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# Project memo

## Standardized messages in C-ITS

The CAN and DENM standards

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**ABSTRACT**
This memo summarizes the Cooperative Awareness Message (CAM) and Decentralized Environmental Notification Message (DENM) message format for C-ITS. CAM and DENM are standardized by ETSI in ETSI EN 302 637-2 (v.1.3.2 used here) and ETSI EN 302 637-3 (v.1.2.1 used here) respectively.

The memo also describes some of the intended use cases for these message types. The memo focuses on the content of the messages, and does not describe or take into account the network of the data communication other than in an overall view where this is required to explain critical aspects. Parties interested in the network and data communication is referenced to standards such as ETSI EN 302 636-4-1 and ETSI EN 302 636-4-2 (Geo-Networking), ETSI EN 302 636-5-1 (BTP) and ETSI EN 302 636-6-1 (IPv6 over GN) for a starting point.

An overview off all the standards that entails the CEN/ISO Release 1 for cooperative ITS can be seen at http://release1.its-standards.eu.

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# Table of contents

# 1 Introduction

This memo contains an introduction to how to read the standard for Cooperative Awareness Message (CAM) and Decentralized Environmental Notification Message (DENM) messages. Hopefully this will give readers without a high degree of knowledge on computer programming the tools needed to read and understand the data packages as described in the standards (using ASN.1 notation).

In Cooperative ITS (C-ITS) data messages is used to communicate between entities in the transportation network. Two types of such data messages are the Cooperative Awareness Message (CAM) and Decentralized Environmental Notification Message (DENM) messages. The reader should note that although the data structure for CAM and DENM messages are standardized, the algorithms used to generate the messages are only described by ETSI on a general level. As such, only the data structures are described here, for the purpose of show an overview of the intended use of the CAM and DENM messages. Also, note that security and certificate handling is not described here for simplicity (see ETSI TS 103 097 for more information on security handling).

When considering C-ITS systems it is usual to consider the parties communicating. If two or more vehicles are communicating, this is referred to as vehicle-to-vehicle (V2V and V2x) communication. If one of the participants is a roadside unit, it is considered an infrastructure to vehicle (I2V and V2I) communication. The entities, such as a vehicle or a roadside unit, run ITS applications that consumes or generate C-ITS data messages.

CAM and DENM data messages are broadly described as data messages containing data for two distinct use cases. Transmission of data between and about entities such as vehicles and roadside units are typically handled in CAM messages. Transmission of data about areas is typically handled in DENM messages. One example of this is for instance the "roadwork" field in a CAM message, that indicates that a vehicle is performing some sort of road maintenance (for instance a vehicle performing side area grass cutting), while "roadwork" in a DENM message is used to notify about work in a whole area (for instance street sweeping). In some cases the use of CAM and DENM will complete each other. An example of this would be a vehicle that performs street sweeping, transmitting CAM messages containing "roadwork", while roadside units are transmitting DENM messages containing data that "roadwork" (street sweeping) is performed in the given area.

The reader should note that CAM messages are generated by an entity consecutively, but an application running on the entities system may be allowed to set the value in certain data fields in the CAM. Such and application may set data vales based on data received from sensors, or even from operators using a GUI. One example could be that a street sweeping vehicle only transmits CAM messages with "roadwork" data set on when the operator actually performs street sweeping. At all other times it transmit CAM messages with "roadwork" data set off. DENM operates in a similar approach.

Note that one could draw distinction between use of CAM and DENM messages based on the communication intent (V2V CAM, I2V CAM, V2V DENM and I2V DENM), but this approach is not used in this memo to simplify and avoid any confusion.

The European Commission and the Amsterdam group (an interest group backed by the European Research Agency for promoting the rollout of C-ITS), have summarized several day-one-applications that are close to

implementation. Table 1 show an overview of the applications that require CAM and/or DENM functionality. Note that only applications using CAM and/or DENM are included here. In addition, only applications that are under development, or planned implemented on real roads in the imminent future i.e. day-one applications, are included here. The final list of the 25 defined day-one and day-one-and-a-half applications are described in the C-ITS Platform report (and Annex 1 by WG1). A description of the actual functionality of each planned C-ITS applications can be found in ETSI TR 102 638.

