Austrian Elementary Profile Traffic travel times

Operational Version 2.0

* 1. Introduction

ASFINAG provides DATEX II traffic information of Austrian motorways and highways for service providers and other interested institutions. This document describes the Austrian Elementary Profile Traffic travel times Profile.

* 1. Data description

ASFINAG provides the current or near-realtime travel times and also predicted travel times for predefined motorway and expressway sections in Austria. It is important to note that the predefined road sections for the current travel times are different from those of the predicted travel times. Along with travel times, average velocity of cars and trucks, and the traffic status (e.g. congested, heavy, free flow, etc. See Section **A.2.1.1**) are also provided. Location referencing is done using linear elements in the form of coordinates, ALERTC, ASFINAG road kilometres, and GIP[[1]](#footnote-1) (Graph Integration Platform). The GIP is a common reference graph for public authorities in Austria. For providing linear referencing using points the level B extension “**LinearByCoordinates**” is used, and for providing the GIP location referencing the level B extension “**ExtendedLinearForGipLink**” is used. Chapter **A.3** and **A.4** give more details about the location referencing.

The location data of the travel times is provided in a separate file for both the current and predicted travel times. For providing the location data the package “**PredefinedLocationPublication**” is used, whereas for providing travel times data the package “**ElaboratedDataPublication**” is used.

* + 1. Current or near-realtime travel time data

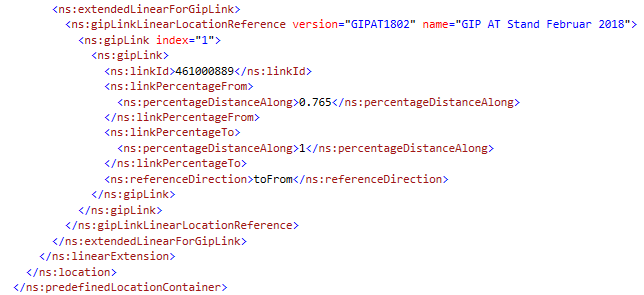
ASFINAG estimates the travel times for cars and trucks based on a number of detection technologies (or data sources)[[2]](#footnote-2). An intelligent data fusion is applied to harmonize and combine these data sources in the best possible way, and thereby a comprehensive travel time estimation is calculated for the entire motorway and expressway network in Austria. For near-realtime data, the road network is divided into 200 meter segments (these are about 22000 segments of the entire Austrian motorway network). The update interval of the travel time estimation is 1 minute.

For data delivery the travel time content is split in two DATEX II files:

1. **TrafficTravelTimesStatic**: This file contains location data of the road sections for which the travel times are computed. Each section is 200m in length and has a unique id. This file uses the DATEX II package “PredefinedLocationsPublication”
2. **TrafficTravelTimesDynamic**: This file contains travel time data of the road sections with a reference to the sections described in the “TrafficTravelTimesStatic” file. This file uses the DATEX II package “ElaboratedDataPublication”.

Example 1 shows an extract of TrafficTravelTimesStatic file and Example 2 shows an extract of TravelTravelTimesDynamic file.





**Example 1: Location referencing of road section “A02\_2\_299200\_v1\_1”**



**Example 2: Travel time values for computed for the road section “A02\_2\_299200\_v1\_1”**

* + - 1. Traffic status calculation

Travel time and mean velocity are calculated using two data sources

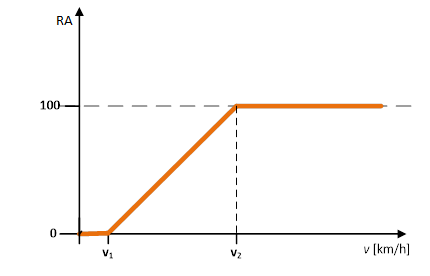
* Cross Section data measured by overhead traffic sensors
* Travel time calculated from toll transactions

For every 200 meter segment, the data fusion algorithm calculates a weighted average of all available data sources. The weighting function takes into account the spatial distance and temporal distance (age) of the input data. For cross section data the algorithm uses the mean velocity of all lanes.

Furthermore, the algorithm also provides an estimate for the traffic status, aka LOS (level-of-service).

The traffic status is calculated from the road availability which represents a percentage value between 0 (blocked road) and 100 (free flow) that indicates the traffic state.

Road availability *RA* is calculated from free-flow velocity *vc* and the actual mean velocity *v* as follows:



**Figure A2.2.1.1: Road availability (RA) is calculated from mean velocity**

|  |  |
| --- | --- |
| **Parameter** | **Value** |
| vfactor1 | 0.2 |
| vfactor2 | 0.8 |

Based on the *RA*, the LOS value is calculated as below:

|  |  |  |
| --- | --- | --- |
| *RA* range | LOS value | DATEX II TrafficStatusEnum |
| *RA* = -1 | 5 | Unspecified |
| 0 <= *RA* < 25 | 4 | Congested |
| 25 <= *RA* < 50 | 3 | Heavy |
| 50 <= *RA* < 75 | 2 | Heavy |
| 75 <= *RA* <= 100 | 1 | Freeflow |

**Table A.2.2.1.1** — **Calculation of LOS and TrafficStatus based on the RA (road availability)**

The LOS value is further mapped to the enumeration literal of the DATEX II TrafficStatusEnum as shown in the above table.

* + 1. Predicted travel time data

The travel times for passenger cars and trucks are predicted using the historical traffic data of the entire Austrian motorway and expressway network[[3]](#footnote-3). The predicting system uses all available data sources such as the historic near-realtime traffic data, roadworks, weather warnings, time series, and traffic messages to calculate travel time predictions (or prognosis) with 10 different time horizons. The predictions are calculated for junction-to-junction segments.

