellipsoid (typically WGS-84). The number has a resolution of 1 decimetre and represents an asymmetric range of positive and negative values.	Not used	DE is replaced by ETSI altitude in REGION-Reg-Position3D.	-

12.4	*regional*
	[REGION.Reg-Position3D]
		The element is used for additional "regional information", as defined in ISO/PDTS 19091.	Conditional	Altitude as described in ETSI TS 102 894-2 V1.2.1 (2014-09).
				
				Altitude ::= SEQUENCE {
				altitudeValue AltitudeValue,
				altitudeConfidence AltitudeConfidence
				}
				
				Mandatory in profile as opposed to standard if the road gradient within the scope of the intersection is more than 2%.
				
				altitudeConfidence is not used in profile, therefore indicated as unavailable = 15.
					Set by application

Annex A: Summary of MAP profile

bold = mandatory/used
bold-italic = conditional
italic = optional
~~strikethrough~~ = not used
red = desired extensions

~~Timestamp [MinuteOfTheYear]~~
msgIssueRevision [MsgCount}
layerType [LayerType]
layerID [LayerID]
intersections [Intersection-GeometryList]
    IntersectionGeometry
        name [Descriptive-Name]
        id [Intersection-ReferenceID]
            region [RoadRegulatorID]
            id [IntersectionID]
        revision [MsgCount]
        refPoint [Position3D]
            lat [Latitude]
            long [Longitude]
            ~~elevation [Elevation]~~
            regional [REGION.Reg-Position3D]
                addGrpC [Position3D-AddGrpC]
                    altitude [Altitude]
                        altitudeValue [AltitudeValue]
                        ~~altitudeConfidence [AltitudeConfidence]~~
        laneWidth [LaneWidth]
        speedLimits [SpeedLimitList]
            RegulatorySpeedLimit
                type [SpeedLimitType]
                speed [Velocity]
        laneSet [LaneList]
            GenericLane
                laneID [LaneID]
                name [DescriptiveName]
                ingressApproach [ApproachID]
                egressApproach [ApproachID]
                laneAttributes [LaneAttributes]
                    directionalUse [LaneDirection]

sharedWith [LaneSharing]
laneType [LaneTypeAttributes]
    vehicle [LaneAttributes-Vehicle]
    crosswalk [LaneAttributes-Crosswalk]
    bikeLane [LaneAttributes-Bike]
    ~~sidewalk [LaneAttributes-Sidewalk]~~
    ~~median [LaneAttributes-Barrier]~~
    ~~striping [LaneAttributes-Striping]~~
    trackedVehicle [LaneAttributesTrackedVehicle]
    ~~parking [LaneAttributes-Parking]~~
~~regional [REGION.Reg-LaneAttributes]~~
~~maneuvers [AllowedManeuvers]~~
nodeList [NodeListXY]
    nodes [NodeSetXY]
        NodeXY
            delta [NodeOffsetPointXY]
                node-XY1 [Node-XY-20b]
                node-XY2 [Node-XY-22b]
                node-XY3 [Node-XY-24b]
                node-XY4 [Node-XY-26b]
                node-XY5 [Node-XY-28b]
                node-XY6 [Node-XY-32b]
                node-LatLon [Node-LLmD-64b]
                ~~regional [REGION.Reg-NodeOffsetPointXY]~~
            attributes [NodeAttributeSetXY]
                localNode [NodeAttributeXYList]
                disabled [SegmentAttributeXYList]
                enabled [SegmentAttributeXYList]
                data [LaneDataAttributeList]
                    LaneDataAttribute
                        ~~pathEndPointAngle [DeltaAngle]~~
                        ~~laneCrownPointCenter [RoadwayCrownAngle]~~
                        ~~laneCrownPointLeft [RoadwayCrownAngle]~~
                        ~~laneCrownPointRight [RoadwayCrownAngle]~~
                        ~~laneAngle [MergeDiverge-NodeAngle]~~
                        speedLimits [SpeedLimitList]
                            RegulatorySpeedLimit
                                type [SpeedLimitType]
                                speed [Velocity]
                      ~~regional [REGION.Reg-LaneDataAttribute]~~
                        ~~addGrpC [LaneDataAttribute-AddGrpC]~~
                          ~~maxVehicleHeight [VehicleHeight]~~
                          ~~maxVehicleWeight [VehicleMass]~~
        dWidth [Offset-B10]

