

French C-ITS Deployment Coordination committee

Common technical specifications for use cases – Master document

Deliverable 2.4.1.2_H_Master

Activity 2: Studies

Sub Activity 2.4 > Specifications

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Black highlighted texts are issues with standards

The following legend is used on master document tables (next sub-chapters) and on profiles in each UC documents:

Standard / Field: if status is mandatory in standard: **bold**, If optional: *italic*.

Profile / Status:

- If mandatory: **I**
- If optional in standard:
 - Used (**U**) when always used
 - Not used (**I**) when never used.
 - Sometimes (**S**) when it depends.

Profile / Content: important settings or information are in ***bold italic pink underline***.

Quality rules

Reference to the version administration

Version number to be composed of 3 digits > vR.XY

- **R** corresponds to the release number: it is upgraded each time SC Studies validates the diffusion of a new release,

- **X** is the major version number: it is upgraded each time SC Studies validates the deliverable,

- **Y** is the minor version number: it is upgraded each time a contributor changes anything.

Once the deliverable is approved, its version number is upgraded from vR.XY to vR.(X+1)0

Once the deliverable is release, its version number is upgraded from vR.XY to v(R+1).00

As illustration:

0.03 > Work in progress version

0.10 > Del. Approved by SC Studies but not released

2.00 > Del. approved & released (in release 2)

2.05 > Del. Updated - in progress version

Requirements identification & traceability

In this document, the following verbal forms are used to indicate requirements: **Shall / Shall not**

Recommendations shall be indicated by the verbal forms: **Should / Should not**

Permissions shall be indicated by the verbal forms: **May / May not**

Possibility and capability shall be indicated by the verbal forms: **Can / Cannot**

Inevitability used to describe behaviour of systems beyond of the scope of this del. shall be indicated by: **Will / Will not**

Facts shall be indicated by the verbal forms: **Is / Is not**

In the table here below:

2.4.X.XX > is the number given to the deliverable (e.g. 2.4.4.8)

YYYY > for digit are given to identifying which component/entity the requirement is addressing (e.g. LTCA for long term certificate authority)

ZZZ > is the numeration of the requirement

ID	2.4.X.XX-YYYY-ZZZ
Component(s)	(e.g.) Vru-ITS-S, Vro-ITS-S, R-ITS-S, PKI
Requirement	(e.g.) An ITS station SHALL be able to request and get a Long term Certificate (LTC) from the SCOOP Public Key Infrastructure (PKI).
Acceptance	(e.g.) CA1: Vru-ITS-S sends a LTC request to the LTCA CA2: R-ITS-S relays the LTC request CA3: The LTCA verifies the request and sends a response CA4: The R-ITS-S relays the response CA5: The response is received by the Vru-ITS-S and is valid
Additional information	

Acronyms & abbreviations

CAM	Cooperative Awareness Message
CC/SCC	causeCode/subCauseCode
C-ITS	Cooperative Intelligent Transport Systems
C-ITS-S	Cooperative ITS Station
DE	Data Element
DENM	Decentralized Environmental Notification Message
DF	Data Frame
DSL	Dynamic Speed Limit
ETA	Estimated Time of Arrival
eVMS	embedded VMS
GLOSA	Green Light Optimal Speed Advisory
HMI	Human-Machine Interface
I2V	Infrastructure To Vehicle
ITS	Intelligent Transport Systems
ITS AID	ITS-Application Identifier
IVI	Infrastructure to Vehicle Information
MAP	Map data
MCTO	Multimodal Cargo Transport Optimization
Nfr-ITS-S	French National ITS Station
PF	Platform
R-ITS-S	Roadside ITS Station (RSU in the French Terminology)
RLT	Road and Lane Topology
RR-ITS	Regulatory Region ITS
RWW+	RoadWorks Warning enhanced
SPAT	Signal Phase and Timing
SSP	Service Specific Permissions
TCC	Traffic Control Centre
TLM	Traffic Light Maneuver
TMS	Traffic Management System
UC	Use Case
VDS	Vehicle Descriptor Section
V-ITS-S	Vehicular ITS Station
VMS	Variable Message Sign
Vro-ITS-S	Road operator V-ITS-S
Vru-ITS-S	Road user V-ITS-S
WMI	World Manufacturer Identifier

WWD	Wrong-Way Driving
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1.1

2. Introduction

2.1 Purpose of the master document

2.4.1.2_H technical specification activity is made of

- One master document (this document)
- UC documents: one document by use-case.

This master document contains the master technical specifications for SCooP, InterCor and C-Roads France use cases. They are valid for each use case of the 2.4.1.2_H activity.

Note that 2.4.1.2_H activity does not explain architecture concerns which are described in 2.4.1_H deliverable, nor functional descriptions that are detailed in 2.2_H deliverable.

2.2 Set of 2.4.1.2_H documents

The set of 2.4.1.2_H document is composed of:

- **0 - Master document (this document)**
- D7 - Wrong Way Driving (I2V)
- C3 - embedded VMS (I2V)
- B1a&B1b - Road Work Warning enhanced (I2V)
- C2 - Dynamic Speed Limit (I2V)
- G1 - Green Light Optimal Speed Advisory (I2V)
- I3 - Road Worker in the Field (P2V)
- H4 - Dynamic Lane Management - Reserved Lane (I2V)
- D12 - Emergency Vehicle Approaching (V2V)
- F1 - Information on parking lots location, availability and services (POI/I2V), including trucks parkings, (InterCor)
- H2 - Permanent and dynamic traffic ban to specific vehicles (InterCor)(I2V)
- H6 - No overtaking for trucks (InterCor)(I2V)
- K1-2-3 – Level Crossing out of order, approaching or in process of closing (I2V)
- K4 – Detection of a vehicle in distress in a critical area (V2I)

J1 (estimated time of arrival (ETA) for trucks), J2 (assigning a slot to a given vehicle for cross-channel traffic), J3 (Information on the site's access conditions) and J4 (Guide the truck in the port (terminal or truck parking)), which are use cases of J (Multimodal Cargo Transport Optimization), are specified apart by 2.4.1.2_Bis_H document(s).

For each use case (UC documents):

1) A figure is given. A sequence diagram is presented with a paragraph that give further explanations. Those explanations include non-technical approach and technical constraints issued from technical specification chosen.

2) A message description is given. Technical details on data elements are given.

3. Master technical choices in I2V context

3.1 DENM

DENM standard (ETSI EN 302 637-3)			DENM Master choices		
Field	Definition / Meaning	Type of data	Status	Content	Value set
Header					
protocol Version	"Version of the C-ITS message and/or communication protocol."	INTEGER{ currentVersion(1) } (0..255)	1	Current version is 1.	is 1
message ID	"Type of the C-ITS message."	INTEGER{ denm(1), cam(2), poi(3), spat(4), map(5), ivi(6), ev-rsr(7) } (0..255),	1	denm(1)	is 1
stationID	"The identifier of the C-ITS-S that generates the C-ITS message in question." This is the ID of the station broadcasting the message.	INTEGER(0..4294967295)	1	ID of the R-ITS-S or Nfr-ITS-S for I2V (ID of OBU for V2V)	by R-ITS-S or Nfr-ITS-S
Management container					
actionID	SEQUENCE : StationID + SequenceNumber "It is used by a receiving C-ITS-S to process information for DENMs that are multiply received."	SEQUENCE {originatingStationID StationID, sequenceNumber SequenceNumber } StationID ::= INTEGER(0..4294967295) SequenceNumber ::= INTEGER (0..65535)	1	The actionID has to be same for DENMs relating to the same event, even for updates and cancel. So it is given by PF in I2V. So, in actionID, the stationID is the one of PF (and not the one of the R-ITS-S). The actionID is unique ID of the event.	by PF

DENM standard (ETSI EN 302 637-3)			DENM Master choices		
Field	Definition / Meaning	Type of data	Status	Content	Value set
detection Time	<p>“Time at which the event is detected by the originating ITS-S. For the DENM repetition, this DE shall remain unchanged.</p> <p>For the DENM update, this DE shall be the time at which the event update is detected.</p> <p>For the DENM termination, this DE shall be the time at which the termination of the event is detected.”</p>	<p>Timestamps ::= INTEGER {utcStartOf2004(0), oneMillisecAfterUTCStartOf2004(1)} (0..4398046511103)</p>	1	<p>In I2v: originally time set by TCC operator in TMS for the beginning of an event, and then time for its update or termination by PF or from TMS (update or termination by operator).</p> <p>For event without an end time set in TMS, detectionTime is also updated as long as the event is active in TMS (e.g. triggering conditions are still active) and that event will be over within 10% of the validityDuration. In that case, detectionTime is set to current time and validity duration is still set to the default time (end time unknown).</p> <p>Justification: validityDuration is defined since detectionTime (in standard). See also validityDuration DE.</p> <p>This DE is used as versioning of the event (identified by its actionID).</p>	from TMS then by PF
reference Time	<p>“This DE refers to the time at which a new DENM, an update DENM or a cancellation DENM is generated.”</p>	<p>Timestamps ::= INTEGER {utcStartOf2004(0), oneMillisecAfterUTCStartOf2004(1)} (0..4398046511103)</p>	1	Time of encoding of the message by R-ITS-S.	by R-ITS-S
termination	<p>This DE is used to cancel the DENM from the originating C-ITS-S (cancellation) or another C-ITS-S (negation).</p>	<p>ENUMERATED {isCancellation(0), isNegation(1)}</p>	S	<p>Only present when cancel or termination is done by TCC operator in TMS.</p> <p>isNegation not used in FR (unwanted) so if this DE is present in DENM, it will be an isCancellation (0)</p>	from TMS