The below table summarizes the expected amount of predictions data:

|  |  |  |  |
| --- | --- | --- | --- |
| # | Prediction type | Update interval | Data count |
| 1 | **15 min** | **5 min** | **866** |
| 2 | **30 min** | **5 min** | **866** |
| 3 | **45 min** | **5 min** | **866** |
| 4 | **60 min** | **5 min** | **866** |
| 5 | **90 min** | **5 min** | **866** |
| 6 | **120 min** | **5 min** | **866** |
| 7 | **150 min** | **5 min** | **866** |
| 8 | **180 min** | **5 min** | **866** |
| 9 | **210 min** | **5 min** | **866** |
| 10 | **240 min** | **5 min** | **866** |

**Table A.2.2.1** — **Amount of expected data from travel time predictions**

For data delivery the predicted travel time content is split into two DATEX II files:

1. **TrafficTravelTimesPrognosisStatic**: This file contains location data of the road sections (junction-to-junctions) for which the travel times are computed. Each section has a unique id. This file uses the DATEX II package “PredefinedLocationsPublication”.
2. **TrafficTravelTimes240minDynamic**: This file contains predictions data (*15min < prediction <= 240min*) of the road sections with a reference to the sections described in the “TrafficTravelTimesPrognosisSatic” file. This file uses the DATEX II package “ElaboratedDataPublication”.

Example 3 shows an extract of TrafficTravelTimesPrognosisStatic, example 4 shows an extract of TravelTravelTimes240minDynamic.





**Example 3: Location referencing of a road section with id “geo\_8”**



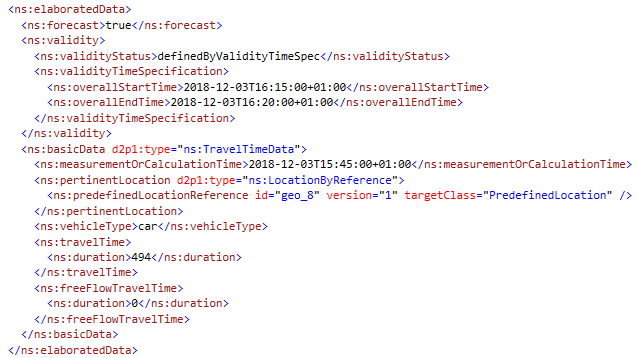
**Example 4: Predicted travel time values for road section the road section with id “geo\_8”**

* + - 1. Differentiating between different forecasts

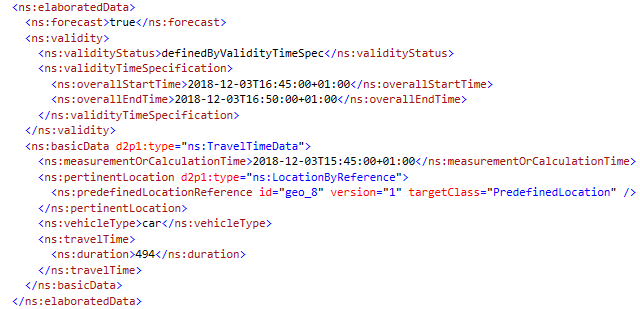
Since the dynamic data file (TravelTravelTimes240min\_dynamic) contains data from different time horizons (15m, 30min, 45min, 60min…), it is important to differentiate between each of them. This can be done using the following DATEX II elements:

1. **validity**: The validity element describes the duration for which the prediction is valid. It contains “**overallAllStartTime**” and “**overallEndTime**” that gives the exact begin and end date times of the prediction.
2. **measurementOrCalculation**: Date time at which the prediction is calculated.

Below example shows a 30 minute prediction which is calculated at 15:45 CEST. The validity of the prediction is between 16:15 CEST and 16:20 CEST. Actually, there is no real validity end time for a prediction. Since, the next prediction (or calculation) is in 5 minutes, the validity end time is provided as “validity start time + 5 minutes”. Therefore: *overallEndTime = overallStartTime + updateInterval*.



Now for the same calculated time 15:45 CEST, a 60 minute prediction would look like:



The below table summaries all possible predictions calculated at the same time. Note that the date is removed for simplicity, but in the feed the complete date time value is provided.

|  |  |  |  |
| --- | --- | --- | --- |
| Prediction  type | measurementOr  CalculationTime | oveallStartTime | overallEndTime |
| 15 min | 15:45:00+1:00 | 16:00:00+1:00 | 16:05:00+1:00 |
| 30 min | 15:45:00+1:00 | 16:15:00+1:00 | 16:20:00+1:00 |
| 45 min | 15:45:00+1:00 | 16:30:00+1:00 | 16:35:00+1:00 |
| 60 min | 15:45:00+1:00 | 16:45:00+1:00 | 16:50:00+1:00 |
| 90 min | 15:45:00+1:00 | 17:15:00+1:00 | 17:20:00+1:00 |
| 120 min | 15:45:00+1:00 | 17:45:00+1:00 | 17:50:00+1:00 |
| 150 min | 15:45:00+1:00 | 18:15:00+1:00 | 18:20:00+1:00 |
| 180 min | 15:45:00+1:00 | 18:45:00+1:00 | 18:50:00+1:00 |
| 210 min | 15:45:00+1:00 | 19:15:00+1:00 | 19:20:00+1:00 |
| 240 min | 15:45:00+1:00 | 19:45:00+1:00 | 19:50:00+1:00 |

Now the same table for the next calculation 15:50:00+1:00 would like:

|  |  |  |  |
| --- | --- | --- | --- |
| Prediction  type | measurementOr  CalculationTime | oveallStartTime | overallEndTime |
| 15 min | 15:50:00+1:00 | 16:05:00+1:00 | 16:10:00+1:00 |
| 30 min | 15:50:00+1:00 | 16:20:00+1:00 | 16:25:00+1:00 |
| 45 min | 15:50:00+1:00 | 16:35:00+1:00 | 16:40:00+1:00 |
| 60 min | 15:50:00+1:00 | 16:50:00+1:00 | 16:55:00+1:00 |
| 90 min | 15:50:00+1:00 | 17:20:00+1:00 | 17:25:00+1:00 |
| 120 min | 15:50:00+1:00 | 17:50:00+1:00 | 17:55:00+1:00 |
| 150 min | 15:50:00+1:00 | 18:20:00+1:00 | 18:25:00+1:00 |
| 180 min | 15:50:00+1:00 | 18:50:00+1:00 | 18:55:00+1:00 |
| 210 min | 15:50:00+1:00 | 19:20:00+1:00 | 19:25:00+1:00 |
| 240 min | 15:50:00+1:00 | 19:50:00+1:00 | 19:55:00+1:00 |

* 1. Location Referencing

ASFINAG provides a number of location referencing methods for locating the 200m road sections for which the travel times are computed. These methods are described in Table 2.1. All locations except the GIP are provided as linear by two points (start point and end point). The GIP may contain one or more GIP nodes, where each node is called as a GIP link.