**Table 1 Day-one applications use of CAM and DENM.**

| Use Case | Domain/Trigger | Message standards |
|---|---|---|
| Hazzard location warning | Safety | DENM |
| Slow vehicle warning | Safety | CAM |
| Traffic Jam ahead warning | Safety | CAM/DENM |
| Road work warning | Safety | DENM |
| Decentralised floating car data | Safety, Efficiency | CAM/Others |
| Dynamic corridor control traffic light optimization | Safety, Efficiency | CAM/Others |
| Emergency vehicle warning | Safety | CAM/DENM |
| Emergency brake light | Safety | CAM/DENM |
| Motorcycle approaching indicator | Safety | CAM |

## 2 CAM – Cooperative Awareness Message

A CAM message is intended to be sent out and received repeatedly by participants, typically a vehicles or a roadside unit, in a C-ITS enabled road network (Figure 1). The data package is intended to be used by other nearby participants. Typically, the data package contains information on location, speed, vehicle type and such on. As such it can be described as a "ping" (in submarine terminology). The range the data package itself is transmitted is typically limited by the underlying communication interface, and the frequency of transmission may vary with the number of vehicles or roadside units nearby, to ensure enough bandwidth (as wireless transmission is typically used). However, note that data packages can be forwarded by relay so actual range can be large.

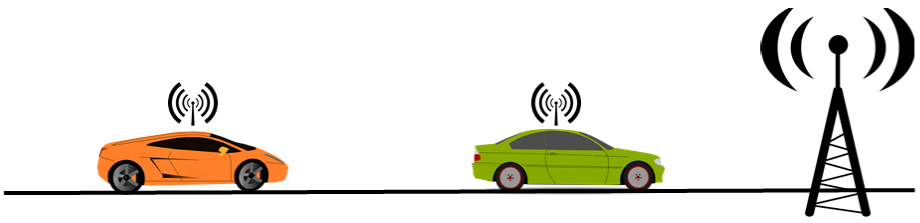


**Figure 1 Vehicles and infrastructure both transmit and receive CAM messag**

A CAM data package is composed of an ITS PDU header (Packet Data Unit) and multiple data containers in the message body. The ITS PDU header is a common header that includes the information of the protocol version, the message type and the ITS Station (ITS-S) ID of the originating ITS-S.

For a vehicle ITS-S, a CAM comprises of one basic container and one high frequency container and may also include one low frequency container and one or more other special containers. The data in the low data frequency container seldom changes, while the data in the high frequency container can typically change in 1-10Hz (where 10Hz is max according to the standard):

- The *basic container* includes basic information related to the originating ITS-S.
- The *high frequency container* contains highly dynamic information of the originating ITS-S.
- The *low frequency container* contains static and not highly dynamic information of the originating ITS-S.
- The *special vehicle container* contains information specific to the vehicle role of the originating vehicle ITS-S.

All CAMs generated by a Road-Side Unit (RSU) station shall include a basic container and optionally more containers. A roadside unit will typically send CAM messages that contains other containers than the basic container to broadcast that it support specific ITS services. Note that a roadside ITS-S that transmit CAM messages is identified as such using the "StationType" data field. Data fields such as speed or driving direction is typically set to zero or the default value.

In Figure 2, we can see an overview of the data package, and how the containers are organized with respect to each other.

