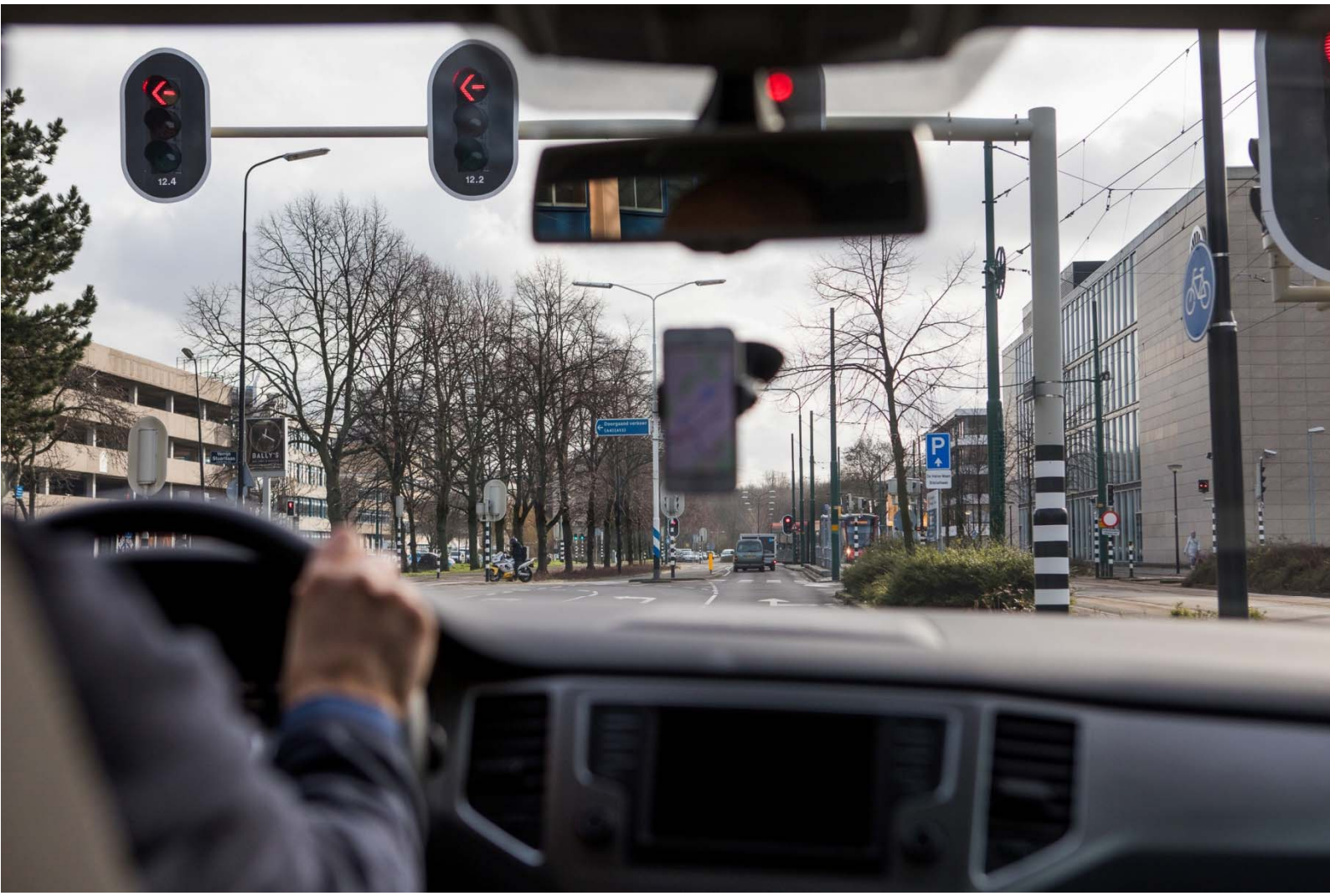
kennisplatform CROW

# SRM 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

# SRM Data

# Contents

# 1 Introduction

## 1.1 Purpose of this Document

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

## 1.2 SRM Message

The Signal Request Message (SRM) is a message sent by a Dedicated Short Range Communications (DSRC) equipped entity (such as a vehicle) to the RoadSide Unit (RSU) in a signalized intersection. It is used for either a priority signal request or a pre-emption signal request depending on the way each request is set. Each request defines a path through the intersection which is desired in terms of lanes and approaches to be used. Each request can also contain the time of arrival and the expected duration of the service. Multiple requests to multiple intersections are supported. The requestor identifies itself in various ways (using methods supported by the RequestorDescription data frame), and its current speed, heading and location can be placed in this structure as well. The specific request for service is typically based on previously decoding and examining the list of lanes and approaches for that intersection (sent in MAP messages). The outcome of all of the pending requests to a signal can be found in the Signal Status Message (SSM), and may be reflected in the SPAT message contents if successful.

