DATEX II profile for CAM Aggregation  
ECo-AT

Version 00-01-00

* 1. Overview

This profile describes the message content for the CAM aggregation use case as described by the project ECo-AT. The profile is divided into three parts: CAM location, CAM content, and CAM single vehicle data. The CAM location part describes the location information for the general CAM aggregation scenario, whereas the CAM content part describes the content information for the general CAM aggregation scenario. The CAM single vehicle data describes the location as well as the content information for the CAM single vehicle data scenario. The profile also uses level b extensions, which are also described in this document. All the extension components are colored in yellow, and the enumeration components are colored in blue. The CAM location uses “MeasuredSiteTablePublication”, the CAM content uses the “MeasuredDataPublication” and the CAM single vehicle data uses the “ElaboratedDataPublication”.

* 1. Data Dictionary for “CAM location”
     1. "Exchange" package
        1. "Exchange" package classes

| **Class name** | **Designation** | **Definition** | **Stereotype** | **Abstract** |
| --- | --- | --- | --- | --- |
| Exchange | Exchange | Details associated with the management of the exchange between the supplier and the client. |  | no |
| InternationalIdentifier | International identifier | An identifier/name whose range is specific to the particular country. |  | no |

**Table 1— Classes of the "Exchange" package**

* + - 1. "Exchange" package association roles

| **Class name** | **Role name** | **Designation** | **Definition** | **Multiplicity** | **Target** |
| --- | --- | --- | --- | --- | --- |
| Exchange | supplierIdentification | Supplier identification | An identifier/name whose range is specific to the particular country. | 1..1 | InternationalIdentifier |

**Table 2— Associations of the "Exchange" package**

* + - 1. "Exchange" package attributes

| **Class name** | **Attribute name** | **Designation** | **Definition** | **Multiplicity** | **Type** |
| --- | --- | --- | --- | --- | --- |
| Exchange | clientIdentification | Client identification | In a data exchange process, an identifier of the organisation or group of organisations which receives information from the DATEX II supplier system. | 0..1 | String |

**Table 3— Attributes of the "Exchange" package**

* + 1. "D2LogicalModel" package
       1. "D2LogicalModel" package classes

| **Class name** | **Designation** | **Definition** | **Stereotype** | **Abstract** |
| --- | --- | --- | --- | --- |
| Exchange | Exchange | Details associated with the management of the exchange between the supplier and the client. |  | no |
| D2LogicalModel | D2 logical model | The DATEX II logical model comprising exchange, content payload and management sub-models. |  | no |
| PayloadPublication | Payload publication | A payload publication of traffic related information or associated management information created at a specific point in time that can be exchanged via a DATEX II interface. |  | yes |

**Table 4— Classes of the "D2LogicalModel" package**

* + - 1. " D2LogicalModel" package association roles

There are no (or not used) association roles in the “D2LogicalModel” package

* + - 1. " D2LogicalModel" package attributes

There are no (or not used) package attributes in the “D2LogicalModel” package

* + 1. "GroupOfLocations " package
       1. "GroupOfLocations" package classes

| **Class name** | **Designation** | **Definition** | **Stereotype** | **Abstract** |
| --- | --- | --- | --- | --- |
| CamGeoAreaExtension | Cam geo area extension | A extension for CAM Aggregation to specifies additional location related attributes other than those provided in the Point Class |  | no |
| GeoArea | Geo area | A geo area as specified for CAM detection zone area. The reference position and heading (azimuth angle) are not specified as they are already provided by the point |  | no |
| GroupOfLocations | Group of locations | One or more physically separate locations. Multiple locations may be related, as in an itinerary (or route), or may be unrelated. It is not for identifying the same physical location using different Location objects for different referencing systems. |  | yes |
| Location | Location | The specification of a location either on a network (as a point or a linear location) or as an area. This may be provided in one or more referencing systems. |  | yes |
| NetworkLocation | Network location | The specification of a location on a network (as a point or a linear location). |  | yes |
| Point | Point | A single geospatial point. |  | no |
| PointCoordinates | Point coordinates | A pair of coordinates defining the geodetic position of a single point using the European Terrestrial Reference System 1989 (ETRS89). |  | no |

Table 5— Classes of the "GroupOfLocations" package

* + - 1. "GroupOfLocations" package association roles

| **Class name** | **Role name** | **Designation** | **Definition** | **Multiplicity** | **Target** |
| --- | --- | --- | --- | --- | --- |
| Point | pointByCoordinates | Point by coordinates | A single point defined only by a coordinate set with an optional bearing direction. | 0..1 | PointByCoordinates |