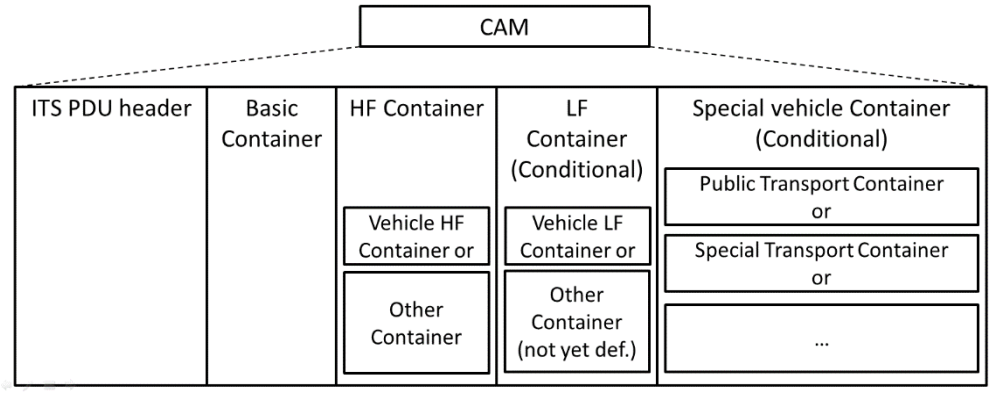



**Figure 2 Overview of a CAM message, recreated from ETSI EN 302 637-2**

Each data container will contain the actual data. The data may be summarize in a list sorted by container:

**CAM**
- **ItsPduHeader**
  - **protocolVersion**
  - **messageID**
  - **stationID**
- **CoopAwareness**
  - **GenerationDeltaTime**
  - **CamParameters**
    - **BasicContainer**
      - StationType,
      - ReferencePosition
    - **HighFrequencyContainer**
      - **BasicVehicleContainerHighFrequency**
        - Heading
        - Speed
        - DriveDirection
        - VehicleLength
        - VehicleWidth
        - LongitudinalAcceleration
        - Curvature
        - CurvatureCalculationMode
        - YawRate
        - AccelerationControl OPTIONAL
        - LanePosition OPTIONAL
        - SteeringWheelAngle OPTIONAL
        - LateralAcceleration OPTIONAL
        - VerticalAcceleration OPTIONAL
        - PerformanceClass OPTIONAL
        - CenDsrcTollingZone OPTIONAL
      - **RSUContainerHighFrequency,**
        - ProtectedCommunicationZonesRSU OPTIONAL
    - **LowFrequencyContainer(OPTIONAL)**
      - **BasicVehicleContainerLowFrequency**
        - VehicleRole
        - ExteriorLights
        - PathHistory
    - **SpecialVehicleContainer(OPTIONAL)**
      - **PublicTransportContainer**
        - EmbarkationStatus
        - PtActivation OPTIONAL
      - **SpecialTransportContainer**
        - SpecialTransportType
        - LightBarSirenInUse
      - **DangerousGoodsContainer**
        - DangerousGoodsBasic

**RoadWorksContainerBasic**
RoadworksSubCauseCode OPTIONAL
LightBarSirenInUse
ClosedLanes OPTIONAL
**RescueContainer**
LightBarSirenInUse
**EmergencyContainer**
LightBarSirenInUse
incidentIndication CauseCode OPTIONAL
EmergencyPriority OPTIONAL
**SafetyCarContainer**
LightBarSirenInUse
incidentIndication CauseCode OPTIONAL
TrafficRule OPTIONAL
SpeedLimit OPTIONAL
**... (Undefined containers)...**
**End CAM**

An in-depth explanation on how to read the standards may be found in appendix 0 (in Norwegian only),

# 3 DENM - Distributed Environment Notification Message

In a C-ITS enabled road network , a DENM message is intended to be sent out by participants, typically a vehicle, a roadside unit or a cell tower. The data package is typically intended for use by participants in a defined area. A vehicle may be tasked to forward a DENM message to other participants in or around the defined area. A DENM message will contain data valid until it is cancelled by another DENM message.

DENM support GeoNetworking. This is data transfer using ad hock network, with no fixed infrastructure requirement. A message can then be routed using Geocast routing. In Geocasting a message has a geographic position as target, and is forwarded using the geographic position of the network nodes (vehicles) and the target position. As such, vehicles may be tasked with resending the message to keep it alive until a cancelation message is received. Note that both a roadside unit and a vehicle may be the original sender of a DENM message.

Another entity may in some cases transmit a cancellation message if the original sender is no longer available. A DENM message is sent by a vehicle or roadside unit if a trigger event occurs. The target for the message is a geographic position/area. GeoNetworking is used to forward the message. Optionally the message can be forwarded using keep-alive forwarding. Re-transmission of DENM may occur on behalf of originator by another entity. This is triggered if the originator stops sending messages within event lifetime (if originator is broken or leave area etc.).