|  |  |  |
| --- | --- | --- |
| **Location Referencing** | **DATEX II element** | **Description** |
| AlertC location codes | alertCLinear | The *alertCLinear* element contains the primary location code, secondary location code, AlertC direction, and offset distances of the corresponding primary and secondary location. |
| ASFINAG road km | directionRelativeOnLinearSection | The *directionRelativeOnLinearSection* element contains the road km location as referenced by ASFINAG. Any point on the ASFINAG road network is described by road number, direction and road km provided in meters. |
| WGS84 | linearByCoordinates | The *linearByCoordinates* element contains the latitude/longitude values of start and end points. |
| GIP | GIPLink | Location reference of GIP (Graph Integration Platform). GIP provides a digital map of Austria's transport network to all authorities. |

**Table A.3.1** — **Location referencing**

* 1. Extensions for additional Location Referencing methods

In addition to the standard location referencing methods supported by the DATEX II Core, ASFINAG also provides location referencing using linear by coordinates and the GIP. They are provided using the level B extensions. These extensions are summarised in this chapter.

* + 1. GipLinkLinearExtension

To add the GIP location referencing the DATEX II class **Linear** is extended. The GIP location referencing method is composed of one or more GIP nodes. Each GIP node is represented as a GIPLink, which contains an id, reference direction, a begin offset (in percentage) and an end offset (in percentage). Note that the GIP is a proprietary standard used by multiple stake holders within Austria. In addition to these details clients also require the shape files of the GIP digital map to interpret the location.

This extension specifies the linear location of a traffic message by one or more GIP links. There must be at least one GIP link.



**Figure A.4.1 ExtendedLinearForGipLink extension**

* + 1. LinearByCoordinates

The linearByCoordinates extension is not a proprietary extension from ASFINAG. It has been available on the datex2.eu[[4]](#footnote-4) platform. This extension has been imported into this profile. This extension allows you to specify linear locations by a number of points represented by coordinates. There must be a start and an end point with an arbitrary number of intermediate points. The provision of intermediate points are optional.



**Figure A.4.2 LinearByCoordinates extension**

* 1. Data Dictionary for "AustrianTrafficTravelTimesProfile"

From this chapter all the 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. "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 |

Table 1— 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 |

Table 2— Associations of the "BasicData" package

* + - 1. "BasicData" package attributes

| **Class name** | **Attribute name** | **Designation** | **Definition** | **Multiplicity** | **Type** |
| --- | --- | --- | --- | --- | --- |
| BasicData | measurementOrCalculatedTimePrecision | Measurement or calculated time precision | The precision to which the time of measurement or calculation is given. | 0..1 | TimePrecisionEnum |
|  | 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 3— Attributes of the "BasicData" package

* + 1. "ElaboratedData" package
       1. "ElaboratedData" package classes

| **Class name** | **Designation** | **Definition** | **Stereotype** | **Abstract** |
| --- | --- | --- | --- | --- |
| 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 |
| Source | Source | Details of the source from which the information was obtained. |  | no |

Table 4— Classes of the "ElaboratedData" package

* + - 1. "ElaboratedData" package association roles

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

* + - 1. "ElaboratedData" package attributes

| **Class name** | **Attribute name** | **Designation** | **Definition** | **Multiplicity** | **Type** |
| --- | --- | --- | --- | --- | --- |
| ElaboratedData | forecast | Forecast | Indication of whether this elaborated data is a forecast (true = forecast). | 0..1 | Boolean |
| Source | reliable | 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 |
|  | sourceCountry | Source country | ISO 3166-1 two character country code of the source of the information. | 0..1 | CountryEnum |
|  | sourceIdentification | 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 name | The name of the organisation which has produced the information relating to this version of the information. | 0..1 | MultilingualString |
|  | sourceType | 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 |

Table 5— Attributes of the "ElaboratedData" package

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

| **Class name** | **Designation** | **Definition** | **Stereotype** | **Abstract** |
| --- | --- | --- | --- | --- |
| ElaboratedDataPublication | Elaborated data publication | A publication containing one or more elaborated data sets. |  | no |
| ReferenceSettings | Reference settings | Specification of the default value for traffic status on a group of predefined locations on the road network. Only when traffic status differs from this value at a location in the group need a value be sent. |  | no |

Table 6— 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** |
| --- | --- | --- | --- | --- | --- |
| ElaboratedDataPublication | forecastDefault | Forecast default | The default value for the publication of whether the elaborated data is a forecast (true = forecast). | 0..1 | Boolean |
|  | periodDefault | Period default | The default value for the publication of 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 |
|  | timeDefault | Time default | The default for the publication of the time at which the values have been computed/derived. | 0..1 | DateTime |
| ReferenceSettings | predefinedNonOrderedLocationGroupReference | Predefined non ordered location group reference | A reference to a versioned instance of a predefined non ordered location group as specified in a PredefinedLocationsPublication. | 0..1 | VersionedReference |
|  | trafficStatusDefault | Traffic status default | The default value of traffic status that can be assumed to apply to the locations defined by the associated predefined location set. | 0..1 | TrafficStatusEnum |

Table 7— Attributes of the "ElaboratedDataPublication" 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 8— 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 9— Associations of the "Exchange" package

* + - 1. "Exchange" package attributes

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

Table 10— Attributes of the "Exchange" package

* + 1. "GipLinkExtensions" package
       1. "GipLinkExtensions" package classes

| **Class name** | **Designation** | **Definition** | **Stereotype** | **Abstract** |
| --- | --- | --- | --- | --- |
| ExtendedLinearForGipLink | Extended linear for gip link | An extension for GipLink linear location reference |  | no |
| GipLink | Gip link | A GIPLink object |  | no |
| GipLinkLinearLocationReference | Gip link linear location reference | Contains one or more gip links that are part of a linear location |  | no |

Table 11— Classes of the "GipLinkExtensions" package

* + - 1. "GipLinkExtensions" package association roles

| **Class name** | **Role name** | **Designation** | **Definition** | **Multiplicity** | **Target** |
| --- | --- | --- | --- | --- | --- |
| GipLink | linkPercentageFrom | Link percentage from | From offset | 1..1 | PercentageDistanceAlongLinearElement |
|  | linkPercentageTo | Link percentage to | To offset | 1..1 | PercentageDistanceAlongLinearElement |

