

CAM Data

Dutch Profile version 2.1



Over deze publicatie

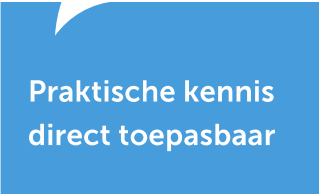
De internationale ontwikkeling van Smart Mobility zorgt voor flinke vernieuwingen in verkeer, vervoer en mobiliteit. Dit raakt direct ook de verkeersregelinstallaties in de Nederlandse steden en provincies en op rijkswegen. Als verkeersregelinstallaties kunnen communiceren met voertuigen en weggebruikers kunnen weggebruikers worden geïnformeerd over actuele fasewisselingen van verkeersregelinstallaties en hierop hun rijgedrag vroegtijdig aanpassen, kunnen doelgroepen als openbaar vervoer, nood- en hulpdiensten en vrachtwagens conform beleidswensen van overheden worden geprioriteerd en kan data van voertuigen zelf worden gebruikt voor betere netwerkregelingen. Dit bevordert doorstroming, bereikbaarheid, verkeersveiligheid en duurzaamheid, legt de basis voor connected en automated driving en speelt in op een digitale samenleving waarin data en connectiviteit bijdragen aan economisch aantrekkelijke en duurzame steden.

Voor het effectief, veilig en leveranciers- en overheidsonafhankelijk communiceren van intelligente verkeersregelinstallaties (iVRI's) met voertuigen en weggebruikers hebben bedrijven en overheden in het Innovatiepartnership Talking Traffic binnen internationale standaarden gezamenlijk specificaties en koppelvlakken voor iVRI's vastgelegd. Eenduidig gebruik door alle overheden en betrokken bedrijven van deze uniforme afspraken binnen internationale standaarden is noodzakelijk voor interoperabiliteit en een goede en betrouwbare werking. Deze standaarden zijn daarom vastgesteld door de landelijke publiek-private Strategic Committee 'Borgen en beheren iVRI standaarden en producten'. Na vaststelling gelden deze standaarden voor alle bedrijven en overheden die in Nederland (willen gaan) werken aan iVRI's t.b.v. intelligente mobiliteit. Vanuit de rol van onafhankelijk en landelijk kennisinstituut verzamelt CROW deze landelijk vastgestelde standaarden en stelt deze transparant ter beschikking aan overheden, adviesbureaus en leveranciers.

About this publication

The international developments in Smart Mobility technology are boosting innovations for traffic, transportation and mobility. This has a direct effect on traffic control systems in Dutch cities and provinces, as well as national highways. When traffic controllers are able to communicate with vehicles and road users, the latter can be informed about real-time phase changes in traffic lights, enabling them to anticipate and adjust driving behaviour accordingly. Also, special interest groups, such as emergency services, public transport and freight carriers, can be prioritized in line with public policy guidelines. The data provided by vehicles themselves can be utilised to improve network-based traffic control programmes. This has a positive effect on flow, accessibility, traffic safety and sustainability, laying out the fundamentals for connected and automated driving and preparing for a digital society in which data and connectivity contribute to economically viable and sustainable cities.

In order to let intelligent traffic controllers (iVRI) communicate with vehicles and road users in an effective, safe and platform independent way, businesses and governments have created and recorded common specifications and interfaces for iVRI technology. These are compliant to international standards and developed within the framework of the Talking Traffic Innovation partnership. The unambiguous use of these uniform agreements, within international standards, by all governmental bodies and businesses is necessary for interoperability and a good and reliable operation. These standards are adopted by the national public-private Strategic Committee 'Ensuring and maintaining iVRI standards and products'. After adoption, these standards apply to all businesses and governmental bodies in the Netherlands that work, or plan to work, on iVRI technology for intelligent mobility purposes. Being an independent national knowledge institute, CROW collects these national standards and provides them to governments, consultants and suppliers in a transparent way.