A DENM message will typically contain data describing a situation or information, and the area the situation is valid for. Day one applications such as Hazard Location Warning and Traffic Jam Ahead warning, Emergency Vehicle Warning and Emergency Brake Light warning requires DENM messaging.

DENM messages will contain cause (eventType) and sub-cause (linkedCause) codes describing the triggering event that started the sending of the DENM message. These codes come from TISA TPEG2 TEC 3.1 (drafted to potentially become ISO/TS 21219, Part 15) and other. For instance:

1. Traffic condition
2. Accident
3. Roadworks

...

26. Slow vehicle

...

91. Vehicle breakdown
97. (Intersection) collision risk.
98. Signal violation
99. Dangerous situation

A DENM is composed of a common ITS PDU header and multiple containers, which constitutes the DENM payload (data body).

The ITS PDU header is common header that includes the information of the protocol version, the message type and the ITS-S ID of the originating ITS-S.

The DENM payload consists of four fixed order parts: the management container, the situation container, the location container and the à la carte container:

- The *management container* contains information related to the DENM management and the DENM protocol.
- The *situation container* contains information related to the type of the detected event.
- The *location container* contains information of the event location, and the location referencing.
- The *à la carte container* contains information specific to the use case which requires the transmission of additional information that is not included in the three previous containers.

For all types of DENM, the ITS PDU header and the management container shall always be present.

The situation container, the location container and the à la carte container are optional containers. For a cancellation DENM or a negation DENM, the situation container, location container and à la carte container shall not be present. If the situation container is present, the location container shall be present as well. The à la carte container is present only when applicable as specified in application specification standards, such as ETSI TS 101 539-1 and ETSI TS 101 539-3.

The DENM structure is illustrated in Figure 3.

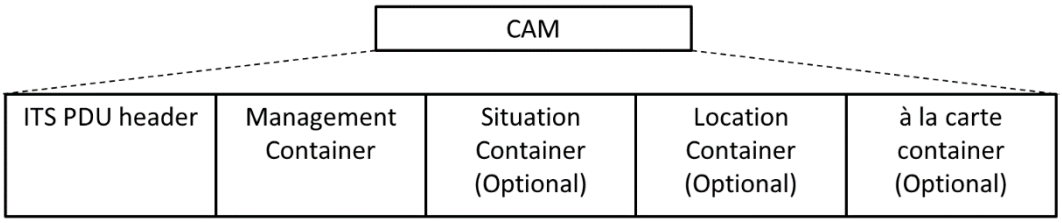



**Figure 3 Overview of a DENM message, recreated from ETSI EN 302 637-3**

Each data container will hold the actual data. One can summarize the data in a list sorted by container:

**DENM**
**ItsPduHeader**
**protocolVersion**
**messageID**
**stationID**
**DecentralizedEnvironmentalNotificationMessage**
**ManagementContainer**
ActionID,
(detectionTime) TimestampIts,
(referenceTime) TimestampIts,
Termination OPTIONAL,
(eventPosition) ReferencePosition,

RelevanceDistance OPTIONAL,
RelevanceTrafficDirection OPTIONAL,
ValidityDuration
DEFAULT defaultValidity,
TransmissionInterval OPTIONAL,
StationType,
...

**SituationContainer OPTIONAL**
InformationQuality,
eventType CauseCode,
linkedCause CauseCode OPTIONAL,
EventHistory OPTIONAL,
...