DENM standard (ETSI EN 302 637-3)			DENM Master choices		
Field	Definition / Meaning	Type of data	Status	Content	Value set
event Position	<p>“Geographical position of the detected event.”</p> <p>“When the event position corresponds to the position of a vehicle C-ITS-S, the eventPosition shall be set to the position of the vehicle C-ITS-S at detectionTime.</p> <p>This DF shall be presented as specified in ETSI TS 102 894-2 ReferencePosition”</p> <p>(Réf. DF A.124)</p>	<p>SEQUENCE</p> <p>See next 4 DE (latitude, longitude, confidencePositionEllipse and altitude)</p>	1	See four next lines	▼▼▼
>latitude	<p>“latitude of the geographical point; it shall be presented as specified in clause A.41 Latitude,”</p> <p>“Absolute geographical latitude in a WGS84 coordinate system, providing a range of 90 degrees in north or in south hemisphere.”</p>	<p>INTEGER</p> <p>{oneMicrodegreeNorth (10), oneMicrodegreeSouth (-10), unavailable(900000001) } (-900000000..900000001)</p>	1	<p>Latitude of eventPosition</p> <p>See each UC for details</p> <p>Latitude is calculated by PF (using position set in TMS)</p>	from TMS by PF
>longitude	<p>“longitude of the geographical point; it shall be presented as specified in clause A.44 Longitude,”</p> <p>“Absolute geographical longitude in a WGS84 co-ordinate system, providing a range of 180 degrees to the east or to the west of the prime meridian.”</p>	<p>INTEGER</p> <p>{oneMicrodegreeEast (10), oneMicrodegreeWest (-10), unavailable(1800000001) } (-1800000000..1800000001)</p>	1	<p>Longitude of eventPosition</p> <p>See each UC for details</p> <p>Longitude is calculated by PF (using position set in TMS)</p>	from TMS by PF
>confidence Position Ellipse	<p>“positionConfidenceEllipse: accuracy of the geographical position; it shall be presented as specified in clause A.119 PosConfidenceEllipse,”</p>	<p>SEQUENCE {</p> <p>semiMajorConfidenceSemiAxisLength,</p> <p>semiMinorConfidenceSemiAxisLength,</p> <p>semiMajorOrientationHeadingValue}</p>	1	<p>Given only because mandatory in standard.</p> <p>Can be set to the values corresponding to ‘unavailable’ e.g. {4095, 4095, 3601}</p>	is {4095, 4095, 3601}

DENM standard (ETSI EN 302 637-3)			DENM Master choices		
Field	Definition / Meaning	Type of data	Status	Content	Value set
>altitude	"altitude and altitude accuracy of the geographical point; it shall be presented as specified in clause A.103 Altitude."	SEQUENCE { altitudeValue AltitudeValue, altitudeConfidence AltitudeConfidence}	]	Always given because mandatory in standard. Can be set to the values corresponding to 'unavailable' e.g. {800001, unavailable (15)} when no possibility to provide it.	is {800001, unavailable (15)} or current altitude
relevance Distance	DE describing a distance of relevance for information indicated in a message, for example, it may be used to describe the distance of relevance of an event indicated in a DENM as defined in ETSI EN 302 637-3. "The distance in which event information is relevant for the receiving ITS-S, starting from the event position as defined in clause 6.1.3.1."	ENUMERATED {lessThan50m(0), lessThan100m(1), lessThan200m(2), lessThan500m(3), lessThan1000m(4), lessThan5km(5), lessThan10km(6), over10km(7)}	]	The usefulness of these DEs is unclear, so not used => Appropriate displaying on on-board HMI is automotive constructors domain.	

DENM standard (ETSI EN 302 637-3)			DENM Master choices		
Field	Definition / Meaning	Type of data	Status	Content	Value set
relevance Traffic Direction	<p>“DE describing a traffic direction that is relevant to information indicated in a message.</p> <p>For example, it may be used to describe traffic direction which is relevant to an event indicated by a DENM as defined in ETSI EN 302 637-3 [i.3], The terms "upstream", "downstream" and "oppositeTraffic" are relative to the event position.”</p> <p>“The traffic direction along which the event information is relevant for the receiving ITS-S, as defined in clause 6.1.3.1.”</p> <p>This DF indicates for which traffic direction the message is relevant (from the perspective of the sender).</p>	<p>ENUMERATED</p> <p>{allTrafficDirections(0), upstreamTraffic(1), downstreamTraffic(2), oppositeTraffic(3)}</p>	U	<p>If a vehicle receives an upstreamTraffic or an allTrafficDirections event and is on one traces of the event, it is concerned by event.</p> <p>To clarify the process that could be done by a vehicle-receiver of a DENM and determine if the event is relevant or not for the vehicle-receiver due to the relevanceTrafficDirection, the following logic may be followed :</p> <p>- upstream : receiver checks if on (one) trace of the event. If yes, concerned.</p> <p>- downstream : receiver checks if event is on its pathHistory AND if the heading of the event is quite the same compares to its own. If yes, concerned.</p> <p>- allTrafficDirection : receiver is concerned if approaching the event point.</p> <p>- oppositeTraffic : receiver is concerned if approaching the event and if its pathHistory is going to complete as a line (one) traces of the event, without superposition (as soon as superposed, the receiver is downstream of the event and thus no more concerned).</p> <p>See each UC for details.</p>	by PF

DENM standard (ETSI EN 302 637-3)			DENM Master choices		
Field	Definition / Meaning	Type of data	Status	Content	Value set
validity Duration	<p>“Validity duration of a DENM.</p> <p>The validityDuration is set by the originating ITS-S. Therefore, it represents an estimation of how long the event may persist. It implies the duration over which the DENM should be kept at the DEN basic service of the receiving ITS-S and the DENM dissemination be maintained in the relevance area or destination area, until the expiration of validityDuration.</p> <p>In case the expiry time of the event cannot be estimated at the originating ITS-S, a default value is used for the DENM protocol operation.</p> <p>This DE may be renewed by the originating ITS-S, if the pre-set expiry time has reached to its limit and the originating ITS-S detects that the event persists.”</p> <p>“The DE is represented as a time offset in the unit of second since detectionTime.</p> <p>This DE is optional. It shall be present if the information is required by the ITS application. If the DE is not present in DENM, a default value defaultValidity is assumed.”</p>	<p>INTEGER {timeOfDetection(0), oneSecondAfterDetection(1)} (0..86400)”</p> <p>e.g. time in seconds.</p> <p>And if unknown, not present, a defaultValidity is assumed (is 600s e.g. 10mn)</p>		<p>ValidityDuration is an estimated duration of event since detectionTime (cf. standard)</p> <p>For I2V use cases:</p> <ul style="list-style-type: none"> - If end time of the event is known and is less than 24 hours (86400 seconds), validityDuration is set to duration to the end of the event. - If end time of event is known and is more than 24 hours (86400 seconds), validityDuration is set to 86400 seconds. - If end time of event is unknown the default validityDuration is a default value (see each UC). <p>These policy on duration may change during experiment to find the best compromise between uses of short, medium or long time.</p>	by PF

DENM standard (ETSI EN 302 637-3)			DENM Master choices		
Field	Definition / Meaning	Type of data	Status	Content	Value set
transmission Interval	<p>"Time interval between two consecutive message transmissions."</p> <p>"Time interval for DENM transmission as defined by the originating ITS-S."</p> <p>This DE informs the receiving ITS-Ss about the intended transmission interval of two consecutive DENM transmissions. It is used for the forwarding ITS-S operation."</p>	<p>INTEGER {oneMilliSecond(1), tenSeconds(10000)} (1..10000)</p>		Not used.	
stationType	<p>"This DE provides the station type information of the originating ITS-S."</p> <p>This defines the type of the station broadcasting the DENM.</p>	<p>INTEGER {unknown(0), pedestrian(1), cyclist(2), moped(3), motorcycle(4), passengerCar(5), bus(6), lightTruck(7), heavyTruck(8), trailer(9), specialVehicles(10), tram(11), roadSideUnit(15)} (0..255)</p>		<p>For I2V UC is set to 15 (roadSideUnit).</p> <p>This is true for fixed R-ITS-S, portable or mobile R-ITS-S and also for message emitted by the N-ITS-S.</p> <p>(Can be 9 (trailer) or 10 (SpecialVehicles) for other UC than those treated in this set of documents, which are I2V only)</p>	is 15 (R-ITS-S)
Situation container					
information Quality	<p>"Quality level of the information provided by the ITS-S application of the originating ITS-S. It indicates the probability of the detected event being truly existent at the event position."</p>	<p>INTEGER {unavailable(0), lowest(1), highest(7)} (0..7)</p>		<p>This can be set to one of eight different values (0..7). ETSI does not specify what the different values mean, but 0 when quality is unknown.</p> <p>As a conclusion of C-Roads PF discussion, road operator should use the following values after the end of SCOOP:</p> <ul style="list-style-type: none"> - 2 for riskof - 4 for probable - 6 for certain <p>See each UC for details</p>	by PF

DENM standard (ETSI EN 302 637-3)			DENM Master choices		
Field	Definition / Meaning	Type of data	Status	Content	Value set
eventType	<p>“Description for the event type, including direct cause and sub cause.”</p> <p>See table 10 ETSI EN 302 637-3 for further details</p>	CauseCodeType and SubCauseCodeType are INTEGER (0..255)	I	See each UC for details	by PF
linkedCause	<p>“Description for a linked event of the provided eventType, including direct cause and sub cause of the linked event.”</p>	CauseCodeType and SubCauseCodeType are INTEGER (0..255)	S	<p>Seems globally not useful. So not given in most of cases. Can be used for road work action due to an ongoing incident. In that case, only CC/SCC of a specified UC through C-ITS projects is admitted (no new CC/SCC pair which is not related to a specified UC).</p> <p>See RWW+ UC for details. Optional.</p>	by PF

DENM standard (ETSI EN 302 637-3)			DENM Master choices		
Field	Definition / Meaning	Type of data	Status	Content	Value set
eventHistory	<p>"This DF indicates the list of positions that a plain event has been detected prior to the eventPosition"</p> <p>"The DF consists of a list of event points which represents the dimension of a plain event in a predefined order. In case that the plain event is detected by a vehicle ITS-S, the DF consists of a list of event detection points along the path that the detecting ITS-S has travelled over some past time and/or distance. Each event point corresponds to a point at which the same event was detected along the path.</p> <p>In the present document up to 40 EventPoint may be added in this DF. The generation of each EventPoint is specified in the related ITS application requirements". (Note that 40 points is written on DENM standard but max 23 points for eventHistory is written in common data dictionary)</p>	<p>SEQUENCE (SIZE(1..23)) OF EventPoint</p> <p>EventPoint ::= SEQUENCE { eventPosition DeltaReferencePosition, eventDeltaTime PathDeltaTime OPTIONAL, informationQuality InformationQuality }</p> <p>DeltaReferencePosition : := SEQUENCE { deltaLatitude DeltaLatitude, deltaLongitude DeltaLongitude, deltaAltitude DeltaAltitude }</p> <p>DeltaLatitude ::= INTEGER {oneMicrodegreeNorth (10), oneMicrodegreeSouth (-10), unavailable(131072)} (-131071..131072)</p> <p>...</p>	S	<p>For 12V, when present, always used without pathDeltaTime. Used for describing a linear event and not for giving previous position of a punctual moving event.</p> <p>eventHistory is a sequence of points, which together form a path from the eventPosition to the end of linear event.</p> <p>informationQuality in the DF of EventPoint is set to the same value than the informationQuality of the event.</p> <p>The maximum distance between the eventposition and the last point of the event history chosen for France is 20,9km. The maximum interval between two event points chosen for France is 910 meters.</p> <p>Those will be the maximum parameters implemented in the platform.</p> <p>Here are the detail of the calculations (max length):</p> <ul style="list-style-type: none"> - The maximum number of points is 23. - This is a sequence of delta positions from point-to-point, with a max of 131071 microdegree form point to point. - 1° latitude is 111,11 km. So, $131071 * 0,000001 * 11,111 \approx 1,46$ km - 1° longitude is 78,85 km at Bordeaux. Is 55,80 km at St-Petersburg... <p>North of France, assimilated to Greenwich, 1° longitude is 69,47km and used as reference for FR.</p> <ul style="list-style-type: none"> - So, $131071 * 0,000001 * 6,947 \approx 0,91$ km (Greenwich). - So, 23 times 0,91 km can be assumed anyway by eventHistory in France. It is 	by PF sequence of delta position without pathDeltaTi me