**Praktische kennis
direct toepasbaar**

CAM Data

Contents

1	Introduction	4
1.1	Purpose of this Document	4
1.2	Cooperative Awareness Messages (CAM)	4
1.3	Assumptions	4
1.4	Legend	4
1.5	Document history	5
2	Cooperative Awareness Message	6
	Annex A: Service Specific Permissions	16
	Annex B: Members subWG NL profile	17

1 Introduction

1.1 Purpose of this Document

This document provides the Dutch Profile for the Cooperative Awareness Messages (CAM). It offers an interpretation of data frames/elements and describes the use of them as extension to the standards.

1.2 Cooperative Awareness Messages (CAM)

Cooperative Awareness Messages (CAMs) are messages exchanged in the ITS network between ITS-stations to create and maintain awareness and to support cooperative performance of vehicles using the road network. A CAM contains status and attribute information of the originating ITS-S. The content varies depending on the type of the ITS-S. For vehicle ITS-Ss the status information includes time, position, motion state, activated systems, etc. and the attribute information includes data about the dimensions, vehicle type and role in the road traffic, etc. On reception of a CAM the receiving ITS-S becomes aware of the presence, type, and status of the originating ITS-S. The received information can be used by the receiving ITS-S to support several ITS applications.

1.3 Assumptions

The following standards have been used to prepare this profile:

- ETSI EN 302 637-2 V1.3.2 (2014-11), Intelligent Transport Systems (ITS); Vehicular Communications; Basic Set of Applications; Part 2: Specification of Cooperative Awareness Basic Service
- 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 CAM.

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;
- Underlined: 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 OR mandatory the standard and profile but not used. It is therefore assumed that this DF or DE will always be provided OR set to unavailable.
- **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	26-04-2017	Initial version
0.2	12-05-2017	Version with new comments, input WG meeting 12 th of May
0.3	07-06-2017	Version with new comments, input WG meeting 12 th of June
1.0	15-06-2017	Final version for broader review
1.2	29-06-2017	Final revised version for approval
1.8	02-11-2017	Revised version for approval
2.1	22-03-2018	Added: corrections, clarifications and interpretation.

2 Cooperative Awareness Message

Standard			Profile		
Level	Field	Meaning	Status	Content	Value
Level 0: CAM					
0.1	header [ItsPduHeader]	ITS PDU header of the CAM.	Mandatory	-	See level 1
0.2	cam [CoopAwareness]	CAM payload.	Mandatory	-	See level 2
Level 1: ItsPduHeader (ETSI TS 102 894-2 V1.2.1)					
1.1	protocolVersion	Version of the protocol.	Fixed	Current version is 1.	Set to 1
1.2	messageID	Indicates the type of message.	Fixed	Examples are denm(1), cam(2), spat(4) etc.	Set to 2
1.3	stationID [StationID]	This is the ID of the station broadcasting the message.	Mandatory	The stationID must be identical to the stationID of the vehicle, defined as 6 bits (prefix service provider) + 26 bits (vehicle identifier). The stationID is subject to change at intervals (pseudonym), but may not change while passing an intersection (see e.g. SRM profile).	Set by application.
Level 2: CoopAwareness					
2.1	generationDeltaTime [Generation-DeltaTime]	Time corresponding to the time of the reference position in the CAM, considered as time of the CAM generation.	Mandatory	-	Set by application
2.2	camParameters [CamParameters]	The sequence of CAM mandatory and optional containers. Other containers may be added in the future.	Mandatory	-	See level 3
Level 3: CamParameters					
3.1	basicContainer [BasicContainer]	The mandatory basic container of CAM.	Mandatory	-	See level 4
3.2	highFrequency-Container [HighFrequency-Container]	The mandatory high frequency container of CAM. Other types of high frequency container might be added in the future.	Mandatory	-	See level 5
3.3	<i>lowFrequencyContainer</i> [LowFrequency-Container]	The low frequency container of CAM. Within the scope of the present document, only the vehicle low frequency container is defined. Other types of low frequency container (e.g. road side ITS-S) might be added in the future.	Profiled	Not used when turn intention is unknown (see row 9.2).	See level 6