**LocationContainer OPTIONAL**
Speed OPTIONAL,
Heading OPTIONAL,
traces,
RoadType OPTIONAL,
...

**AlacarteContainer OPTIONAL**
LanePosition OPTIONAL,
**ImpactReductionContainer OPTIONAL,**
(heightLonCarrLeft) HeightLonCarr,
(heightLonCarrRight) HeightLonCarr,
(posLonCarrLeft) PosLonCarr,
(posLonCarrRight) PosLonCarr,
PositionOfPillars,
PosCentMass,
WheelBaseVehicle,
TurningRadius,
PosFrontAx,
PositionOfOccupants,
VehicleMass,
RequestResponseIndication
externalTemperature Temperature OPTIONAL,
**RoadWorksContainerExtended OPTIONAL,**
LightBarSirenInUse OPTIONAL,
ClosedLanes OPTIONAL,
RestrictedTypes OPTIONAL,
SpeedLimit OPTIONAL,
incidentIndication CauseCode OPTIONAL,
(recommendedPath) ItineraryPath OPTIONAL,
(startingPointSpeedLimit) DeltaReferencePosition OPTIONAL,
(trafficFlowRule) TrafficRule OPTIONAL,
ReferenceDenms OPTIONAL
PositioningSolutionType OPTIONAL,
**StationaryVehicleContainer OPTIONAL,**

StationarySince OPTIONAL,
stationaryCause CauseCode OPTIONAL,
(carryingDangerousGoods) DangerousGoodsExtended OPTIONAL,
NumberOfOccupants OPTIONAL,
VehicleIdentification OPTIONAL,
EnergyStorageType OPTIONAL
**... (Undefined containers)...**
**End DENM**

If an in depth explanation of the data values are required, we refer to Annex 0 (in Norwegian), on how to read the standards.

## Annex A Hvordan lese C-ITS standarder

Dette notatet inneholder en enkel innføring i hvordan CAM[1]-/DENM[2]-standardene skal leses, slik at også personer uten inngående kjennskap til programmeringsspråk kan lese dem. Meldingsdefinisjonene er gitt ved hjelp av ASN.1-notasjon, som er en standard brukt for å beskrive innhold og sending av data over datanettverk.

Både CAM- og DENM-standardene er beskrevet i offisielle dokumenter som begge inneholder vedleggene A og B, hvor A gir ASN.1-spesifikasjonen til standarden (det vil si hvordan meldingene er satt sammen), og B inneholder en beskrivelse av datastrukturene brukt i standarden (det vil si hvilke data meldingene faktisk kan inneholde).

Seksjon A.1 av dette notatet inneholder en skjematisk fremstilling av hvordan spesifikasjonene skal leses. Denne er relativt overfladisk, og støttes av en mer grundig seksjon A.2.

Data fra CAM-dokumentet er stort sett brukt som eksempler i denne gjennomgangen, men DENM-dokumentet følger akkurat samme oppbygning, og kan tolkes på nøyaktig samme måte.