## 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 SRM 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;
- 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. 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. A response to the use of this DF or DE is therefore not guaranteed, but as the message is compliant with the SN.1 specification, the message is valid.

- 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 | 12-04-2017 | First draft version |
| 0.2 | 14-04-2017 | Version with new comments for subWG meeting 14th of April |
| 0.3 | 01-05-2017 | New version based on meeting 14th of April |
| 0.4 | 12-05-2017 | Version with new comments after subWG meeting 12th of May |
| 1.0 | 02-06-2017 | Final draft for approval |
| 1.1 | 15-06-2017 | Minor revisions which are tracked in Annex C + summary of SRM profile added in Annex A. |
| 1.2 | 29-06-2017 | Final revised version for approval |
| 2.1 | 08-02-2018 | v1.8 revisions categorised into v2.1 and v3.0 changes. Added: corrections, clarifications and interpretation |

# 2 Signal Request Message Profile

| Standard | | | | Profile | | |
|---|---|---|---|---|---|---|
| Level | Field | Meaning | | Status | Content | Value |
| **Header container (ItsPduHeader - ETSI TS 102 894-2 V1.4.1)** | | | | | | |
| h.1 | **protocol-Version** | Version of the protocol. | | Fixed | Current version is 1. | Set to 1 |
| h.2 | **messageID** | Indicates the type of message. | | Fixed | Examples are denm(1), cam(2), spat(4) etc.<br>SRM messageID is 7. | 7 |
| ~~h.3~~ | **stationID** | This is the ID of the station broadcasting the message. | | Mandatory | The stationID must be identical to the stationID of the CAM message of the vehicle. The stationID is subject to change at intervals (pseudonym), but may not change while passing an intersection. | Set by application. |

| **Level 0: SRM** | | | | | | |
|---|---|---|---|---|---|---|
| 0.1 | *timeStamp [MinuteOfThe-Year]* | The MinuteOfTheYear data element expresses the number of elapsed minutes of the current year in the time system being used (typically UTC time). | | Profiled | Mandatory in profile as opposed to standard. To be used in combination with the following data element second. | Set by application |
| 0.2 | **second [Dsecond]** | The DSRC second expressed in this data element represents the milliseconds within the current UTC minute. | | Mandatory | - | Set by application |
| 0.3 | *sequenceNumber [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. | | Profiled | Mandatory in profile as opposed to standard. The sequence number will be increased by one when the content of the message has changed from the prior message.<br>The value of the MsgCount data element is limited to 127. Therefore, MsgCounts must be numbered continuously starting at 1. | Set by application<br><br>Start at 1 |
| 0.4 | *requests [SignalRequest-List] (1..32)* | The SignalRequestList data frame consists of a list of SignalRequest entries.<br><br>Request Data for one or more signalized intersections that support SRM dialogs. | SignalRequestPackage<br><br>The SignalRequest-Package data frame contains both the service request itself (the preemption and priority details and the inbound-outbound path details for an intersection) and the time period (start and end time) over which this service is sought from one single intersection. One or more of these packages are contained in a list in the Signal Request Message (SRM). | Profiled | Mandatory in profile as opposed to standard.<br><br>One package contains the SignalRequests for one Intersection, therefore one SRM message might contain multiple requests for multiple intersections. It is not guaranteed that each SSM response contains the exact same SignalRequests (no 1:1 relation between SRM and SSM messages). | See level 1 |

| Standard | | | Profile | | |
|---|---|---|---|---|---|
| Level | Field | Meaning | Status | Content | Value |
| 0.5 | **requestor [Requestor-Description]** | The RequestorDescription data frame is used to provide identity information about a selected vehicle or users. | Mandatory | - | See level 3 |
| 0.6 | *regional [REGION.Reg-SignalRequest-Message]* | The element is used for additional "regional information", as defined in ISO/PDTS 19091. | Not used | - | - |

