



BSI Standards Publication

Intelligent transport systems - DATEX II data exchange specifications for traffic management and information

Part 3: Situation Publication

National foreword

This British Standard is the UK implementation of EN 16157-3:2018. It supersedes DD CEN/TS 16157-3:2011, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee EPL/278, Intelligent transport systems.

A list of organizations represented on this committee can be obtained on request to its secretary.

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English Version

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specifications for traffic management and information -
Part 3: Situation Publication

Systèmes de transport intelligents - Spécifications
DATEX II d'échange de données pour la gestion du
trafic et l'information routière - Partie 3 : Publication
de situations

Intelligente Verkehrssysteme - DATEX II
Datenaustauschspezifikation für Verkehrsmanagement
und Verkehrsinformationen - Teil 3: Publikation von
Verkehrssituationen

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European foreword

This document (EN 16157-3:2018) has been prepared by Technical Committee CEN/TC 278 “Intelligent transport systems”, the secretariat of which is held by NEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2019, and conflicting national standards shall be withdrawn at the latest by June 2019.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes CEN/TS 16157-3:2011.

The major differences introduced in this part are the following:

- remodelling of the cause of traffic situations, better fitting the operational use;
- enabling the mark up of Safety Related traffic information according to Commission Delegated Regulation (EU) No 886/2013;
- improving consistency of accidents and vehicle obstructions;
- adding several requested enumeration literals to support operational requirements;
- correcting of different bugs.

EN 16157-3 is the third part of a multi-part standard under the general title *Intelligent transport systems — DATEX II data exchange specifications for traffic management and information*.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

This European Standard defines a common set of data exchange specifications to support the vision of a seamless interoperable exchange of traffic and travel information across boundaries, including national, urban, interurban, road administrations, infrastructure providers and service providers. Standardization in this context is a vital constituent to ensure interoperability, reduction of risk, reduction of the cost base, promotion of open marketplaces and many social, economic and community benefits to be gained from more informed travellers, network managers and transport operators.

Delivering European Transport Policy in line with the White Paper issued by the European Commission requires co-ordination of traffic management and development of seamless pan European services. With the aim to support sustainable mobility in Europe, the European Commission has been supporting the development of information exchange mainly between the actors of the road traffic management domain for a number of years. In the road sector, DATEX II has been long in fruition, with the European Commission being fundamental to its development through an initial contract and subsequent co-funding through the Euro-Regional projects. With this standardization of DATEX II, there is a real basis for common exchange between the actors of the traffic and travel information sector.

This European Standard includes the framework and context for exchanges, the modelling approach, data content, data structure and relationships.

This European Standard supports a methodology that is extensible.

This part of EN 16157 deals with the publication of situation information. It specifies the structures and definitions of information that may be exchanged to convey situation information relating to a road network, both from a road network manager and road user point of view. Traffic and travel information situations cover:

- road traffic event information – planned and unplanned occurrences both on the road network and in the surrounding environment, including weather and environmental information,
- operator initiated actions,
- road traffic management information and instructions relating to use of the road network.

1 Scope

This document specifies and defines component facets supporting the exchange and shared use of data and information in the field of traffic and travel.

The component facets include the framework and context for exchanges, the modelling approach, data content, data structure and relationships.

This document is applicable to:

- traffic and travel information which is of relevance to road networks (non-urban and urban),
- public transport information that is of direct relevance to the use of a road network (e.g. road link via train or ferry service),
- traffic and travel information in the case of Cooperative intelligent transport systems (C-ITS).

This document establishes specifications for data exchange between any two instances of the following actors:

- Traffic Information Centres (TICs),
- Traffic Control Centres (TCCs),
- Service Providers (SPs),

Use of this document can be applicable for use by other actors.