Table 6— Associations of the "GroupOfLocations" package

* + - 1. "GroupOfLocations" package attributes

| **Class name** | **Attribute name** | **Designation** | **Definition** | **Multiplicity** | **Type** |
| --- | --- | --- | --- | --- | --- |
| GeoArea | distA | Distance A | It is used as two fold. For GeoArea of type "rectangular", it represents the distance between the center point and one side of the rectangle. Whereas for GeoArea of type "circular" it represents the sector radius | 1 | MetresAsNonNegativeInteger |
|  | distB | Distance B | Only mandatory for GeoArea of type "rectangular". Specifies the distance between the center point and the second side of the rectangle | 0..1 | MetresAsNonNegativeInteger |
|  | shape | Shape | Specifies the geo area shape | 1 | GeoAreaTypeEnum |
|  | toleranceAngle | Tolerance angle | For the heading a tolerance angle of delta = +/- 10° is set. All vehicles that are inside this tolerance are counted for this heading | 1 | NonNegativeInteger |
| PointByCoordinates | bearing | Bearing | A bearing at the point measured in degrees (0 - 359). Unless otherwise specified the reference direction corresponding to 0 degrees is North. | 0..1 | NonNegativeInteger |
| PointCoordinates | latitude | Latitude | Latitude in decimal degrees using the European Terrestrial Reference System 1989 (ETRS89). | 1..1 | Float |
|  | longitude | Longitude | Longitude in decimal degrees using the European Terrestrial Reference System 1989 (ETRS89). | 1..1 | Float |

Table 7— Attributes of the "GroupOfLocations" package

* + 1. "MeasurementSiteTablePublication" package
       1. "MeasurementSiteTablePublication" package classes

| **Class name** | **Designation** | **Definition** | **Stereotype** | **Abstract** |
| --- | --- | --- | --- | --- |
| MeasurementSiteTable | Measurement site table | A Measurement Site Table comprising a number of sets of data, each describing the location from where a stream of measured data may be derived. Each location is known as a "measurement site" which can be a point, a linear road section or an area. |  | no |

Table 8— Classes of the "MeasurementSiteTablePublication" package

* + - 1. "MeasurementSiteTablePublication" package association roles

There are no defined association roles in the "MeasurementSiteTablePublication" package.

* + - 1. "MeasurementSiteTablePublication" package attributes

There are no defined attributes in the "MeasurementSiteTablePublication" package.

* + 1. "MeasurementSiteTable" package
       1. "MeasurementSiteTable" package classes

| **Class name** | **Designation** | **Definition** | **Stereotype** | **Abstract** |
| --- | --- | --- | --- | --- |
| MeasurementSiteRecord | Measurement site record | An identifiable single measurement site entry/record in the Measurement Site table. | versionIdentifiable | no |
| MeasurementSiteRecordExtended | Measurement site record extended | Extension for MeasurementSiteRecord |  | no |

Table 9— Classes of the "MeasurementSiteTable" package

* + - 1. "MeasurementSiteTable" package association roles

| **Class name** | **Role name** | **Designation** | **Definition** | **Multiplicity** | **Target** |
| --- | --- | --- | --- | --- | --- |
| MeasurementSiteRecord | measurementSiteLocation | Measurement site location | The location of a measurement site may be a point, a linear section of road or an area. Linear sections may even be specified as itineraries or predefined location sets, e.g. for travel time routes which comprise one or more different roads. | 1..1 | GroupOfLocations |

**Table 10— Associations of the "MeasurementSiteTable" package**

* + - 1. "MeasurementSiteTable" package attributes

| **Class name** | **Attribute name** | **Designation** | **Definition** | **Multiplicity** | **Type** |
| --- | --- | --- | --- | --- | --- |
| MeasurementSiteRecord | computationMethod | Computation method | Method of computation which is used to compute the measured value(s) at the measurement site. | 0..1 | ComputationMethodEnum |
|  | measurementSide | Measurement side | Side of the road on which measurements are acquired, corresponding to the direction of the road. | 0..1 | DirectionEnum |
|  | measurementSiteNumberOfLanes | Measurement site number of lanes | The number of lanes over which the measured value is determined. | 0..1 | NonNegativeInteger |
|  | measurementSiteRecordVersionTime | Measurement site record version time | The date/time that this version of the measurement site record was defined. The identity and version of the measurement site record are defined by the class stereotype implementation. | 0..1 | DateTime |
| MeasurementSiteRecordExtended | selfConfigured | Self-configured | Indicates if the measurement site (detection zone in CAM) was configured by input from external component (eg. C-ITS-S) or self-configured. | 0..1 | Boolean |

**Table 11— Associations of the "MeasurementSiteTable" package**

* + 1. "PayloadPublication" package
       1. "PayloadPublication" package classes

| **Class name** | **Designation** | **Definition** | **Stereotype** | **Abstract** |
| --- | --- | --- | --- | --- |
| PayloadPublication | Payload publication | A payload publication of traffic related information or associated management information created at a specific point in time that can be exchanged via a DATEX II interface. |  | yes |

Table 12— Classes of the "PayloadPublication" package

* + - 1. "PayloadPublication" package association roles

| **Class name** | **Role name** | **Designation** | **Definition** | **Multiplicity** | **Target** |
| --- | --- | --- | --- | --- | --- |
| PayloadPublication | publicationCreator | Publication creator | An identifier/name whose range is specific to the particular country. | 1..1 | InternationalIdentifier |

Table 13— Associations of the "PayloadPublication" package

* + - 1. "PayloadPublication" package attributes

| **Class name** | **Attribute name** | **Designation** | **Definition** | **Multiplicity** | **Type** |
| --- | --- | --- | --- | --- | --- |
| PayloadPublication | publicationTime | Publication time | Date/time at which the payload publication was created. | 1..1 | DateTime |
|  | lang | Language | The default language used throughout the payload publication. | 1..1 | Language |