| Level 1: SignalRequestList → SignalRequestPackage | | | | | |
|---|---|---|---|---|---|
| 1.1 | **request [SignalRequest]** | The SignalRequest data frame is used (as part of a request message) to request either a priority or a preemption service from a signalized intersection. | Mandatory | - | See level 2 |
| 1.2 | *minute [MinuteOfThe-Year]* | The MinuteOfTheYear data element expresses the number of elapsed minutes of the current year in the time system being used (typically UTC time). | Optional | The data elements MinuteOfTheYear and second indicate the Estimated Time of Arrival (ETA) to the intersection stopline from the moment when the service was requested, based on free-flow traffic. If the ETA deviates by more than 10% from the travel time based on the previous ETA (minimum 3 seconds), an update of the SRM message will follow. | Set by application |
| 1.3 | *second [Dsecond]* | The DSRC second expressed in this data element represents the milliseconds within the current UTC minute. | Optional | The data elements MinuteOfTheYear and second indicate the Estimated Time of Arrival (ETA) to the intersection from the moment when the service was requested, based on free-flow traffic. If the ETA deviates by more than 10% from the travel time based on the previous ETA (minimum 3 seconds), an update of the SRM message will follow. | Set by application |
| 1.4 | *duration [DSecond]* | The duration value is used to provide a short interval that extends the ETA so that the requesting vehicle can arrive at the point of service with uncertainty or with some desired duration of service. | Not used | - | - |
| 1.5 | *regional [REGION.Reg-SignalRequest-Package]* | The element is used for additional "regional information", as defined in ISO/PDTS 19091. | Not used | - | - |

| Standard | | | | Profile | | |
|---|---|---|---|---|---|---|
| Level | Field | Meaning | | Status | Content | Value |
| **Level 2: SignalRequest** | | | | | | |
| 2.1 | **id [Intersection-ReferenceID]** | The Intersection-ReferenceID is a globally unique value set, consisting of an optional RoadRegulatorID and a required IntersectionID assignment, providing a unique mapping to the intersection MAP. | *region [RoadRegulatorID]*<br><br>The RoadRegulatorID data element is a globally unique identifier assigned to a regional authority. | Profiled | Mandatory in Dutch profile as opposed to standard.<br><br>For each road operator a RoadRegulatorID is provided in the document 'Addendum VRA en geregeld Kruisingsvlak Identificatie 20170728'. | Set by application |
| | | | **id [IntersectionID]**<br><br>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 |
| 2.2 | **requestID [RequestID]** | The RequestID data element is used to provide a unique ID between two parties for various dialog exchanges. Combined with the sender's VehicleID, this provides a unique string for some mutually defined period of time. | | Mandatory | The value of the RequestID data element is limited to 255. Therefore, RequestIDs must be numbered continuously starting at 1.<br><br>The requestID uniquely links the request to the corresponding status from the intersection (SSM). | Set by application.<br><br>Start at 1. |
| 2.3 | **requestType [Priority-RequestType]** | The PriorityRequestType data element provides a means to indicate if a request (found in the Signal Request Message) represents a new service request, a request update, or a request cancellation for either preemption or priority services. | | Mandatory | Types:<br>• priorityRequestTypeReserved (0),<br>• priorityRequest (1),<br>• priorityRequestUpdate (2),<br>• priorityCancellation (3),<br>Each priority request must be cancelled when the priority vehicle passes the stop line or when the manoeuvre changes. | Set by application |
| 2.4 | **inBoundLane [Intersection-AccessPoint]** | The IntersectionAccess-Point data frame is used to specify the index of either a single approach or a single lane at which a | | Mandatory | The IntersectionAccessPoint data frame is used to indicate the inbound points by which the requestor can traverse an intersection. One of the following three options can be choosen: LaneID, ApproachID or LaneConnectionID. | - |