This document covers, at least, the following types of informational content:

- road traffic event information – planned and unplanned occurrences both on the road network and in the surrounding environment,
- operator-initiated actions,
- road traffic measurement data, status data, and travel time data,
- travel information relevant to road users, including weather and environmental information,
- road traffic management information and instructions relating to use of the road network.

This document specifies the informational structures, relationships, roles, attributes and associated data types required for publishing situation traffic and travel information within the DATEX II framework. This is specified as a DATEX II Situation Publication sub-model which is part of the DATEX II platform independent model, but this part excludes those elements that relate to:

- location information which are specified in FprEN 16157-2;
- common information elements, which are specified in EN 16157-7.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 16157-1:2018, *Intelligent transport systems — DATEX II data exchange specifications for traffic management and information — Part 1: Context and framework*

FprEN 16157-2:2018, *Intelligent transport systems — DATEX II data exchange specifications for traffic management and information — Part 2: Location referencing*

EN 16157-7, *Intelligent transport systems — DATEX II data exchange specifications for traffic management and information — Part 7: Common data elements*

ISO/IEC 19505-1, *Information technology — Object Management Group Unified Modeling Language (OMG UML) — Part 1: Infrastructure*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 16157-1:2018, FprEN 16157-2:2018 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1

Payload publication

traffic related information or associated management information created at a specific point in time that is exchanged via a DATEX II interface

3.2

Publication

see 3.1: Payload publication

3.3

Situation

identifiable occurrence in the real world comprising one or more traffic/travel circumstances which are linked by one or more causal relationships

Note 1 to entry: Each situation has its own life-cycle which encompasses the life-cycles of its component circumstances.

3.4

Situation element

identifiable occurrence in the real world comprising one traffic/travel circumstance which has its own life-cycle

Note 1 to entry: Details of each situation element are mapped into a single data record.

4 Symbols and abbreviations

For the purposes of this document, the abbreviation of terms given in EN 16157-1:2018 and the following apply.

ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
GUID	Globally Unique Identifier
HTML	Hypertext mark-up language
IP	Internet Protocol
LPG	Liquid Petroleum Gas
PDF	Portable document format created by Adobe
RSS	Really simple syndication comprises a Web feed format used to publish frequently updated sources of information.
UML	Unified Modelling Language
URL	Uniform Resource Locator
VIP	Very Important Person
VMS	Variable Message Sign

5 Conformance

The DATEX II platform independent data model of which the Situation Publication sub-model is a part, corresponds to the Level A model as defined in EN 16157-1.

Conformance with this Part shall require platform independent models from which platform specific models are generated to comply with the UML modelling rules defined in EN 16157-1 and with the following requirements of this sub-model which are expressed in this part.

6 UML notation

The UML notation used in this document is as described in ISO/IEC 19505-1.

NOTE Some introduction guides to UML 2 are provided in the Bibliography of EN 16157-1:2018.

7 The Situation model

7.1 Overview of Situation

The Situation namespace shall comprise the packages used in the Situation model and the Classes and Enumerations specific for this Payload Publication.

7.2 Overview of SituationPublication

The SituationPublication model shall comprise a number of packages, with the <<D2Package>>SituationPublication package providing the entry to the model and the subordinate SituationRecord modelling the individual elements of a Situation. The SituationPublication package shall be one of several packages which are immediately subordinate to the PayloadPublication package and hence forms the top of the hierarchy in the Situation Publication model. The SituationRecord package shall make use of a number of packages thus invoking a hierarchy of packages.

Each SituationPublication instance shall specify any number of individual situations in the real world, each of which shall comprise separate, but related, elements which are modelled in DATEX II as SituationRecords.

A SituationRecord shall be further specialized as being either of type ServiceInformation, TrafficElement, OperatorAction or GenericSituationRecord.

The GenericSituationRecord is provided purely for user extension of the model.

ServiceInformation, as the name suggests, models events and information which are not occurring directly on or related to the road itself, but may still indirectly affect the operation of the road network, e.g. a road side service area is closed or a ferry service is not operating.