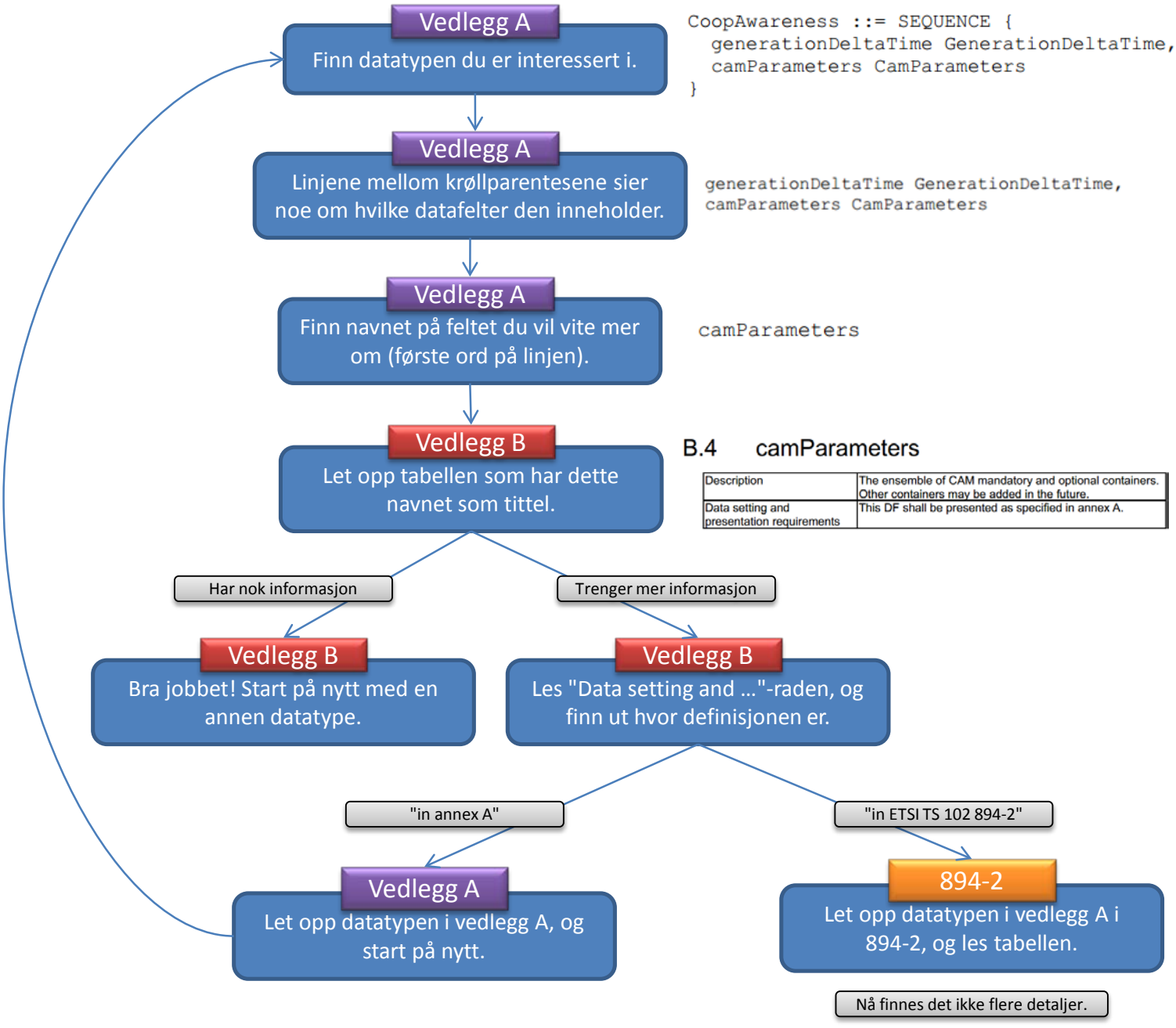
[1] Cooperative Awareness Message
[2] Decentralized Environmental Notification Message

## A.1 Skjematisk fremstilling av definisjonstolkning

Teksten til høyre (utenfor boksene) er praktiske eksempler for å demonstrere hva som menes.

"Vedlegg A" og "Vedlegg B" henviser til vedleggene i CAM- eller DENM-dokumentene.
"894-2" henviser til dokumentet "ETSI TS 102 894-2".

Se seksjon 2 for en mer gjennomgående forklaring av fremgangsmåten.



## A.2 Hvordan lese spesifikasjonene

Vedlegg A i CAM-spesifikasjonen er her brukt som eksempel. Oppsettet i DENM-spesifikasjonen er identisk. For å gjøre det lettere å følge med har vi gitt de ulike delene av koden ulike farger.

### A.2.1 Hva kan ignoreres?

Først av alt kan man vanligvis ignorere de første linjene. De er for programmerere og for at selve systemet skal vite hva som trengs for å kjøre koden. Det som er interessant for en menneskelig leser starter etter linjen:

```
--  The root data frame for cooperative awareness messages
```

### A.2.2 Datatypene i definisjonen

Under denne linjen følger definisjonen av alt innholdet i en CAM-melding. Hver av de sammenhengende blokkene med tekstlinjer representerer en *datatype*. En datatype begynner med en linje som slutter med {, og avsluttes med en }. Den første datatypen definerer "omrisset" av en CAM-melding, og ser slik ut:

```
CAM ::= SEQUENCE {
   header    ItsPduHeader,
   cam       CoopAwareness
}
```

Det vil typisk være slik at desto lengre ned i dokumentet vi beveger oss, desto mer detaljert blir informasjonen. Den første datatypen sier noe om innholdet i hele CAM-meldingen, men når vi fortsetter å arbeide oss nedover, så ser vi på innholdet i deler av CAM-meldingen.