| Standard | | | | Profile | | |
|---|---|---|---|---|---|---|
| Level | Field | Meaning | | Status | Content | Value |
| | | service is needed. | lane<br>[LaneID]<br><br>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 | - | - |
| | | | approach<br>[ApproachID]<br><br>The ApproachID data element is used to relate the index of an approach, either ingress or egress within the subject lane. | Choice (alternative option) | This is the alternative option to choose, the preferred option is the LaneConnectionID.<br><br>This option can be used if the direction/route taken at the intersection is not known. | Set by application |
| | | | connection<br>[LaneConnectionID]<br><br>The LaneConnectionID data entry is used to state a connection index for a lane to lane connection. | Choice (preferred option) | This is the preferred option. If set, it must be in accordance with the LaneID defined in the MAP message. Note that this option can only be selected if the direction/route taken at the intersection is known. | Set by application |
| 2.5 | *outBoundLane [Intersection-AccessPoint]* | The IntersectionAccess-Point data frame is used to specify the index of either a single approach or a single lane at which a service is needed. This is used to indicate the outbound points by which the requestor can traverse an intersection. | | Not used | - | - |
| | | | lane<br>[LaneID] | Not used | - | - |
| | | | approach<br>[ApproachID] | Not used | - | - |
| | | | connection<br>[LaneConnectionID] | Not used | - | - |
| 2.6 | *regional [REGION.Reg-SignalRequest]* | The element is used for additional "regional information", as defined in ISO/PDTS 19091. | | Not used | - | - |

| Standard | | | | Profile | | |
|---|---|---|---|---|---|---|
| Level | Field | Meaning | | Status | Content | Value |
| **Level 3: RequestorDescription** | | | | | | |
| 3.1 | **id**<br>**[VehicleID]** | The VehicleID is used to uniquely identify a vehicle or other object.<br><br>The VehicleID data frame is used to contain either a (US) TemporaryID or an (EU) StationID in a simple frame.<br><br>In normal use cases, this value changes over time to prevent tracking of the subject vehicle. | | Mandatory | - | - |
| | | | entityID<br>[TemporaryID]<br><br>This is the random device identifier, called the TemporaryID. When used for a mobile OBU device, this value will change periodically to ensure the overall anonymity of the vehicle. Other devices, such as infrastructure (RSUs), may have a fixed value for the temporary ID value. | Not used | - | - |
| | | | stationID<br>[StationID]<br><br>This is the ID of the station broadcasting the message. | Profiled | The stationID must be identical to the stationID of the CAM message of the vehicle. The stationID is subject to change at intervals (pseudonym), but may not change while passing an intersection or during pendings SRMs (i.e. active services). | Set by application. |
| 3.2 | *type*<br>*[RequestorType]* | The RequestorType data frame is used when a DSRC-equipped device is requesting service from another device. The most common use case is when a vehicle is requesting a signal preemption or priority service call from the signal controller in an intersection. | | Profiled | Mandatory in profile as opposed to standard. Information regarding all type and class data about the requesting vehicle is required. | See level 4 |
| 3.3 | *position*<br>*[Requestor-PositionVector]* | The RequestorPosition-Vector data frame provides a report of the requestor's position, speed, and heading. | | Not used | Information regarding the requestor's position, speed, and heading will be included in CAM. | Set by application |
| | | | **position**<br>**[Position3D]**<br><br>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. | Not used | - | See level 5 |
| | | | *heading*<br>*[Angle]* | Not used | - | - |

| Standard | | | Profile | | |
|---|---|---|---|---|---|
| Level | Field | Meaning | Status | Content | Value |
| | | The Angle data element is used to describe an angular measurement in units of degrees. | | | |
| | | *speed [TransmissionAndSpeed]*<br><br>The TransmissionAnd-Speed data frame expresses the speed of the vehicle and the state of the transmission. | Not used | - | See level 6 |
| 3.4 | *name [Descriptive-Name]* | A human readable name for debugging use. | Optional | - | Set by application |
| 3.5 | *routeName [Descriptive-Name]* | The DescriptiveName data element is used to provide a human readable and recognizable name for transit operations use. | Conditional | Mandatory in case of transit operations. This data element will be used to obtain numerical line number of the route of the transit vehicle identical to the use in CAM. | Set by application |
| 3.6 | *transitStatus [TransitVehicleStatus]* | The TransitVehicleStatus data element is used to relate basic information about the transit run in progress. | Conditional | Mandatory in case of transit operations. Each time the status changes an updated SRM shall be send. Note that the CAM message allows tracking of the vehicle.<br><br>Types:<br>• **loading (0), -- parking and unable to move at this time**<br>• anADAuse (1), --an ADA access is in progress (wheelchairs, kneeling, etc.)<br>• aBikeLoad (2), -- loading of a bicycle is in progress<br>• **doorOpen (3), -- a vehicle door is open for passenger access**<br>• charging (4), -- a vehicle is connected to charging point<br>• atStopLine (5), -- a vehicle is at the stop line for the lane it is in | Set by application |
| 3.7 | *transitOccupancy [TransitVehicleOccupancy]* | The TransitVehicleOccupancy data element is used to relate basic level of current ridership. | Not used | The exact number of passengers it to be provided through the PtActivation field of the CAM message. | - |