Table 12— Associations of the "GipLinkExtensions" package

* + - 1. "GipLinkExtensions" package attributes

| **Class name** | **Attribute name** | **Designation** | **Definition** | **Multiplicity** | **Type** |
| --- | --- | --- | --- | --- | --- |
| GipLink | linkId | Link id | Identifier of the GipLink | 1..1 | String |
|  | referenceDirection | Reference direction | Reference direction | 1..1 | GipReferenceDirectionEnum |
| GipLinkLinearLocationReference | name | Name | Name of the provided GIP | 0..1 | String |
|  | version | Version | Version of the provided GIP links. | 0..1 | String |

Table 13— Attributes of the "GipLinkExtensions" 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 |
| AlertCDirection | ALERT-C direction | The direction of traffic flow along the road to which the information relates. |  | no |
| AlertCLocation | ALERT-C location | Identification of a specific point, linear or area location in an ALERT-C location table. |  | no |
| AlertCMethod2PrimaryPointLocation | ALERT-C method2 primary point location | The point (called Primary point) which is either a single point or at the downstream end of a linear road section. The point is specified by a reference to a point in a pre-defined ALERT-C location table. |  | no |
| AlertCMethod2SecondaryPointLocation | ALERT-C method2 secondary point location | The point (called Secondary point) which is at the upstream end of a linear road section. The point is specified by a reference to a point in a pre-defined ALERT-C location table. |  | no |
| AlertCMethod4PrimaryPointLocation | ALERT-C method4 primary point location | The point (called Primary point) which is either a single point or at the downstream end of a linear road section. The point is specified by a reference to a point in a pre-defined ALERT-C location table plus a non-negative offset distance. |  | no |
| AlertCMethod4SecondaryPointLocation | ALERT-C method4 secondary point location | The point (called Secondary point) which is at the upstream end of a linear road section. The point is specified by a reference to a point in a pre-defined Alert-C location table plus a non-negative offset distance. |  | 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 |
| LocationByReference | Location by reference | A location defined by reference to a predefined location. |  | no |
| NetworkLocation | Network location | The specification of a location on a network (as a point or a linear location). |  | yes |
| OffsetDistance | Offset distance | The non negative offset distance from the ALERT-C referenced point to the actual 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 |
| SupplementaryPositionalDescription | Supplementary positional description | A collection of supplementary positional information which improves the precision of the location. |  | no |

Table 14— Classes of the "GroupOfLocations" package

* + - 1. "GroupOfLocations" package association roles

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

Table 15— 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 |
|  | footpath | Footpath | Indicates whether the pedestrian footpath is the subject or part of the subject of the location. (True = footpath is subject) | 0..1 | Boolean |
|  | lane | Lane | Indicates the specific lane to which the location relates. | 0..\* | LaneEnum |
|  | lengthAffected | Length affected | This indicates the length of road measured in metres affected by the associated traffic element. | 0..1 | MetresAsFloat |
| AlertCDirection | alertCDirectionCoded | ALERT-C direction coded | The direction of traffic flow to which the situation, traffic data or information is related. Positive is in the direction of coding of the road. | 1..1 | AlertCDirectionEnum |
|  | alertCDirectionNamed | ALERT-C direction named | ALERT-C name of a direction e.g. Brussels -> Lille. | 0..1 | MultilingualString |
|  | alertCDirectionSense | ALERT-C direction sense | Indicates for circular routes (i.e. valid only for ring roads) the sense in which navigation should be made from the primary location to the secondary location, to avoid ambiguity. TRUE indicates positive RDS direction, i.e. direction of coding of road. | 0..1 | Boolean |
| AlertCLocation | alertCLocationName | ALERT-C location name | Name of ALERT-C location. | 0..1 | MultilingualString |
|  | specificLocation | Specific location | Unique code within the ALERT-C location table which identifies the specific point, linear or area location. | 1..1 | AlertCLocationCode |
| LocationByReference | predefinedLocationReference | Predefined location reference | A reference to a versioned predefined location. | 1..1 | VersionedReference |
| OffsetDistance | offsetDistance | Offset distance | The non negative offset distance from the ALERT-C referenced point to the actual point. The ALERT-C locations in the Primary and Secondary locations must always encompass the linear section being specified, thus Offset Distance is towards the other point. | 1..1 | MetresAsNonNegativeInteger |
| 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 |
| SupplementaryPositionalDescription | locationDescriptor | Location descriptor | Specifies a descriptor which helps to identify the specific location. | 0..\* | LocationDescriptorEnum |
|  | locationPrecision | Location precision | Indicates that the location is given with a precision which is better than the stated value in metres. | 0..1 | MetresAsNonNegativeInteger |
|  | sequentialRampNumber | Sequential ramp number | The sequential number of an exit/entrance ramp from a given location in a given direction (normally used to indicate a specific exit/entrance in a complex junction/intersection). | 0..1 | NonNegativeInteger |

Table 16— Attributes of the "GroupOfLocations" package

* + 1. "Linear" package
       1. "Linear" package classes

| **Class name** | **Designation** | **Definition** | **Stereotype** | **Abstract** |
| --- | --- | --- | --- | --- |
| AlertCLinear | ALERT-C linear | A linear section along a road defined between two points on the road by reference to a pre-defined ALERT-C location table. |  | yes |
| Linear | Linear | A linear section along a single road with optional directionality defined between two points on the same road. |  | no |

Table 17— Classes of the "Linear" package

* + - 1. "Linear" package association roles

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

* + - 1. "Linear" package attributes

| **Class name** | **Attribute name** | **Designation** | **Definition** | **Multiplicity** | **Type** |
| --- | --- | --- | --- | --- | --- |
| AlertCLinear | alertCLocationCountryCode | ALERT-C location country code | EBU country code. | 1..1 | String |
|  | alertCLocationTableNumber | ALERT-C location table number | Number allocated to an ALERT-C table in a country. Ref. EN ISO 14819-3 for the allocation of a location table number. | 1..1 | String |
|  | alertCLocationTableVersion | ALERT-C location table version | Version number associated with an ALERT-C table reference. | 1..1 | String |