Standard			Profile			
Level	Field	Meaning	Status	Content	Value	
3.4	<i>specialVehicleContainer</i> [<i>SpecialVehicle-Container</i>]	The special container of the CAM shall be present as defined in clause 6.1.3.	Conditional	As appropriate, subject to the vehicleRole. Mandatory when the vehicleRole is set to a special vehicle type, to activate a special vehicle container.	See level 7	
Level 4: BasicContainer						
4.1	stationType [StationType]	Station type of the originating ITS-S.	Mandatory	Shall not be used to authorise priority request unless specifically required by the road regulator.	Set by application	
4.2	referencePosition [ReferencePosition]	Position and position accuracy measured at the reference point of the originating ITS-S.	Latitude	Mandatory	-	Set by application
			Longitude	Mandatory	-	Set by application
			positionConfidenceEllipse The positionConfidence-Ellipse provides the accuracy of the measured position with the 95 % confidence level. Otherwise, the position-ConfidenceEllipse shall be set to unavailable.	Optional	If available, e.g. if GPS provides HDOP (horizontal dilution of precision).	See level 18
			Altitude	Profiled	Mandatory but not used in profile therefore set to unavailable. Accuracy of altitude measurement typically is poor.	See level 19
Level 5: HighFrequencyContainer						
5.1	<u>basicVehicleContainer-HighFrequency</u> [<u>BasicVehicleContainer-HighFrequency</u>]	The mandatory high frequency container of the CAM when the originating ITS-S is of the type vehicle ITS-S.	Used	Subject to ITS station type.	See level 8	
5.2	<u>rsuContainer-HighFrequency</u> [<u>RSUContainer-HighFrequency</u>]	The mandatory high frequency container of CAM when the type of the originating ITS-S is RSU ITS-S.	Used	Subject to ITS station type. Since data elements within are mostly unused (see below), this DE is typically not used.	See level 17	

Standard			Profile			
Level	Field	Meaning	Status	Content	Value	
Level 6: LowFrequencyContainer						
6.1	<u>basicVehicleContainer-LowFrequency</u> [BasicVehicleContainer-LowFrequency]	The low frequency container of the CAM when the originating ITS-S is of the type vehicle ITS-S.	Used	It shall be present as defined in 3.3, therefore mandatory for vehicle ITS stations.	See level 9	
Level 7: SpecialVehicleContainer						
7.1	<u>publicTransport-Container</u> [PublicTransport-Container]	A container of the CAM included in the special vehicle container.	Used	If the DE vehicleRole is set to publicTransport(1) this container shall be present.	See level 10	
7.2	<u>specialTransport-Container</u> [SpecialTransport-Container]	A container of the CAM included in the special vehicle container.	Used	If the DE vehicleRole is set to specialTransport(2) this container shall be present.	See level 11	
7.3	<u>dangerousGoods-Container</u> [DangerousGoods-Container]	A container of the CAM included in the special vehicle container.	Used	If the DE vehicleRole is set to dangerousGoods(3) this container shall be present.	See level 12	
7.4	<u>roadWorksContainer-Basic</u> [RoadWorksContainer-Basic]	A container of the CAM included in the special vehicle container.	Used	If the DE vehicleRole is set to roadWork(4) this container shall be present.	See level 13	
7.5	<u>rescueContainer</u> [RescueContainer]	A container of the CAM included in the special vehicle container.	Used	If the DE vehicleRole is set to rescue(5) his container shall be present.	See level 14	
7.6	<u>emergencyContainer</u> [EmergencyContainer]	A container of the CAM included in the special vehicle container.	Used	If the DE vehicleRole is set to emergency(6) this container shall be present.	See level 15	
7.7	<u>safetyCarContainer</u> [SafetyCarContainer]	A container of the CAM included in the special vehicle container.	Used	If the DE vehicleRole is set to safetyCar(7) this container shall be present.	See level 16	
Level 8: BasicVehicleContainerHighFrequency						
8.1	heading [Heading]	Heading and heading accuracy of the vehicle movement of the originating ITS-S with regards to the true north.		Mandatory		
			headingValue	Mandatory	-	Set by application
			The (compass) direction of the vehicle, in 1/10th of a degree.			
			headingConfidence	Profiled	Not used in profile but kept optional. By defaultset to unavailable = 127	127
			The heading accuracy provided in			