DENM standard (ETSI EN 302 637-3)			DENM Master choices		
Field	Definition / Meaning	Type of data	Status	Content	Value set
Location container					
eventSpeed	<p>“Moving speed of a detected event and the confidence of the moving speed information.”</p> <p>“When the eventPosition corresponds to the position of a vehicle ITS-S, the eventSpeed shall be set to the vehicle speed at detectionTime.”</p>	<p>Speed ::= SEQUENCE {speedValue SpeedValue, speedConfidence SpeedConfidence}</p> <p>SpeedValue ::= INTEGER {standstill(0), oneCentimeterPerSec(1), unavailable(16383)} (0..16383)</p> <p>SpeedConfidence ::= INTEGER {equalOrWithinOneCentimeterPerSec(1), equalOrWithinOneMeterPerSec(100), outOfRange(126), unavailable(127)} (1..127)</p>		As we have only I2V use cases in the set of documents and we won't really know event speeds, this DF won't be used	
eventPositionHeading	<p>“The heading direction of the event and the confidence of the heading information, if applicable.”</p>	<p>Heading ::= SEQUENCE {headingValue HeadingValue, headingConfidence HeadingConfidence}</p> <p>HeadingValue ::= INTEGER {wgs84North(0), wgs84East(900), wgs84South(1800), wgs84West(2700), unavailable(3601)} (0..3601)</p> <p>HeadingConfidence ::= INTEGER {equalOrWithinZeroPointOneDegree (1), equalOrWithinOneDegree (10), outOfRange(126), unavailable(127)} (1..127)</p>	S	<p>For moving event or set as the direction of the carriageway concerned by the event.</p> <p>HeadingConfidence is set as 127 (unavailable) if unknown.</p> <p>See each UC</p>	by PF

DENM standard (ETSI EN 302 637-3)			DENM Master choices		
Field	Definition / Meaning	Type of data	Status	Content	Value set
traces	<p>“This DF is the location referencing information of eventPosition. It includes a group of traces as defined in clause 6.1.3.2.</p> <p>Each trace describes a set of consecutive PathPoint positions leading to the event position.</p> <p>ITS-S located near to or inside this trace path may be concerned by the event.</p> <p>Multiple traces may be defined in case multiple road sections or traffic flows are leading to the event position. In the present standards, up to seven traces may be added in a DENM.</p> <p>For each trace, multiple PathPoint positions are provided to describe the trace path.”</p> <p>“Within one trace, the PathPoint closest to the event position shall be put as the first waypoint, it presents an offset delta position with regards to the eventPosition. Other PathPoints shall be structured in ascending order according to the distance to the eventPosition along the trace path. Each PathPoint presents an offset delta position and optionally an offset travel time with regards to the previous PathPoint.”</p> <p>“When the event position corresponds to the position of a vehicle ITS-S, the first trace in the DF shall be the PathHistory of the vehicle as defined in the CA basic</p>	<p>SEQUENCE SIZE(1..7) OF PathHistory</p> <p>PathHistory::= SEQUENCE (SIZE(0..40)) OF PathPoint</p> <p>PathPoint ::= { pathPosition DeltaReferencePosition, pathDeltaTime PathDeltaTime OPTIONAL }</p>		<p>This DF consists of minimum 1, maximum 7 traces of type PathHistory. These traces consist of points describing the path towards the eventLocation. These are used by approaching vehicles to determine whether the DENM is relevant or not.</p> <p>The maximum number of points a trace can hold is assumed to be 40, the minimum number of points is 2 (start and end). This is a sequence of delta positions from point-to-point.</p> <p>Sequence of delta positions from event position to the beginning of the way leading to the eventPosition.</p> <p>The maximum distance between the eventposition and the last point of the trace chosen for France is 36,4km (40 times 910m). The maximum interval between two path points chosen for France is 910 meters.</p> <p>Those will be the maximum parameters implemented in the platform.</p> <p>See the details of calculations in DENM/eventHistory.</p>	by PF

DENM standard (ETSI EN 302 637-3)			DENM Master choices		
Field	Definition / Meaning	Type of data	Status	Content	Value set
roadType	"The road type information at the event position."	ENUMERATED {urban-NoStructuralSeparationToOppositeLanes(0), urban-WithStructuralSeparationToOppositeLanes(1), nonUrban-NoStructuralSeparationToOppositeLanes(2), nonUrban-WithStructuralSeparationToOppositeLanes(3)}	U	For I2V, providing this information presents no difficulty. So it is given. It is the road type at the <i>eventPosition</i> (may vary through <i>traces</i> or <i>eventHistory</i>)	by PF
À la carte container					
lanePosition	"The lane position of the event position in the road counted from the outside boarder of the road. This DE is included in the alacarte container. If this data is provided, the originating ITS-S is required to determine the lane position with a predefined confidence level as defined by the ITS applications (e.g. 95 %)."	INTEGER {offTheRoad(-1), hardShoulder(0), outermostDrivingLane(1), secondLaneFromOutside(2)} (-1..14)	S	See each UC for details.	by PF
impactReduction	"It contains the vehicle detailed information required for mitigating the consequences of a collision."	SEQUENCE See next DE from heightLonCarLeft to requestResponseIndication	J	Not needed and not appropriate for the use cases of this document	
>heightLonCarLeft >heightLonCarRight	"Height of [left/right] longitudinal carrier of the vehicle from base to top. The [left/right] carrier refers to the [left/right] side seen from vehicle rear to vehicle front."	HeightLonCarLeft ::= INTEGER {oneCentimeter(1), unavailable(100)} (1..100)	▲		
>posLonCarLeft >posLonCarRight	"Distance from the centre of vehicle front bumper to the front of the [left/right] longitudinal carrier of vehicle. The [left/right] carrier refers to the [left/right] seen from vehicle rear to vehicle front."	PosLonCarLeft ::= INTEGER {oneCentimeter(1), unavailable(127)} (1..127)	▲		

DENM standard (ETSI EN 302 637-3)			DENM Master choices		
Field	Definition / Meaning	Type of data	Status	Content	Value set
>positionOfPillars	"The positionOfPillars contains a list of distance, which refers to the perpendicular distance between centre of vehicle front bumper to vehicle A pillar, between neighbour vehicle pillars until the last pillar of the vehicle."	PosPillar ::= INTEGER {tenCentimeters(1), unavailable(30)} (1..30)	▲		
>posCentMass	"Perpendicular distance from centre of mass of an empty charged vehicle to vehicle front bumper."	INTEGER {tenCentimeters(1), unavailable(63)} (1..63)	▲		
>wheelBaseVehicle	Perpendicular distance between front and rear axle of the wheel base of a passenger vehicle.	INTEGER {tenCentimeters(1), unavailable(127)} (1..127)	▲		
>turningRadius	"The turning radius of a vehicle is the size of the smallest circular turn (i.e. U-turn) that the vehicle is capable of making."	INTEGER {point4Meters(1), unavailable(255)} (1..255)	▲		
>posFrontAx	"Perpendicular distance between the front wheel axle and front bumper."	INTEGER {tenCentimeters(1), unavailable(20)} (1..20)	▲		
>positionOfOccupants	"This DF indicates whether a in vehicle seat is occupied at the moment when the impactReduction is generated. The in vehicle seats layout is defined in rows from the front to the rear of the vehicle. The left seat of a row refers to the left side with regards to the vehicle heading direction."	BIT STRING { row1LeftOccupied (0), row1RightOccupied (1), row1MidOccupied (2), row1NotDetectable (3), row1NotPresent (4), row2LeftOccupied (5), row2RightOccupied (6), row2MidOccupied (7), row2NotDetectable (8), row2NotPresent (9), row3LeftOccupied (10), row3RightOccupied (11), row3MidOccupied (12), row3NotDetectable (13), row3NotPresent (14), row4LeftOccupied (15), row4RightOccupied (16), row4MidOccupied (17), row4NotDetectable (18), row4NotPresent (19) } (SIZE(20))	▲		

DENM standard (ETSI EN 302 637-3)			DENM Master choices		
Field	Definition / Meaning	Type of data	Status	Content	Value set
>vehicle Mass	"This DE indicates the mass of an empty load vehicle."	INTEGER {hundredKg(1), unavailable(1024)} (1..1024)	▲		
>request Response Indication	"This DE is included in impactReduction DF in the alacarte container. It indicates whether the originating ITS-S transmitting the impactReduction DF is requesting the receiving ITS-S to provide also its impactReduction DF. On reception of a DENM with this DE set to 0, the receiving ITS-S may in turn transmit a DENM with its impactReduction DF as response to the request."	ENUMERATED {request(0), response(1)}	▲		
external Temperature	"Information included in the alacarte container for the adverse weather condition use case as specified in ETSI TS 101 539-1 [i.4]."	Temperature ::= INTEGER {equalOrSmallerThanMinus60Deg (-60), oneDegreeCelsius(1), equalOrGreaterThan67Deg(67)} (-60..67)	┘	Not used for the UC of this document as none are about "adverse weather condition".	
roadWorks	"It includes information of the road work zone and specific access conditions."	SEQUENCE See next DE from lightBarSirenInUse to referenceDenms	S	See next lines for details. (when this DF is used by the UC)	▼▼▼
>lightBar SirenInUse	"This DE indicates whether a roadwork vehicle has switched on the light bar or siren."	BIT STRING {lightBarActivated (0), sirenActivated (1) } (SIZE(2))	┘	Not used in the UC of this document. Not appropriate for UC.	

