Austrian Traffic Signs Profile

Version 2.0

* 1. Introduction

ASFINAG provides DATEX II traffic data of Austrian motorways and highways for service providers to be distributed to vehicles.

This document describes the Austrian Traffic Signs Profile. ASFINAG delivers the traffic signs feed through two different APIs. One contains information related to the locations of the traffic signs, and the other contains the actual content of the traffic signs. The feed with location information is called as “TraffficSignsStatic” and the feed with the traffic signs content is called as “TrafficSignsDynamic”.

To know where the traffic sign is located and what information the traffic sign provides both feeds needs to be processed.

* + 1. TrafficSignsStatic

The TrafficSignsStatic feed contains location information of all traffic signs. The corresponding traffic sign content information like speed limits, restrictions, etc., are provided in the TrafficSignsDynamic feed.

The TrafficSignsStatic feed uses DATEX II VmsTablePublication as the data structure. **Figure 1** provides an overview about the data structure of the TrafficSignsStatic and **Figure 2** provides an example for it in XML.

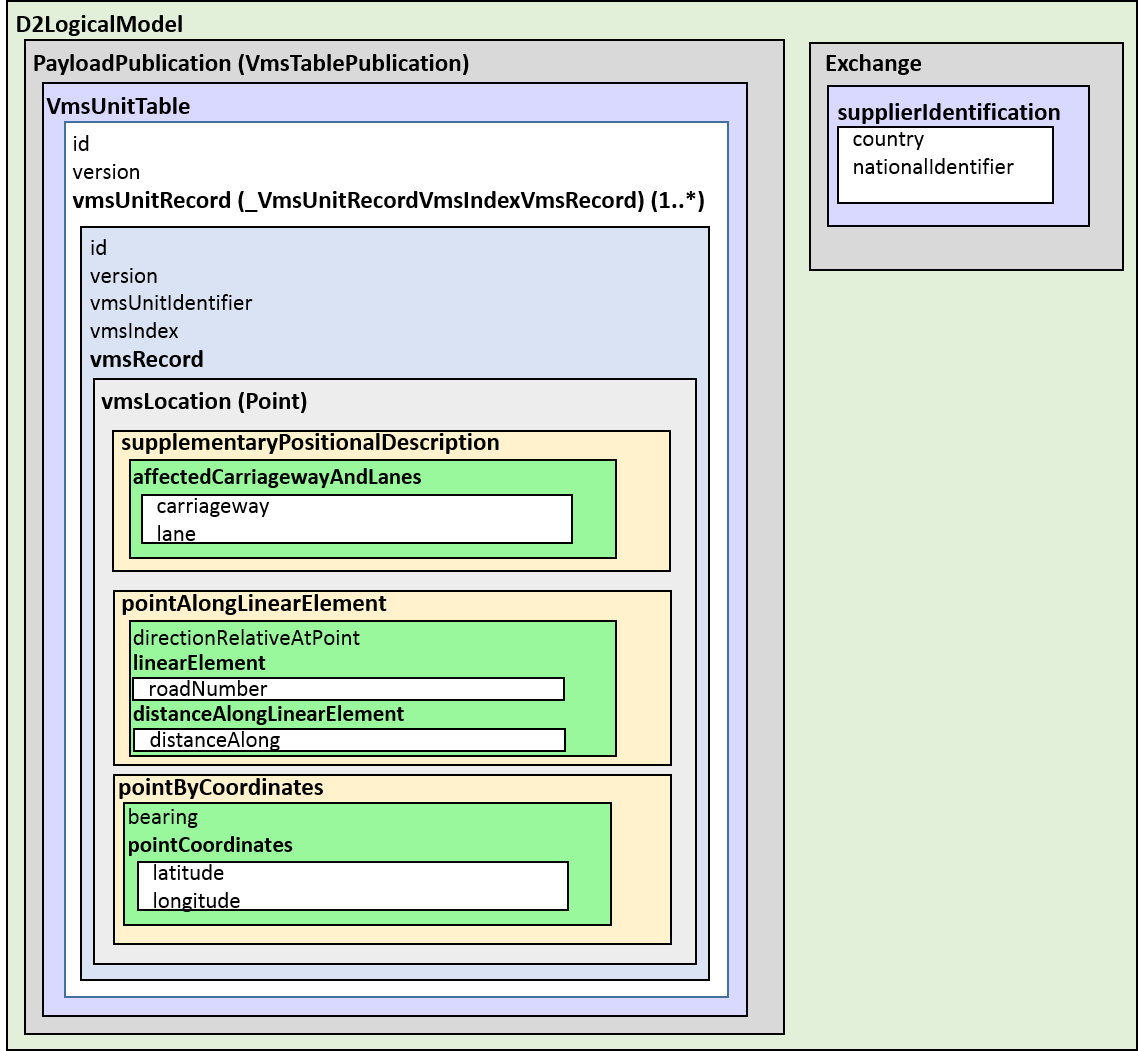


Figure 1: Data structure for TrafficSignsStatic



Figure 2: An example for TrafficSignsStatic

* + 1. TrafficSignsDynamic

The TrafficSignsDynamic feed contains actual content information (speed limits, restrictions, etc.,) of all traffic signs. The corresponding traffic sign location information is provided in the TrafficSignsStatic feed.

The TrafficSignsDynamic feed uses DATEX II VmsPublication as the data structure. **Figure 3** provides an overview about the data structure of the TrafficSignsDynamic and **Figure 4** provides an example for it in XML. Due to the complexity of the data structure of VmsPublication some of the elements are not shown in **Figure 3**, however the missing elements are covered in the example shown in **Figure 4**.

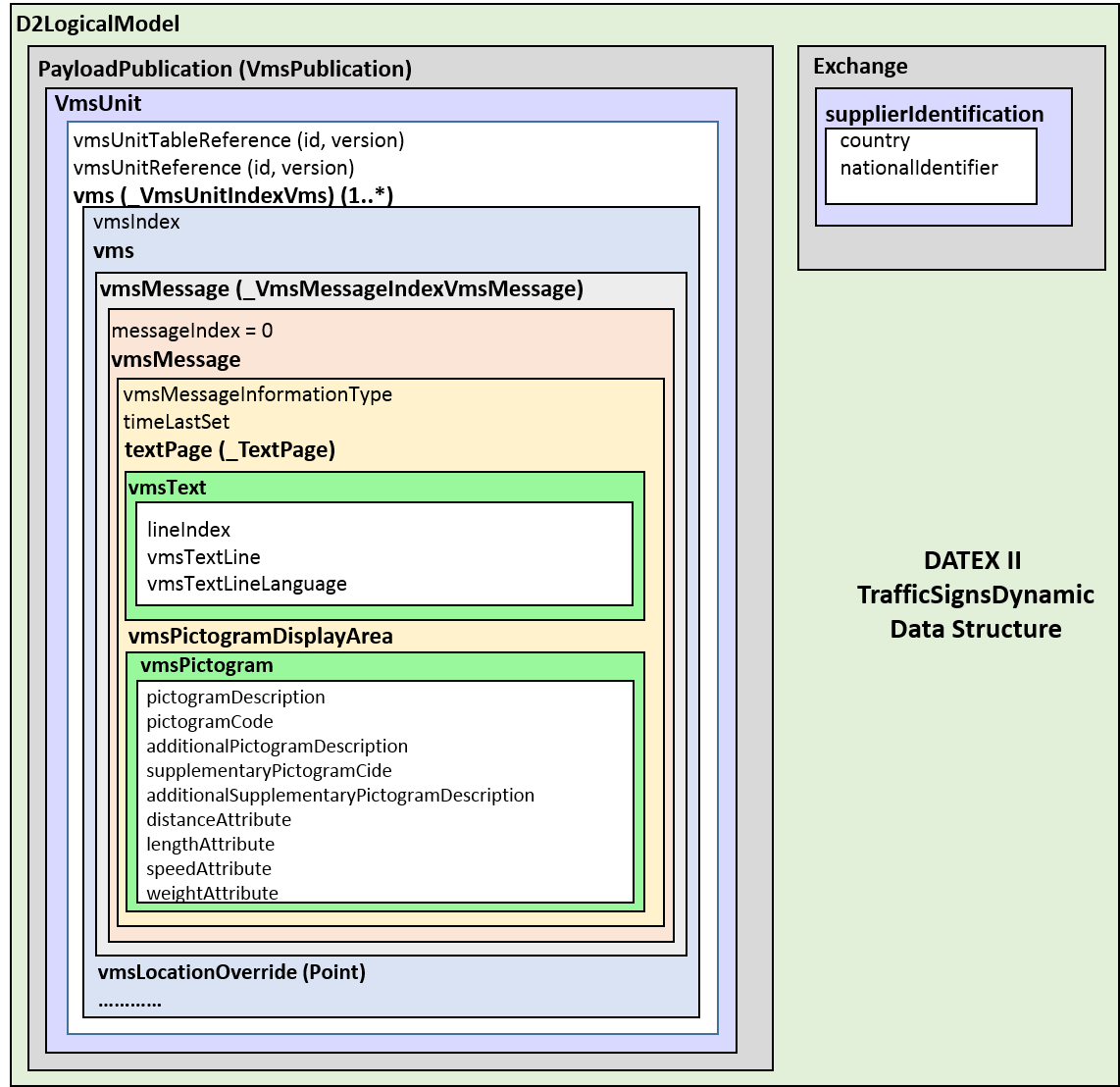


Figure 3: Data structure for TrafficSignsDynamic



Figure 4: An example for TrafficSignsDynamic

* + 1. Lanes

To understand traffic signs it is important to understand how lanes are numbered at ASFINAG. Lanes are numbered in either direction starting with the right most driveable lane on the main carriageway as “lane1”. Then the number is increased to the left. In Datex2 this information is provided by ASFINAG with the “affectedCarriagewayAndLanes”. In this element the “carriageway” is set to mainCarriageway and the “lane” is set to e.g. lane1. Note that more than one lane can be specified in the affectedCarriagewayAndLanes.