Standard			Profile			
Level	Field	Meaning	Status	Content	Value	
8.2	speed [Speed]	Driving speed and speed accuracy of the originating ITS-S.				
			speedValue	Mandatory		Set by application
			Speed of the vehicle in cm/s.			
			speedConfidence	Profiled	Not used in profile but kept optional. By default set to unavailable = 127	127
			The speed accuracy provided in the DE speedConfidence shall provide the accuracy of the speed value with a confidence level of 95 %. Otherwise, the speed-Confidence shall be set to unavailable.			
8.3	driveDirection [DriveDirection]	The direction the vehicle is travelling in.	Mandatory	forward(0), backward(1) or unavailable(2).	Set by application	
8.4	vehicleLength [VehicleLength]	Vehicle length of the vehicle ITS-S that originates the CAM.				
			vehicleLengthValue	Mandatory	Length of the vehicle in steps of 10 cm. 1 == 10cm.	Set by application
			Vehicle length of the vehicle ITS-S that originates the CAM.			
			vehicleLengthConfidence-Indication	Mandatory	Not used in profile but kept optional. By default set to known.	Set by application
			vehicleLengthConfidenceIndication: indication of whether trailer is detected to be present and whether the length of the trailer is known.			
8.5	vehicleWidth [VehicleWidth]	Vehicle width, measured of the vehicle ITS-S that originates the CAM, including side mirrors.	Mandatory	Mandatory for special vehicles with extra width. Otherwise set to unavailable.	Set by application	
8.6	longitudinal-Acceleration [Longitudinal-]	Vehicle longitudinal acceleration of the originating ITS-S in the				
			longitudinalAcceleration-Value	Profiled	Not used in profile but kept optional. By default	161

Standard			Profile			
Level	Field	Meaning	Status	Content	Value	
	Acceleration]	centre of the mass of the empty vehicle.		set to unavailable = 161		
			longitudinalAcceleration-Confidence	Profiled	Not used in profile but kept optional. By default set to unavailable = 102	102
				The accuracy value with the confidence level of 95 %. Otherwise, the longitudinalAcceleration-Confidence shall be set to unavailable.		
8.7	curvature [Curvature]	The curvature of the vehicle trajectory.		Not used in profile but kept optional.	-	
			curvatureValue	Profiled	Not used in profile but kept optional. By default set to unavailable = 30001	30001
				curvatureValue denoted as inverse of the vehicle current curve radius and the turning direction of the curve with regards to the driving		
			curvatureConfidence	Profiled	Not used in profile but kept optional. By default set to unavailable = 7	7
		curvatureConfidence denoted as the accuracy of the provided curvatureValue for a confidence level of 95 %.				
8.8	curvature-CalculationMode [Curvature-CalculationMode]	The calculation mode for the curvature. Flag indicating whether vehicle yaw-rate is used in the calculation of the curvature of the vehicle ITS-S that originates the CAM.	Profiled	Not used in profile but kept optional. By default set to unavailable = 2	2	
8.9	yawRate [YawRate]	The rate the vehicle is spinning around its centre of mass.		Not used in profile but kept optional.	-	
			yawRateValue	Profiled	Not used in profile but kept optional. By default set to unavailable = 32767	32767
				yawRateValue denotes the vehicle rotation around the		