Table 18— Attributes of the "Linear" package

* + 1. "LinearByCoordinates" package
       1. "LinearByCoordinates" package classes

| **Class name** | **Designation** | **Definition** | **Stereotype** | **Abstract** |
| --- | --- | --- | --- | --- |
| ExtendedLinear | Extended linear | Extension point for linear Locations. |  | no |
| LinearByCoordinates | Linear by coordinates | A linear location defined by coordinates. |  | no |

Table 19— Classes of the "LinearByCoordinates" package

* + - 1. "LinearByCoordinates" package association roles

| **Class name** | **Role name** | **Designation** | **Definition** | **Multiplicity** | **Target** |
| --- | --- | --- | --- | --- | --- |
| LinearByCoordinates | end | End | End point of a LinearByCoordinates | 1..1 | PointCoordinates |
|  | intermediate | Intermediate | Points of a LinearByCoordinates object that are neither start or end point. | 1..1 | PointCoordinates |
|  | start | Start | Start point of a LinearByCoordinates | 1..1 | PointCoordinates |

Table 20— Associations of the "LinearByCoordinates" package

* + - 1. "LinearByCoordinates" package attributes

| **Class name** | **Attribute name** | **Designation** | **Definition** | **Multiplicity** | **Type** |
| --- | --- | --- | --- | --- | --- |
| LinearByCoordinates | directed | Directed | Whether this linear is directed or not. Default is directed=true | 0..1 | Boolean |
|  | 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 |

Table 21— Attributes of the "LinearByCoordinates" package

* + 1. "LinearWithinLinearElement" package
       1. "LinearWithinLinearElement" package classes

| **Class name** | **Designation** | **Definition** | **Stereotype** | **Abstract** |
| --- | --- | --- | --- | --- |
| LinearWithinLinearElement | Linear within linear element | A linear section along 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 |

Table 22— Classes of the "LinearWithinLinearElement" package

* + - 1. "LinearWithinLinearElement" package association roles

| **Class name** | **Role name** | **Designation** | **Definition** | **Multiplicity** | **Target** |
| --- | --- | --- | --- | --- | --- |
| LinearWithinLinearElement | fromPoint | From point | A point on the linear element that defines the start node of the linear section. | 1..1 | DistanceAlongLinearElement |
|  | toPoint | To point | A point on the linear element that defines the end node of the linear section. | 1..1 | DistanceAlongLinearElement |

Table 23— Associations of the "LinearWithinLinearElement" package

* + - 1. "LinearWithinLinearElement" package attributes

| **Class name** | **Attribute name** | **Designation** | **Definition** | **Multiplicity** | **Type** |
| --- | --- | --- | --- | --- | --- |
| LinearWithinLinearElement | administrativeAreaOfLinearSection | Administrative area of linear section | Identification of the road administration area which contains the specified linear section. | 0..1 | MultilingualString |
|  | directionBoundOnLinearSection | Direction bound on linear section | The direction of traffic flow on the linear section in terms of general destination direction. | 0..1 | DirectionEnum |
|  | directionRelativeOnLinearSection | Direction relative on linear section | The direction of traffic flow on the linear section relative to the direction in which the linear element is defined. | 0..1 | LinearReferencingDirectionEnum |
|  | heightGradeOfLinearSection | Height grade of linear section | Identification of whether the linear section that is part of the linear element is at, above or below the normal elevation of a linear element of that type (e.g. road or road section) at that location, typically used to indicate "grade" separation. | 0..1 | HeightGradeEnum |

Table 24— Attributes of the "LinearWithinLinearElement" 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 25— 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 26— 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 27— Attributes of the "PayloadPublication" package

* + 1. "PredefinedLocationsPublication" package
       1. "PredefinedLocationsPublication" package classes

| **Class name** | **Designation** | **Definition** | **Stereotype** | **Abstract** |
| --- | --- | --- | --- | --- |
| PredefinedLocation | Predefined location | An identifiable versioned instance of a single predefined location. | versionedIdentifiable | no |
| PredefinedLocationContainer | Predefined location container | A container which may comprise the definition of a predefined itinerary, non ordered group of locations or single location. |  | yes |
| PredefinedLocationsPublication | Predefined locations publication | A publication containing one or more groups of predefined locations organised either as litineraries, non ordered groups or as individual locations. |  | no |

Table 28— Classes of the "PredefinedLocationsPublication" package

* + - 1. "PredefinedLocationsPublication" package association roles

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

* + - 1. "PredefinedLocationsPublication" package attributes

| **Class name** | **Attribute name** | **Designation** | **Definition** | **Multiplicity** | **Type** |
| --- | --- | --- | --- | --- | --- |
| PredefinedLocation | predefinedLocationName | Predefined location name | A name assigned to the predefined location (e.g. extracted out of the network operator's gazetteer). | 0..1 | MultilingualString |

Table 29— Attributes of the "PredefinedLocationsPublication" package

* + 1. "TrafficData" package
       1. "TrafficData" package classes

| **Class name** | **Designation** | **Definition** | **Stereotype** | **Abstract** |
| --- | --- | --- | --- | --- |
| 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 30— Classes of the "TrafficData" package**

* + - 1. "TrafficData" package association roles

| **Class name** | **Role name** | **Designation** | **Definition** | **Multiplicity** | **Target** |
| --- | --- | --- | --- | --- | --- |
| 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 31— Associations of the "TrafficData" package**

* + - 1. "TrafficData" package attributes

There are no attributes for the package “TrafficData”

* + 1. "TrafficStatus" package
       1. "TrafficStatus" package classes

| **Class name** | **Designation** | **Definition** | **Stereotype** | **Abstract** |
| --- | --- | --- | --- | --- |
| TrafficStatus | Traffic status | The status of traffic conditions on a specific section or at a specific point on the road network. |  | no |

Table 32— Classes of the "TrafficStatus" package

* + - 1. "TrafficStatus" package association roles

| **Class name** | **Role name** | **Designation** | **Definition** | **Multiplicity** | **Target** |
| --- | --- | --- | --- | --- | --- |
| TrafficStatus | trafficStatus | Traffic status | Status of traffic conditions on the identified section of road in the specified direction. | 0..1 | TrafficStatusValue |

Table 33— Associations of the "TrafficStatus" package

* + - 1. "TrafficStatus" package attributes

| **Class name** | **Attribute name** | **Designation** | **Definition** | **Multiplicity** | **Type** |
| --- | --- | --- | --- | --- | --- |
| TrafficStatus | trafficTrendType | Traffic trend type | A characterization of the trend in the traffic conditions at the specified location and direction. | 0..1 | TrafficTrendTypeEnum |