TrafficElement models events, activities and conditions which are occurring on the road network or are directly affecting the operation of the road network, e.g. an accident, an obstruction on the road or bad weather.

OperatorAction models actions or initiatives that a traffic operator may implement (either manually or automatically) to mitigate dangerous or poor driving conditions, and maintain optimal efficiency and safety of the road network which may include maintenance of the road infrastructure.

The entry class of each of the ServiceInformation, TrafficElement, OperatorAction or GenericSituationRecord sub-packages shall be a class in the higher-level package. The hierarchy of packages shall be strictly linear without any circular referencing.

Some of the packages and individual classes used within the SituationPublication package reside in the D2Namespace Common because they can be used in different places within this package or by other packages either now or in the future. The D2Namespace Common shall be a container for a number of packages and individual classes. Those packages and classes which are contained in the D2Namespace Common are identified in the following clauses. The use of individual classes from the Common namespace is **only** described in detail if their use in the SituationPublication affect their semantics.

7.3 The <<D2Package>>SituationPublication

7.3.1 Overview of the <<D2Package>>SituationPublication

The SituationPublication package shall be immediately subordinate to the PayloadPublication package and comprises a sub-model for defining publishable Situations, each of which may comprise one or more elements (see Figure 1). Each element of a Situation shall be modelled as an individual SituationRecord.