DENM standard (ETSI EN 302 637-3)			DENM Master choices		
Field	Definition / Meaning	Type of data	Status	Content	Value set
>closedLanes	<p>This DF indicates the opening/closure status of a lane or a set of lanes.</p> <p>HardShoulderStatus: "indicates the current status of a hard shoulder lane whether it is available for special usage (e.g. for stopping or for driving) or closed for all vehicles."</p> <p>DrivingLaneStatus: "indicates whether a driving lane is open to traffic.</p> <p>A lane is counted from outside boarder of the road. The numbering is matched to LanePosition DE as defined in clause A.40. If a lane is closed to traffic, the corresponding bit shall be set to 1. Otherwise, it shall be set to 0."</p>	<p>SEQUENCE {hardShoulderStatus HardShoulderStatus OPTIONAL, drivingLaneStatus DrivingLaneStatus, ... }</p> <p>HardShoulderStatus ::= ENUMERATED {availableForStopping(0), closed(1), availableForDriving(2)}</p> <p>DrivingLaneStatus ::= BIT STRING {outermostLaneClosed(1), secondLaneFromOutsideClosed(2) }</p>	S	See UC for details.	by PF
>restriction	<p>"This DF indicates the types of vehicles that are restricted to access the road work zone. More than one vehicle types may be provided by this DF if the restriction apply to multiple vehicle types."</p>	<p>RestrictedTypes ::= SEQUENCE (SIZE(1..3, ...)) OF StationType</p> <p>StationType ::= INTEGER {unknown(0), pedestrian(1), cyclist(2), moped(3), motorcycle(4), passengerCar(5), bus(6), lightTruck(7), heavyTruck(8), trailer(9), specialVehicles(10), tram(11), roadSideUnit(15)} (0..255)</p>		<p>Not needed as:</p> <ul style="list-style-type: none"> - restricted lane should be described via IVI format (not DENM) - give restriction of the access of a road work zone. Kind of things not done in FR. 	
>speedLimit	<p>"This DE indicates the speed limitation applied to the roadwork zone."</p>	<p>INTEGER {oneKmPerHour(1)} (1..255)</p>	S	See UC for details.	by PF

DENM standard (ETSI EN 302 637-3)			DENM Master choices		
Field	Definition / Meaning	Type of data	Status	Content	Value set
>incidentIndication	<p>"This DF indicates the incident related to the roadworks to provide additional information of the roadworks zone."</p>	<p>CauseCode ::= SEQUENCE {causeCode CauseCodeType, subCauseCode SubCauseCodeType}</p>	J	<p>If needed to link road work to a cause, <i>linkedCause</i> will be used (and not <i>incidentIndication</i>). This DF is a redundancy in standard from the point of view of FR.</p>	
>recommendedPath	<p>"This DF indicates the recommended itinerary in order to contour the roadworks zone.</p> <p>A recommended path is presented with a list of path points in the order from the starting point closest to the roadworks zone to the end point of the recommended path."</p> <p>"This DF shall be presented as specified in ETSI TS 102 894-2 [5] ItineraryPath."</p>	<p>ItineraryPath ::= SEQUENCE SIZE(1..40) OF ReferencePosition</p> <p>ReferencePosition ::= SEQUENCE {latitude Latitude, longitude Longitude, positionConfidenceEllipse PosConfidenceEllipse, altitude Altitude}</p>	S	See UC for details. Optional.	by PF
>startingPointSpeedLimit	<p>"The DF indicates the effective starting position of a speed limit being applied to the roadwork zone. Generally speaking, the speed limit applies a certain distance prior to the roadwork zone starting position. It is described as a delta position with regards to the eventPosition for a DENM."</p> <p>"This DF shall be presented as specified in ETSI TS 102 894-2 [5] DeltaReferencePosition."</p>	<p>DeltaReferencePosition : := SEQUENCE {deltaLatitude DeltaLatitude, deltaLongitude DeltaLongitude, deltaAltitude DeltaAltitude}</p>	J	Not used in FR as it brings many difficulties for providing it through PF. May be used by other C-Roads state members.	
>trafficFlowRule	<p>"The DE indicates the side of the road to which the traffic should flow around a roadwork. The traffic could flow to the left or to the right of the roadwork."</p> <p>"This DE shall be presented as specified in ETSI TS 102 894-2 [5] TrafficRule."</p>	<p>TrafficRule ::= ENUMERATED {noPassing(0), noPassingForTrucks(1), passToRight(2), passToLeft(3), ... }</p>	S	<p>See UC for details.</p> <p>Sadly, for the moment, an ENUMERATED for passToLeftOrRight is missing (and may be needed)</p>	by PF

DENM standard (ETSI EN 302 637-3)			DENM Master choices		
Field	Definition / Meaning	Type of data	Status	Content	Value set
>reference Denms	<p>"The DF indicates is a sequence of actionIDs for different DENMs that describe the same event. If it is available it is part of all DENMs describing this event."</p> <p>"This DF consists of list of other DENMs describing the same road work event."</p> <p>Each DENM shall be presented as specified in ETSI TS 102 894-2 [5] ActionID."</p>	SEQUENCE (SIZE(1..8, ...)) OF ActionID	S	See UC for details.	by PF
positioning Solution	"This DE indicates technical solution being used by the originating ITS-S to estimate the event position. Typically, this DE may be included for events that are caused by vehicle ITS-S."	PositioningSolutionType : := ENUMERATED {noPositioningSolution(0), sGNSS(1), dGNSS(2), sGNSSplusDR(3), dGNSSplusDR(4), dR(5), ...}	┘	<p>As this set of documents is about I2V UC, this DE is not given (appropriate in V2X context only).</p> <p>Sadly, in the standard no ENUMERATED are included for position given by roadOperator from TCC (mouse click on a map or assimilated)</p>	
stationary Vehicle	"DF included in the alacarte container for the stationary vehicle use case as specified in ETSI TS 101 539-1 [i.4]. It provides information of the stationary vehicle."	SEQUENCE See next DE from stationarySince to energyStorageType	┘	Not needed and not appropriate for the use cases of this set of 2.4.1.2_H documents.	
>stationarySince	"This DE provides the time duration of the stationary vehicle being stationary."	StationarySince ::= ENUMERATED {lessThan1Minute(0), lessThan2Minutes(1), lessThan15Minutes(2), equalOrGreater15Minutes(3)}	▲		

DENM standard (ETSI EN 302 637-3)			DENM Master choices		
Field	Definition / Meaning	Type of data	Status	Content	Value set
>stationaryCause	<p>"This DE provides additional information to describe causes of the stationary vehicle event such as human problem as defined in ETSI TS 101 539-1 [i.4]."</p> <p>"This DE shall be presented as specified in ETSI TS 102 894-2 [5] CauseCode."</p>	CauseCode ::= SEQUENCE {causeCode CauseCodeType, subCauseCode SubCauseCodeType}	▲		
>carryingDangerousGoods	<p>"DF included in the stationaryVehicle DF in the alacarte container if a vehicle carrying dangerous goods is involved in a stationary vehicle event. It provides information on the type of dangerous goods, the required emergency action and other information."</p> <p>"This DF shall be presented as specified in ETSI TS 102 894-2 [5] DangerousGoodsExtended."</p>	DangerousGoodsExtended ::= SEQUENCE {dangerousGoodsType DangerousGoodsBasic, unNumber INTEGER (0..9999), elevatedTemperature BOOLEAN, tunnelsRestricted BOOLEAN, limitedQuantity BOOLEAN, emergencyActionCode IA5String (SIZE(1..24)) OPTIONAL, phoneNumber IA5String (SIZE(1..24)) OPTIONAL, companyName UTF8String (SIZE(1..24)) OPTIONAL}	▲		
>numberOfOccupants	<p>"This DE provides the estimated number of occupants involved in the stationary vehicle event as specified in ETSI TS 101 539-1 [i.4]."</p> <p>"Number of occupants in a vehicle. For values equal to or higher than 126, the value shall be set to 126. If the information is not available, the value shall be set to 127."</p>	INTEGER {oneOccupant (1), unavailable (127)} (0 .. 127)	▲		

DENM standard (ETSI EN 302 637-3)			DENM Master choices		
Field	Definition / Meaning	Type of data	Status	Content	Value set
>vehicleIdentification	<p>"This DF provides the vehicle identification of the stationary vehicle as specified in ETSI TS 101 539-1 [i.4], including the World Manufacturer Identifier (WMI) code and the Vehicle Descriptor Section (VDS) as defined in ISO 3779 [i.15]."</p> <p>WMI number: "World Manufacturer Identifier (WMI). The values are assigned according to ISO 3779 [i.7]."</p> <p>VDS: "Vehicle Descriptor Section (VDS). The values are assigned according to ISO 3779 [i.7]."</p>	<p>SEQUENCE {wMI number WMI number OPTIONAL, vDS VDS OPTIONAL, ...}</p> <p>WMI number ::= IA5String (SIZE(1..3))</p> <p>VDS ::= IA5String (SIZE(6))</p>	▲		
>energyStorageType	<p>"This DE provides the vehicle energy storage type information of the stationary vehicle as specified in ETSI TS 101 539-1 [i.4], such as electric, diesel, etc."</p> <p>"Type of energy being used and stored in vehicle. If a storage type is used by the vehicle, the corresponding bit shall be set to 1. Otherwise, the corresponding bit shall be set to 0."</p>	<p>BIT STRING {hydrogenStorage(0), electricEnergyStorage(1), liquidPropaneGas(2), compressedNaturalGas(3), diesel(4), gasoline(5), ammonia(6)} (SIZE(7))</p>	▲		

3.2 IVI

FR choice: using the IVI message structure of ISO/TS 19321. Indeed, this standard seems sufficient to cover needs, so that ISO/TS 17425 (IVS) does not seem to provide any real additional advantage.