**Table 14— Attributes of the "PayloadPublication" package**

* 1. Data Dictionary for “CAM content”
     1. "BasicData" package
        1. "BasicData" package classes

| **Class name** | **Designation** | **Definition** | **Stereotype** | **Abstract** |
| --- | --- | --- | --- | --- |
| BasicData | Basic data | Data that is either measured or calculated (elaborated) at the same time or over the same time period. |  | yes |
| CAMSpeedCharacteristics | CAM speed characteristics | Additional speed information such as min, max speeds provided via a processed CAM message |  | no |
| SpeedValue | Speed value | A measured or calculated value of speed. |  | no |
| TrafficConcentration | Traffic concentration | Averaged measurements or calculations of traffic concentration. |  | no |
| TrafficData | Traffic data | Measured or derived values relating to traffic or individual vehicle movements on a specific section or at a specific point on the road network. |  | yes |
| TrafficSpeed | Traffic speed | Averaged measurements or calculations of traffic speed. |  | no |
| TrafficSpeedExtended | Traffic speed extended | Extension for TrafficSpeed |  | no |

**Table 15— Classes of the "BasicData" package**

* + - 1. "BasicData" package association roles

| **Class name** | **Role name** | **Designation** | **Definition** | **Multiplicity** | **Target** |
| --- | --- | --- | --- | --- | --- |
| CAMSpeedCharacteristics | averageSpeedSpace | Average speed space | Average speed in space for the detectionZoneId and stationTypeGroupID during the collection interval. The units in DATEX II overwrite those specified in CAM specifications. Typically in CAM specs the units are m/s which must be converted k/h | 1 | SpeedValue |
|  | averageSpeedTime | Average speed time | Average speed in time for the detectionZoneId and stationTypeGroupID during the collection interval. The units in DATEX II overwrite those specified in CAM specifications. Typically in CAM specs the units are m/s which must be converted k/h | 1 | SpeedValue |
|  | maxSpeed | Max speed | Max speed for the measured site (detectionZoneId and stationTypeGroupID) during the time period (or collection interval) | 1 | SpeedValue |
|  | minSpeed | Min speed | Min speed for the measured site (detectionZoneId and stationTypeGroupID) during the time period (or collection interval) | 1 | SpeedValue |
| TrafficData | forVehiclesWithCharacteristicsOf | For vehicles with characteristics of | Used to define the vehicle characteristics to which the TrafficValue is applicable primarily in Elaborated Data Publications, but may also be used in Measured Data Publications to override vehicle characteristics defined for the measurement site. | 0..1 | VehicleCharacteristics |
| TrafficConcentration | concentration | Concentration | An averaged measurement or calculation of the concentration of vehicles at the specified measurement site. | 0..1 | ConcentrationOfVehiclesValue |
| TrafficSpeed | averageVehicleSpeed | Average vehicle speed | An averaged measurement or calculation of the speed of vehicles at the specified location. | 0..1 | SpeedValue |
| TrafficSpeedExtended | additionalSpeedValues | Additional speed values | Additional speed values | 0..1 | CAMSpeedCharacteristics |

Table 16— Associations of the "BasicData" package

* + - 1. "BasicData" package attributes

| **Class name** | **Attribute name** | **Designation** | **Definition** | **Multiplicity** | **Type** |
| --- | --- | --- | --- | --- | --- |
| BasicData | measurementOrCalculationPeriod | Measurement or calculation period | The time elapsed between the beginning and the end of the sampling or measurement period. This item may differ from the unit attribute; e.g. an hourly flow can be estimated from a 5-minute measurement period. | 0..1 | Seconds |
|  | measurementOrCalculationTime | Measurement or calculation time | Point in time at which this specific value or set of values has been measured or calculated. It may also be a future time at which a data value is predicted. | 0..1 | DateTime |

**Table 17— Attributes of the "BasicData" package**

* + 1. "MeasuredDataPublication" package
       1. "MeasuredDataPublication" package classes

| **Class name** | **Designation** | **Definition** | **Stereotype** | **Abstract** |
| --- | --- | --- | --- | --- |
| HeaderInformation | Header information | Management information relating to the data contained within a publication. |  | no |
| MeasuredDataPublication | Measured data publication | A publication containing one or more measurement data sets, each set being measured at a single measurement site. |  | no |
| \_MeasurementSiteTableVersionedReference | Measurement site table versioned reference | A reference to a versioned Measurement Site table. |  | no |
| \_MeasurementSiteRecordVersionedReference | Measurement site record versioned reference | A reference to a versioned measurement site record defined in a Measurement Site table. |  | no |
| MeasuredValue | Measured value | Composition to the indexed measured value associated with the measurement site. The index uniquely associates the measurement value with the corresponding indexed measurement characteristics defined for the measurement site. |  | no |
| SiteMeasurements | Site measurements | Additional speed information such as min, max speeds provided via a processed CAM message |  | no |

**Table 18— Classes of the "MeasuredDataPublication" package**

* + - 1. "MeasuredDataPublication" package association roles

There are no defined association roles in the "MeasuredDataPublication" package.