| Standard | | | Profile | | |
|---|---|---|---|---|---|
| Level | Field | Meaning | Status | Content | Value |
| 3.8 | *transitSchedule [DeltaTime]* | The DeltaTime data element provides a time definition for an object's schedule adherence (typically a transit vehicle) within a limited range of time. When the reporting object is ahead of schedule, a positive value is used; when behind, a negative value is used. A value of zero indicates schedule adherence. | Conditional | Mandatory in case of transit operations. | Set by application |
| 3.9 | *regional [REGION.Reg-Requestor-Description]* | The element is used for additional "regional information", as defined in ISO/PDTS 19091. | Not used | - | - |

| **Level 4: RequestorType** | | | | | |
|---|---|---|---|---|---|
| 4.1 | **role [BasicVehicle-Role]** | The BasicVehicleRole data element provides a means to indicate the current role that a DSRC device is playing. | Mandatory | EU Types:<br>• basicVehicle (0),<br>• publicTransport (1),<br>• specialTransport (2),<br>• dangerousGoods (3),<br>• roadWork (4),<br>• roadRescue (5),<br>• emergency (6),<br>• safetyCar (7), | Set by application |
| 4.2 | *subrole [RequestSubRole]* | The RequestSubRole data element is used to further define the details of the role which any DSRC device might play when making a request to a signal controller.<br><br>Meanings based on regional needs to refine and expand the basic roles which are defined elsewhere. | Profiled | To be used to enrich information provided by the BasicVehicleRole data element.<br>Mandatory to add further details about the role of a PublicTransport vehicle. Is it a bus or a tram/light rail vehicle. Since one value can be provided, 5-10 must be used over 1-4 in case two values apply.<br><br>Types:<br>• requestSubRoleUnKnown (0),<br>• requestSubRole1 (1), -- bus<br>• requestSubRole2 (2), -- tram<br>• requestSubRole3 (3), -- metro<br>• requestSubRole4 (4), -- train<br>• requestSubRole5 (5), -- emergency (with or without blue light and/or siren)<br>• requestSubRole6 (6), -- 'glijdend transport' | Set by application |

| Standard | | | Profile | | |
|---|---|---|---|---|---|
| Level | Field | Meaning | Status | Content | Value |
| | | | | • requestSubRole7 (7), -- 'dienstregelingsrit'<br>• requestSubRole8 (8), -- 'regelmaatdienstrit'<br>• requestSubRole9 (9), -- 'HOV-lijn'<br>• requestSubRole10 (10), -- 'materiaalrit'<br>• requestSubRole11 (11),<br>• requestSubRole12 (12),<br>• requestSubRole13 (13),<br>• requestSubRole14 (14),<br>• requestSubRoleReserved (15) | |
| 4.3 | *request [Request-ImportanceLevel]* | The RequestImportanceLevel data element is used to state what type of signal request is being made to a signal controller by a DSRC device in a defined role.<br><br>The levels of the request typically convey a sense of urgency or importance with respect to other demands to allow the controller to use predefined business rules to determine how to respond.<br><br>Meanings based on regional needs to refine and expand the basic roles which are defined elsewhere. | Optional | Not preferred as typically the requesting vehicle is not allowed to determine its own level of importance.<br><br>Priority levels are to be defined by the local road authority.<br><br>Types:<br>• requestImportanceLevelUnKnown (0),<br>• requestImportanceLevel1 (1),<br>• requestImportanceLevel2 (2),<br>• requestImportanceLevel3 (3),<br>• requestImportanceLevel4 (4),<br>• requestImportanceLevel5 (5),<br>• requestImportanceLevel6 (6),<br>• requestImportanceLevel7 (7),<br>• requestImportanceLevel8 (8),<br>• requestImportanceLevel9 (9),<br>• requestImportanceLevel10 (10),<br>• requestImportanceLevel11 (11),<br>• requestImportanceLevel12 (12),<br>• requestImportanceLevel13 (13),<br>• requestImportanceLevel14 (14),<br>• requestImportanceReserved (15) | Set by application |
| 4.4 | *iso3833 [Iso3833Vehicle-Type]* | The Iso3833VehicleType data element represents the value domain provided by ISO 3833 for general vehicle types. It is a European list similar to the list used for the Highway Performance Monitoring System (HPMS) in the US region. In this | Not used | - | - |