IVI standard (ISO TS 19321)			IVI Master choices		
Field/IVI	Description / Meaning	Type of data	Status	Content	Value set
Header					
protocol Version	"Version of the ITS message and/or communication protocol."	INTEGER{ currentVersion(1) } (0..255)	1	Current version is 1.	is 1
message ID	"Type of the ITS message."	INTEGER{ denm(1), cam(2), poi(3), spat(4), map(5), ivi(6), ev-rsr(7) } (0..255),	1	ivi(6) as we are in IVItransverse choices section	is 6
stationID	"The identifier of the ITS-S that generates the ITS message in question." This is the ID of the station broadcasting the message.	INTEGER(0..4294967295)	1	ID of the R-ITS-S or Nfr-ITS-S as we have only I2V use cases in this document	by R-ITS-S or Nfr-ITS-S
Management container					

IVI standard (ISO TS 19321)			IVI Master choices		
FieldIVI	Description / Meaning	Type of data	Status	Content	Value set
service ProviderId	<p>"Identifies the organization that provided the IVI by using the DE Provider; contains a country code according to ISO 3166-1.1. Numbers shall be assigned on national basis. See ISO 14816 for registration."</p> <p>"The data element Provider contains the ID of the service provider through its two components:</p> <ul style="list-style-type: none"> - CountryCode indicates the ISO 3166-1 country code; - IssuerIdentifier indicates the identifier of the service provider as registered." <p>"ISO 3166-1 two characters country code of the catalogue." ISO17425(IVS)</p>	<p>SEQUENCE of CountryCode and IssuerIdentification</p> <p>CountryCode is octetString (size(2))</p> <p>IssuerIdentifier::= INTEGER(0 .. 16383)</p>		<p>CountryCode for France is : 10110 01010</p> <p>Indeed: As specified in ISO 3166-1: France is code "FR" and as specified in table ITA-2 of ISO 14816: - F is coded 10110 - R is coded 01010</p> <p>IssuerIdentifier: one by road operator. Given as following:</p> <ul style="list-style-type: none"> - xx for SCA with xx is RTTT Coding structure CS1 for toll station (01 = ASFA Test ; 02 = SFTRF ; 03 = AREA ; 04 = ASF ; 05 = COFIROUTE ; 06 = ESCOTA ; 07 = SANEF ; 08 = SAPN ; 09 = APRR ; 10 = ATMB ; 11 = BPNL ; 12 = ALIS ; 13 = CEVM ; 14 = ARCOUR ; 15 = ADELAC ; 16 = TFREJUS ; 17 = ALICORNE ; 18 = ALIENOR ; 19 = ATLANDES ; 20 = ALBEA ; 41 = REPA ; 42 = REORA ; 48 = Euro Toll ; 49 = Axxès ; 50 = SMTPC ; 51 = CCIH ; 52 = TOTAL ; 53 = INDIGO ; 54 = PARK+ ; 55 = REC ; 60 = ATMB PARK ; 70 = RPAS ; 77 = OSS ; 90 = TEA ; 91 = TEV.) - postal code divided by 10 for city (3300 = Bordeaux Métropole; 2200 = St Brieuc Agglo ; 6700 = Eurométropole Strasbourg ; etc.) 	by PF

IVI standard (ISO TS 19321)			IVI Master choices		
Field/IVI	Description / Meaning	Type of data	Status	Content	Value set
ivi Identification Number	<p>"Identifier of the IVI Structure, as assigned by the Service Provider using the DE <i>IviIdentificationNumber</i>."</p> <p>This component serves as the ID of the message and can be used by other related messages as a reference.</p>	INTEGER(1..32767,...)	1	<p>Similar to actionID for DENMs, the combination of serviceProviderId + iviIdentificationNumber unique ID of an IVI event.</p> <p>Same pair when updates and cancel.</p> <p>serviceProviderId + iviIdentificationNumber is unique ID of each IVI event.</p>	by PF
timestamp	<p>"Timestamp of the generation or last change of information content."</p> <p>The message is valid from this time if <i>validFrom</i> is omitted.</p>	Timestamppts ::= INTEGER {utcStartOf2004(0), oneMillisecAfterUTCStartOf2004(1)} (0..4398046511103)	U	<p>Used as versioning of IVI. Has to change when update (including repetition loop) or cancel.</p> <p>Is kind of versioning of the event (as detectionTime for DENM).</p>	by PF
validFrom	"Start time of the validity period of the message."	Timestamppts ::= INTEGER {utcStartOf2004(0), oneMillisecAfterUTCStartOf2004(1)} (0..4398046511103)	S	<p>Useful for scheduled event.</p> <p>If not set in TCC, start time of event is considered equal to timestamp.</p>	from TMS
validTo	"End time of the validity period of the message."	Timestamppts ::= INTEGER {utcStartOf2004(0), oneMillisecAfterUTCStartOf2004(1)} (0..4398046511103)	U	<p>If end time is unknown by road operator, validTo (of the first iteration of the message) is a shift of default value (see each UC) since validFrom. If event is still active in TMS within 10% of this default value before validTo and end time is still not given by TMS, validTo is extended of another time this default value (through an update).</p> <p>These policy on duration may change during experiment to find the best compromise between use of short, medium or long unknown duration till end time.</p>	from TMS or by PF
connected IviStructures	"List of other <i>iviIdentificationNumber</i> identifying other IVI Structures of the same authority which are connected to the IVI Structure using the DE <i>IviIdentificationNumber</i> ."	SEQUENCE (SIZE(1..8)) OF IviIdentificationNumber	1	Seems not useful for the set of UC.	

IVI standard (ISO TS 19321)			IVI Master choices		
Field/IVI	Description / Meaning	Type of data	Status	Content	Value set
iviStatus	"Status of the IVI Structure using the DE <i>IviStatus</i> ."	INTEGER {new (0), update (1), cancellation (2), negation (3) } (0..7)	1	No negation (as in SCooP1). So only new, update or cancel status will be used by FR.	by PF
Geographic Location Container					
reference Position	"Any suitable position which serves as reference for the polygonal line, using the DE <i>ReferencePosition</i> ."	SEQUENCE {latitude Latitude, longitude Longitude, positionConfidenceEllipse PosConfidenceEllipse , altitude Altitude}	1	As for DENM/eventPosition. See each UC	by PF
reference Position Time	"Time at which the Reference Position, if dynamic, was valid."	Timestamp ::= INTEGER {utcStartOf2004(0), oneMillisecAfterUTCStartOf2004(1)} (0..4398046511103)	1	No moving event (in IVI) for the set of 2.4.1.2_H UC.	
reference Position Heading	"Direction of the Reference Position, if dynamic, using the DE <i>Heading</i> ."	Heading ::= SEQUENCE {headingValue HeadingValue, headingConfidence HeadingConfidence} HeadingValue ::= INTEGER {wgs84North(0), wgs84East(900), wgs84South(1800), wgs84West(2700), unavailable(3601)} (0..3601) HeadingConfidence ::= INTEGER {equalOrWithinZeroPointOneDegree (1), equalOrWithinOneDegree (10), outOfRange(126), unavailable(127)} (1..127)	1	See zoneHeading.	

IVI standard (ISO TS 19321)			IVI Master choices		
FieldIVI	Description / Meaning	Type of data	Status	Content	Value set
reference Position Speed	"Actual speed of the Reference Position, if dynamic, using the DE <i>Speed</i> ." [km/h]	Speed ::= SEQUENCE {speedValue SpeedValue, speedConfidence SpeedConfidence} SpeedValue ::= INTEGER {standstill(0), oneCentimeterPerSec(1), unavailable(16383)} (0..16383) SpeedConfidence ::= INTEGER {equalOrWithinOneCentimeterPerSec(1), equalOrWithinOneMeterPerSec(100), outOfRange(126), unavailable(127)} (1..127)	]	No moving event (in IVI) for the set of 2.4.1.2_H UC.	
parts	(1..16) GlcPart. Minimum is one part	SEQUENCE (SIZE (1..16,...)) OF GlcPart GlcPart ::= SEQUENCE of DE from zoneld to zone (see the next five DE)	]	See 5 next lines.	▼▼▼
>zoneld	"Identifier of the definition of the zone, using the DE <i>Zid</i> ." There shall be at least one zone (i.e. the detection zone) e.g as traces (DENM)	INTEGER (1..32,...)	]	First zone(s) Id(s) may be used to define the "detection zone(s)", approach of the event position (as traces in DENM). Then, next zone(s) Id(s) may be used to define "relevance zone(s)" in which the event is relevant (as eventHistory in DENM).	by PF
>laneNumber	"Identification of the lane represented by the Location Container using the DE <i>LaneNumber</i> ." Note that <i>laneNumber</i> is not in data dictionary, only <i>lanePosition</i> . asn.1 of IVI confirm that <i>laneNumber</i> is equal to <i>lanePosition</i>	LanePosition ::= INTEGER {offTheRoad(-1), hardShoulder(0), outermostDrivingLane(1), secondLaneFromOutside(2)} (-1..14)	]	Not used as zone are described as linear (opened polygonalLines) with points centred on carriageway. UC with lane specificity will use applicableLanes (see below) but doesn't need laneNumber to do so.	
>zone Extension	"Extension of the zone as a circular area around the Reference Position in 10m units."	INTEGER (0..255)	]	No needed for the UC of this set of documents.	

IVI standard (ISO TS 19321)			IVI Master choices		
Field/IVI	Description / Meaning	Type of data	Status	Content	Value set
>zoneHeading	"Applicable heading of the zone, e.g. the effective direction of applicability of the sign, at the Reference Position, using the DE <i>Heading</i> ."	<p>Heading ::= SEQUENCE {headingValue HeadingValue, headingConfidence HeadingConfidence}</p> <p>HeadingValue ::= INTEGER {wgs84North(0), wgs84East(900), wgs84South(1800), wgs84West(2700),unavailable(3601)} (0..3601)</p> <p>HeadingConfidence ::= INTEGER {equalOrWithinZeroPoint OneDegree (1), equalOrWithinOneDegree e (10), outOfRange(126), unavailable(127)} (1..127)</p>	U	<p>Set as the direction of the carriageway concerned by the event at referencePosition point. The DE direction will refer to this heading.</p> <p>HeadingConfidence is set to 127 (unavailable) when unknown.</p> <p>See each UC for details</p>	