Det første ordet i datatypen er navnet på den, og betyr at denne datatypen kan refereres til med ordet `CAM` andre steder i spesifikasjonen. Når vi leter etter en datatype, er det dette ordet vi skal se på.

Det andre ordet på første linje forteller noe om innholdet i denne datatypen. I dette tilfellet snakker vi om en `SEQUENCE`, eller en *datasekvens*, det vil si en sekvens med informasjon som følger et bestemt mønster slik at den enkelt kan tolkes hos mottakeren.

Krøllparentesene ({ og }) er brukt for å vise hva som er innholdet i datatypen, og '::=' kan trygt ignoreres. Selve mønsteret på datasekvensen er definert av linjene mellom krøllparentesene. Hver linje representerer en type informasjon, og er i følgende format:

```
navn    datatype        [ekstra informasjon]
```

Datasekvensen `CAM` inneholder dermed to typer informasjon: ett felt som heter "`header`", og ett som heter "`cam`". Vi ser at feltet "`header`" er av typen `ItsPduHeader`, og feltet "`cam`" er av typen `CoopAwareness`. Ingen av disse to feltene har noe ekstra informasjon (se seksjon A.2.5).

Det er viktig å merke seg at selv om det er oppgitt at en datatype skal inneholde et gitt felt, så kan det være situasjoner der en bilprodusent velger å sende en konstant standardverdi i stedet for faktisk informasjon.

Feltnavnene kan benyttes for å finne mer informasjon i vedlegg B. Hvis vi leter etter "cam", finner vi følgende tabell:

**Table 2 Beskrivelse av datatype.**

## B.2 cam

| | |
|---|---|
| **Description** | CAM payload. It includes the time stamp of CAM, mandatory containers basic container and high frequency container, and optional containers low frequency container and special vehicle container. The selection of the attached mandatory high frequency container depends on the ITS station type. The selection of the optional container depends on the ITS station type and other criteria e.g. vehicle role. Other containers may be added in the future. |
| **Data setting and presentation requirements** | This DF shall be presented as specified in annex A. |

Denne gir oss informasjon om innholdet i feltet (rad 1), og sier hvor vi kan finne mer informasjon (rad 2). Se seksjon A.2.6 dersom det på rad 2 *ikke* henvises til "annex A", men heller til "ETSI TS 102 894-2".

### A.2.3 Hvordan leter vi videre?

Til nå vet vi at en CAM-melding skal bestå av to datafelt, hvor det ene feltet heter "cam" og det andre heter "header". For å finne ut hvilken informasjon hvert av disse feltene inneholder, må vi lese videre.

Hvis vi vil ha mer informasjon om "cam", må vi lete etter en datatype med navn `CoopAwareness`. I tabellen vi fant i vedlegg B så vi at definisjonen av denne datatypen skal befinne seg i vedlegg A, så da må vi lete videre der. Og på de neste linjene av vedlegg A finner vi nettopp dette:

```
CoopAwareness ::= SEQUENCE {
   generationDeltaTime   GenerationDeltaTime,
   camParameters         CamParameters
}
```

Det forteller oss hvilken informasjon som ligger i datatypen `CoopAwareness`.

Tolking av ASN.1-definisjoner er i stor grad en gravejobb. Vi må nå fortsette å lete etter definisjonene av `GenerationDeltaTime` og `CamParameters` på samme måte hvis vi vil finne ut hvilken informasjon som ligger i disse feltene.

### A.2.4 Andre datatyper

Når vi graver oss gjennom ASN.1-koden kan vi også finne datatyper med andre typer enn `SEQUENCE`. For eksempel er ett av datafeltene under `CamParameters` av typen `HighFrequencyContainer`, som har type `CHOICE` i stedet for `SEQUENCE`:

```
HighFrequencyContainer ::= CHOICE {
   basicVehicleContainerHighFrequency     BasicVehicleContainerHighFrequency,
```

```
   rsuContainerHighFrequency              RSUContainerHighFrequency,
   ...  -- further type specific RSU containers might be added as extensions
}
```

Det betyr at denne datatypen vil innehold *ett* av feltene som er listet opp. Det vil altså *enten* være en `BasicVehicleContainerHighFrequency`, *eller* en `RSUContainerHighFrequency`.