| Standard | | | Profile | | |
|---|---|---|---|---|---|
| Level | Field | Meaning | Status | Content | Value |
| | | standard, the HPMS list is used in the data concept named VehicleType. | | | |
| 4.5 | *hpmsType [VehicleType]* | The VehicleType data element is a type list (i.e., a classification list) of the vehicle in terms of overall size. | Not used | - | - |
| 4.6 | *regional [REGION.Reg-RequestorType]* | The element is used for additional "regional information", as defined in ISO/PDTS 19091. | Not used | - | - |

| Level 5: Position3D | | | | | |
|---|---|---|---|---|---|
| 5.1 | **lat [Latitude]** | The geographic latitude of an object. | Not used | Position3D is not used, therefore this DE is not used. | - |
| 5.2 | **long [Longitude]** | The geographic longitude of an object. | Not used | Position3D is not used, therefore this DE is not used. | - |
| 5.3 | *elevation [Elevation]* | The Elevation data element represents the geographic position above or below the reference ellipsoid. | Not used | Position3D is not used, therefore this DE is not used. | - |
| 5.4 | *regional [REGION.Reg-Position3D]* | The element is used for additional "regional information", as defined in ISO/PDTS 19091. | Not used | Position3D is not used, therefore this DE is not used. | - |

| Level 6: TransmissionAndSpeed | | | | | |
|---|---|---|---|---|---|
| 6.1 | **transmission [Transmission-State]** | The TransmissionState data element is used to provide the current state of the vehicle transmission.<br><br>0 neutral<br>1 park<br>2 forwardGears<br>3 reverseGears<br>4 reserved1<br>5 reserved2<br>6 reserved3<br>7 unavailable | Not used | TransmissionAndSpeed is not used, therefore this DE is not used. | - |
| 6.2 | **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. | Not used | TransmissionAndSpeed is not used, therefore this DE is not used. | - |

# Annex A: Summary of SRM profile

**bold** = mandatory/used

***bold-italic*** = conditional

*italic* = optional

~~strikethrough~~ = not used

red = extensions

**timestamp [MinuteOfTheYear]**

**second [Dsecond]**

**sequenceNumber [MsgCount]**

**requests [SignalRequestList]**

**SignalRequestPackage**

**request [SignalRequest]**

**id [IntersectionReferenceID]**

**region [RoadRegulatorID]**

**Id [IntersectionID]**

**requestID [RequestID]**

**requestType [PriorityRequestType]**

**inBoundLane [IntersectionAccessPoint]**

~~lane [LaneID]~~

*approach [ApproachID]*

*connection [LaneConnectionID]*

~~outBoundLane [IntersectionAccessPoint]~~

~~lane [LaneID]~~

~~approach [ApproachID]~~

~~connection [LaneConnectionID]~~

~~regional [REGION.Reg_SignalRequest]~~

*minute [MinuteOfTheYear]*

*second [Dsecond]*

~~duration [DSecond]~~

~~regional [REGION.Reg_SignalRequestPackage]~~

**requestor [RequestorDescription]**

**id [VehicleID]**

~~entityID [TemporaryID]~~

**stationID [StationID]**

**type [RequestorType]**

**role [BasicVehicleRole]**

**subrole [RequestSubRole]**

*request [RequestImportanceLevel]*

~~iso3833 [Iso3833VehicleType]~~

~~hpmsType [VehicleType]~~

~~regional [REGION.Reg_RequestorType]~~

~~position [RequestorPositionVector]~~

~~position [Position3D]~~

~~lat [Latitude]~~

~~long [Longitude]~~

~~elevation [Elevation]~~

~~regional [REGION.Reg-Position3D]~~

~~heading [Angle]~~

~~speed [TransmissionAndSpeed]~~

~~transmission [TransmissionState]~~

~~speed [Velocity]~~

name [DescriptieveName]