If a hard shoulder (for break downs) or an acceleration/ a deceleration lane (because of a ramp) is present this is not “Lane1” as these lanes are not accounted to the main carriageway.

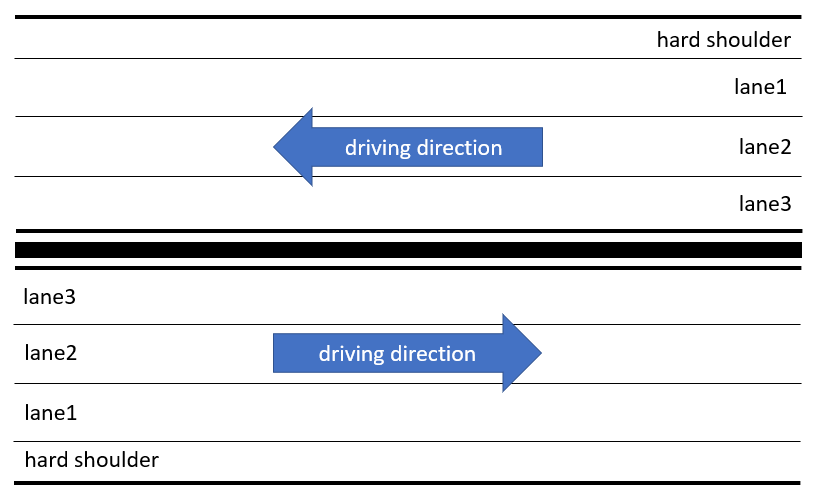


Figure 5: Lane numbering

Ramps can have one to many lanes and they follow the same logic. The right most driveable lane of the ramp is specified as “lane1”. In Datex2 this information is provided by ASFINAG also with the “affectedCarriagewayAndLanes” element. However, the “carriageway” in this case is set to rightHandFeederRoad and the “lane” is set to e.g. lane1.

* 1. Traffic Sign Categories at ASFINAG

At ASFINAG the traffic signs are categorized into:

* Electronic road signs
  + Variable message signs (VMS)
  + Variable text panels (VTP)
  + Variable direction signs (VDS)
* Metal signs
  + 1. Variable Message Signs (VMS)

The cross-section signs mounted centrally overhead consist of centre-lane (or centre of the lane) mounted VMS signs with an additional information sign below and intermediate VMS, also with an additional sign below. The centre-lane mounted VMS are called “A” signs and the additional or supplementary information signs below them are called as “AC” signs. The same way, the intermediate VMS are called as “B” signs and the additional or supplementary information signs below them are called as “BC” signs[[1]](#footnote-1).

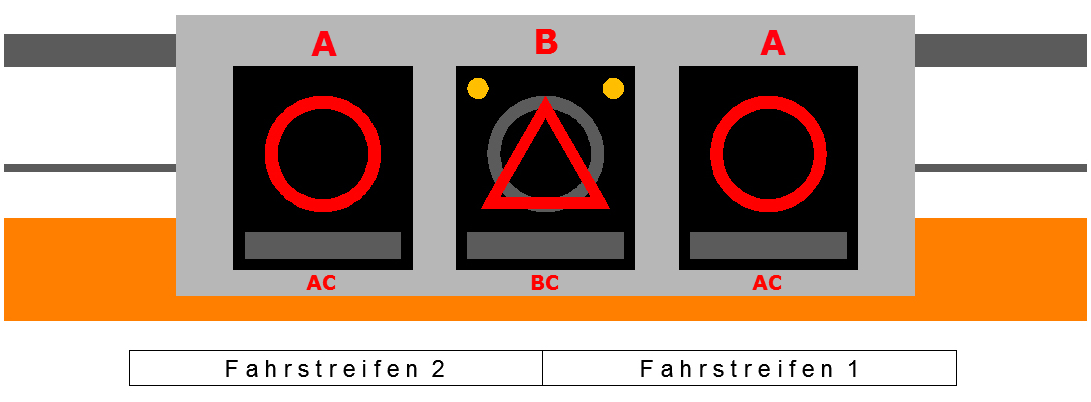
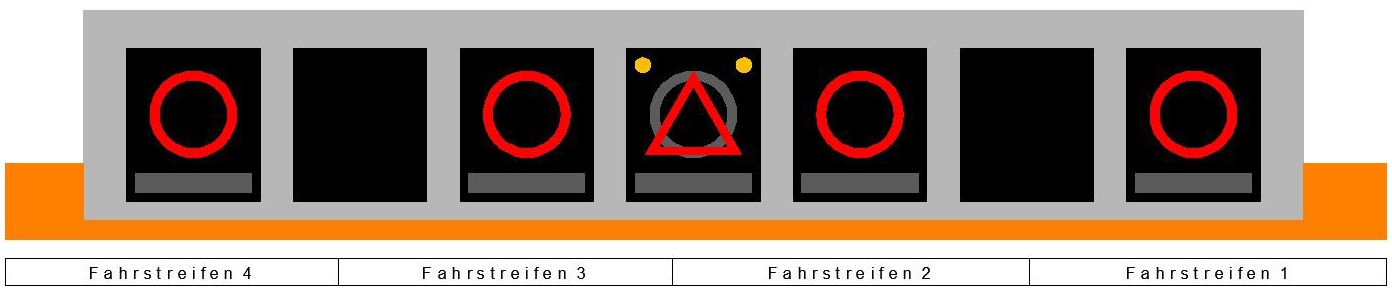


Figure 5: Variable Message Sign (VMS) covering two lanes1



**A**

**A**

**B**

**A**

**A**

**AC**

**AC**

**AC**

**AC**

**BC**

*Figure 6: Variable Message Sign (VMS) covering four lanes1*

**Figures 5** and **6** gives an overview about the VMS. The text “Fahrstreifen” means “Lane” (e.g., Lane1, Lane2…).

In DATEX II a typical VMS would look like as shown in **Figure 7** (In the DATEX II examples only relevant XML structure is provided):





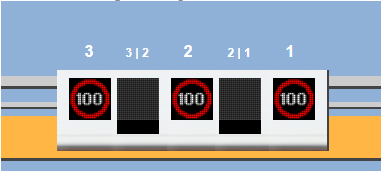
Figure 7: A sample VMS in DATEX II

Additional elements such as “*supplementaryPanel*”, “*lengthAttributes*”, “*distanceAttribute*”, etc. are provided based on the available information. For example a VMS which displays “*snow chains compulsory*” in the primary pictogram display, and “*applies to goods vehicles*” in the supplementary or additional pictogram display is encoded in DATEX II as shown in **Figure 8**.

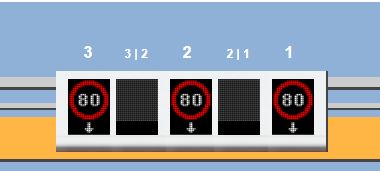


Figure 8: A sample VMS with supplementary pictogram in DATEX II

**Geographic validity of speed signs:** Geographically a speed sign is valid from the point where it is shown up to until the next VMS gantry or metal sign in driving direction1. Unless specified, the speed limit displayed on one lane is applicable to all the lanes. **Figures 9a** and **9b** illustrates the difference between general speed limits (that apply to all the lanes) and lane specific speed limits. You can notice that an arrow sign is displayed just below the speed limit for lane specific speed limits (**Figure 9b**).



*Figure 9a: VMS with speed limits applying to all lanes*



*Figure 9b: VMS with lanes specific speed limits*

The same scenario in DATEX II messages is illustrated in **Figure 10**. **Figure 10a** shows an example for speed signs that apply to all the lanes, whereas **Figure 10b** shows an example for lane specific speed signs. The examples are from the TrafficSignsDynamic feed. For the speed signs, the location information is provided again in the TrafficSignsDynamic in order to specify the lanes to which the speed limits are applicable. The default case is shown in **Figure 10a**, where the speed limit applies to all the lanes. **Figure 10b** shows the other case where the speed limit applies to only specific lanes, for example “lane1”. To specify the lane information in TrafficSignsDynamic we use DATEX II “*vmsLocationOverride*”.

To sum it up, the location information from the TrafficSignsStatic feed describes the physical location of the signs (Answering the questions: Where is the sign mounted? Above which lanes or beside the road?). In the TrafficSignsDynamic feed for **speed signs,** the Datex II “vmsLocationOverride” element provides information about lanes that are affected by the speed sign. In most cases the speed limit will apply to all the lanes. (Answering the question: Which speed sign is valid for which lane(s)?)



*Figure 10a: An example DATEX II message with speed limit applying to all lanes*



*Figure 10b: An example DATEX II message with speed limit applying to lane 1*

* + 1. Variable Text Panels (VTP)

Variable Text Panels are changeable signs on which information about particular events are presented in the form of free text, accompanied by at least one pictogram. Typically it consists of three lines of text and one VMS to display a road sign or a pictogram1. See **Figures** **11** and **12** to get an overview about VTPs.



Figure 11: Variable Text Panel (VTP)1



Figure 12: VTP example (Text in German)1

**Figure 13** shows a sample DATEX II message with a VTP showing 3 lines of text and a pictogram.



Figure 13: An example DATEX II message for VTP (Text in German)

* + 1. Variable Directional Signs (VDS)

Variable Directional Signs (VDS) are signs that can display pre-defined scenarios on otherwise conventional road sign plates by rotation of three or four prism bars. The movement of the prism is controlled by a motor1. **Figure 14** gives an overview about the VDS and **Figure 15** shows a sample DATEX II message for VDS.