IVI standard (ISO TS 19321)			IVI Master choices		
FieldIVI	Description / Meaning	Type of data	Status	Content	Value set
>zone	<p>Definition of a zone using the DF Zone.</p> <p>[shall contain the definition of a zone according to one of the following options: : segment, area (closed PolygonalLine) or computedSegment.</p> <p>DF Segment contain : component line (polygonal line : sequence of delta points with respect to the previous position, with latitude and longitude, as coded by the data element DeltaPosition, the first position being the referencePosition in the locationContainer) and laneWidth (width of segment in cm. Is optional and only used when a single lane is referenced within the zone)]]</p>	<p>Zone ::= CHOICE {segment Segment, area PolygonalLine, computedSegment ComputedSegment, ...}</p> <p>Segment::= SEQUENCE { line PolygonalLine, laneWidth LaneWidth OPTIONAL}</p> <p>PolygonalLine::= CHOICE {deltaPositions SEQUENCE (SIZE (1..32,...)) OF DeltaPosition, deltaPositionsWithAltitude SEQUENCE (SIZE (1..32,...)) OF DeltaReferencePosition, absolutePositions SEQUENCE (SIZE (1..8,...)) OF AbsolutePosition, absolutePositionsWithAltitude SEQUENCE (SIZE (1..8,...)) OF AbsolutePositionWithAltitude, ... (18),}</p> <p>DeltaPosition::=SEQUENCE { deltaLatitude DeltaLatitude, deltaLongitude DeltaLongitude }</p> <p>ComputedSegment::= SEQUENCE { zoneld, laneNumber LanePosition, laneWidth offsetDistance INTEGER (-32768..32767) OPTIONAL, offsetPosition DeltaReferencePosition}</p>	U	<p>FR will use the Segment option: PolygonalLine as a line constructed with deltaPosition as for DENM lines a (deltaLatitude and deltaLongitude, similar to DENM / deltaReferencePosition) and without laneWidth.</p> <p>The maximum distance between the referenceposition and the end of the segment chosen for France is 29,1km (32 times 910m). The maximum interval between two positions chosen for France is 910 meters.</p> <p>Those will be the maximum parameters implemented in the platform.</p> <p>See the details of calculations in DENM/eventhistory</p> <p>Sadly, in standard, it's not possible to give the number of lane represented by a polygonalLine (no DE for this purpose). So for IVI wich are lanes specific, all the lanes should be described at least one time (to provide the status of each lane and/or the totla number of lanes).</p>	by PF
General IVI Application Container		SEQUENCE (1.. 16) of GicParts			

IVI standard (ISO TS 19321)			IVI Master choices		
Field/IVI	Description / Meaning	Type of data	Status	Content	Value set
detection Zonelds	"List of Identifier(s) of the definition(s) of the Detection Zone(s), using the DE <i>Zid</i> ."	SEQUENCE (SIZE (1..8,...)) OF Zid OPTIONAL	U	As traces to the event. Minimum one waypoint to the event.	By PF
its-rrid	"Identifier of the ITS Regulatory Region to which the IVS Container is applicable. See DE <i>ItsRrid</i> ." "Used to uniquely identify an ITS regulatory region (ITS-RR) in the ITS-S communication profile selection process specified in ISO/TS 17423. The following types of regulatory regions are identified: radio regulation, security regulation, privacy regulation, traffic regulation"	ITSrrID::=VarLengthNumber	J	Unclear and not needed.	
relevance Zonelds	"List of Identifier(s) of the definition(s) of the Relevance Zone(s), to which the IVS Container applies, using the DE <i>Zid</i> ."	SEQUENCE (SIZE (1..8,...)) OF Zid OPTIONAL	U	As eventHistory from event position. Minimum one Zid as relevance section of the event.	by TMS or PF
direction	"Direction of relevance within the relevance zone using the DE <i>direction</i> ."	INTEGER{ sameDirection (0), oppositeDirection (1), bothDirections (2), valueNotUsed } (0..3)	U	Is always set to sameDirection (0) with respect to the <i>zoneHeading</i>	is 0.
driver Awareness Zonelds	"List of Identifier(s) of the definition(s) of the Driver Awareness Zone(s), using the DE <i>Zid</i> ."	SEQUENCE (SIZE (1..8,...)) OF Zid OPTIONAL	J	For FR, appropriate displaying on on-board HMI is automotive constructors' domain only.	
minimum Awareness Time	"Time in tenths of seconds before the vehicle enters the relevance area, in which the IVI should be available as a minimum. "	INTEGER (0..255) OPTIONAL	J	Same that above. For FR, appropriate displaying on on-board HMI is automotive constructors' domain only.	
applicable Lanes	List of identifiers of the lane(s) to which the IVS Container applies using the DE <i>LaneNumber</i> .	SEQUENCE (SIZE (1..8,...)) OF LanePosition OPTIONAL LanePosition ::= INTEGER {offTheRoad(-1), hardShoulder(0), outermostDrivingLane(1), secondLaneFromOutside(2)} (-1..14)	S	See each UC. When used, each lane of the carriageway should be described (so that total number of lanes is known).	by PF

IVI standard (ISO TS 19321)			IVI Master choices		
Field/IVI	Description / Meaning	Type of data	Status	Content	Value set
iviType	<p>"Priority of the Container information within the overall context of IVI. See DE <i>IVIType</i>."</p> <p>This DE is used to determine the priority of the IVI message. Higher priority message are : 0 and 1</p> <p>Lower priority message are : 2, 3 and 4</p>	<p>INTEGER</p> <p>{ immediateDangerWarningMessages (0), regulatoryMessages (1), trafficRelatedInformationMessages (2), pollutionMessages (3), notTrafficRelatedInformationMessages (4) } (0..7)</p>	]	See each UC	by PF
iviPurpose	<p>"The data element IviPurpose provides the purpose of the IVI for further usage by the receiving ITS-S."</p> <p>This informs the receiving ITS-S on how the message should be used.</p>	<p>INTEGER { safety (0), environmental (1), trafficOptimisation (2) } (0..3)</p>	]	Not really needed, no real additive information compared with iviType.	
laneStatus	<p>Status of the lane(s) to which the Application Container Part applies. See DE <i>LaneStatus</i>.</p>	<p>INTEGER { open (0), closed (1), mergeR (2), mergeL (3), mergeLR (4), provisionallyOpen (5), diverging (6) — value 7 reserved for future use } (0..7, ...)</p>	]	Not used for the UC of this set of documents.	

IVI standard (ISO TS 19321)			IVI Master choices		
FieldIVI	Description / Meaning	Type of data	Status	Content	Value set
vehicle Characteristics	<p>"Characteristics of vehicle, for which the IVI is applicable. See DE CompleteVehicleCharacteristics. The applicable regulations, such as limits, are defined as part of the roadSignCode component."</p> <p>Can be used to communicate vehicle restrictions within the relevance zone.]</p>	<p>CompleteVehicleCharacteristics::= SEQUENCE{ tractor TractorCharacteristics OPTIONAL, trailer SEQUENCE (SIZE (1..3)) OF TrailerCharacteristics OPTIONAL, train TrainCharacteristics OPTIONAL }</p> <p>TractorCharacteristics::= SEQUENCE{ equalTo SEQUENCE (SIZE (1..4,...)) OF VehicleCharacteristicsFixValues OPTIONAL, notEqualTo SEQUENCE (SIZE (1..4,...)) OF VehicleCharacteristicsFixValues OPTIONAL, ranges SEQUENCE (SIZE (1..4,...)) OF VehicleCharacteristicsRanges OPTIONAL }</p> <p>TrailerCharacteristics::= SEQUENCE{ equalTo SEQUENCE (SIZE (1..4,...)) OF VehicleCharacteristicsFixValues (WITH COMPONENTS {..., euroAndCo2value ABSENT, engineCharacteristics ABSENT}) OPTIONAL, notEqualTo SEQUENCE (SIZE (1..4,...)) OF VehicleCharacteristicsFixValues (WITH COMPONENTS {..., euroAndCo2value ABSENT, engineCharacteristics ABSENT}) OPTIONAL, ranges SEQUENCE (SIZE (1..4,...)) OF VehicleCharacteristicsRanges (WITH COMPONENTS {comparisonOperator, limits (WITH</p>	S	<p>To be provided when IVI concerns specific type of vehicles. Optional.</p> <p>In case train is used with ranges, all DE of the DF used (e.g vehicleWeightLimits) are filled. For Int2 data it is assumed that the value "0" means "noEntry" (not literally explained in the ISO 14906 standard for Int2 values but several DE uses "0" for "noEntry" (e.g euroValue, copValue, DescriptiveCharacteristics, ...))</p>	by PF

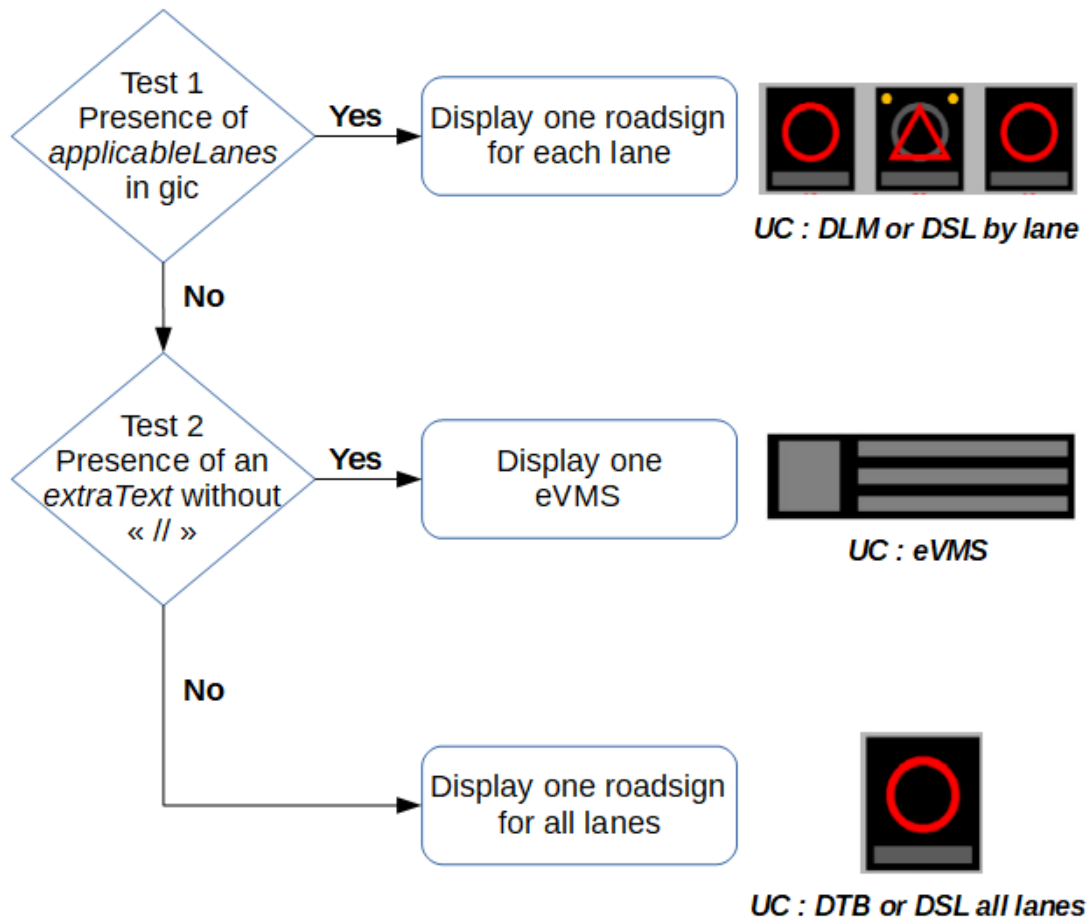
IVI standard (ISO TS 19321)			IVI Master choices		
Field/IVI	Description / Meaning	Type of data	Status	Content	Value set
driver Characteristics	"Driver characteristics relevant for regulations. See DE <i>DriverCharacteristics</i> ."	DriverCharacteristics ::= INTEGER{ unexperience dDrivers (0), experiencedDrivers (1), rfu1 (2), rfu2 (3) } (0..3)	]	Not needed for the UC of this set of documents (and seems useless in any case)	
layoutId	"Identifier of the connected layout definition in the IVI Structure."	INTEGER(1..4,...) OPTIONAL ref. to LayoutContainer	]	C-Roads PF choice is: no intrusion on how to display on HMI through IVI. So layoutId won't be used, because layoutContainer won't be defined.	
preStore d LayoutId	"Identifier of a pre-stored layout definition." "the component preStoredLayoutId to connect the content of the IVS container to a pre-stored layout template defined by the Service Provider."	INTEGER(1..64,...) OPTIONAL	]	C-Roads PF choice is: no intrusion on how to display on HMI through IVI. As for LayoutId and layoutComponent, preStoredLayoutId won't be used.	