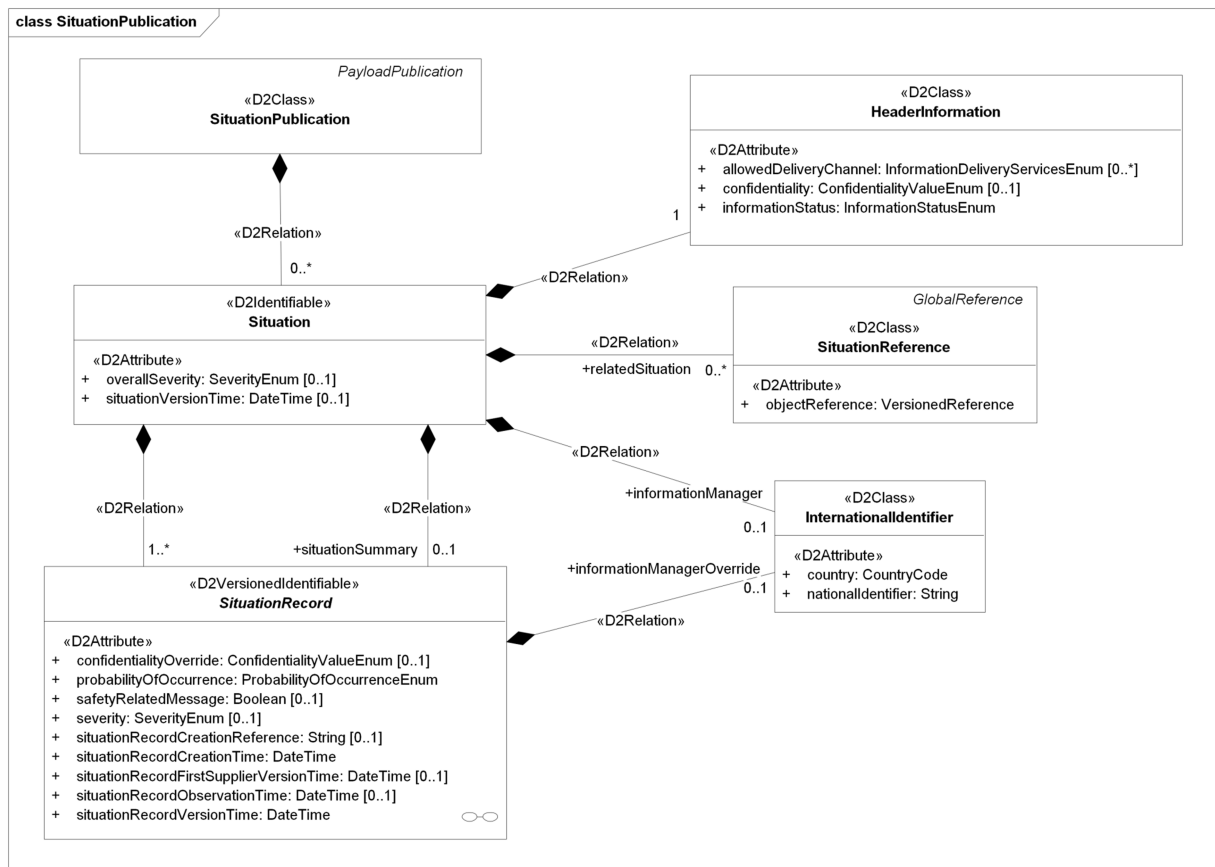


Figure 1 — The <<D2Package>> SituationPublication class model

7.3.2 Semantics of the <<D2Package>>SituationPublication

7.3.2.1 <<D2Package>>SituationPublication semantics - general

The <<D2Package>>SituationPublication class shall be the only entry point of the package and is a specific realizable case of a PayloadPublication. Each SituationPublication may contain any number of separate situations each of which themselves may comprise one or more elements. Each element of a Situation shall be modelled as a SituationRecord in DATEX II.

The modelling of each situation and each component situation element represented by an instance of a SituationRecord class shall be uniquely identifiable for the particular DATEX II service and have its own lifecycle. Although each may iterate through different time-stamped versions all instances of the Situation class have an assigned stereotype of <<Identifiable>>, whereas the SituationRecord class has an assigned stereotype of <<VersionedIdentifiable>>, to allow for referencing to a specific version of the SituationRecord during its lifecycle (see EN 16157-1 for how the implementation of these stereotypes in the PSM allows identity and version to be represented in a data exchange).

7.3.2.2 Situation class

The Situation class shall be the base class for detailing a situation that may affect traffic on the roads.

7.3.2.3 HeaderInformation class

(from Common namespace)

Each instance of a Situation shall have associated metadata contained in the HeaderInformation class which allows the supplier of the publication to specify how the recipient should treat the information contained in the Situation.

The HeaderInformation class and its components is defined in EN 16157-7.

7.3.2.4 SituationReference class

An instance of a Situation can be related somehow to any other Situation, either published by the same publication creator or by another one. The use of the SituationReference class is defined as relatedSituation. There may be any number of relatedSituations. For instance a Situation containing an Accident element and a resulting AbnormalTraffic element (e.g. indicating queuing traffic) could be related to a Situation containing an AbnormalTraffic element on the opposite carriageway.

- **Attribute objectReference** shall be used to provide the related Situation. In case of a reference to a specific version, the attribute version may be used. In case a generic reference to that Situation is made, the attribute version shall be omitted.

7.3.2.5 InternationalIdentifier class

(from Common namespace)

The InternationalIdentifier class can be used in association with the Situation class, to provide the information manager of the Situation, by using this attribute in the role informationManager. The information manager is defined as the organization that manages the information content (is responsible for updates of this information) typically the organization that first made the DATEX II publication of this content.

Associated to the situation record the class InternationalIdentifier can be used to provide a different organization as being the information manager of that specific situation record, by using this class in the role of informationManagerOverride

The InternationalIdentifier class and its components is defined in EN 16157-7.

7.4 The SituationRecord package

7.4.1 Overview of the SituationRecord package

The package, SituationRecord, shall comprise a sub-model for defining an individual element of a Situation as a single identifiable, version-managed record (see Figure 2).