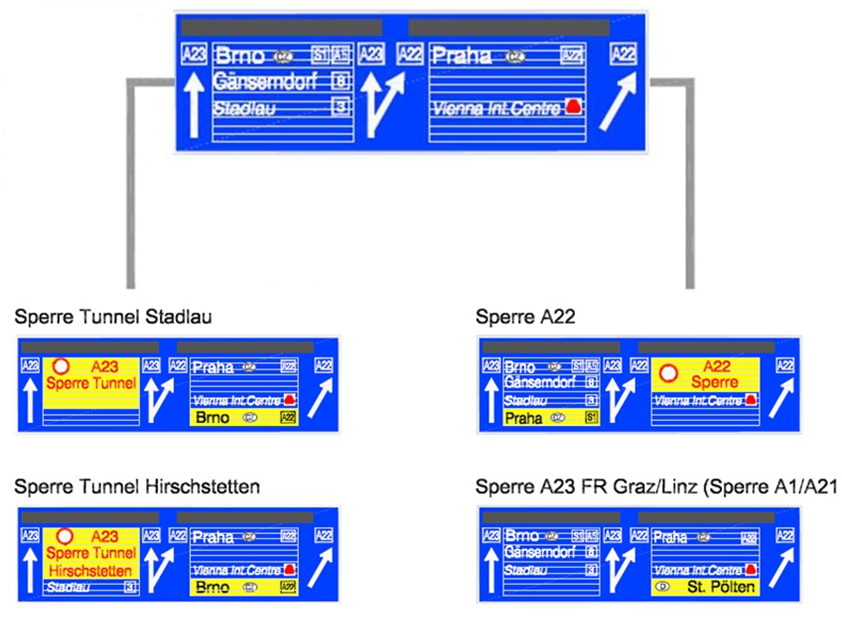


Figure 14: Variable Direction Signs (VDS)1



Figure 15: An example DATEX II message for VDS

* + 1. Metal Signs

Metal Signs are actual sign plates placed on the side of the road1. **Figure 16** shows metal signs with a speed restriction of 60 KMPH over 1.7km.



Figure 16: Metal Signs

The data structure of the metal sign is same as that of a VMS. **Figure 17** shows a sample DATEX II message for a metal sign.

Figure 17: An example DATEX II message for Metal Signs

* 1. Traffic Signs extensions

The Level B extensions for Austrian Traffic Signs Profile are summarised in this section.

Using the core traffic signs model of DATEX II (VmsPublication & VmsUnitPublication) it is not possible to provide the overall lanes of the carriage way above which a traffic sign is mounted. Therefore, the DATEX II class “AffectedCarriagewayAndLanes” which is part of the “NetworkLocation” (NetworkLocation/SupplementaryPositionalDescription/AffectedCarriagewayAndLanes) is extended.

In addition, we have also extended the “VmsUnitRecord” class to specify the category of the traffic signs gantry (Chapter A.2 Traffic sign categories), and also to specify whether or not a traffic sign gantry is capable to display the “max allowed speed limit”. Using these attributes, clients can not only filter the signs based on the category, but they can also select the speed signs exclusively.

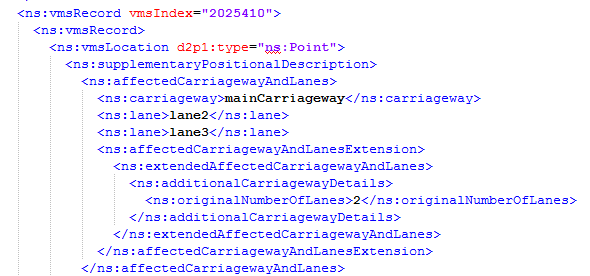
* + 1. AffectedCarriagewayAndLanes extension

Figure 18: AffectedCarriagewayAndLanes extension

The class “AdditionalCarriagewayDetails” is added to the “AffectedCarriagewayAndLanes” extension. It contains the following elements:

1. orginalNumberOfLanes :- The normal number of usable lanes in the specified direction that the carriageway has (this may include the hard shoulder if it is being used as an operation lane)
2. isHardShoulderUsable :- Specifies whether or not the hard shoulder is used as an operation lane. This is reserved for the future use. At the moment this is not specified in the feed.

Below you can also see an example for this extension



*Figure 19: AffectedCarriagewayAndLanes extension example*

* + 1. VmsUnitRecord extension

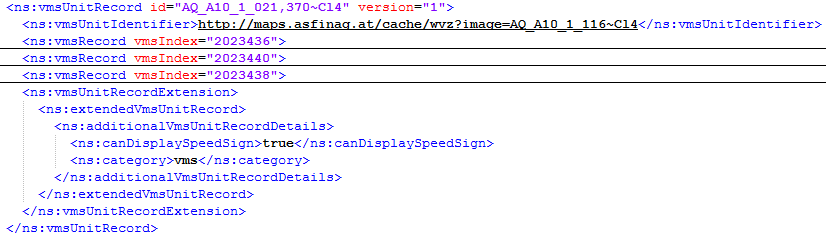
The class “AdditionalVmsDetails” (role additionalVmsUnitRecordDetails) is added to the “VmsUnitRecord”. It contains the following elements:

1. canDisplaySpeedSign :- Indicates whether or not a VmsUnit (or VmsGantry) is capable of displaying a speed limit sign.
2. category :- Category of the VmsUnit (Chapter A2.2). This is of type “VmsCategoryEnum”. The enum has the following literals:
   1. vms :- Variable Message Sign
   2. vtp :- Variable Text Panel
   3. vds :- Variable Directional Sign
   4. metalSign :- Conventional sign plates placed on the side of the road
   5. other :- Other than those specified in the enumeration. Those which cannot be categorized.



*Figure 20: VmsUnitRecord extension*

Below you can also see an example for this extension



*Figure 21: VmsUnitRecord extension example*

* 1. Traffic Signs Catalogue for ASFINAG VMS/VTP

The traffic signs catalogue for ASFINAG VMS/VTP is based on the current specification in planning manuals for the ASFINAG traffic control system (“*PlaPB 800.551.2000 Technische Spezifikation*”)[[2]](#footnote-2). The sign catalogue contains a list of pictogram codes which are converted to “*pictogramDescription*” and “*supplementaryPictogramDescription*” of *vmsPictogram* class in DATEX II. If an appropriate definition for a code is not found, then a textual definition of that code is added in “*addtionalPictogramDescription / additionalSupplementaryPictogramDescription*” fields.

The below table gives few examples of the pictogram codes to DATEX II conversion. The complete list is found in “**ASFINAG\_PictogramCodes\_ToDATEXII.xlsx**”.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pictogram  Code | Pictogram  Description | additionalPictogramDescription | speed  Attribute  [kmph] | weight  Attribute  [tons] | length  Attribute  [metres] | distanceAttribute  [metres] | height  Attribute  [metres] | supplementary  Pictogram  Description | additionalSupplementary  PictogramDescription |
| 24 | maximumSpeedLimitedToTheFigureIndicated |  | 60 |  |  |  |  |  |  |
| 26 | maximumSpeedLimitedToTheFigureIndicated |  | 80 |  |  |  |  |  |  |
| 28 | maximumSpeedLimitedToTheFigureIndicated |  | 100 |  |  |  |  |  |  |
| 31 | overtakingProhibited |  |  |  |  |  |  |  |  |
| 32 | overtakingByGoodsVehiclesProhibited |  |  | 3.5 |  |  |  |  |  |
| 44 | endOfSpeedLimit |  | 60 |  |  |  |  |  |  |
| 46 | endOfSpeedLimit |  | 80 |  |  |  |  |  |  |
| 48 | endOfSpeedLimit |  | 100 |  |  |  |  |  |  |
| 53 |  | allRestrictionsEnded |  |  |  |  |  |  |  |
| 212 |  | wrongWayDriver |  |  |  |  |  |  |  |
| 102 |  |  |  | 7.5 |  |  |  | restrictedToGoodsVehicles |  |
| 229 |  |  |  |  |  |  |  |  | blackIce |
| 82 |  |  |  |  |  | 1000 |  | distanceToTheBeginningofTheApplicationZone |  |
| 92 |  |  |  |  | 1000 |  |  | lengthOfTheApplicationZone |  |
| 216 |  | heightRestrictionInOperation |  |  |  |  | 4 |  |  |

* 1. Data Dictionary for "AustrianTrafficSignsProfile"

In this chapter all data elements that are provided by the ASFINAG Content interface are marked in green colour. Other elements, attributes, enumeration and enumeration literals are left open for future use

* + 1. "AdditionalCarriagewayDetails" package
       1. "AdditionalCarriagewayDetails" package classes

| **Class name** | **Designation** | **Definition** | **Stereotype** | **Abstract** |
| --- | --- | --- | --- | --- |
| AdditionalCarriagewayDetails | Additional carriageway details | Additional details of the carriageway |  | no |
| ExtendedAffectedCarriagewayAndLanes | Extended affected carriageway and lanes | Extension for AffectedCarriagewayAndLanes |  | no |

Table 1— Classes of the "AdditionalCarriagewayDetails" package

* + - 1. "AdditionalCarriagewayDetails" package association roles

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

* + - 1. "AdditionalCarriagewayDetails" package attributes

| **Class name** | **Attribute name** | **Designation** | **Definition** | **Multiplicity** | **Type** |
| --- | --- | --- | --- | --- | --- |
| AdditionalCarriagewayDetails | isHardShoulderUsable | Is hard shoulder usable | Set to true if the HardShoulder becomes operational (e.g. in hard shoulder running schemes) | 0..1 | Boolean |
|  | originalNumberOfLanes | Original number of lanes | The normal number of usable lanes in the specified direction that the carriageway has (this may include the hard shoulder if it is being used as an operational lane). | 1..1 | NonNegativeInteger |

Table 2— Attributes of the "AdditionalCarriagewayDetails" package

* + 1. "AdditionalVmsUnitRecordDetails" package
       1. "AdditionalVmsUnitRecordDetails" package classes

| **Class name** | **Designation** | **Definition** | **Stereotype** | **Abstract** |
| --- | --- | --- | --- | --- |
| AdditionalVmsDetails | Additional VMS details | Additional details related to a Vms. This can be part of both VmsUnitRecord (static feed) and VmsUnit (dynamic feed) |  | no |
| ExtendedVmsUnitRecord | Extended VMS unit record | Extension for VmsUnitRecord |  | no |

Table 3— Classes of the "AdditionalVmsUnitRecordDetails" package

* + - 1. "AdditionalVmsUnitRecordDetails" package association roles

| **Class name** | **Role name** | **Designation** | **Definition** | **Multiplicity** | **Target** |
| --- | --- | --- | --- | --- | --- |
| ExtendedVmsUnitRecord | additionalVmsUnitRecordDetails | Additional VMS unit record details | Additional details related to a VmsUnitRecord | 0..1 | AdditionalVmsDetails |