* + - 1. "MeasuredDataPublication" package attributes

| **Class name** | **Attribute name** | **Designation** | **Definition** | **Multiplicity** | **Type** |
| --- | --- | --- | --- | --- | --- |
| HeaderInformation | confidentiality | Confidentiality | The extent to which the related information may be circulated, according to the recipient type. Recipients must comply with this confidentiality statement. | 1..1 | ConfidentialityValueEnum |
|  | informationStatus | Information status | The status of the related information (real, test, exercise ....). | 1..1 | InformationStatusEnum |
| MeasuredDataPublication | headerInformation | Header information | Management information relating to the data contained within a publication. | 0..1 | HeaderInformation |
|  | siteMeasurements | Site measurements | A measurement data set derived from a specific measurement site. | 1..\* | SiteMeasurements |
| MeasuredValue | basicData | Basic data | Data that is either measured or calculated (elaborated) at the same time or over the same time period. | 0..1 | BasicData |
| SiteMeasurements | measurementTimeDefault | Measurement time default | The time associated with the set of measurements. It may be the time of the beginning, the end or the middle of the measurement period. | 1..1 | DateTime |
|  | measuredValue | Measured value | Composition to the indexed measured value associated with the measurement site. The index uniquely associates the measurement value with the corresponding indexed measurement characteristics defined for the measurement site. | 0..\* | \_SiteMeasurementsIndexMeasuredValue |

**Table 19— Attributes of the "MeasuredDataPublication" package**

* + 1. "VehicleCharacteristics" package
       1. "VehicleCharacteristics" package classes

| **Class name** | **Designation** | **Definition** | **Stereotype** | **Abstract** |
| --- | --- | --- | --- | --- |
| VehicleCharacteristics | Vehicle characteristics | The characteristics of a vehicle, e.g. lorry of gross weight greater than 30 tonnes. |  | no |
| VehicleCharacteristicExtended4CAM | Vehicle characteristic extended for CAM | Extension for Vehicle Characteristic specific to a processed CAM message |  | no |

**Table 20— Classes of the "VehicleCharacteristics" package**

* + - 1. "VehicleCharacteristics" package association roles

There are no defined association roles in the "VehicleCharacteristics" package.

* + - 1. "VehicleCharacteristics" package attributes

| **Class name** | **Attribute name** | **Designation** | **Definition** | **Multiplicity** | **Type** |
| --- | --- | --- | --- | --- | --- |
| VehicleCharacteristics | vehicleType | Vehicle type | Vehicle type. | 0..\* | VehicleTypeEnum |
| VehicleCharacteristicExtended4CAM | vehicleTypeCAM | Vehicle type CAM | Vehicle types (or station types) | 1..\* | VehicleTypeCAMEnum |

**Table 21— Attributes of the "VehicleCharacteristics" package**

* 1. Data Dictionary for “CAM single vehicle data”
     1. "BasicData" package
        1. "BasicData" package classes

| **Class name** | **Designation** | **Definition** | **Stereotype** | **Abstract** |
| --- | --- | --- | --- | --- |
| BasicData | Basic data | Data that is either measured or calculated (elaborated) at the same time or over the same time period. |  | yes |
| IndividualVehicleDataValues | Individual vehicle data values | Measured or calculated data values relating to individual vehicles derived from detectors at the specified measurement site. |  | no |
| SpeedValue | Speed value | A measured or calculated value of speed. |  | no |
| TrafficData | Traffic data | Measured or derived values relating to traffic or individual vehicle movements on a specific section or at a specific point on the road network. |  | yes |

**Table 22— Classes of the "BasicData" package**

* + - 1. "BasicData" package association roles

| **Class name** | **Role name** | **Designation** | **Definition** | **Multiplicity** | **Target** |
| --- | --- | --- | --- | --- | --- |
| BasicData | pertinentLocation | Pertinent location | The location (e.g. the stretch of road or area) to which the data value(s) is or are pertinent/relevant. This may be different from the location of the measurement equipment (i.e. the measurement site location). | 0..1 | GroupOfLocations |
| IndividualVehicleDataValues | individualVehicleSpeed | Individual vehicle speed | The measured speed of the individual vehicle at the specified measurement site. | 0..1 | SpeedValue |
| TrafficData | forVehiclesWithCharacteristicsOf | For vehicles with characteristics of | Used to define the vehicle characteristics to which the TrafficValue is applicable primarily in Elaborated Data Publications, but may also be used in Measured Data Publications to override vehicle characteristics defined for the measurement site. | 0..1 | VehicleCharacteristics |

Table 23— Associations of the "BasicData" package

* + - 1. "BasicData" package attributes

| **Class name** | **Attribute name** | **Designation** | **Definition** | **Multiplicity** | **Type** |
| --- | --- | --- | --- | --- | --- |
| BasicData | measurementOrCalculationPeriod | Measurement or calculation period | The time elapsed between the beginning and the end of the sampling or measurement period. This item may differ from the unit attribute; e.g. an hourly flow can be estimated from a 5-minute measurement period. | 0..1 | Seconds |
|  | measurementOrCalculationTime | Measurement or calculation time | Point in time at which this specific value or set of values has been measured or calculated. It may also be a future time at which a data value is predicted. | 0..1 | DateTime |

**Table 24— Attributes of the "BasicData" package**

* + 1. "ElaboratedDataPublication" package
       1. "ElaboratedDataPublication" package classes

| **Class name** | **Designation** | **Definition** | **Stereotype** | **Abstract** |
| --- | --- | --- | --- | --- |
| HeaderInformation | Header information | Management information relating to the data contained within a publication. |  | no |
| ElaboratedData | Elaborated data | An instance of data which is derived/computed from one or more measurements over a period of time. It may be a current value or a forecast value predicted from historical measurements. |  | no |
| ElaboratedDataPublication | Elaborated data publication | A publication containing one or more elaborated data sets. |  | no |

**Table 25— Classes of the "ElaboratedDataPublication" package**

* + - 1. "ElaboratedDataPublication" package association roles

There are no defined association roles in the "ElaboratedDataPublication" package.