**Table 34— Attributes of the "TrafficStatus" package**

* + 1. "TrafficSpeed" package
       1. "TrafficSpeed" package classes

| **Class name** | **Designation** | **Definition** | **Stereotype** | **Abstract** |
| --- | --- | --- | --- | --- |
| SpeedPercentile | Speed percentile | Details of percentage (from an observation set) of vehicles whose speeds fall below a stated value. |  | no |
| TrafficSpeed | Traffic speed | Averaged measurements or calculations of traffic speed. |  | no |

Table 35— Classes of the "TrafficSpeed" package

* + - 1. "TrafficSpeed" package association roles

| **Class name** | **Role name** | **Designation** | **Definition** | **Multiplicity** | **Target** |
| --- | --- | --- | --- | --- | --- |
| SpeedPercentile | speedPercentile | Speed percentile | The speed below which the associated percentage of vehicles in the measurement set are travelling at. | 0..1 | SpeedValue |
|  | vehiclePercentage | Vehicle percentage | The percentage of vehicles from the observation set whose speeds fall below the stated speed (speedPercentile). | 0..1 | PercentageValue |
| TrafficStatus | averageVehicleSpeed | Average vehicle speed | An averaged measurement or calculation of the speed of vehicles at the specified location. | 0..1 | SpeedValue |

Table 36— Associations of the "TrafficSpeed" package

* + - 1. "TrafficSpeed" package attributes

There are no attributes for the package “TrafficSpeed”.

* + 1. "TravelTimeData" package
       1. "TravelTimeData" package classes

| **Class name** | **Designation** | **Definition** | **Stereotype** | **Abstract** |
| --- | --- | --- | --- | --- |
| TravelTimeData | Travel time data | Derived/computed travel time information relating to a linear section of the road network; forecast = true means a forecast for a vehicle at the start of the specified location, forecast = false means calculation/measurement at the end. |  | no |

Table 37— Classes of the "TravelTimeData" package

* + - 1. "TravelTimeData" package association roles

| **Class name** | **Role name** | **Designation** | **Definition** | **Multiplicity** | **Target** |
| --- | --- | --- | --- | --- | --- |
| TravelTimeData | freeFlowSpeed | Free flow speed | The free flow speed expected under ideal conditions, corresponding to the freeFlowTravelTime. | 0..1 | SpeedValue |
|  | freeFlowTravelTime | Free flow travel time | The travel time which would be expected under ideal free flow conditions. | 0..1 | DurationValue |
|  | normallyExpectedTravelTime | Normally expected travel time | The travel time which is expected for the given period (e.g. date/time, holiday status etc.) and any known quasi-static conditions (e.g. long term roadworks). This value is derived from historical analysis. | 0..1 | DurationValue |
|  | travelTime | Travel time | Derived/computed travel time information relating to a specific group of locations. | 0..1 | DurationValue |

Table 38— Associations of the "TravelTimeData" package

* + - 1. "TravelTimeData" package attributes

| **Class name** | **Attribute name** | **Designation** | **Definition** | **Multiplicity** | **Type** |
| --- | --- | --- | --- | --- | --- |
| TravelTimeData | travelTimeTrendType | Travel time trend type | The current trend in the travel time between the defined locations in the specified direction. | 0..1 | TravelTimeTrendTypeEnum |
|  | travelTimeType | Travel time type | Indication of the way in which the travel time is derived. | 0..1 | TravelTimeTypeEnum |
|  | vehicleType | Vehicle type | Vehicle type. | 0..\* | VehicleTypeEnum |

Table 39— Attributes of the "TravelTimeData" package

* + 1. "Validity" package
       1. "Validity" package classes

| **Class name** | **Designation** | **Definition** | **Stereotype** | **Abstract** |
| --- | --- | --- | --- | --- |
| DayWeekMonth | Day week month | Specification of periods defined by the intersection of days, weeks and months. |  | no |
| OverallPeriod | Overall period | A continuous or discontinuous period of validity defined by overall bounding start and end times and the possible intersection of valid periods (potentially recurring) with the complement of exception periods (also potentially recurring). |  | no |
| Period | Period | A continuous time period or a set of discontinuous time periods defined by the intersection of a set of criteria all within an overall delimiting interval. |  | no |
| Validity | Validity | Specification of validity, either explicitly or by a validity time period specification which may be discontinuous. |  | no |

Table 40— Classes of the "Validity" package

* + - 1. "Validity" package association roles

| **Class name** | **Role name** | **Designation** | **Definition** | **Multiplicity** | **Target** |
| --- | --- | --- | --- | --- | --- |
| Validity | validityTimeSpecification | 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— Associations of the "Validity" package

* + - 1. "Validity" package attributes

| **Class name** | **Attribute name** | **Designation** | **Definition** | **Multiplicity** | **Type** |
| --- | --- | --- | --- | --- | --- |
| OverallPeriod | overallEndTime | Overall end time | End of bounding period of validity defined by date and time. | 0..1 | DateTime |
|  | overallStartTime | Overall start time | Start of bounding period of validity defined by date and time. | 1..1 | DateTime |
| Validity | overrunning | Overrunning | The activity or action described by the SituationRecord is still in progress, overrunning its planned duration as indicated in a previous version of this record. | 0..1 | Boolean |
|  | validityStatus | Validity status | Specification of validity, either explicitly overriding the validity time specification or confirming it. | 1..1 | ValidityStatusEnum |

Table 42— Attributes of the "Validity" 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 43— 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 44— Attributes of the "VehicleCharacteristics" package**

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

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

* + 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>> "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>> "Seconds"

Seconds.