Table 4— Associations of the "AdditionalVmsUnitRecordDetails" package

* + - 1. "AdditionalVmsUnitRecordDetails" package attributes

| **Class name** | **Attribute name** | **Designation** | **Definition** | **Multiplicity** | **Type** |
| --- | --- | --- | --- | --- | --- |
| AdditionalVmsDetails | canDisplaySpeedSign | Can display speed sign | Indicates whether or not a VmsUnit is capable to display a speed sign. If the value is true, then it indicates that the VmsUnit can display the speed sign. | 1..1 | Boolean |
|  | category | Category | Category of the VmsUnit | 1..1 | VmsCategoryEnum |

**Table 5— Attributes of the "AdditionalVmsUnitRecordDetails" package**

* + 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 |

Table 6— Classes of the "Exchange" package

* + - 1. "Exchange" package association roles

| **Class name** | **Role name** | **Designation** | **Definition** | **Multiplicity** | **Target** |
| --- | --- | --- | --- | --- | --- |
| Exchange | supplierIdentification | Supplier identification |  | 1..1 | InternationalIdentifier |

Table 7— Associations of the "Exchange" package

* + - 1. "Exchange" package attributes

There are no attributes in the Exchange package.

| **Class name** | **Attribute name** | **Designation** | **Definition** | **Multiplicity** | **Type** |
| --- | --- | --- | --- | --- | --- |

Table 8— Attributes of the "Exchange" package

* + 1. "Fault" package
       1. "Fault" package classes

| **Class name** | **Designation** | **Definition** | **Stereotype** | **Abstract** |
| --- | --- | --- | --- | --- |
| Fault | Fault | Information about a fault relating to a specific piece of equipment or process. |  | no |
| VmsFault | VMS fault | Details of the fault which is being reported for the specified variable message sign panel. |  | no |
| VmsUnitFault | VMS unit fault | Details of the fault which is being reported for the specified variable message sign control unit. |  | no |

Table 9— Classes of the "Fault" package

* + - 1. "Fault" package association roles

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

* + - 1. "Fault" package attributes

| **Class name** | **Attribute name** | **Designation** | **Definition** | **Multiplicity** | **Type** |
| --- | --- | --- | --- | --- | --- |
| Fault | faultCreationTime | Fault creation time | The date and time at which the fault was originally recorded/reported. | 0..1 | DateTime |
|  | faultDescription | Fault description | Textual description of the fault. | 0..1 | String |
|  | faultIdentifier | Fault identifier | Unique identifier of the fault. | 0..1 | String |
|  | faultLastUpdateTime | Fault last update time | The date and time at which the fault information as specified in this instance was last updated. | 1..1 | DateTime |
|  | faultSeverity | Fault severity | The severity of the fault in terms of how it affects the usability of the equipment or the reliability of the data generated by the equipment. | 0..1 | FaultSeverityEnum |
| VmsFault | vmsFault | VMS fault | The type of fault which is being reported for the specified variable message sign panel. | 1..1 | VmsFaultEnum |
| VmsUnitFault | vmsUnitFault | VMS unit fault | The type of fault which is being reported for the VMS unit. | 1..1 | VmsFaultEnum |

Table 10— Attributes of the "Fault" package

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

| **Class name** | **Designation** | **Definition** | **Stereotype** | **Abstract** |
| --- | --- | --- | --- | --- |
| AffectedCarriagewayAndLanes | Affected carriageway and lanes | Supplementary positional information which details carriageway and lane locations. Several instances may exist where the element being described extends over more than one carriageway. |  | 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 |
| PointCoordinates | Point coordinates | A pair of coordinates defining the geodetic position of a single point using the European Terrestrial Reference System 1989 (ETRS89). |  | no |
| SupplementaryPositionalDescription | Supplementary positional description | A collection of supplementary positional information which improves the precision of the location. |  | no |

Table 11— Classes of the "GroupOfLocations" package

* + - 1. "GroupOfLocations" package association roles

There are no association roles in the GroupOfLocation package.

| **Class name** | **Role name** | **Designation** | **Definition** | **Multiplicity** | **Target** |
| --- | --- | --- | --- | --- | --- |

Table 12— Associations of the "GroupOfLocations" package

* + - 1. "GroupOfLocations" package attributes

| **Class name** | **Attribute name** | **Designation** | **Definition** | **Multiplicity** | **Type** |
| --- | --- | --- | --- | --- | --- |
| AffectedCarriagewayAndLanes | carriageway | Carriageway | Indicates the section of carriageway to which the location relates. | 1..1 | CarriagewayEnum |
|  | lane | Lane | Indicates the specific lane to which the location relates. | 0..\* | LaneEnum |
| 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 13— Attributes of the "GroupOfLocations" 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 14— Classes of the "PayloadPublication" package

* + - 1. "PayloadPublication" package association roles

| **Class name** | **Role name** | **Designation** | **Definition** | **Multiplicity** | **Target** |
| --- | --- | --- | --- | --- | --- |
| PayloadPublication | publicationCreator | Publication creator |  | 1..1 | InternationalIdentifier |

Table 15— Associations of the "PayloadPublication" package

* + - 1. "PayloadPublication" package attributes

| **Class name** | **Attribute name** | **Designation** | **Definition** | **Multiplicity** | **Type** |
| --- | --- | --- | --- | --- | --- |
| PayloadPublication | defaultLanguage | Default language | The default language used throughout the payload publication. | 1..1 | Language |
|  | feedDescription | Feed description | A description of the information which is to be found in the publications originating from the particular feed (URL). | 0..1 | MultilingualString |
|  | feedType | Feed type | A classification of the information which is to be found in the publications originating from the particular feed. | 0..1 | String |
|  | publicationTime | Publication time | Date/time at which the payload publication was created. | 1..1 | DateTime |

Table 16— Attributes of the "PayloadPublication" package

* + 1. "Point" package
       1. "Point" package classes

| **Class name** | **Designation** | **Definition** | **Stereotype** | **Abstract** |
| --- | --- | --- | --- | --- |
| Point | Point | A single geospatial point. |  | no |
| PointByCoordinates | Point by coordinates | A single point defined only by a coordinate set with an optional bearing direction. |  | no |

Table 17— Classes of the "Point" package

* + - 1. "Point" package association roles

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

* + - 1. "Point" 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 |

Table 18— Attributes of the "Point" package

* + 1. "PointAlongLinearElement" package
       1. "PointAlongLinearElement" package classes

| **Class name** | **Designation** | **Definition** | **Stereotype** | **Abstract** |
| --- | --- | --- | --- | --- |
| DistanceAlongLinearElement | Distance along linear element | Distance of a point along a linear element either measured from the start node or a defined referent on that linear element, where the start node is relative to the element definition rather than the direction of traffic flow. |  | yes |
| DistanceFromLinearElementReferent | Distance from linear element referent | Distance of a point along a linear element measured from a "from referent" on the linear element, in the sense relative to the linear element definition rather than the direction of traffic flow or optionally towards a "towards referent". |  | no |
| DistanceFromLinearElementStart | Distance from linear element start | Distance of a point along a linear element measured from the start node of the linear element, where start node is relative to the element definition rather than the direction of traffic flow. |  | no |
| LinearElement | Linear element | A linear element along a single linear object, consistent with ISO 19148 definitions. |  | no |
| PointAlongLinearElement | Point along linear element | A point on a linear element where the linear element is either a part of or the whole of a linear object (i.e. a road), consistent with ISO 19148 definitions. |  | no |
| Referent | Referent | A referent on a linear object that has a known location such as a node, a reference marker (e.g. a markerpost), an intersection etc. |  | no |

Table 19— Classes of the "PointAlongLinearElement" package

* + - 1. "PointAlongLinearElement" package association roles

| **Class name** | **Role name** | **Designation** | **Definition** | **Multiplicity** | **Target** |
| --- | --- | --- | --- | --- | --- |
| DistanceFromLinearElementReferent | fromReferent | From referent | A known location along the linear element from which the distanceAlong is measured, termed the "fromReferent" in ISO 19148. | 1..1 | Referent |
|  | towardsReferent | Towards referent | A known location along the linear element towards which the distanceAlong is measured, termed the "towardsReferent" in ISO 19148. | 0..1 | Referent |

Table 20— Associations of the "PointAlongLinearElement" package

* + - 1. "PointAlongLinearElement" package attributes

| **Class name** | **Attribute name** | **Designation** | **Definition** | **Multiplicity** | **Type** |
| --- | --- | --- | --- | --- | --- |
| DistanceFromLinearElementReferent | distanceAlong | Distance along | A measure of distance along a linear element. | 1..1 | MetresAsFloat |
| DistanceFromLinearElementStart | distanceAlong | Distance along | A measure of distance along a linear element. | 1..1 | MetresAsFloat |
| LinearElement | roadName | Road name | Name of the road of which the linear element forms a part. | 0..1 | MultilingualString |
|  | roadNumber | Road number | Identifier/number of the road of which the linear element forms a part. | 0..1 | String |
| PointAlongLinearElement | directionBoundAtPoint | Direction bound at point | The direction of traffic flow at the specified point in terms of general destination direction. | 0..1 | DirectionEnum |
|  | directionRelativeAtPoint | Direction relative at point | The direction of traffic flow at the specified point relative to the direction in which the linear element is defined. | 0..1 | LinearReferencingDirectionEnum |
| Referent | referentDescription | Referent description | Description of the referent. | 0..1 | MultilingualString |
|  | referentIdentifier | Referent identifier | The identifier of the referent, unique on the specified linear element (i.e. road or part of). | 1..1 | String |
|  | referentName | Referent name | The name of the referent, e.g. a junction or intersection name. | 0..1 | String |
|  | referentType | Referent type | The type of the referent. | 1..1 | ReferentTypeEnum |