* + - 1. "ElaboratedDataPublication" package attributes

| **Class name** | **Attribute name** | **Designation** | **Definition** | **Multiplicity** | **Type** |
| --- | --- | --- | --- | --- | --- |
| HeaderInformation | confidentiality | Confidentiality | The extent to which the related information may be circulated, according to the recipient type. Recipients must comply with this confidentiality statement. | 1..1 | ConfidentialityValueEnum |
|  | informationStatus | Information status | The status of the related information (real, test, exercise ....). | 1..1 | InformationStatusEnum |
| ElaboratedDataPublication | headerInformation | Header information | Management information relating to the data contained within a publication. | 0..1 | HeaderInformation |
|  | elaboratedData | Elaborated data | An instance of data which is derived/computed from one or more measurements over a period of time. It may be a current value or a forecast value predicted from historical measurements. | 0..\* | ElaboratedData |
| ElaboratedData | basicData | Basic data | Data that is either measured or calculated (elaborated) at the same time or over the same time period. | 0..1 | BasicData |

**Table 26— Attributes of the "ElaboratedDataPublication" package**

* + 1. "GroupOfLocations " package
       1. "GroupOfLocations" package classes

| **Class name** | **Designation** | **Definition** | **Stereotype** | **Abstract** |
| --- | --- | --- | --- | --- |
| GroupOfLocations | Group of locations | One or more physically separate locations. Multiple locations may be related, as in an itinerary (or route), or may be unrelated. It is not for identifying the same physical location using different Location objects for different referencing systems. |  | yes |
| Location | Location | The specification of a location either on a network (as a point or a linear location) or as an area. This may be provided in one or more referencing systems. |  | yes |
| NetworkLocation | Network location | The specification of a location on a network (as a point or a linear location). |  | yes |
| Point | Point | A single geospatial point. |  | no |
| PointCoordinates | Point coordinates | A pair of coordinates defining the geodetic position of a single point using the European Terrestrial Reference System 1989 (ETRS89). |  | no |
| PointCoordinatesExtended | Point coordinates extended | Extension for point coordinates. |  | no |

Table 27— Classes of the "GroupOfLocations" package

* + - 1. "GroupOfLocations" package association roles

| **Class name** | **Role name** | **Designation** | **Definition** | **Multiplicity** | **Target** |
| --- | --- | --- | --- | --- | --- |
| Point | pointByCoordinates | Point by coordinates | A single point defined only by a coordinate set with an optional bearing direction. | 0..1 | PointByCoordinates |
| PointByCoordinates | pointCoordinates | Point coordinates | A pair of coordinates defining the geodetic position of a single point using the European Terrestrial Reference System 1989 (ETRS89). | 1..1 | PointCoordinates |

Table 28— Associations of the "GroupOfLocations" package

* + - 1. "GroupOfLocations" package attributes

| **Class name** | **Attribute name** | **Designation** | **Definition** | **Multiplicity** | **Type** |
| --- | --- | --- | --- | --- | --- |
| PointByCoordinates | bearing | Bearing | A bearing at the point measured in degrees (0 - 359). Unless otherwise specified the reference direction corresponding to 0 degrees is North. | 0..1 | NonNegativeInteger |
| PointCoordinates | latitude | Latitude | Latitude in decimal degrees using the European Terrestrial Reference System 1989 (ETRS89). | 1..1 | Float |
|  | longitude | Longitude | Longitude in decimal degrees using the European Terrestrial Reference System 1989 (ETRS89). | 1..1 | Float |
| PointCoordinatesExtended | altitude | Altitude | A measure of altitude in metres | 0..1 | MetresAsFloat |

**Table 29— Attributes of the "GroupOfLocations" package**

* + 1. "VehicleCharacteristics" package
       1. "VehicleCharacteristics" package classes

| **Class name** | **Designation** | **Definition** | **Stereotype** | **Abstract** |
| --- | --- | --- | --- | --- |
| VehicleCharacteristics | Vehicle characteristics | The characteristics of a vehicle, e.g. lorry of gross weight greater than 30 tonnes. |  | no |

**Table 30— Classes of the "VehicleCharacteristics" package**

* + - 1. "VehicleCharacteristics" package association roles

There are no defined association roles in the "VehicleCharacteristics" package.