Standard			Profile		
Level	Field	Meaning	Status	Content	Value
		centre of mass of the empty vehicle. The leading sign denotes the direction of rotation. The value is negative if the motion is clockwise when viewing from the top.			
		yawRateConfidence yawRateConfidence denotes the accuracy for the 95 % confidence level for the measured yawRateValue. Otherwise, the value of yawRateConfidence shall be set to unavailable.	Profiled	Not used in profile but kept optional. By default set to unavailable = 8	8
8.10	<i>accelerationControl</i> [AccelerationControl]	Current status of the vehicle mechanisms controlling the longitudinal movement of the vehicle ITS-S (e.g. brake pedal, gas pedal, etc. engaged) that originates the CAM as specified in ETSI TS 102 894-2 [2].	Not used	-	-
8.11	<i>lanePosition</i> [LanePosition]	The DE lanePosition of the referencePosition of a vehicle, counted from the outside border of the road, in the direction of the traffic flow.	Not used	-	-
8.12	<i>steeringWheelAngle</i> [SteeringWheelAngle]	This DF includes the steering wheel angle and accuracy as measured at the vehicle ITS-S that originates the CAM.	steeringWheelAngleValue	Not used	-
			steeringWheelAngleValue denotes steering wheel angle as measured at the vehicle ITS-S that originates the CAM.	Not used	-

Standard			Profile		
Level	Field	Meaning	Status	Content	Value
				steeringWheelAngle-Confidence	
				steeringWheelAngle-Confidence denotes the accuracy of the measured steeringWheelAngleValue for a confidence level of 95 %. Otherwise, the value of steeringWheel-AngleValue shall be set to unavailable.	
8.13	<i>lateralAcceleration</i> [LateralAcceleration]	Vehicle lateral acceleration of the originating ITS-S in the centre of the mass of the empty vehicle.	Not used	-	-
8.14	<i>verticalAcceleration</i> [VerticalAcceleration]	Vertical Acceleration of the originating ITS-S in the centre of the mass of the empty vehicle.	Not used	-	-
8.15	<i>performanceClass</i> [PerformanceClass]	The DE performanceClass characterizes the maximum age of the CAM data elements with regard to the generationDeltaTime.	Not used	-	-
8.16	<i>cenDsrcTollingZone</i> [CenDsrcTollingZone]	Information about the position of a CEN DSRC Tolling Station operating in the 5.8 GHz frequency band. If this information is provided by vehicle ITS-S, a receiving vehicle ITS-S is prepared to adopt mitigation techniques when being in the vicinity of CEN DSRC tolling stations.	Not used	-	-

Level 9: BasicVehicleContainerLowFrequency					
9.1	vehicleRole [VehicleRole]	The role of the vehicle (e.g. public transport).	Mandatory		Set by application
9.2	exteriorLights [ExteriorLights]	This DE is a sequence of bits (BIT STRING) of size 8. Each bit holds the status of the exterior light switches of a vehicle (e.g. fogLightOn, leftTurnSignalOn, etc.).	Mandatory	Turn signals are set based on navigation system (turn intention). If no signals are set, the vehicle is expected to follow the straight movement.	Set by application
9.3	pathHistory [PathHistory]	This DF can hold up to 40 points (pathPosition) of where the vehicle has been, optionally with an accompanying timestamp (pathDeltaTime). The timestamp would allow for speed calculation between the points.	Profiled	Mandatory but not used in profile, therefore only 1 pathPosition will be provided which is the current position.	Set by application