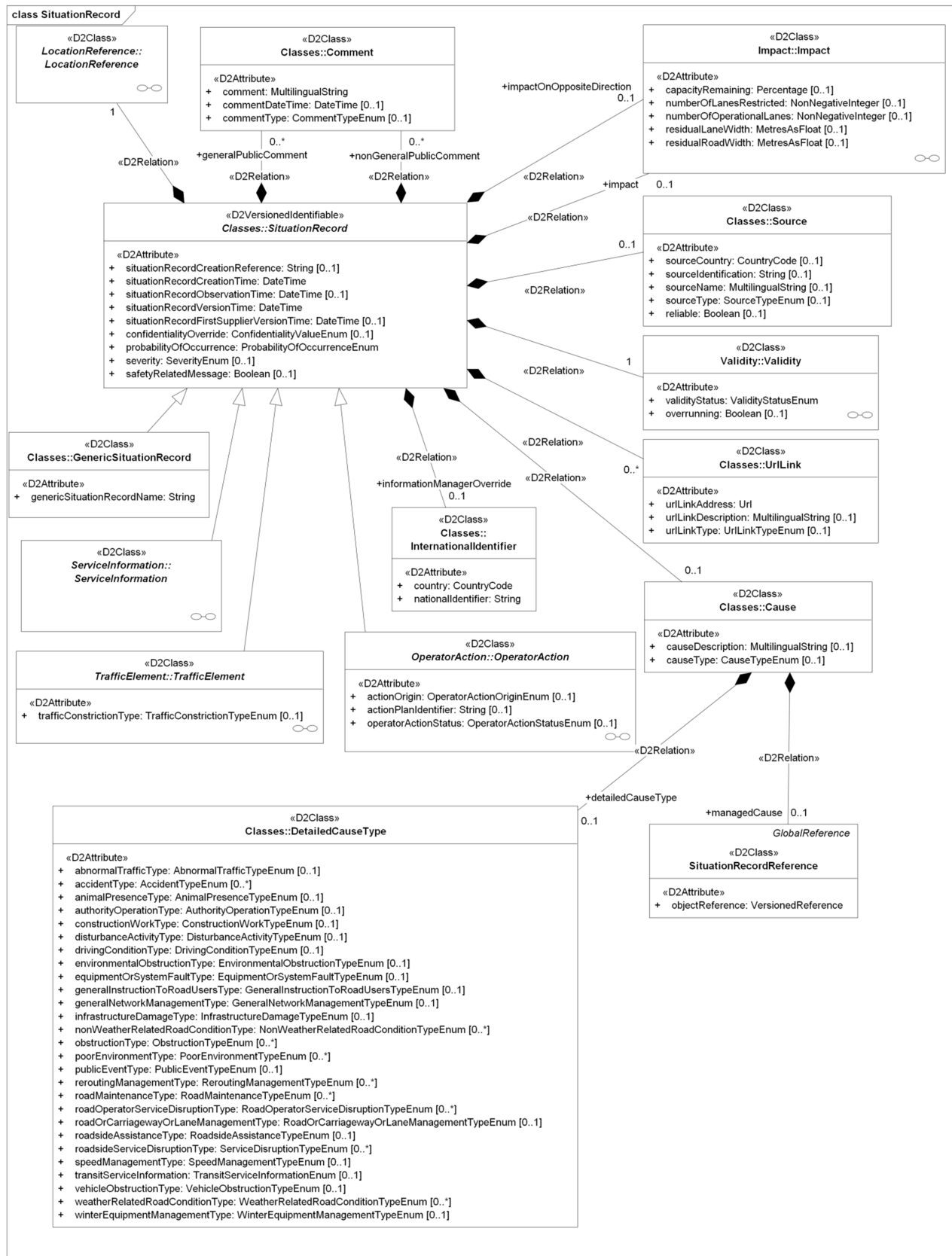


Figure 2 — The SituationRecord package class model

7.4.2 Semantics of the SituationRecord package

7.4.2.1 SituationRecord package semantics – general

The SituationRecord package shall comprise an abstract SituationRecord class which shall be realized as one of four specializations which are used to model the details of an element of a Situation. Each version of a SituationRecord shall have associated location information and validity information as a minimum.