* + - 1. "VehicleCharacteristics" package attributes

| **Class name** | **Attribute name** | **Designation** | **Definition** | **Multiplicity** | **Type** |
| --- | --- | --- | --- | --- | --- |
| VehicleCharacteristics | vehicleType | Vehicle type | Vehicle type. | 0..\* | VehicleTypeEnum |

**Table 31— Attributes of the "VehicleCharacteristics" package**

* 1. Data Dictionary of <<enumerations>> for “CAM Aggregation Profile”

This clause contains the definitions of all enumerations which are used in the “CAM Aggregation Profile (all parts)”.

* + 1. The <<enumeration>> "ConfidentialityValueEnum"

Values of confidentiality.

| **Enumerated value name** | **Designation** | **Definition** |
| --- | --- | --- |
| internalUse | Internal use | For internal use only of the recipient organisation. |
| noRestriction | No restriction | No restriction on usage. |
| restrictedToAuthorities | Restricted to authorities | Restricted for use only by authorities. |
| restrictedToAuthoritiesAndTrafficOperators | Restricted to authorities | Restricted for use only by authorities and traffic operators. |
| restrictedToAuthoritiesTrafficOperatorsAndPublishers | Restricted to authorities traffic operators and publishers | Restricted for use only by authorities, traffic operators and publishers (service providers). |
| restrictedToAuthoritiesTrafficOperatorsAndVms | Restricted to authorities traffic operators and Vms | Restricted for use only by authorities, traffic operators, publishers (service providers) and variable message signs. |

Table 32— Values contained in the enumeration "ConfidentialityValueEnum"

* + 1. The <<enumeration>> "CountryEnum"

List of countries.

| **Enumerated value name** | **Designation** | **Definition** |
| --- | --- | --- |
| at | at | Austria |
| de | de | Germany |

Table 33— Values contained in the enumeration "CountryEnum"

* + 1. The <<enumeration>> "DirectionEnum"

Types of the perceived driving conditions.

| **Enumerated value name** | **Designation** | **Definition** |
| --- | --- | --- |
| allDirections | All directions | All directions (where more than two are applicable) at this point on the road network. |
| bothWays | Both ways | Both directions that are applicable at this point on the road network. |
| clockwise | Clock wise | Clockwise. |
| anticlockwise | Anti-clockwise | Anti-clockwise. |
| innerRing | Inner ring | Inner ring direction. |
| outerRing | Outer ring | Outer ring direction. |
| northBound | North bound | North bound general direction. |
| northEastBound | North east bound | North east bound general direction. |
| eastBound | East bound | East bound general direction. |
| southEastBound | South east bound | South east bound general direction. |
| southBound | South bound | South bound general direction. |
| southWestBound | South west bound | South west bound general direction. |
| westBound | West bound | West bound general direction. |
| northWestBound | North west bound | North west bound general direction. |
| inboundTowardsTown | Inbound towards town | Heading towards town centre direction of travel. |
| outboundFromTown | Out bound from town | Heading out of or away from the town centre direction of travel. |
| unknown | Unknown | Direction is unknown. |
| opposite | Opposite | Opposite direction to the normal direction of flow at this point on the road network. |
| other | Other | Other than as defined in this enumeration. |

Table 34— Values contained in the enumeration "DirectionEnum"

* + 1. The <<enumeration>> "GeoAreaTypeEnum"

Type of GeoArea

| **Enumerated value name** | **Designation** | **Definition** |
| --- | --- | --- |
| rectangular | Rectangular | Represents a rectangular shape |
| circular | Circular | Represents a circular shape |

Table 35— Values contained in the enumeration "InformationStatusEnum"

* + 1. The <<enumeration>> "InformationStatusEnum"

Status of the related information (i.e. real, test or exercise).

| **Enumerated value name** | **Designation** | **Definition** |
| --- | --- | --- |
| real | Real | The information is real. It is not a test or exercise. |
| securityExercise | Security exercise | The information is part of an exercise which is for testing security. |
| technicalExercise | Technical exercise | The information is part of an exercise which includes tests of associated technical subsystems. |
| test | Test | The information is part of a test for checking the exchange of this type of information. |

Table 36— Values contained in the enumeration "InformationStatusEnum"

* + 1. The <<enumeration>> "ValidityStatusEnum"

Values of validity status that can be assigned to a described event, action or item.

| **Enumerated value name** | **Designation** | **Definition** |
| --- | --- | --- |
| active | Active | The described event, action or item is currently active regardless of the definition of the validity time specification. |
| definedByValidityTimeSpec | Defined by validity time spec | The validity status of the described event, action or item is in accordance with the definition of the validity time specification. |
| suspended | Suspended | The described event, action or item is currently suspended, that is inactive, regardless of the definition of the validity time specification. |

Table 37— Values contained in the enumeration "ValidityStatusEnum"

* + 1. The <<enumeration>> "VehicleTypeCAMEnum"

Types of vehicle.

| **Enumerated value name** | **Designation** | **Definition** |
| --- | --- | --- |
| bus | Bus | Bus. |
| heavyTruck | Heavy truck | Heavy truck. |
| lightTruck | Light truck | Light truck. |
| motorcycle | Motorcycle | Motorcycle. |
| passengerCar | Passenger car | Passenger car. |
| specialVehicles | Special vehicles | Special vehicles. |
| unknown | Unknown | Vehicle of unknown type. |
| vehicleWithBeamHeadlightsOn | Vehicle with beam headlights on | Vehicle with headlights on. |
| vehicleWithDaytimeRunningLightsOn | Vehicle with daytime running lights on | Vehicle with daytime running lights on. |
| vehicleWithFogLightOn | Vehicle with fog light on | Vehicle with fog lights on. |