Standard			Profile																								
Level	Field	Meaning	Status	Content	Value																						
Level 10: PublicTransportContainer																											
10.1	embarkationStatus [EmbarkationStatus]	This DE indicates whether the passenger embarkation is currently ongoing.	Mandatory	The presentation and data setting rules shall be as specified in ETSI TS 102 894-2 [2] EmbarkationStatus. It shall be set to TRUE when the embarkation is ongoing. Otherwise, it shall be set to FALSE.	Set by application																						
10.2	<i>ptActivation</i> [PtActivation]	This DF is used by public transport vehicles for controlling traffic lights, barriers, bollards, etc.	PtActivationType	Mandatory	Added: 3) coding of PtActivationData based on Dutch profile recommendations.	3																					
			PtActivationData	Mandatory	Defined as follows (all bits unsigned; 'big endian format (most significant octet first):	Set by application																					
			DE used for various tasks in the public transportation environment, especially for controlling traffic signal systems to prioritize and speed up public transportation in urban area (e.g. intersection "bottlenecks").		<table border="1"> <thead> <tr> <th>Octet #</th> <th>Field name</th> <th>Size</th> </tr> </thead> <tbody> <tr> <td>0,1</td> <td>Line nr PT</td> <td>16 bits</td> </tr> <tr> <td>2,3</td> <td>Vehicle ID</td> <td>16 bits</td> </tr> <tr> <td>4,5</td> <td>Block nr</td> <td>16 bits</td> </tr> <tr> <td>6,7</td> <td>Journey nr</td> <td>16 bits</td> </tr> <tr> <td>8,9</td> <td>Support journey nr</td> <td>16 bits</td> </tr> <tr> <td>10</td> <td>Company nr</td> <td>8 bits</td> </tr> <tr> <td>11,12</td> <td>Occupancy</td> <td>16 bits</td> </tr> </tbody> </table>	Octet #	Field name	Size	0,1	Line nr PT	16 bits	2,3	Vehicle ID	16 bits	4,5	Block nr	16 bits	6,7	Journey nr	16 bits	8,9	Support journey nr	16 bits	10	Company nr	8 bits	11,12
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10	Company nr	8 bits																									
11,12	Occupancy	16 bits																									
Level 11: SpecialTransportContainer																											
11.1	specialTransportType [SpecialTransport-Type]	This DE indicates whether the originating ITS-S is mounted on a special transport vehicle with heavy or oversized load or both.	Mandatory	Mandatory if the container is used.	Set by application																						
11.2	lightBarSirenInUse [LightBarSirenInUse]	This DE indicates whether light-bar or a siren is in use by the vehicle originating the CAM.	Mandatory	Mandatory if the container is used.	Set by application																						

Standard			Profile		
Level	Field	Meaning	Status	Content	Value
Level 12: DangerousGoodsContainer					
12.1	dangerousGoods-Basic [Dangerous-GoodsBasic]	This DE identifies the type of the dangerous goods transported by the vehicle that originates the CAM.	Mandatory	Mandatory if the container is used.	Set by application
Level 13: RoadWorksContainerBasic					
13.1	<i>roadworksSubCause-Code</i> [RoadworksSubCause-Code]	This DE is included in case the originating ITS-S is mounted to a vehicle ITS-S participating to roadwork. It provides information on the type of roadwork that it is currently undertaking.	Not used	It is recommended to include the information in a DENM message.	-
13.2	lightBarSirenInUse [LightBarSirenInUse]	This DE indicates whether light-bar or a siren is in use by the vehicle originating the CAM.	Mandatory	Mandatory if the container is used.	Set by application
13.3	<i>closedLanes</i> [ClosedLanes]	This DE provides information about the opening/closure status of the lanes ahead. Lanes are counted from the outside boarder of the road.	Not used	It is recommended to include the information in a DENM message.	-
Level 14: RescueContainer					
14.1	lightBarSirenInUse [LightBarSirenInUse]	This DE indicates whether light-bar or a siren is in use by the vehicle originating the CAM.	Mandatory	Mandatory if the container is used.	Set by application
Level 15: EmergencyContainer					
15.1	lightBarSirenInUse [LightBarSirenInUse]	This DE indicates whether light-bar or a siren is in use by the vehicle originating the CAM.	Mandatory	Mandatory if the container is used.	Set by application
15.2	<i>incidentIndication</i> [CauseCode]		Not used	It is recommended to include the information in a DENM message.	Set by application
15.3	<i>emergencyPriority</i> [EmergencyPriority]	Right of way indicator of the vehicle ITS-S that originates the CAM PDU. It shall be originated by authorized vehicles only, e.g. ambulance, police, etc.	Not used	It is recommended to include the information in a DENM message.	Set by application
Level 16: SafetyCarContainer					
16.1	lightBarSirenInUse [LightBarSirenInUse]	This DE indicates whether light-bar or a siren is in use by the vehicle originating the CAM.	Mandatory	Mandatory if the container is used.	Set by application
16.2	<i>incidentIndication</i> [CauseCode]	This DE describes the event type of the emergency or safety mission.	Not used	-	-
16.3	<i>trafficRule</i> [TrafficRule]	This DE indicates whether vehicles are allowed to overtake a safety car that is originating this CAM.	Optional	May be used by road inspectors.	Set by application
16.4	<i>speedLimit</i> [SpeedLimit]	This DE indicates whether a speed limit is applied to vehicles following the safety car.	Optional	May be used by road inspectors.	Set by application