Table 61— Attributes of the "PointAlongLinearElement" package

* + 1. "VmsMessage" package
       1. "VmsMessage" package classes

| **Class name** | **Designation** | **Definition** | **Stereotype** | **Abstract** |
| --- | --- | --- | --- | --- |
| VmsMessage | VMS message | A message displayed on a VMS which may comprise one or more sequentially displayed text pages and/or pictograms with supplementary details. When in a sequence of displayed messages sequencing of text pages and pictograms within a message are prohibited. |  | no |
| VmsPictogram | VMS pictogram | A main pictogram displayable on the VMS panel. Note a main pictogram may have an associated supplementary panel which may itself contain a further pictogram and line of text. |  | no |
| VmsPictogramDisplayArea | VMS pictogram display area | An area on a VMS used for the display of pictograms and associated supplemental information or instructions. |  | no |
| VmsSupplementaryPanel | VMS supplementary panel | A panel which may display information or a regulatory instruction which is supplemental to the associated pictogram, comprising either an additional line of text or a pictogram or both. |  | no |
| VmsSupplementaryPictogram | VMS supplementary pictogram | An additional pictogram that is displayed in the panel which is supplemental to the associated pictogram display. |  | no |
| VmsText | VMS text | A page of text (comprising one or more ordered lines) that are displayed simultaneously on the VMS. Where more than one page is defined these are sequentially displayed according to their "pageNumber". |  | no |
| VmsTextLine | VMS text line | A single line of text on a text display area or supplementary panel. |  | no |

Table 22— Classes of the "VmsMessage" package

* + - 1. "VmsMessage" package association roles

| **Class name** | **Role name** | **Designation** | **Definition** | **Multiplicity** | **Target** |
| --- | --- | --- | --- | --- | --- |
| VmsMessage | textPage | Text page |  | 1..1 | VmsText |
| VmsSupplementaryPanel | vmsSupplementaryText | VMS supplementary text | One line of text displayed in the panel which is supplemental to the pictogram display. | 0..1 | VmsTextLine |

Table 23— Associations of the "VmsMessage" package

* + - 1. "VmsMessage" package attributes

| **Class name** | **Attribute name** | **Designation** | **Definition** | **Multiplicity** | **Type** |
| --- | --- | --- | --- | --- | --- |
| VmsMessage | messageSetBy | Message set by | The organisation or authority which set the message currently being displayed. | 0..1 | MultilingualString |
|  | setBySystem | Set by system | Indicates whether the message has been set automatically by a system. True = automatically set. | 0..1 | Boolean |
|  | timeLastSet | Time last set | The date/time at which the sign was last set. | 1..1 | DateTime |
|  | vmsMessageInformationType | VMS message information type | Type of information being displayed. | 0..\* | VmsMessageInformationTypeEnum |
| VmsPictogram | additionalPictogramDescription | Additional pictogram description | Additional description of the pictogram. | 0..1 | MultilingualString |
|  | distanceAttribute | Distance attribute | Value of distance that is displayable as part of the pictogram (e.g. for keep minimum safe distance). | 0..1 | MetresAsNonNegativeInteger |
|  | heightAttribute | Height attribute | Value of height that is displayable as part of the pictogram (e.g. for a vehicle height restriction). | 0..1 | MetresAsFloat |
|  | lengthAttribute | Length attribute | Value of length that is displayable as part of the pictogram (e.g. for a vehicle length restriction). | 0..1 | MetresAsFloat |
|  | pictogramCode | Pictogram code | The code of the pictogram from the pictogram code list referenced in the VmsPictogramDisplayCharacteristics for the VMS that is identified in the relevant VMS Unit table. | 0..1 | String |
|  | pictogramDescription | Pictogram description | Description of the (main) displayed pictogram. | 0..\* | VmsDatexPictogramEnum |
|  | pictogramFlashing | Pictogram flashing | Indication of whether the pictogram is flashing. | 0..1 | Boolean |
|  | pictogramUrl | Pictogram url | Reference to a URL from where an image of the displayed pictogram can be be obtained. | 0..1 | Url |
|  | presenceOfRedTriangle | Presence of red triangle | Indication of the presence of a red triangle around the pictogram, often used to indicate imminence, typically within 2km, of signed danger. | 1..1 | Boolean |
|  | speedAttribute | Speed attribute | Value of speed that is displayable as part of the pictogram (e.g. for a maximum speed limit). | 0..1 | KilometresPerHour |
|  | viennaConventionCompliant | Vienna convention compliant | Indicates that the displayed pictogram conforms with the Vienna Convention defined pictogram list as modified by "UNECE Consolidated Resolution on Road Signs and Signals". | 0..1 | Boolean |
|  | weightAttribute | Weight attribute | Value of weight that is displayable as part of the pictogram (e.g. for a maximum weight restriction). | 0..1 | Tonnes |
|  | weightPerAxleAttribute | Weight per axle attribute | Value of axle weight that is displayable as part of the pictogram (e.g. for a maximum axle weight restriction). | 0..1 | Tonnes |
|  | widthAttribute | Width attribute | Value of width that is displayable as part of the pictogram (e.g. for a vehicle width restriction). | 0..1 | MetresAsFloat |
| VmsSupplementaryPanel | supplementaryMessageDescription | Supplementary message description | Free text description of the message that is displayed in the panel which is supplemental to the main pictogram display. | 0..1 | MultilingualString |
| VmsSupplementaryPictogram | additionalSupplementaryPictogramDescription | Additional supplementary pictogram description | Additional free text description of the supplementary pictogram. | 0..1 | MultilingualString |
|  | pictogramFlashing | Pictogram flashing | Indication of whether the pictogram is flashing. | 0..1 | Boolean |
|  | supplementaryPictogramCode | Supplementary pictogram code | The code of the supplementary pictogram from the supplementary pictogram code list referenced in the VmsSupplementaryPanelCharacteristics for the VMS that is identified in the relevant VMS Unit table. | 0..1 | String |
|  | supplementaryPictogramDescription | Supplementary pictogram description | Description of the supplementary displayed pictogram. | 0..1 | VmsDatexSupplementalPictogramEnum |
|  | supplementaryPictogramUrl | Supplementary pictogram url | Reference to a URL from where an image of the displayed supplementary pictogram can be be obtained. | 0..1 | Url |
| VmsTextLine | vmsTextLine | VMS text line | A free-text string that is displayed on a single line on the text display area. | 1..1 | String |
|  | vmsTextLineHtml | VMS text line html | The displayed line of text defined by an HTML string showing text formatting tags. | 0..1 | String |
|  | vmsTextLineLanguage | VMS text line language | The language of the displayed line of text, specified by an ISO 639-2 3-alpha code. | 0..1 | Language |

Table 24— Attributes of the "VmsMessage" package

* + 1. "VmsPublication" package
       1. "VmsPublication" package classes

| **Class name** | **Designation** | **Definition** | **Stereotype** | **Abstract** |
| --- | --- | --- | --- | --- |
| VmsPublication | VMS publication | A publication containing the current status and settings of one or more VMS units, each unit controlling one or more individual variable message signs. |  | no |

Table 25— Classes of the "VmsPublication" package

* + - 1. "VmsPublication" package association roles

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

* + - 1. "VmsPublication" package attributes

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

* + 1. "VmsRelated" package
       1. "VmsRelated" package classes

| **Class name** | **Designation** | **Definition** | **Stereotype** | **Abstract** |
| --- | --- | --- | --- | --- |
| VmsPictogramDisplayCharacteristics | VMS pictogram display characteristics | Characteristics specific to the pictogram display area(s) on the VMS where pictogramDisplayAreaIndex indicates which pictogram area it relates to. |  | no |

Table 26— Classes of the "VmsRelated" package

* + - 1. "VmsRelated" package association roles

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

* + - 1. "VmsRelated" package attributes

There are no defined attributes in “VmsRelated” package.

| **Class name** | **Attribute name** | **Designation** | **Definition** | **Multiplicity** | **Type** |
| --- | --- | --- | --- | --- | --- |

Table 27— Attributes of the "VmsRelated" package

* + 1. "VmsTablePublication" package
       1. "VmsTablePublication" package classes

| **Class name** | **Designation** | **Definition** | **Stereotype** | **Abstract** |
| --- | --- | --- | --- | --- |
| VmsRecord | VMS record | A sub-record in the VMS Unit table defining the characteristics of a single variable message sign that is controlled by a specific VMS unit. Locations are on or adjacent to the road network but may be updated over time if relating to a mobile VMS unit. |  | no |
| VmsTablePublication | VMS table publication | A publication containing one or more VMS Unit Tables each comprising a set of records which hold details of VMS units. |  | no |
| VmsUnitRecord | VMS unit record | A versioned single VMS unit entry/record in the VMS Unit table that defines the characteristics of the VMS unit. | versionedIdentifiable | no |
| VmsUnitTable | VMS unit table | A versioned VMS Unit Table comprising a number of data records, each record defining the characteristics of a specific deployed variable message sign unit. | versionedIdentifiable | no |

Table 28— Classes of the "VmsTablePublication" package

* + - 1. "VmsTablePublication" package association roles

| **Class name** | **Role name** | **Designation** | **Definition** | **Multiplicity** | **Target** |
| --- | --- | --- | --- | --- | --- |
| VmsRecord | backgroundImageUrl | Background image url | A URL reference from where an image of the "painted" static background on the VMS can be obtained. | 0..1 | UrlLink |
|  | vmsLocation | VMS location | The point location of the variable message sign. For mobile VMS which are regularly moved this need not be provided. Instead the VMS location should be provided in the VmsPublication along with current settings. | 0..1 | Location |