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

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

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

The direction of traffic flow concerned by a situation or traffic data. In ALERT-C the positive (resp. negative) direction corresponds to the positive offset direction within the RDS location table.

| **Enumerated value name** | **Designation** | **Definition** |
| --- | --- | --- |
| both | Both | Indicates that both directions of traffic flow are affected by the situation or relate to the traffic data. |
| negative | Negative | The direction of traffic flow concerned by a situation or traffic data. In ALERT-C the negative direction corresponds to the negative offset direction within the RDS location table. |
| positive | Positive | The direction of traffic flow concerned by a situation or traffic data. In ALERT-C the positive direction corresponds to the positive offset direction within the RDS location table. |
| unknown | Unknown | Unknown direction. |

Table 45— Values contained in the enumeration "AlertCDirectionEnum"

* + 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 46— Values contained in the enumeration "CarriagewayEnum"

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

List of countries.

| **Enumerated value name** | **Designation** | **Definition** |
| --- | --- | --- |
| at | at | Austria |
| be | be | Belgium |
| bg | bg | Bulgaria |
| ch | ch | Switzerland |
| cs | cs | Serbia and Montenegro |
| cy | cy | Cyprus |
| cz | cz | Czech Republic |
| de | de | Germany |
| dk | dk | Denmark |
| ee | ee | Estonia |
| es | es | Spain |
| fi | fi | Finland |
| fo | fo | Faroe Islands |
| fr | fr | France |
| gb | gb | Great Britain |
| gg | gg | Guernsey |
| gi | gi | Gibraltar |
| gr | gr | Greece |
| hr | hr | Croatia |
| hu | hu | Hungary |
| ie | ie | Ireland |
| im | im | Isle Of Man |
| is | is | Iceland |
| it | it | Italy |
| je | je | Jersey |
| li | li | Lichtenstein |
| lt | lt | Lithuania |
| lu | lu | Luxembourg |
| lv | lv | Latvia |
| ma | ma | Morocco |
| mc | mc | Monaco |
| mk | mk | Macedonia |
| mt | mt | Malta |
| nl | nl | Netherlands |
| no | no | Norway |
| other | other | Other than as defined in this enumeration. |
| pl | pl | Poland |
| pt | pt | Portugal |
| ro | ro | Romania |
| se | se | Sweden |
| si | si | Slovenia |
| sk | sk | Slovakia |
| sm | sm | San Marino |
| tr | tr | Turkey |
| va | va | Vatican City State |

**Table 47— Values contained in the enumeration "CountryEnum"**

* + 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 48— Values contained in the enumeration "DirectionEnum"

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

Enumeation for GipLink digitalization direction

| **Enumerated value name** | **Designation** | **Definition** |
| --- | --- | --- |
| fromTo | From to |  |
| toFrom | To from |  |

Table 49— Values contained in the enumeration "GipLinkDirectionEnum"

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

List of height or vertical gradings of road sections.

| **Enumerated value name** | **Designation** | **Definition** |
| --- | --- | --- |
| aboveGrade | Above grade | Above or over the normal road grade elevation. |
| atGrade | At grade | At the normal road grade elevation. |
| belowGrade | Below grade | Below or under the normal road grade elevation. |

Table 50— Values contained in the enumeration "HeightGradeEnum"

* + 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 51— 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 52— Values contained in the enumeration "LinearReferencingDirectionEnum"

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

List of descriptors to help to identify a specific location.

| **Enumerated value name** | **Designation** | **Definition** |
| --- | --- | --- |
| aroundABendInRoad | Around a bend in road | Around a bend in the road. |
| atMotorwayInterchange | At motorway interchange | At a motorway interchange. |
| atRestArea | At rest area | At rest area off the carriageway. |
| atServiceArea | At service area | At service area. |
| atTollPlaza | At toll plaza | At toll plaza. |
| atTunnelEntryOrExit | At tunnel entry or exit | At entry or exit of tunnel. |
| inbound | Inbound | On the carriageway or lane which is inbound towards the centre of the town or city. |
| inGallery | In gallery | In gallery. |
| inTheCentre | In the centre | In the centre of the roadway. |
| inTheOppositeDirection | In the opposite direction | In the opposite direction. |
| inTunnel | In tunnel | In tunnel. |
| onBorder | On border | On border crossing. |
| onBridge | On bridge | On bridge. |
| onConnector | On connector | On connecting carriageway between two different roads or road sections. |
| onElevatedSection | On elevated section | On elevated section of road. |
| onFlyover | On flyover | On flyover, i.e. on section of road over another road. |
| onIceRoad | On ice road | On ice road. |
| onLevelCrossing | On level crossing | On level-crossing. |
| onLinkRoad | On link road | On road section linking two different roads. |
| onPass | On pass | On mountain pass. |
| onRoundabout | On roundabout | On roundabout. |
| onTheLeft | On the left | On the left of the roadway. |
| onTheRight | On the right | On the right of the roadway. |
| onTheRoadway | On the roadway | On the roadway. |
| onUndergroundSection | On underground section | On underground section of road. |
| onUnderpass | On underpass | On underpass, i.e. section of road which passes under another road. |
| outbound | Outbound | On the carriageway or lane which is outbound from the centre of the town or city. |
| overCrestOfHill | Over crest of hill | Over the crest of a hill. |
| withinJunction | Within junction | On the main carriageway within a junction between exit slip road and entry slip road. |

Table 53— Values contained in the enumeration "LocationDescriptorEnum"

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

Type of sources from which situation information may be derived.

| **Enumerated value name** | **Designation** | **Definition** |
| --- | --- | --- |
| automobileClubPatrol | Automobile club patrol | A patrol of an automobile club. |
| cameraObservation | Camera observation | A camera observation (either still or video camera). |
| freightVehicleOperator | Freight vehicle operator | An operator of freight vehicles. |
| inductionLoopMonitoringStation | Induction loop monitoring station | A station dedicated to the monitoring of the road network by processing inductive loop information. |
| infraredMonitoringStation | Infrared monitoring station | A station dedicated to the monitoring of the road network by processing infrared image information. |
| microwaveMonitoringStation | Microwave monitoring station | A station dedicated to the monitoring of the road network by processing microwave information. |
| mobileTelephoneCaller | Mobile telephone caller | A caller using a mobile telephone (who may or may not be on the road network). |
| nonPoliceEmergencyServicePatrol | Non police emergency service patrol | Emergency service patrols other than police. |
| otherInformation | Other information | Other sources of information. |
| otherOfficialVehicle | Other official vehicle | Personnel from a vehicle belonging to the road operator or authority or any emergency service, including authorised breakdown service organisations. |
| policePatrol | Police patrol | A police patrol. |
| privateBreakdownService | Private breakdown service | A private breakdown service. |
| publicAndPrivateUtilities | Public and private utilities | A utility organisation, either public or private. |
| registeredMotoristObserver | Registered motorist observer | A motorist who is an officially registered observer. |
| roadAuthorities | Road authorities | A road authority. |
| roadOperatorPatrol | Road operator patrol | A patrol of the road operator or authority. |
| roadsideTelephoneCaller | Roadside telephone caller | A caller who is using an emergency roadside telephone. |
| spotterAircraft | Spotter aircraft | A spotter aircraft of an organisation specifically assigned to the monitoring of the traffic network. |
| trafficMonitoringStation | Traffic monitoring station | A station, usually automatic, dedicated to the monitoring of the road network. |
| transitOperator | Transit operator | An operator of a transit service, e.g. bus link operator. |
| vehicleProbeMeasurement | Vehicle probe measurement | A specially equipped vehicle used to provide measurements. |
| videoProcessingMonitoringStation | Video processing monitoring station | A station dedicated to the monitoring of the road network by processing video image information. |