Table 38— Values contained in the enumeration "VehicleTypeCAMEnum"

* + 1. The <<enumeration>> "VehicleTypeEnum"

Types of vehicle.

| **Enumerated value name** | **Designation** | **Definition** |
| --- | --- | --- |
| anyVehicle | Any vehicle | Vehicle of any type. |
| bus | Bus | Bus. |
| car | Car | Car. |
| lorry | Lorry | Lorry of any type. |

Table 39— Values contained in the enumeration "VehicleTypeEnum"

* 1. Alphabetical list of attributes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute name** | **Class name** | **Designation** | **Definition** | **Multiplicity** | **Type** |
| altitude | PointCoordinatesExtended | Altitude | A measure of altitude in metres | 0..1 | MetresAsFloat |
| bearing | PointByCoordinates | Bearing | A bearing at the point measured in degrees (0 - 359). Unless otherwise specified the reference direction corresponding to 0 degrees is North. | 0..1 | NonNegativeInteger |
| clientIdentification | Exchange | Client identification | In a data exchange process, an identifier of the organisation or group of organisations which receives information from the DATEX II supplier system. | 0..1 | String |
| computationMethod | MeasurementSiteRecord | Computation method | Method of computation which is used to compute the measured value(s) at the measurement site. | 0..1 | ComputationMethodEnum |
| country | InternationalIdentifier | Country | ISO 3166-1 two character country code. | 1..1 | CountryEnum |
| confidentiality | HeaderInformation | Confidentiality | The extent to which the related information may be circulated, according to the recipient type. Recipients must comply with this confidentiality statement. | 1..1 | ConfidentialityValueEnum |
| distA | GeoArea | Distance A | It is used as two fold. For GeoArea of type "rectangular", it represents the distance between the center point and one side of the rectangle. Whereas for GeoArea of type "circular" it represents the sector radius | 1..1 | MetresAsNonNegativeInteger |
| distB | GeoArea | Distance B | Only mandatory for GeoArea of type "rectangular". Specifies the distance between the center point and the second side of the rectangle | 0..1 | MetresAsNonNegativeInteger |
| informationStatus | HeaderInformation | Information status | The status of the related information (real, test, exercise ....). | 1..1 | InformationStatusEnum |
| lang | PayloadPublication | Language | The default language used throughout the payload publication. | 1..1 | Language |
| latitude | PointCoordinates | Latitude | Latitude in decimal degrees using the European Terrestrial Reference System 1989 (ETRS89). | 1..1 | Float |
| longitude | PointCoordinates | Longitude | Longitude in decimal degrees using the European Terrestrial Reference System 1989 (ETRS89). | 1..1 | Float |
| measurementOrCalculationPeriod | BasicData | Measurement or calculation period | The time elapsed between the beginning and the end of the sampling or measurement period. This item may differ from the unit attribute; e.g. an hourly flow can be estimated from a 5-minute measurement period. | 0..1 | Seconds |
| measurementOrCalculationTime | BasicData | Measurement or calculation time | Point in time at which this specific value or set of values has been measured or calculated. It may also be a future time at which a data value is predicted. | 0..1 | DateTime |
| measurementSide | MeasurementSiteRecord | Measurement side | Side of the road on which measurements are acquired, corresponding to the direction of the road. | 0..1 | DirectionEnum |
| measurementSiteNumberOfLanes | MeasurementSiteRecord | Measurement site number of lanes | The number of lanes over which the measured value is determined. | 0..1 | NonNegativeInteger |
| measurementSiteRecordVersionTime | MeasurementSiteRecord | Measurement site record version time | The date/time that this version of the measurement site record was defined. The identity and version of the measurement site record are defined by the class stereotype implementation. | 0..1 | DateTime |
| measurementTimeDefault | SiteMeasurements | Measurement time default | The time associated with the set of measurements. It may be the time of the beginning, the end or the middle of the measurement period. | 1..1 | DateTime |
| nationalIdentifier | InternationalIdentifier | National identifier | Identifier or name unique within the specified country. | 1..1 | String |
| overallEndTime | OverallPeriod | Overall end time | End of bounding period of validity defined by date and time. | 0..1 | DateTime |
| overallStartTime | OverallPeriod | Overall start time | Start of bounding period of validity defined by date and time. | 1..1 | DateTime |
| publicationTime | PayloadPublication | Publication time | Date/time at which the payload publication was created. | 1..1 | DateTime |
| reliable | Source | Reliable | An indication as to whether the source deems the associated information to be reliable/correct. "True" indicates it is deemed reliable. | 0..1 | Boolean |
| selfConfigured | MeasurementSiteRecordExtended | Self-configured | Indicates if the measurement site (detection zone in CAM) was configured by input from external component (eg. C-ITS-S) or self-configured. | 0..1 | Boolean |
| shape | GeoArea | Shape | Specifies the geo area shape | 1..1 | GeoAreaTypeEnum |
| sourceCountry | Source | Source country | ISO 3166-1 two character country code of the source of the information. | 0..1 | CountryEnum |
| sourceIdentification | Source | Source identification | Identifier of the organisation or the traffic equipment which has produced the information relating to this version of the information. | 0..1 | String |
| sourceName | Source | Source name | The name of the organisation which has produced the information relating to this version of the information. | 0..1 | MultilingualString |
| sourceType | Source | Source type | Information about the technology used for measuring the data or the method used for obtaining qualitative descriptions relating to this version of the information. | 0..1 | SourceTypeEnum |
| toleranceAngle | GeoArea | Tolerance angle | For the heading a tolerance angle of delta = +/- 10° is set. All vehicles that are inside this tolerance are counted for this heading | 1..1 | NonNegativeInteger |
| validityStatus | Validity | Validity status | Specification of validity, either explicitly overriding the validity time specification or confirming it. | 1..1 | ValidityStatusEnum |
| vehicleType | VehicleCharacteristics | Vehicle type | Vehicle type. | 0..\* | VehicleTypeEnum |
| vehicleTypeCAM | VehicleCharacteristicExtended4CAM | Vehicle type CAM | Vehicle types (or station types) | 1..\* | VehicleTypeCAMEnum |