Table 29— Associations of the "VmsTablePublication" package

* + - 1. "VmsTablePublication" package attributes

| **Class name** | **Attribute name** | **Designation** | **Definition** | **Multiplicity** | **Type** |
| --- | --- | --- | --- | --- | --- |
| VmsRecord | dynamicallyConfigurableDisplayAreas | Dynamically configurable display areas | Identifies (when True) that the VMS has a display area that may be dynamically configured to display different combinations of text and pictogram areas. The current configuration will normally be given with each published current VMS setting. | 0..1 | Boolean |
|  | numberOfPictogramDisplayAreas | Number of pictogram display areas | Number of pictogram display areas which the VMS contains. | 0..1 | NonNegativeInteger |
|  | vmsDescription | VMS description | The description of the VMS (possibly giving a description of its location or its normal use). | 0..1 | MultilingualString |
|  | vmsPhysicalMounting | VMS physical mounting | Description of how the VMS is physically mounted or deployed on the road. | 0..1 | PhysicalMountingEnum |
|  | vmsType | VMS type | Broad classification of the type of variable message sign. | 0..1 | VmsTypeEnum |
| VmsUnitRecord | numberOfVms | Number of VMS | Number of variable message signs contolled by the unit. | 0..1 | NonNegativeInteger |
|  | vmsUnitIdentifier | VMS unit identifier | Identification of a VMS unit used by the supplier or consumer systems. | 0..1 | String |
| VmsUnitTable | vmsUnitTableIdentification | VMS unit table identification | An alphanumeric identification for the VMS Unit table, possibly human readable. | 0..1 | String |

Table 30— Attributes of the "VmsTablePublication" package

* + 1. "VmsUnit" package
       1. "VmsUnit" package classes

| **Class name** | **Designation** | **Definition** | **Stereotype** | **Abstract** |
| --- | --- | --- | --- | --- |
| Vms | Vms | Provides the current status and settings of the VMS and the currently displayed information. Where a VMS is displaying a sequence or alternating set of messages these are ordered according to the messageIndex qualifier. |  | no |
| VmsSetting | VMS setting | Provides information on variable message signs and the information currently displayed. |  | yes |
| VmsUnit | VMS unit | Status of a VMS unit which may control one or more variable message signs on a single gantry or on different gantries. |  | no |

Table 31— Classes of the "VmsUnit" package

* + - 1. "VmsUnit" package association roles

| **Class name** | **Role name** | **Designation** | **Definition** | **Multiplicity** | **Target** |
| --- | --- | --- | --- | --- | --- |
| Vms | vmsLocationOverride | VMS location override | The current point location of the VMS which overrides that stated in the associated VMSTable entry. Typically it is used for giving the updated location of a mobile VMS which has recently been moved. | 0..1 | Location |

Table 32— Associations of the "VmsUnit" package

* + - 1. "VmsUnit" package attributes

| **Class name** | **Attribute name** | **Designation** | **Definition** | **Multiplicity** | **Type** |
| --- | --- | --- | --- | --- | --- |
| Vms | vmsWorking | VMS working | Indicates whether the VMS is usable. Note it may still be usable with minor faults. | 1..1 | Boolean |
| VmsUnit | vmsUnitReference | VMS unit reference | A reference to a versioned VMS unit record in a VMS Unit table which defines the characteristics of the VMS unit. | 1..1 | VersionedReference |
|  | vmsUnitTableReference | VMS unit table reference | A reference to a versioned VMS Unit table. | 1..1 | VersionedReference |

Table 33— Attributes of the "VmsUnit" package

* 1. Data Dictionary of <<datatypes>> for "AustrianTrafficSignsProfile"

This clause contains the definitions of all data types which are used in the "AustrianTrafficSignsProfile".

* + 1. The <<datatype>> "AlertCLocationCode"

A positive integer number (between 1 and 63,487) which uniquely identifies a pre-defined Alert C location defined within an Alert-C table.

* + 1. The <<datatype>> "KilometresPerHour"

A measure of speed defined in kilometres per hour.

* + 1. The <<datatype>> "MetresAsFloat"

A measure of distance defined in metres in a floating point format.

* + 1. The <<datatype>> "MetresAsNonNegativeInteger"

A measure of distance defined in metres in a non negative integer format.

* + 1. The <<datatype>> "Percentage"

A measure of percentage.

* + 1. The <<datatype>> "Seconds"

Seconds.

* + 1. The <<datatype>> "Tonnes"

A measure of weight defined in metric tonnes.

* 1. Data Dictionary of <<enumerations>> for "AustrianTrafficSignsProfile"

This clause contains the definitions of all enumerations which are used in the "AustrianTrafficSignsProfile".

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

List of descriptors identifying specific carriageway details.

| **Enumerated value name** | **Designation** | **Definition** |
| --- | --- | --- |
| connectingCarriageway | Connecting carriageway | On the connecting carriageway. |
| entrySlipRoad | Entry slip road | On the entry slip road. |
| exitSlipRoad | Exit slip road | On the exit slip road. |
| flyover | Flyover | On the flyover, i.e. the section of road passing over another. |
| leftHandFeederRoad | Left hand feeder road | On the left hand feeder road. |
| leftHandParallelCarriageway | Left hand parallel carriageway | On the left hand parallel carriageway. |
| mainCarriageway | Main carriageway | On the main carriageway. |
| oppositeCarriageway | Opposite carriageway | On the opposite carriageway. |
| parallelCarriageway | Parallel carriageway | On the adjacent parallel carriageway. |
| rightHandFeederRoad | Right hand feeder road | On the right hand feeder road. |
| rightHandParallelCarriageway | Right hand parallel carriageway | On the right hand parallel carriageway. |
| roundabout | Roundabout | On the roundabout. |
| serviceRoad | Service road | On the adjacent service road. |
| slipRoads | Slip roads | On the slip roads. |
| underpass | Underpass | On the underpass, i.e. the section of road passing under another. |

Table 34— Values contained in the enumeration "CarriagewayEnum"

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

List of directions of travel.

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

Table 35— Values contained in the enumeration "DirectionEnum"

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

Classification of the severity of faults.

| **Enumerated value name** | **Designation** | **Definition** |
| --- | --- | --- |
| high | High | The fault is of high severity which will render the equipment unusable or any data generated by the equipment to be of no value. |
| low | Low | The fault is of low severity and has only limited impact on the usability of the equipment or the value of the data generated by the equipment. |
| medium | Medium | The fault is of medium severity which will significantly limit the usability of the equipment or devalue the usefulness of the data generated by the equipment. |
| unknown | Unknown | The fault is of unknown severity and hence its effect on the usability of the equipment or the usefulness of the data generated by the equipment can not be assessed. |

Table 36— Values contained in the enumeration "FaultSeverityEnum"

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

List of descriptors identifying specific lanes.

| **Enumerated value name** | **Designation** | **Definition** |
| --- | --- | --- |
| allLanesCompleteCarriageway | All lanes complete carriageway | In all lanes of the carriageway. |
| busLane | Bus lane | In the bus lane. |
| busStop | Bus stop | In the bus stop lane. |
| carPoolLane | Car pool lane | In the carpool lane. |
| centralReservation | Central reservation | On the central median separating the two directional carriageways of the highway. |
| crawlerLane | Crawler lane | In the crawler lane. |
| emergencyLane | Emergency lane | In the emergency lane. |
| escapeLane | Escape lane | In the escape lane. |
| expressLane | Express lane | In the express lane. |
| hardShoulder | Hard shoulder | On the hard shoulder. |
| heavyVehicleLane | Heavy vehicle lane | In the heavy vehicle lane. |
| lane1 | Lane1 | In the first lane numbered from nearest the hard shoulder to central median. |
| lane2 | Lane2 | In the second lane numbered from nearest the hard shoulder to central median. |
| lane3 | Lane3 | In the third lane numbered from nearest the hard shoulder to central median. |
| lane4 | Lane4 | In the fourth lane numbered from nearest the hard shoulder to central median. |
| lane5 | Lane5 | In the fifth lane numbered from nearest the hard shoulder to central median. |
| lane6 | Lane6 | In the sixth lane numbered from nearest the hard shoulder to central median. |
| lane7 | Lane7 | In the seventh lane numbered from nearest the hard shoulder to central median. |
| lane8 | Lane8 | In the eighth lane numbered from nearest the hard shoulder to central median. |
| lane9 | Lane9 | In the ninth lane numbered from nearest the hard shoulder to central median. |
| layBy | Lay by | In a lay-by. |
| leftHandTurningLane | Left hand turning lane | In the left hand turning lane. |
| leftLane | Left lane | In the left lane. |
| localTrafficLane | Local traffic lane | In the local traffic lane. |
| middleLane | Middle lane | In the middle lane. |
| opposingLanes | Opposing lanes | In the opposing lanes. |
| overtakingLane | Overtaking lane | In the overtaking lane. |
| rightHandTurningLane | Right hand turning lane | In the right hand turning lane. |
| rightLane | Right lane | In the right lane. |
| rushHourLane | Rush hour lane | In the lane dedicated for use during the rush (peak) hour. |
| setDownArea | Set down area | In the area/lane reserved for passenger pick-up or set-down. |
| slowVehicleLane | Slow vehicle lane | In the slow vehicle lane. |
| throughTrafficLane | Through traffic lane | In the through traffic lane. |
| tidalFlowLane | Tidal flow lane | In the lane dedicated for use as a tidal flow lane. |
| turningLane | Turning lane | In the turning lane. |
| verge | Verge | On the verge. |

Table 37— Values contained in the enumeration "LaneEnum"

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

Directions of traffic flow relative to the direction in which the linear element is defined.

| **Enumerated value name** | **Designation** | **Definition** |
| --- | --- | --- |
| aligned | Aligned | Indicates that the direction of traffic flow affected by the situation or related to the traffic data is in the same sense as the direction in which the linear element is defined. |
| both | Both | Indicates that both directions of traffic flow are affected by the situation or relate to the traffic data. |
| opposite | Opposite | Indicates that the direction of traffic flow affected by the situation or related to the traffic data is in the opposite sense to the direction in which the linear element is defined. |
| unknown | Unknown | Indicates that the direction of traffic flow affected by the situation or related to the traffic data is unknown. |

Table 38— Values contained in the enumeration "LinearReferencingDirectionEnum"

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

The ways in which equipments such as VMS are mounted or deployed on the road.