IVI standard (ISO TS 19321)			IVI Master choices		
FieldIVI	Description / Meaning	Type of data	Status	Content	Value set
roadSign Codes	"Ordered list of applicable road sign codes according to the selected catalogue, including additional attributes, using the DF RSCode. If present, an additional panel shall follow the sign to which it is associated."	<p>roadSignCodes SEQUENCE (SIZE (1..4),...) OF RSCode</p> <p>RSCode ::= SEQUENCE { layoutComponentId INTEGER (1..4,...) OPTIONAL, code CHOICE { viennaConvention VcCode, ISO 14823 ISO 14823Code, itisCodes INTEGER (0..65535), anyCatalogue AnyCatalogue, ... } }</p> <p>ISO14823Code ::= SEQUENCE { pictogram Code SEQUENCE { countryCode OCTET STRING (SIZE (2)) OPTIONAL, serviceCategoryCode CHOICE { trafficSignPictogram ENUMERATED { dangerWarning, regulatory, informative, ... }, publicFacilitiesPictogram ENUMERATED { publicFacilities, ... }, ambientOrRoadCondition Pictogram ENUMERATED { ambientCondition, roadCondition, ... }, ... }, pictogram CategoryCode nature INTEGER (1..9), serialNumber INTEGER (0..99) } }, Attributes ISO14823Attributes OPTIONAL }</p>		<p>C-Roads PF chooses to opt for TS14823:2017.</p> <p>Some examples (nature / serialNumber):</p> <ul style="list-style-type: none"> - Lane closed (6 / 59), - Lane free (6 / 60) - Clear lane to left (6 / 61), - Clear lane to right (6 / 62), - Overtaking prohibited (5 / 42), - Overtaking by goods vehicles prohibited (5 / 44), - Maximum speed (5 / 57), - Other danger (9 / 99) <p>...</p> <p>For FR, it involves to have a table to pass from IISR9 (French standard and references used by TCC) to TS14823:2017. ► A document deals with this subject. (see annex #1 of the Master)</p>	by PF

IVI standard (ISO TS 19321)			IVI Master choices		
FieldIVI	Description / Meaning	Type of data	Status	Content	Value set
extraText	"List of text lines associated to the ordered list of road sign codes. Each piece contains language code plus extra, limited-size text in the selected language using the DF Text."	<p>extraText SEQUENCE (SIZE (1..4),...) OF Text (WITH COMPONENTS</p> <p>Text::= SEQUENCE { layoutComponentId INTEGER(1..4,...) OPTIONAL, language BIT STRING (SIZE(10)), textContent UTF8String }</p>	S	<p>Can be used to send a message for clarification or additional information.</p> <p>As layout won't be defined but layoutComponentId is here mandatory, it will always be set to "1".</p> <p>Language should be set to "10110 01010" for FR/France (see serviceProviderId/countryCode) due to difficulties to do multiple languages (no possibility to set in TMS multiple languages and automatic translation word by word is not appropriate)</p>	by TCC
Road Configuration Container			┘	See next line.	
	"The purpose for the Road Configuration Container is to convey information regarding the actual or planned configuration of a road segment in one or more zone(s). This information can be used by the receiving ITS-S to support use cases like In-vehicle Signage, Contextual Speeds, and Road Works Warning and/or for localization purposes."	<p>SEQUENCE (SIZE (1..16,...)) OF RccPart</p> <p>RccPart::= SEQUENCE{ zoneIds SEQUENCE (SIZE (1..8,...)) OF Zid, roadType RoadType, laneConfiguration SEQUENCE (SIZE (1..16,...)) OF LaneInformation, ... }</p> <p>LaneInformation::= SEQUENCE{ laneNumber LanePosition, direction Direction, validity DTM OPTIONAL, laneType LaneType, laneTypeQualifier CompleteVehicleCharacteristics OPTIONAL, laneStatus LaneStatus, laneWidth LaneWidth OPTIONAL, ... }</p>	▲	Useless as it is not possible to describe the number of lane of one segment in IVI, as it is possible to do so in DENM (through closedLanes/drivingLaneStatus).	
Text Container			┘	See next line	

IVI standard (ISO TS 19321)			IVI Master choices		
FieldIVI	Description / Meaning	Type of data	Status	Content	Value set
	<p>"The purpose for Text Container is to allow the presentation of additional information for usage in the in-vehicle signage use case or of information which is not IVS related. This information is in the form of text or an image file."</p>	<p>SEQUENCE (SIZE (1..16,...)) OF TcPart</p> <p>TcPart ::= SEQUENCE { detectionZonelds SEQUENCE (SIZE (1..8,...)) OF Zid OPTIONAL, relevanceZonelds SEQUENCE (SIZE (1..8,...)) OF Zid, direction, driverAwarenessZonelds SEQUENCE (SIZE (1..8,...)) OF Zid OPTIONAL, minimumAwarenessTime INTEGER (0..255) OPTIONAL, applicableLanes SEQUENCE (SIZE (1..8,...)) OF LanePosition OPTIONAL, layoutId INTEGER(1..4,...) OPTIONAL, preStoredlayoutId INTEGER(1..64,...) OPTIONAL, text SEQUENCE (SIZE (1..4,...)) OF Text OPTIONAL, data OCTET STRING, ... }</p>	▲	Not needed for the UC of this document.	
Layout Container			┘	See next line	
	<p>"The purpose for the Layout Container is to convey information about the suggested layout of the information provided by General IVI Container(s) and/or Text Container(s) being displayed to the driver. This can be used, for example, to present the information in the vehicle with a similar arrangement as is presented on the road, i.e. by reflecting the real layout of the VMS on the road or in other more appropriate ways."</p>	<p>SEQUENCE{ layoutId INTEGER(1..4,...), height width INTEGER(10..265) OPTIONAL, layoutComponents SEQUENCE SIZE (1..4,...) OF LayoutComponent, ... }</p>	▲	FR choice is: no intrusion on how to display on HMI through IVI. So layoutContainer won't be defined.	

To clarify the process that could be done by a vehicle-receiver of an IVI and choose the appropriate format solution to display the IVI message on HMI, the following logigram may be followed :



3.3 SPaT/Map

The whole profile is detailed in G1 - GLOSA document.

3.4 POI

POI UC uses descriptions out of standard, but inspired by ETSI TS 101 556-1 V1.1.1 "Electric Vehicle Charging Spot Notification Specification". This standard is pointed by ETSI 102 894-2 V1.2.1 "common data dictionary", chapter A.114 on DF_ItsPduHeader, for integer associated to messageID : "poi(3): Point of Interest message as specified in ETSI TS 101 556-1".

The standard is respected until the POIType, where value 1 is still used for EVCS (Electrical Vehicle Charging Station) as described in the standard, but other values are defined out of standard to address the new use cases.

DF/DE conserved from current standard :

```
POIType ::= INTEGER(0..65535)

ItsPOIHeader ::= SEQUENCE {
    poiType POIType,
    timeStamp TimestampIts,
    relayCapable BOOLEAN
}
```

Beginning of the structure conserved from the current standard :

```
EvcsnPdu ::= SEQUENCE {
    header ItsPduHeader,
    evcsn EVChargingSpotNotificationPOIMessage
}

EVChargingSpotNotificationPOIMessage ::= SEQUENCE {
    poiHeader ItsPOIHeader, -- Specific POI Message Header
}

As following :
```

```
xxxPdu ::= SEQUENCE {
    header ItsPduHeader,
    xxx xxxMessage
}

xxxMessage ::= SEQUENCE {
    poiHeader ItsPOIHeader,
```

At this point the POIType has just been given (ItsPOIHeader contains POIType). This is this POIType that gives the structure to follow to decode the message as following :

Value	Type	Additional description	Use case an structure to use for decoding
0	Unknown	An unknown type	
		Electric vehicle Charging spot	Standard / EVCSNPdu structure
11	Slots	Port slots	J3 MCTO UC / shall use SlotsPdu structure
12	Docks	Port Docks	J2 MCTO UC / shall use DocksPdu structure
4013	TrainStation		
4100	CommuterRailStation	Commuter rail station, such as a metro station	
4170	BusStation		
4482	FerryTerminal		

Common technical specifications for use cases

4581	Airport		
5540	PetrolStation	A petrol / gas station	(no UC yet / may use BasicPoiPdu structure)
5800	Restaurant		(no UC yet / may use BasicPoiPdu structure)
7011	HotelMotel	A hotel or motel	(no UC yet / may use BasicPoiPdu structure)
7520	ParkingLot	A parking lot (free park)	F1 UC / shall use BasicPoiPdu structure
7521	ParkingGarage	A parking garage (not free)	F1 UC / shall use BasicPoiPdu structure
7522	ParkAndRide	A Park & Ride facility	F1 UC / shall use BasicPoiPdu structure
8060	Hospitals		(no UC yet / may use BasicPoiPdu structure)
9221	PoliceStation		
20023	CargoCentre		
20026	Campground	(whithout caravanning)	(no UC yet / may use BasicPoiPdu structure)
20027	CaravanSite		(no UC yet / may use BasicPoiPdu structure)
20028	CoachandLorryParking	Bus and Truck Parking	F1 UC / shall use BasicPoiPdu structure
20033	Stadium	Stadium (nationaly known)	
20061	ConcertHall		(no UC yet / may use BasicPoiPdu structure)
20114	ToiletPublicAmenities	Toilet/Public Amenities	