*routeName [DescriptiveName]*

*transitStatus [TransitVehicleStatus]*

~~transitOccupancy [TransitVehicleOccupancy]~~

*transitSchedule [DeltaTime]*

~~regional [REGION.Reg-RequestorDescription]~~

~~addGrpC [RequestorDescription-AddGrpC]~~

~~regional [REGION.Reg-SignalRequestMessage]~~

# Annex B: Planned v3.0 revisions

Planned changes are marked in red.

| | | | | | |
|---|---|---|---|---|---|
| h.2 | **messageID** | Indicates the type of message. | Fixed | Examples are denm(1), cam(2), spat(4) etc.<br>SRM messageID is 7*. | 7 |

* Update to the latest release of ETSI's Common Data Dictionary once released.

| | | | | | |
|---|---|---|---|---|---|
| 1.2 | *minute*<br><br>*[MinuteOfThe-Year]* | The MinuteOfTheYear data element expresses the number of elapsed minutes of the current year in the time system being used (typically UTC time). | Profiled | Mandatory in profile as opposed to standard.<br>The data elements MinuteOfTheYear and second indicate the Estimated Time of Arrival (ETA) to the intersection stopline from the moment when the service was requested, based on free-flow traffic. If the ETA deviates by more than 10% from the travel time based on the previous ETA (minimum 3 seconds), an update of the SRM message will follow. | Set by applicatio n |
| 1.3 | *second*<br>*[Dsecond]* | The DSRC second expressed in this data element represents the milliseconds within the current UTC minute. | Profiled | Mandatory in profile as opposed to standard.<br>The data elements MinuteOfTheYear and second indicate the Estimated Time of Arrival (ETA) to the intersection from the moment when the service was requested, based on free-flow traffic. If the ETA deviates by more than 10% from the travel time based on the previous ETA (minimum 3 seconds), an update of the SRM message will follow. | Set by applicatio n |

| | | | | | |
|---|---|---|---|---|---|
| 2.5 | *outBoundLane*<br>*[Intersection-AccessPoint]* | The IntersectionAccess-Point data frame is used to specify the index of either a single approach or a single lane at which a service is needed. This is used to indicate the outbound points by which the requestor can traverse an intersection. | | Not used | - | - |
| | | | lane<br>[LaneID] | Not used | - | - |
| | | | approach<br>[ApproachID] | Used | The vehicle requests an inbound approach-outbound approach combination and the signal controller determines the best suitable inbound lane or connection. | - |
| | | | connection<br>[LaneConnectionID] | Not used | - | - |

| | | | | | |
|---|---|---|---|---|---|
| 3.5 | *routeName [Descriptive-Name]* | The DescriptiveName data element is used to provide a human readable and recognizable name for transit operations use. | Conditional | Mandatory in case of transit operations. This data element will be used to obtain the numerical line number* of the transit vehicle, identical to the use in CAM. | Set by application |

* Review if this works in practice or obtain alternative approach e.g. from KAR.

| | | | | | |
|---|---|---|---|---|---|
| 3.9 | *regional [REGION.Reg-Requestor-Description]* | The element is used for additional "regional information", as defined in ISO/PDTS 19091. | Optional | Two extensions are defined for this data frame:<br><br>fuelType [FuelType] – integer as defined in J2735:<br>• unknownFuel (0)<br>• gasoline (1)<br>• ethanol (2)<br>• diesel (3)<br>• electric (4)<br>• hybrid (5)<br>• hydrogen (6)<br>• natGasLiquid (7)<br>• natGasComp (8)<br>• propane (9)<br><br>batteryStatus [BatteryStatus] – enumeration with types:<br>• Unknown (0)<br>• Critical (1)<br>-- Battery level below TBD%<br>• Low (2)<br>- Battery level below TBD%<br>• Good (3)<br>-- Battery level above TBD% | Set by application |

## Annex C: Bit string example

A bit string is an arbitrarily long array of bits. Specific bits can be identified by parenthesized integers and assigned names. As an example, the bit string for the data element LaneSharing is shown in **Figure 1**.