| **Enumerated value name** | **Designation** | **Definition** |
| --- | --- | --- |
| centralReservationMounted | Central reservation mounted | Equipment mounted in the central reservation. |
| gantryMounted | Gantry mounted | Equipment mounted on an overhead gantry across the roadway. |
| overheadBridgeMounted | Overhead bridge mounted | Equipment mounted overhead on a bridge structure. |
| roadsideCantileverMounted | Roadside cantilever mounted | Equipment mounted on a cantilever from the roadside. |
| roadsideMounted | Roadside mounted | Equipment mounted at the roadside. |
| trailerMounted | Trailer mounted | Equipment mounted on a movable trailer. |
| tunnelEntranceMounted | Tunnel entrance mounted | Equipment mounted on the entrance to a tunnel. |
| vehicleMounted | Vehicle mounted | Equipment mounted on a vehicle. |

Table 39— Values contained in the enumeration "PhysicalMountingEnum"

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

A set of types of known points along a linear object such as a road.

| **Enumerated value name** | **Designation** | **Definition** |
| --- | --- | --- |
| boundary | Boundary | A boundary between two jurisdictional or administrative areas. These may be legal boundaries such as between counties or countries, maintenance responsibility boundaries or control boundaries. |
| intersection | Intersection | A crossing of two or more roads where the precise point of intersection is defined according to specific business rules. |
| landmark | Landmark | A visible identifiable physical landmark either alongside or close to the linear object. |
| referenceMarker | Reference marker | A marker which is usually but not necessarily physical that is one of a sequence which are spaced out along the linear object (road) to provide a location reference. The spacing of markers is not necessarily even. |
| roadNode | Road node | A topological node defined on a road network. Such nodes may delineate the segmentation of the road network according to defined business rules or may constitute a purely topological representation of a road network. |

Table 40— Values contained in the enumeration "ReferentTypeEnum"

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

Category of the Vms

| **Enumerated value name** | **Designation** | **Definition** |
| --- | --- | --- |
| metalSign | Metal sign | Conventional sign plates placed on the side of the road. |
| other | Other | Other than those specified in the enumeration |
| vds | Vds | Variable Directional Signs (VDS) are signs that can display pre-defined scenarios on otherwise conventional road sign plates by rotation of three or four prism bars. |
| vms | Vms | A standard "Variable Message Sign" that contains one or more centre-lane (or centre of the lane) mounted traffic signs. |
| vtp | Vtp | Variable Text Panels or VTPs are changeable signs on which information about particular events are presented in the form of free text, accompanied by at least one pictogram. |

**Table 7— Values contained in the enumeration "VmsCategoryEnum"**

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

Types of main pictograms.

| **Enumerated value name** | **Designation** | **Definition** |
| --- | --- | --- |
| accident | Accident | Accident. |
| advisorySpeed | Advisory speed | Advisory speed limit. |
| animalsOnRoad | Animals on road | Animal(s) on the road. |
| blankVoid | Blank void | Blank or void. |
| bridgeClosed | Bridge closed | Bridge closed. |
| bridgeSwingInOperation | Bridge swing in operation | Bridge swing in operation. |
| carParkFull | Car park full | Car park full. |
| carParkSpacesAvailable | Car park spaces available | Spaces available in car park. |
| carriagewayNarrows | Carriageway narrows | The carriageway narrows ahead. |
| carriagewayNarrowsOnTheLeft | Carriageway narrows on the left | The carriageway narrows ahead from the left. |
| carriagewayNarrowsOnTheRight | Carriageway narrows on the right | The carriageway narrows ahead from the right. |
| carriagewayReducedToOneLane | Carriageway reduced to one lane | Carriageway reduced to one lane. |
| carriagewayReducedToThreeLanes | Carriageway reduced to three lanes | Carriageway reduced to three lanes. |
| carriagewayReducedToTwoLanes | Carriageway reduced to two lanes | Carriageway reduced to two lanes. |
| chainsOrSnowTyresRecommended | Chains or snow tyres recommended | Chains or snow tyres are recommended. |
| compulsoryMinimumSpeed | Compulsory minimum speed | Mandatory minimum speed limit. |
| crossWind | Cross wind | Cross wind. |
| dangerOfFire | Danger of fire | Danger of fire. |
| drivingOfVehiclesLessThanXMetresApartProhibited | Driving of vehicles less than x metres apart prohibited | The driving of vehicles less than X metres apart is prohibited. |
| endOfAdvisorySpeed | End of advisory speed | End of advisory speed. |
| endOfCompulsoryMinimumSpeed | End of compulsory minimum speed | End of compulsory minimum speed limit. |
| endOfProhibitionOfOvertaking | End of prohibition of overtaking | End of prohibition of overtaking. |
| endOfProhibitionOfOvertakingForGoodsVehicles | End of prohibition of overtaking for goods vehicles | End of prohibition of overtaking for goods vehicles. |
| endOfSpeedLimit | End of speed limit | End of mandatory speed limit. |
| exitClosed | Exit closed | Exit closed. |
| fallingRocks | Falling rocks | Danger of rock fall or landslide. |
| fastenChildrensSeatBelts | Fasten childrens seat belts | Fasten the seat belts of children. |
| fastenYourSeatBelt | Fasten your seat belt | Fasten your seat belt. |
| fire | Fire | Fire. |
| floodingOrFlashFloods | Flooding or flash floods | Flooding or flash floods. |
| fog | Fog | Fog. |
| footballMatch | Football match | Football match (current or anticipated disruption due to football match). |
| hardShoulderNotRunning | Hard shoulder not running | Hard shoulder running is in operation. |
| hardShoulderRunning | Hard shoulder running | Hard shoulder running is not in operation. |
| keepASafeDistance | Keep a safe distance | Keep a safe distance. |
| keepLeft | Keep left | Keep left. |
| keepRight | Keep right | Keep right. |
| lane1ClosedOf2 | Lane1 closed of2 | Lane 1 closed on a 2 lane carriageway. Lanes numbered from nearside (next to hard shoulder on motorway) to central median. |
| lane1ClosedOf3 | Lane1 closed of3 | Lane 1 closed on a 3 lane carriageway. Lanes numbered from nearside (next to hard shoulder on motorway) to central median. |
| lane1ClosedOf4 | Lane1 closed of4 | Lane 1 closed on a 4 lane carriageway. Lanes numbered from nearside (next to hard shoulder on motorway) to central median. |
| lane2ClosedOf2 | Lane2 closed of2 | Lane 2 closed on a 2 lane carriageway. Lanes numbered from nearside (next to hard shoulder on motorway) to central median. |
| lane3ClosedOf3 | Lane3 closed of3 | Lane 3 closed on a 3 lane carriageway. Lanes numbered from nearside (next to hard shoulder on motorway) to central median. |
| lane4ClosedOf4 | Lane4 closed of4 | Lane 4 closed on a 4 lane carriageway. Lanes numbered from nearside (next to hard shoulder on motorway) to central median. |
| laneClosed | Lane closed | Lane closed. |
| laneDeviationToLeft | Lane deviation to left | Lane deviates to the left. |
| laneDeviationToRight | Lane deviation to right | Lane deviates to the right. |
| laneOpen | Lane open | Lane open. |
| lanes1And2And3ClosedOf4 | Lanes1 and2 and3 closed of4 | Lanes 1, 2 and 3 closed on a 4 lane carriageway. Lanes numbered from nearside (next to hard shoulder on motorway) to central median. |
| lanes1And2ClosedOf3 | Lanes1 and2 closed of3 | Lanes 1 and 2 closed on a 3 lane carriageway. Lanes numbered from nearside (next to hard shoulder on motorway) to central median. |
| lanes1And2ClosedOf4 | Lanes1 and2 closed of4 | Lanes 1 and 2 closed on a 4 lane carriageway. Lanes numbered from nearside (next to hard shoulder on motorway) to central median. |
| lanes2And3And4ClosedOf4 | Lanes2 and3 and4 closed of4 | Lanes 2, 3 and 4 closed on a 4 lane carriageway. Lanes numbered from nearside (next to hard shoulder on motorway) to central median. |
| lanes2And3ClosedOf3 | Lanes2 and3 closed of3 | Lanes 2 and 3 closed on a 3 lane carriageway. Lanes numbered from nearside (next to hard shoulder on motorway) to central median. |
| lanes3And4ClosedOf4 | Lanes3 and4 closed of4 | Lanes 3 and 4 closed on a 4 lane carriageway. Lanes numbered from nearside (next to hard shoulder on motorway) to central median. |
| leftHandLaneClosed | Left hand lane closed | Left hand lane closed ahead. |
| lightSignals | Light signals | Traffic light signals ahead. |
| looseGravel | Loose gravel | Loose gravel. |
| maintenanceVehicleInAction | Maintenance vehicle in action | Maintenance vehicles in action. |
| maximumSpeedLimitedToTheFigureIndicated | Maximum speed limited to the figure indicated | Mandatory maximum speed limit, displayed as speed limit indside a red circle. |
| narrowLanesAead | Narrow lanes aead | Narrow lanes ahead. |
| noEntry | No entry | No entry. |
| noEntryForAnyPowerDrivenVehicleDrawingATrailer | No entry for any power driven vehicle drawing a trailer | No entry for any power driven vehicle drawing a trailer |
| noEntryForAnyPowerDrivenVehicleDrawingATrailerOtherThanASemiTrailerOrASingleAxleTrailer | No entry for any power driven vehicle drawing a trailer other than a semi trailer or a single axle trailer | No entry to any power driven vehicle drawing a trailer other than a semi-trailer or a single axle trailer. A semi-trailer is one designed to be coupled to a motor vehicle so that part of its weight and that of its load is borne by the motor vehicle. |
| noEntryForGoodsVehicles | No entry for goods vehicles | No entry for goods vehicles. |
| noEntryForVehiclesCarryingDangerousGoods | No entry for vehicles carrying dangerous goods | No entry for vehicles carrying dangerous goods. |
| noEntryForVehiclesExceedingXTonnesLadenMass | No entry for vehicles exceeding x tonnes laden mass | No entry for vehicles exceeding X tonnes laden mass. |
| noEntryForVehiclesHavingAMassExceedingXTonnesOnOneAxle | No entry for vehicles having a mass exceeding x tonnes on one axle | No entry for vehicles having a mass exceeding X tonnes on a single axle. |
| noEntryForVehiclesHavingAnOverallHeightExceedingXMetres | No entry for vehicles having an overall height exceeding x metres | No entry for vehicles having an overall height exceeding X metres. |
| noEntryForVehiclesHavingAnOverallLengthExceedingXMetres | No entry for vehicles having an overall length exceeding x metres | No entry for vehicles having an overall length exceeding X metres. |
| noEntryForVehiclesHavingAnOverallWidthExceedingXMetres | No entry for vehicles having an overall width exceeding x metres | No entry for vehicles having an overall width exceeding X metres. |
| other | Other | Other than as defined in this enumeration. |
| otherDangers | Other dangers | Danger ahead of an unspecified nature. |
| overtakingByGoodsVehiclesProhibited | Overtaking by goods vehicles prohibited | Overtaking prohibited for goods vehicles. |
| overtakingProhibited | Overtaking prohibited | Overtaking prohibited. |
| pollutionOrSmogAlert | Pollution or smog alert | Pollution or smog alert. |
| queue | Queue | Queue ahead. |
| rain | Rain | Rain. |
| rightHandLaneClosed | Right hand lane closed | Right hand lane closed ahead. |
| roadClosedAhead | Road closed ahead | Road closed ahead. |
| roadworks | Roadworks | Roadworks. |
| slipperyRoad | Slippery road | Slippery road. |
| smoke | Smoke | Smoke. |
| snow | Snow | Snow. |
| snowChainsCompulsory | Snow chains compulsory | The use of snow chains is compulsory. |
| snowPloughInAction | Snow plough in action | Snow plough(s) in action. |
| snowTyresCompulsory | Snow tyres compulsory | The use of snow tyres is compulsory. |
| speedCamerasInAction | Speed cameras in action | Speed cameras in action. |
| trafficCongestion | Traffic congestion | Traffic congestion and possible queues. |
| trafficDeviatedToOppositeCarriagewayAhead | Traffic deviated to opposite carriageway ahead | All traffic is diverted to the opposite carriageway ahead in a contraflow layout. |
| trafficPartiallyDeviatedToOppositeCarriagewayAhead | Traffic partially deviated to opposite carriageway ahead | Traffic is partially diverted to the opposite carriageway ahead in a contraflow layout. |
| tunnelClosed | Tunnel closed | Tunnel closed. |
| turnLeft | Turn left | Mandatory turn left. |
| turnRight | Turn right | Mandatory turn right. |
| twoWayTraffic | Two way traffic | Two way traffic (on a single carriageway). |
| unevenRoad | Uneven road | Uneven road surface. |
| vehicleFire | Vehicle fire | Vehicle fire. |