Standard			Profile		
Level	Field	Meaning	Status	Content	Value
Level 17: RSUContainerHighFrequency					
17.1	<i>protected-Communication-ZonesRSU</i> [Protected-Communication-ZonesRSU]	Information about position of a CEN DSRC Tolling Station operating in the 5,8 GHz frequency band. If this information is provided by RSUs a receiving vehicle ITS-S is prepared to adopt mitigation techniques when being in the vicinity of CEN DSRC tolling stations.	Not used	Out of scope for Dutch use cases.	-
Level 18: positionConfidenceEllipse → PosConfidenceEllipse					
18.1	semiMajorConfidence [SemiAxisLength]	semiMajorConfidence: half of length of the major axis, i.e. distance between the centre point and major axis point of the position accuracy ellipse.	Profile	Not used in profile but kept optional. By default set to unavailable = 4095	4095
18.2	semiMinorConfidence [SemiAxisLength]	semiMinorConfidence: half of length of the minor axis, i.e. distance between the centre point and minor axis point of the position accuracy ellipse.	Profiled	Not used in profile but kept optional. By default set to unavailable = 4095	4095
18.3	semiMajorOrientation [HeadingValue]	semiMajorOrientation: orientation direction of the ellipse major axis of the position accuracy ellipse with regards to the WGS84 north.	Profiled	Not used in profile but kept optional. By default set to unavailable = 3601	3601
Level 19: altitude → Altitude					
19.1	altitudeValue [AltitudeValue]	Altitude of a geographical point.	Profiled	Not used in profile but kept optional. By default set to unavailable = 800001	800001
19.2	altitudeConfidence [AltitudeConfidence]	Accuracy of the reported altitudeValue within a specific confidence level.	Profiled	Not used in profile but kept optional. By default set to unavailable = 15	15

Annex A: Service Specific Permissions

Based on ETSI EN 302 637-2 V1.3.2 (2014-11).

Octet	Bit	Emergency	publicTransport	Logistics	Other	SSP-Value
1	0	0	0	0	1	CenDsrcTollingZone/ ProtectedCommunicationZonesRSU
1	1	0	1	0	0	publicTransport / publicTransportContainer
1	2	0	0	1	0	specialTransport / specialTransportContainer
1	3	0	0	1	0	dangerousGoods / dangerousGoodsContainer
1	4	0	0	0	1	roadwork / roadWorksContainerBasic
1	5	0	0	0	1	rescue / rescueContainer
1	6	1	0	0	0	emergency / emergencyContainer
1	7	0	0	0	1	safetyCar / safetyCarContainer

Octet	Bit	Emergency	publicTransport	Logistics	Other	SSP-Value
2	0	0	0	0	1	closedLanes / RoadworksContainerBasic
2	1	1	1	1	0	requestForRightOfWay / EmergencyContainer: EmergencyPriority
2	2	1	1	1	0	requestForFreeCrossingAtAtrafficLight / EmergencyContainer: EmergencyPriority
2	3	0	0	0	1	noPassing / SafetyCarContainer: TrafficRule
2	4	0	0	0	1	noPassingForTrucks / SafetyCarContainer: TrafficRule
2	5	0	0	0	1	speedLimit / SafetyCarContainer
2	6	0	0	0	0	-
2	7	0	0	0	0	-

Annex B: Members subWG NL profile

Jaap Vreeswijk – MAPtm

Martijn Harmenzon – MAPtm

Martin Barto – Vialis

Eric Koenders – Dynniq

Peter Luns – Siemens

Eddy Verhoeven – Siemens

Peter Smit – Swarco

Jaap Zee – Swarco

Kartik Mundaragi Shivakumar – RHDHV

Klaas-Jan op den Kelder – RHDHV

Wannes de Smet – BeMobile

Arie Schreuders – Sweco

Bram Schiltmans – RWS

Colophon

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