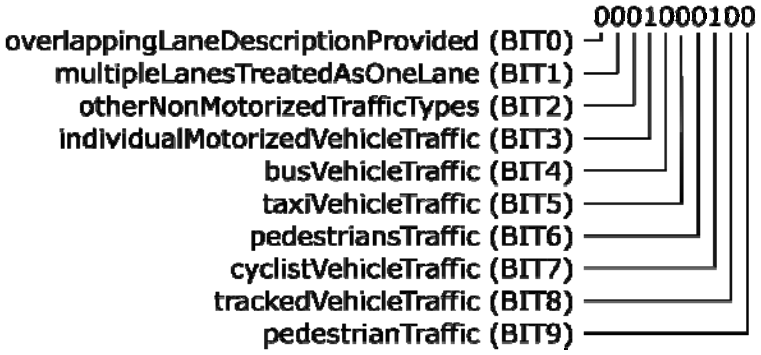



**Figure 1** Bit string example

The example shows the 10 bit sting '0001000100', where BIT3and BIT7 are set from left to right. This indicates that user types individualMotorizedVehicleTraffic and cyclistVehicleTraffic can access and use the respective lane.

## Annex D: Service Specific Permissions

Based on ETSI TS 103 301 V1.1.1 (2016-11) - section 8.4.3.2

| Octet | Bit | Emergency | publicTransport | Logistics | Other | SSP-Value |
|---|---|---|---|---|---|---|
| 1 | 0 | 1 | 1 | 1 | 0 | Signal request {SREM.srm.requests} |
| 1 | 1 | 0 | 1 | 0 | 0 | Requestor role (public transport) {SREM.srm.requestor.type.role. publicTransport} |
| 1 | 2 | 0 | 0 | 1 | 0 | Requestor role (special transport) {SREM.srm.requestor.type.role. specialTransport} |
| 1 | 3 | 0 | 0 | 1 | 0 | Requestor role (dangerousGoods) {SREM.srm.requestor.type.role. dangerousGoods} |
| 1 | 4 | 0 | 0 | 0 | 1 | Requestor role (roadWork) {SREM.srm.requestor.type.role. roadWork} |
| 1 | 5 | 0 | 0 | 0 | 1 | Requestor role (roadRescue) {SREM.srm.requestor.type.role. roadRescue} |
| 1 | 6 | 1 | 0 | 0 | 0 | Requestor role (emergency) {SREM.srm.requestor.type.role. emergency} |
| 1 | 7 | 0 | 0 | 0 | 1 | Requestor role (safetyCar) {SREM.srm.requestor.type.role. safetyCar} |
| | | | | | | |
| Octet | Bit | | | | | SSP-Value |
| 2 | 0 | 0 | 0 | 1 | 0 | Requestor role (truck) {SREM.srm.requestor.type.role. truck} |
| 2 | 1 | 0 | 0 | 0 | 1 | Requestor role (motorcycle) {SREM.srm.requestor.type.role. motorcycle} |
| 2 | 2 | 1 | 0 | 0 | 0 | Requestor role (police) {SREM.srm.requestor.type.role. police} |
| 2 | 3 | 1 | 0 | 0 | 0 | Requestor role (fire) {SREM.srm.requestor.type.role. fire} |
| 2 | 4 | 1 | 0 | 0 | 0 | Requestor role (ambulance) {SREM.srm.requestor.type.role. ambulance} |
| 2 | 5 | 0 | 0 | 0 | 1 | Requestor role (dot) {SREM.srm.requestor.type.role. dot} |
| 2 | 6 | 0 | 1 | 0 | 0 | Requestor role (transit) {SREM.srm.requestor.type.role. transit} |
| 2 | 7 | 0 | 0 | 0 | 1 | Requestor role (slowMoving) {SREM.srm.requestor.type.role. slowMoving} |

| Octet | Bit | | | | | SSP-Value |
|---|---|---|---|---|---|---|
| 3 | 0 | 0 | 0 | 0 | 1 | Requestor role (cyclist) {SREM.srm.requestor.type.role. cyclist} |
| 3 | 1 | 0 | 0 | 0 | 1 | Requestor role (pedestrian) {SREM.srm.requestor.type.role. pedestrian} |
| 3 | 2 | 0 | 0 | 0 | 1 | Requestor role (military) {SREM.srm.requestor.type.role. military} |
| 3 | 3 | 0 | 0 | 0 | 0 | - |
| 3 | 4 | 0 | 0 | 0 | 0 | - |
| 3 | 5 | 0 | 0 | 0 | 0 | - |
| 3 | 6 | 0 | 0 | 0 | 0 | - |
| 3 | 7 | 0 | 0 | 0 | 0 | - |

## Annex E: 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

**SRM Data**

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