Table 40- Alphabetical list of attributes

* 1. Alphabetical list of roles

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Role name** | **Class name** | **Designation** | **Definition** | **Multiplicity** | **Target** |
| averageSpeedSpace | CAMSpeedCharacteristics | Average speed space | Average speed in time for the detectionZoneId and stationTypeGroupID during the collection interval. The units in DATEX II overwrite those specified in CAM specifications. Typically in CAM specs the units are m/s which must be converted k/h | 1..1 | SpeedValue |
| averageSpeedTime | CAMSpeedCharacteristics | Average speed time | Average speed in time for the detectionZoneId and stationTypeGroupID during the collection interval. The units in DATEX II overwrites those specified in CAM specifications. Typically in CAM specs the units are m/s which must be converted k/h | 1..1 | SpeedValue |
| averageVehicleSpeed | TrafficSpeed | Average vehicle speed | An averaged measurement or calculation of the speed of vehicles at the specified location. | 0..1 | SpeedValue |
| additionalSpeedValues | TrafficSpeedExtended | Additional speed values | Additional speed values | 0..1 | CAMSpeedCharacteristics |
| concentration | TrafficConcentration | Concentration | An averaged measurement or calculation of the concentration of vehicles at the specified measurement site. | 0..1 | ConcentrationOfVehiclesValue |
| distA | GeoArea | Distance A | It used as two fold. For GeoArea of type "rectangular", it represents the distance between the center point and one side of the rectangle. Whereas for GeoArea of type "circular" it represents the sector radius | 1..1 | MetresAsNonNegativeInteger |
| distB | GeoArea | Distance B | Only mandatory for GeoArea of type "rectangular". Specifies the distance between the center point and the second side of the rectangle | 0..1 | MetresAsNonNegativeInteger |
| individualVehicleSpeed | IndividualVehicleDataValues | Individual vehicle speed | The measured speed of the individual vehicle at the specified measurement site. | 0..1 | SpeedValue |
| forVehiclesWithCharacteristicsOf | TrafficData | For vehicles with characteristics of | The characteristics of those vehicles for which the network management is applicable. | 0..\* | VehicleCharacteristics |
| maxSpeed | CAMSpeedCharacteristics | Max speed | Max speed for the measured site (detectionZoneId and stationTypeGroupID) during the time period (or collection interval) | 1..1 | SpeedValue |
| measurementSiteLocation | MeasurementSiteRecord | Measurement site location | The location of a measurement site may be a point, a linear section of road or an area. Linear sections may even be specified as itineraries or predefined location sets, e.g. for travel time routes which comprise one or more different roads. | 1..1 | GroupOfLocations |
| minSpeed | CAMSpeedCharacteristics | Min speed | Min speed for the measured site (detectionZoneId and stationTypeGroupID) during the time period (or collection interval) | 1..1 | SpeedValue |
| pertinentLocation | BasicData | Pertinent location | The location (e.g. the stretch of road or area) to which the data value(s) is or are pertinent/relevant. This may be different from the location of the measurement equipment (i.e. the measurement site location). | 0..1 | GroupOfLocations |
| publicationCreator | PayloadPublication | Publication creator | An identifier/name whose range is specific to the particular country. | 1..1 | InternationalIdentifier |
| pointByCoordinates | Point | Point by coordinates | A single point defined only by a coordinate set with an optional bearing direction. | 0..1 | PointByCoordinates |
| shape | GeoArea |  |  |  |  |
| supplierIdentification | Exchange | Supplier identification | An identifier/name whose range is specific to the particular country. | 1..1 | InternationalIdentifier |
| validityTimeSpecification | Validity | Validity time specification | A specification of periods of validity defined by overall bounding start and end times and the possible intersection of valid periods with exception periods (exception periods overriding valid periods). | 1..1 | OverallPeriod |

Table 41- Alphabetical list of roles

* 1. Figures



Figure 1: CAM Aggregation Location Model (MeasuredSiteTablePublication)



Figure 2: CAM Aggregation Content Model (MeasuredDataPublication)



Figure 3: CAM Single Vehicle Data (ElaboratedDataPublication)