~~dElevation [Offset-B10]~~ **dElevation [Offset-B10]**
~~regional [REGION.Reg-NodeAttributeSetXY]~~
~~computed [ComputedLane]~~
~~referenceLaneId [LaneID]~~
~~offsetXaxis~~
~~small [DrivenLineOffsetSm]~~
~~large [DrivenLineOffsetLg]~~
~~offsetYaxis~~
~~small [DrivenLineOffsetSm]~~
~~large [DrivenLineOffsetLg]~~
~~rotateXY [Angle]~~
~~scaleXaxis [Scale-B12]~~
~~scaleYaxis [Scale-B12]~~
~~regional [REGION.Reg-ComputedLane]~~
connectsTo [ConnectsToList]
Connection
connectingLane [ConnectingLane]
lane [LaneID]
maneuver [AllowedManeuvers]
remoteIntersection [Intersection-ReferenceID]
region [RoadRegulatorID]
id [IntersectionID]
signalGroup [SignalGroupID]
userClass [RestrictionClassID]
connectionID [LaneConnectionID]
~~overlays [OverlayLaneList]~~
~~laneID~~
regional [REGION.Reg-GenericLane]
addGrpC [ConnectionTrajectory-AddGrpC]
nodes [NodeSetXY]
connectionId [LaneConnectionID]
~~preemptPriorityData [PreemptPriorityList]~~
~~regional [REGION.Reg-IntersectionGeometry]~~
~~roadSegments [RoadSegmentList]~~
dataParameters [DataParameters]
~~processMethod [ProcessMethod]~~
processAgency [ProcessAgency]
lastCheckedDate [LastCheckedDate]
~~geoidUsed [GeoidUsed]~~
restrictionList [RestrictionClassList]
RestrictionClassAssignment
id [RestrictionClassID]
users [RestrictionUserTypeList]
RestrictionUserType

basicType [RestrictionAppliesTo]
regional [REGION.RestrictionUserType]
addGrpC [RestrictionUserType-AddGrpC]
emission [EmissionType]
fuelType [Fueltype]

regional [REGION.Reg-MapData]

Annex B: Revision log and wish list

Revision log – changes compared to v1.0

Row DF/DE	Revision
0.2	Text change and made mandatory (as in standard) as this element is supposed to indicate the version of the defining standard.
0.5	Added arguments for the definition of 'independent intersection'.
0.7	processAgency changed to mandatory. Used to indicate the creator of the MapData.
0.7	lastCheckedDate changed to mandatory. Used to indicate the date the source data was last checked.
1.3	Minor text change to better indicate that this element is used to link the right versions of SPAT and MAP messages.
5.3	Added indication that element is mandatory for ingress lanes only.
5.4	Added indication that element is mandatory for egress lanes only.
5.7	For nodes [NodeSetXY]: added phrase 'In that case, the ingress lane of the other intersection much continue to the conflict area of the current intersection' for clarification.
5.7	For computed [ComputedLane]: text changes and removal of the phrase 'In that case use multipleLanesTreatedAsOneLane and adjust the width accordingly'. It was agreed not to use this bit and to describe all lanes individually.
5.8	Remove the phrase '*If the distance between two intersections (within the same MAP) is less than 500 meters, Connections link the ingress lanes of both and no additional egress lanes are provided*'. Updated first bullet accordingly. This allows both alternatives, i.e. with and without described the egress lanes (decision WG Techniek dd. 01-06-2017).
5.10	Added conditionality conditions of the ConnectionTrajectory and changed LaneConnectoinID to desired extension (therefore not used in this profile and added to the wish list).
7.2	Removed duplicated % signs in content description of 'dElevation'.
9.5	Text change to clarify that LaneConnectionID does not have to be unique as Connections with

	the same SignalGroupID can have the same LaneConnectionID.
10.7	Added references to J2735 to define the type of maxVehicleHeight and maxVehicleWeight.
11.1	Removed 'mandatory' indication as it contradicts the data structure this element is part of.
11.2	Added reference to J2735 to define the type of fuelType.
12.1-12.4	Removed underline font style as these elements are not part of a choice.
12.4	Added phrase 'altitudeConfidence is not used in profile, therefore shall be indicated as unavailable = 15.

Wishlist – changes considered for v2.0

Row DF/DE	Revision
7.1	It is suggested to not use 'node-LatLon' and instead add an additional node if the distance is more than 327.67m from the previous node.
7.2	Include 'yield' as attribute in localNode element. Requires change to ASN1.
10.2	Change regional extension for LaneConnectionID in ConnectionTrajectory to mandatory. Requires change to ASN1.
10.7	Change regional extension for maximum vehicle height and weight to conditional (i.e. mandatory when applicable). Requires change to ASN1.
11.2	Change regional extension for fuel type to conditional (i.e. mandatory when applicable). Requires change to ASN1.

Annex C: Members subWG NL profile

Jaap Vreeswijk – MAPtm
Martin Barto – Vialis
Eric Koenders – Dynniq
Peter Luns – Siemens
Eddy Verhoeven – Siemens
Peter Smit – Swarco
Jaap Zee – Swarco
Kartik Mundaragi Shivakumar – DHDHV
Klaas-Jan op den Kelder – RHDHV
Wannes de Smet – BeMobile
Arie Schreuders – Sweco
Bram Schiltmans – RWS