Common DF and DE for all the structure :

standard ETSI TS 101 556-1 modified			Master choices		
Field	Description / Meaning	Type of data	Status	Content	Value set
header		ItsPduHeader		<p>Contained in xxxPdu</p> <p>BasicPoiPdu ::= SEQUENCE {</p> <p>header ItsPduHeader,</p> <p>xxx xxxPoiMessage</p> <p>}</p>	
protocol Version	"Version of the ITS message and/or communication protocol."	INTEGER{ currentVersion(1) } (0..255)	1	Current version is 1.	is 1
messageID	"Type of the ITS message."	INTEGER{ denm(1),cam(2), poi(3), spat(4), map(5), ivi(6), ev-rsr(7) } (0..255),	1	is poi(3)	is 3
stationID	"The identifier of the ITS-S that generates the ITS message in question." This is the ID of the station broadcasting the message.	INTEGER(0..4294967295)	1	ID of the R-ITS-S or Nfr-ITS-S (I2V)	by R-ITS-S or Nfr-ITS-S
xxx		xxxMessage ::= SEQUENCE { poiHeader ItsPOIHeader, ...by UC...}			
poiHeader		ItsPOIHeader ::= SEQUENCE {poiType POIType, timeStamp Timestamps, relayCapable BOOLEAN}	1	Same than in TS 101 556-1. See three next lines.	▼▼▼
poiType	Type of POI regarding a table of correspondence with the type of POI	INTEGER(0..65535)	1	See previous table.	by PF

standard ETSI TS 101 556-1 modified			Master choices		
Field	Description / Meaning	Type of data	Status	Content	Value set
L_timestam mp	The MinuteOfTheYear data element expresses the number of elapsed minutes of the current year in the time system being used (typically UTC time).	TimestampPlts ::= INTEGER {utcStartOf2004(0), oneMillisecAfterUTCStartOf2004(1)} (0..4398046511103)	I	Mandatory to have a versioning of POI information broadcasted by the station.	by PF
L_relayCap able	Indicates whether the originating ITS station is able to relay further reservation messages	BOOLEAN	I	Set to "false", not needed (specific for EVCS)	is "false"
<i>Common DE</i>				<i>Common DE for several POIType (F1, MCTO, ...)</i>	
<i>OpeningPe</i> <i>riod</i>		OpeningPeriod ::= SEQUENCE { opening TimeOfDay, closing TimeOfDay }	S	Used when time periods of opening hours needs to be provided.	
<i>TimeOfDay</i>		TimeOfDay ::= INTEGER { midnight(0), oneMinuteAfterMidnight(1) } (0..1440)	S	Format of the time of day.	

4. Type of Datex II typology use case

	D7	C3	B1a	B1b	C2	G1	I3	H4	D12	F1	H2	H6	K
2Way_Punctual_AllTrafficDirection													
2Way_Punctual_UpStream_Aligned													
2Way_Punctual_UpStream_Opposite													
2Way_Linear_AllTrafficDirection													
2Way_Linear_UpStream_Aligned		X			X			X			X	X	
2Way_Linear_UpStream_Opposite		X			X			X			X	X	
DualCarriageWay_Punctual_AllTrafficDirection													
DualCarriageWay_Punctual_UpStream_Aligned			X	X									
DualCarriageWay_Punctual_UpStream_Opposite			X	X									
DualCarriageWay_Linear_AllTrafficDirection													
DualCarriageWay_Linear_UpStream_Aligned	X	X	X	X	X			X			X	X	
DualCarriageWay_Linear_UpStream_Opposite	X	X	X	X	X			X			X	X	

5.

6. SSP

6.1 DENM

ITS-AID value: 37 (ref. TS 102 965)

SSP (ref. ETSI EN 302 637-3)

Octet Position	Bit Position	CauseCodeType / Container	Vru-ITS-S (PSA, Renault)	Vro-ITS-S in user mode	Vro-ITS-S in operator mode	R-ITS-S	Nfr-ITS-S
1	0	trafficCondition(1) <u>or railwayLevelCrossing (100)</u>	0	0	0	1	1
1	1	accident(2)	1	1	1	1	1
1	2	roadworks(3)	0	0	1	1	1
1	3	adverseWeatherCondition-Adhesion(6)	1	1	1	1	1
1	4	hazardousLocation-SurfaceCondition(9)	1	1	1	1	1
1	5	hazardousLocation-ObstacleOnTheRoad(10)	1	1	1	1	1
1	6	hazardousLocation-AnimalOnTheRoad(11)	1	1	1	1	1
1	7	humanPresenceOnTheRoad(12)	1	1	1	1	1
2	0	wrongWayDriving(14)	0	0	0	1	1
2	1	rescueAndRecoveryWorkInProgress(15)	0	0	1	0	0
2	2	adverseWeatherCondition-ExtremeWeatherCondition(17)	0	0	0	1	1
2	3	adverseWeatherCondition-Visibility(18)	1	1	1	1	1
2	4	adverseWeatherCondition-Precipitation(19)	1	1	1	0	0
2	5	slowVehicle(26)	0	0	1	0	0
2	6	dangerousEndOfQueue(27)	1	1	1	1	1
2	7	vehicleBreakdown(91)	0	0	0	0	0
3	0	postCrash(92)	0	0	0	0	0
3	1	humanProblem(93)	0	0	0	0	0
3	2	stationaryVehicle(94)	1	1	1	1	1
3	3	emergencyVehicleApproaching(95)	0	0	1	0	0
3	4	hazardousLocation-DangerousCurve(96)	0	0	0	0	0
3	5	collisionRisk(97)	0	0	0	0	0
3	6	signalViolation(98)	0	0	0	0	0
3	7	dangerousSituation(99)	1	1	1	0	0

If value is underlined: the value has been changed since 2.4.4.8 release 2 of SCOOP

6.2

6.3 IVI

ITS-AID value: 139 (ref. TS 102 965)

SSP (ref. ETSI TS 103 301 V 1.1.1 or 1.2.1)

Octet Position	Bit Position	IVI data Item	Vru-ITS-S (PSA, Renault)	Vro-ITS-S in user mode	Vro-ITS-S in operator mode	R-ITS-S	Nfr-ITS-S
4	0	Vienna Convention Code for road sign	0	0	0	0	0
4	1	ISO/TS14823 traffic sign pictogram (danger warning)	0	0	0	1	1
4	2	ISO/TS14823 traffic sign pictogram (regulatory)	0	0	0	1	1
4	3	ISO/TS14823 traffic sign pictogram (informative)	0	0	0	1	1
4	4	ISO/TS14823 traffic sign pictogram (public facilities)	0	0	0	1	1
4	5	ISO/TS14823 traffic sign pictogram (ambient condition)	0	0	0	1	1
4	6	ISO/TS14823 traffic sign pictogram (road condition)	0	0	0	1	1
4	7	ITIS codes	0	0	0	0	0
5	0	Lane status	0	0	0	1	1
5	1	Road configuration container	0	0	0	1	1
5	2	Text container	0	0	0	1	1
5	3	Layout container	0	0	0	0	0
5	4	IVI status negation	0	0	0	0	0

6.4 MAP (RLT)

ITS-AID value: 138 (ref. TS 102 965)

SSP (ref. ETSI TS 103 301 V 1.2.1*)

Octet Position	Bit Position	RLT service SSP data Item	Vru-ITS-S (PSA, Renault)	Vro-ITS-S in user mode	Vro-ITS-S in operator mode	R-ITS-S	Nfr-ITS-S
1	0	Intersection geometry list allowed to transmit	0	0	0	1	1
1	1	Road geometry list allowed to transmit	0	0	0	1	1

*: V 1.2.1 is preferred for SSP of RLT, because data item of V 1.1.1 seems inappropriate to specify properly the permissions in regard of the use cases.

6.5

6.6 SPAT (TLM)

ITS-AID value: 137 (ref. TS 102 965)

SSP (ref. ETSI TS 103 301 V 1.2.1*)

Octet Position	Bit Position	SPATEM data Item	Vru-ITS-S (PSA, Renault)	Vro-ITS-S in user mode	Vro-ITS-S in operator mode	R-ITS-S	Nfr-ITS-S
1	0	Signal Phase and Timing	0	0	0	1	1
1	1	Public transport prioritization status response	0	0	0	1	1
1	2	Maneuver assisting information	0	0	0	0	0

*: V 1.2.1 is preferred for SSP of TLM, because data item of V 1.1.1 seems inappropriate to specify properly the permissions in regard of the use cases.

6.7 CAM

ITS-AID value: 36 (ref. TS 102 965)

SSP (ref. ETSI EN 302 637-2)

Octet Position	Bit Position	Permission Items	Vru-ITS-S (PSA, Renault)	Vro-ITS-S in user mode	Vro-ITS-S in operator mode	R-ITS-S	Nfr-ITS-S
1	0	CenDsrcTollingZone/ ProtectedCommunicationZonesRSU	0	0	0	1	0
1	1	publicTransport / publicTransportContainer	0	0	0	0	0
1	2	specialTransport / specialTransportContainer	0	0	0	0	0
1	3	dangerousGoods / dangerousGoodsContainer	0	0	0	0	0
1	4	roadwork / roadWorksContainerBasic	0	0	1	0	0
1	5	rescue / rescueContainer	0	0	0	0	0
1	6	emergency / emergencyContainer	0	0	1*	0	0
1	7	safetyCar / safetyCarContainer	0	0	0	0	0
2	0	closedLanes / RoadworksContainerBasic	0	0	0	0	0
2	1	requestForRightOfWay / EmergencyContainer: EmergencyPriority	0	0	1*	0	0

Common technical specifications for use cases

2	2	requestForFreeCrossingAtATrafficLight / EmergencyContainer: EmergencyPriority	0	0	1*	0	0
2	3	noPassing / SafetyCarContainer: TrafficRule	0	0	0	0	0
2	4	noPassingForTrucks / SafetyCarContainer: TrafficRule	0	0	0	0	0
2	5	speedLimit / SafetyCarContainer	0	0	0	0	0
2	6	reserved for future usage	0	0	0	0	0
2	7	reserved for future usage	0	0	0	0	0

*: only for specific test-vehicles dedicated to test the emergency vehicle approaching use-case.

If value is underlined: the value has been changed since 2.4.4.8 release 2 of SCOOP

6.8 POI

ITS-AID value: 16 491 (test)

SSP (test)

Octet Position	Bit Position	POI service SSP data Item	Vru-ITS-S (PSA, Renault)	Vro-ITS-S in user mode	Vro-ITS-S in operator mode	R-ITS-S	Nfr-ITS-S
1	0	POI information list allowed to transmit	0	0	0	1	1