Table 54— Values contained in the enumeration "SourceTypeEnum"

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

List of terms used to describe traffic conditions.

| **Enumerated value name** | **Designation** | **Definition** |
| --- | --- | --- |
| congested | Congested | Traffic in the specified direction is congested making driving very slow and difficult. |
| freeFlow | Free flow | Traffic in the specified direction is free flowing. |
| heavy | Heavy | Traffic in the specified direction is heavier than usual making driving conditions more difficult than normal. |
| impossible | Impossible | Traffic in the specified direction is completely congested, effectively at a standstill, making driving impossible. |
| unknown | Unknown | Traffic conditions are unknown. |

Table 55— Values contained in the enumeration "TrafficStatusEnum"

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

List of terms used to describe the trend in traffic conditions.

| **Enumerated value name** | **Designation** | **Definition** |
| --- | --- | --- |
| trafficBuildingUp | Traffic building up | Traffic conditions are changing from free-flow to heavy or slow service levels. Queues may also be expected. |
| trafficEasing | Traffic easing | Traffic conditions are changing from heavy or slow service levels to free-flow. |
| trafficStable | Traffic stable | Traffic conditions are currently stable. |
| unknown | Unknown | The trend of traffic conditions is currently unknown. |

Table 56— Values contained in the enumeration "TrafficTrendTypeEnum"

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

List of terms used to describe the trend in travel times.

| **Enumerated value name** | **Designation** | **Definition** |
| --- | --- | --- |
| decreasing | Decreasing | Travel times are decreasing. |
| increasing | Increasing | Travel times are increasing. |
| stable | Stable | Travel times are stable. |

Table 57— Values contained in the enumeration "TravelTimeTrendTypeEnum"

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

List of ways in which travel times are derived.

| **Enumerated value name** | **Designation** | **Definition** |
| --- | --- | --- |
| best | Best | Travel time is derived from the best out of a monitored sample. |
| estimated | Estimated | Travel time is an automated estimate. |
| instantaneous | Instantaneous | Travel time is derived from instantaneous measurements. |
| reconstituted | Reconstituted | Travel time is reconstituted from other measurements. |

Table 58— Values contained in the enumeration "TravelTimeTypeEnum"

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

Types of vehicle.

| **Enumerated value name** | **Designation** | **Definition** |
| --- | --- | --- |
| agriculturalVehicle | Agricultural vehicle | Vehicle normally used for agricultural purposes, e.g. tractor, combined harvester etc. |
| anyVehicle | Any vehicle | Vehicle of any type. |
| articulatedVehicle | Articulated vehicle | Articulated vehicle. |
| bicycle | Bicycle | Bicycle. |
| bus | Bus | Bus. |
| car | Car | Car. |
| caravan | Caravan | Caravan. |
| carOrLightVehicle | Car or light vehicle | Car or light vehicle. |
| carWithCaravan | Car with caravan | Car towing a caravan. |
| carWithTrailer | Car with trailer | Car towing a trailer. |
| constructionOrMaintenanceVehicle | Construction or maintenance vehicle | Vehicle normally used for construction or maintenance purposes, e.g. digger, excavator, bulldozer, lorry mounted crane etc. |
| fourWheelDrive | Four wheel drive | Four wheel drive vehicle. |
| highSidedVehicle | High sided vehicle | High sided vehicle. |
| lorry | Lorry | Lorry of any type. |
| moped | Moped | Moped (a two wheeled motor vehicle characterized by a small engine typically less than 50cc and by normally having pedals). |
| motorcycle | Motorcycle | Motorcycle. |
| motorcycleWithSideCar | Motorcycle with side car | Three wheeled vehicle comprising a motorcycle with an attached side car. |
| motorscooter | Motorscooter | Motorscooter (a two wheeled motor vehicle characterized by a step-through frame and small diameter wheels). |
| other | Other | Other than as defined in this enumeration. |
| tanker | Tanker | Vehicle with large tank for carrying bulk liquids. |
| threeWheeledVehicle | Three wheeled vehicle | Three wheeled vehicle of unspecified type. |
| trailer | Trailer | Trailer. |
| tram | Tram | Tram. |
| twoWheeledVehicle | Two wheeled vehicle | Two wheeled vehicle of unspecified type. |
| van | Van | Van. |
| vehicleWithCaravan | Vehicle with caravan | Vehicle (of unspecified type) towing a caravan. |
| vehicleWithCatalyticConverter | Vehicle with catalytic converter | Vehicle with catalytic converter. |
| vehicleWithoutCatalyticConverter | Vehicle without catalytic converter | Vehicle without catalytic converter. |
| vehicleWithTrailer | Vehicle with trailer | Vehicle (of unspecified type) towing a trailer. |
| withEvenNumberedRegistrationPlates | With even numbered registration plates | Vehicle with even numbered registration plate. |
| withOddNumberedRegistrationPlates | With odd numbered registration plates | Vehicle with odd numbered registration plate. |

Table 59— Values contained in the enumeration "VehicleTypeEnum”

1. GIP - <http://www.gip.gv.at/> [↑](#footnote-ref-1)
2. ARMS – Asfinag Traveltime Management System: <https://zenodo.org/record/1486434#.XADZV02Wwis> [↑](#footnote-ref-2)
3. VORAB Prognosis - <https://ieeexplore.ieee.org/document/7297598> [↑](#footnote-ref-3)
4. http://www.datex2.eu/content/linear-coordinates [↑](#footnote-ref-4)