Noen ganger, som i definisjonen av `HighFrequencyContainer`, vil det være tomme linjer mellom feltene. Disse har ingen betydning, og kan ignoreres. Her er det viktig å passe på at vi ikke leser feil, og tror det betyr at datatypen er ferdig – den er ikke ferdig før vi kommer til en lukkende krøllparentes ( } ).

Merk også at noen ganger slutter en datatype med tre prikker ("..."). Det betyr at det her kan komme flere datafelter i senere versjoner av CAM-dokumentet.

Tekst etter to bindestreker, som vist på den siste linjen inne i `HighFrequencyContainer`, er kommentarer. De vil ikke bli tolket av programmet, og er der kun for å opplyse en eventuell menneskelig leser om noe.

### A.2.5 Valgfrie felt

Dersom et felt ender med OPTIONAL, så betyr det at dette feltet ikke trenger å være inkludert. Hvis det ikke er inkludert vil det vanligvis være en standardverdi der i stedet for faktisk informasjon.

```
PublicTransportContainer ::= SEQUENCE {
   embarkationStatus    EmbarkationStatus,
   ptActivation         PtActivation        OPTIONAL
}
```

### A.2.6 Når kan jeg slutte å grave?

Ofte gir navnene på feltene en god beskrivelse av hva de inneholder. Hvis det er tilstrekkelig å vite at `BasicVehicleContainerHighFrequency` inneholder felt med navn `vehicleRole`, `exteriorLights` og `pathHistory`, og vi ikke trenger å vite helt detaljert hvordan disse feltene er definerte, så kan vi stoppe der.

Hvis vi derimot trenger mer informasjon må vi slå opp i vedlegg B, og se om vi finner mer informasjon der. Dersom vi fremdeles ikke er fornøyd, må vi følge sporet videre til definisjonen av datatypen. Som vist i Table 1 står dette i den andre raden i tabellen. Dersom denne henviser til "annex A" må vi tilbake til vedlegg A og lete etter datatypen, og hvis den henviser til "ETSI TS 102 894-2", så må vi inn i et helt annet dokument.

Hvis vi for eksempel slår opp datatypen `ProtectedCommunicationZonesRSU`, i vedlegg B, ser vi at feltet "shall be presented as specified in ETSI TS 102 894-2".

I dokumentet "ETSI TS 102 894-2" kan vi slå opp i vedlegg A, som inneholder en oversikt over alle de ekstra datatypene med beskrivelse, definisjon og enhet. Datatypene er prefikset med "DE_" ("Data Element" – en datatype som har én enkelt verdi) eller "DF_" ("Data Frame" – en datatype som har flere verdier), og er sorterte alfabetisk. For eksempel kan vi slå opp mer informasjon om `ProtectedCommunicationZonesRSU`:

**Table 3 Informasjon om datatype fra 894-2**

### A.122 DF_ProtectedCommunicationZonesRSU

| | |
|---|---|
| **Descriptive Name** | ProtectedCommunicationZonesRSU |
| **Identifier** | DataType_ 122 |
| **ASN.1 representation** | ProtectedCommunicationZonesRSU ::= SEQUENCE (SIZE(1..16)) OF ProtectedCommunicationZone |
| **Definition** | DF that describes a list of protected communication zones by a road side ITS-S (Road Side Unit RSU). It may provide up to 16 protected communication zones information. Each protected communication zone shall be presented as defined in clause A.121 ProtectedCommunicationZone. |
| **Unit** | N/A |
| **Category** | Infrastructure information, Communication information |

De viktigste radene i denne tabellen er vanligvis "Definition" og "Unit", som gir oss en god oversikt over hva denne datatypen forteller oss, og hvilken enhet den har. Datatypen i dette eksempelet har ingen enhet, men vi kan slå opp andre datatyper, for eksempel `NumberOfOccupants`, og se at den har enheten "1 person", som betyr at det er et tall som sier hvor mange personer som er ombord.

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