Table 42— Values contained in the enumeration "VmsDatexPictogramEnum"

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

Types of pictograms displayable in supplementary panels (normally below the main pictogram display which it qualifies).

| **Enumerated value name** | **Designation** | **Definition** |
| --- | --- | --- |
| distanceToTheBeginningofTheApplicationZone | Distance to the beginningof the application zone | Distance to the beginning of the application zone. |
| exceptAnyPowerDrivenVehicleDrawingTrailer | Except any power driven vehicle drawing trailer | Except any power driven vehicle drawing a trailer. |
| exceptBus | Except bus | Except for buses. |
| exceptGoodsVehicles | Except goods vehicles | Except for goods vehicles. |
| exceptSemiTrailer | Except semi trailer | Except for semi trailers (i.e. any trailer designed to be coupled to a motor vehicle in such a way that part of its weight and that of its load is borne by the motor vehicle). |
| exceptVehiclesCarryingDangerousGoods | Except vehicles carrying dangerous goods | Except for vehicles carrying dangerous goods (i.e. for which special sign plating is prescribed). |
| inCaseOfIceOrSnow | In case of ice or snow | In case of ice or snow. |
| lengthOfTheApplicationZone | Length of the application zone | Length of the applicable zone. |
| maintenanceVehicles | Maintenance vehicles | Maintenance vehicles. |
| other | Other | Other than as defined in this enumeration. |
| restricetdToBus | Restricetd to bus | Restricted to buses. |
| restrictedToAnyPowerDrivenVehicleDrawingTrailer | Restricted to any power driven vehicle drawing trailer | Restricted to any power driven vehicle drawing a trailer. |
| restrictedToGoodsVehicles | Restricted to goods vehicles | Restricted to goods vehicles. |
| restrictedToSemiTrailer | Restricted to semi trailer | Restricted to semi trailers (i.e. any trailer designed to be coupled to a motor vehicle in such a way that part of its wieght and that of its load is borne by the motor vehicle). |
| restrictedToVehiclesCarryingDangerousGoods | Restricted to vehicles carrying dangerous goods | Restricted to vehicles carrying dangerous goods (i.e. for which special sign plating is prescribed). |
| snowPloughs | Snow ploughs | Snow ploughs. |

Table 43— Values contained in the enumeration "VmsDatexSupplementalPictogramEnum"

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

Types of variable message sign faults.

| **Enumerated value name** | **Designation** | **Definition** |
| --- | --- | --- |
| communicationsFailure | Communications failure | Comunications failure affecting VMS. |
| incorrectMessageDisplayed | Incorrect message displayed | Incorrect message is being displayed. |
| incorrectPictogramDisplayed | Incorrect pictogram displayed | Incorrect pictogram is being displayed. |
| other | Other | Other than as defined in this enumeration. |
| outOfService | Out of service | Not currently in service (e.g. intentionally disconnected or switched off during roadworks). |
| powerFailure | Power failure | Power to VMS has failed. |
| unableToClearDown | Unable to clear down | Unable to clear down information displayed on VMS. |
| unknown | Unknown | Unknown VMS fault. |

Table 44— Values contained in the enumeration "VmsFaultEnum"

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

Types of information displayable on a VMS.

| **Enumerated value name** | **Designation** | **Definition** |
| --- | --- | --- |
| campaignMessage | Campaign message | Campaign type information which is non time specific that may request certain actions (e.g. "do not drink and drive") or which is intended to influence drivers' behaviour. |
| dateTime | Date time | Current date and/or time information. |
| futureInformation | Future information | Information which may inform road users about future situations which potentially may cause congestion or influence future travel plans (e.g. future roadworks, closures, sporting events, public concerts, suspension of train or ferry services). |
| instructionOrMessage | Instruction or message | Instructions or messages to road users which are relevant at the current time, (e.g. "do not throw out any burning objects" or an Amber alert message). |
| situationWarning | Situation warning | Information warning of a current situation likely to affect traffic on the road ahead. |
| temperature | Temperature | Temperature information. |
| trafficManagement | Traffic management | Information comprising traffic management instructions. |
| travelTime | Travel time | Travel time information. |

Table 45— Values contained in the enumeration "VmsMessageInformationTypeEnum"

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

Type of variable message sign.

| **Enumerated value name** | **Designation** | **Definition** |
| --- | --- | --- |
| colourGraphic | Colour graphic | A colour graphic display. |
| continuousSign | Continuous sign | A sign implementing fixed messages which are selected by electromechanical means. |
| matrixSign | Matrix sign | Simple display made up of a fixed matrix of pixels (e.g. sets of LEDs or lights) capable of showing a limited set of aspects (or matrix images). The display area is regarded as a pictogram area in DATEX II. |
| monochromeGraphic | Monochrome graphic | A monochrome graphic display. |
| other | Other | Other than as defined in this enumeration. |

Table 46— Values contained in the enumeration "VmsTypeEnum"

* 1. Annex

Like mentioned in Chapter A.3 some of the pictogram codes in ASFINAG sign catalogue could not be mapped to either the “pictogramDescription” or “supplementaryPictogramDescription” of the vmsPictogram element. Therefore, for such codes a textual description is added in the “additionalPictogramDescription” and/or “additionalSupplementaryPictogramDescription” elements. The below table describes these pictogram codes:

|  |  |  |
| --- | --- | --- |
| pictogramCode | additionalPictogramDescription | additionalSupplementaryPictogramDescription |
| 3 | snowOrIceSleekness |  |
| 53 | allRestrictionsEnded |  |
| 62 |  | trafficCongestion |
| 63 |  | dangerOfTrafficCongestion |
| 64 |  | fog |
| 65 |  | wetRoadSurface |
| 66 |  | accident |
| 67 |  | limitedVisibility |
| 71 | ozone |  |
| 72 | noiseProtection |  |
| 105 |  | restrictedToPassengerCars |
| 106 | dangerOfTrafficCongestion |  |
| 107 | redTrafficLight |  |
| 108 | amberTrafficLight |  |
| 109 | greenTrafficLight |  |
| 110 | redAndAmberTrafficLights |  |
| 201 |  | laneSpecificInformation |
| 212 | wrongWayDriver |  |
| 213 | railCargoCarrier |  |
| 215 | truckParkingArea |  |
| 216 | heightRestrictionInOperation |  |
| 224 | turnOffEngine |  |
| 225 |  | noEntryForVehiclesExceedingXTonnesLadenMass |
| 226 |  | keepASafeDistance |
| 227 |  | wrongWayDriver |
| 228 |  | dangerOfBlackIce |
| 229 |  | blackIce |
| 230 |  | pollutionOrSmogAlert |
| 231 |  | tollInspection |
| 232 |  | oilSlick |
| 233 |  | brokenDownVehicle |
| 234 |  | crossWind |
| 235 |  | tunnelClosed |
| 236 |  | diversionAHead |
| 237 |  | winterServiceVehicleInAction |
| 238 |  | truckTrafficJams |
| 239 |  | roadClosed |
| 240 |  | pollutionOrSmogAlert |

1. Eco-AT\_SWP2.1\_InVehicleInformation\_v03.60 (http://www.eco-at.info/Specification\_request.html) [↑](#footnote-ref-1)
2. *http://www.asfinag.net/Home/DownloadPdf?filename=get\_file~uuid%3D306d67cf-75ed-49b8-8df7-3614e5572230%26groupId%3D10141.pdf*

   [↑](#footnote-ref-2)