7.4.2.2 SituationRecord class

The SituationRecord class is abstract and shall be realized as an instance of either a ServiceInformation, a TrafficElement, an OperatorAction or a GenericSituationRecord. The latter may only be used if a level B extension is required for a new type of SituationRecord.

The purpose of each of these instances of a SituationRecord is as follows:

- **ServiceInformation:** events and information which are not occurring directly on or related to the road itself, but may still indirectly affect the operation of the road network
- **TrafficElement:** events, activities and conditions which are occurring on the road network or are directly affecting the operation of the road network
- **OperatorAction:** actions or initiatives that a traffic operator (or an automatic system under the operator's control) may implement to mitigate dangerous or poor driving conditions, and maintain optimal efficiency and safety of the road network
- **GenericSituationRecord:** a generic record for use in level B extensions of the DATEX II model.

Before describing the details of the SituationRecord class it needs to be understood that the DATEX II model has been designed to cater for the relaying of traffic and travel information down a supply chain of systems or nodes where the first system (the creator that can be reflected by using informationManager) in that chain creates SituationRecords in its database and then supplies them to the next system in the chain. Each system in the supply chain is a supplier to the next. The attributes in the SituationRecord reflect this supply chain concept and, if used correctly, should assist with the correct processing of situation information received via complex supply chains.

- **Attribute situationRecordCreationReference** may be used to specify a reference for the SituationRecord object that was created by the original supplier in the supply chain when the first version of the record was created. This shall not change in subsequent versions of the same SituationRecord. It is up to the original supplier to manage these references which may be used by downstream systems to correctly process data received via diverse supply chains (e.g. the same data may be unknowingly received via different supply chains and this reference will help identify such occurrences).
- **Attribute situationRecordCreationTime** shall be used to specify the date/time that the first version of the SituationRecord object was created by the original supplier. It shall not change in subsequent versions of the same SituationRecord. Again it shall be up to the original supplier to create this time stamp.
- **Attribute situationRecordObservationTime** may be used to specify the time at which the information contained in the current version of the SituationRecord was actually observed by the original source of the information (i.e. as close to the sensing source as possible).

- **Attribute situationRecordVersionTime** shall be used to specify the date/time that this current version of the SituationRecord was written into the database of the supplier which is involved in this data exchange. This time and the associated version identification shall be different from those provided by preceding suppliers (if there are any) in the supply chain since they are relative to this supplier. Note that the actual version of the SituationRecord is placed in an attribute which is part of the platform specific realization of the <<versionedIdentifiable>> stereotype.
- **Attribute situationRecordFirstSupplierVersionTime** may be used to specify the date/time that the current version of the SituationRecord was written into the database of the original supplier in the supply chain. If there is only the current supplier in the supply chain then this time should be identical to that in situationRecordVersionTime and hence would not normally be given.
- **Attribute safetyRelatedMessage** may be used to indicate, whether this SituationRecord specifies a safety-related message according to Commission Delegated Regulation (EU) No 886/2013.

7.4.2.3 LocationReference class

(from LocationReferencing namespace)

The LocationReference class shall be used to identify details of the location where the information contained in the instance/version of the SituationRecord is situated.

The LocationReference class and its components is defined in FprEN 16157-2.

7.4.2.4 Comment class

The Comment class may be used to allow any number of free text comments to be specified for an instance of a SituationRecord. The association used to relate to the SituationRecord specifies whether the comment shall be allowed to be published to the general public or not (identified by role names of generalPublicComment and NonGeneralPublicComment respectively). Each SituationRecord instance may have any number of each type of these comments.

Each comment attribute shall be of a multilingual string type which means a publication may contain the same comment in several different languages.

- **Attribute commentType** may be used to classify the type of comment. This should be helpful in allowing a recipient to use the information more effectively.

7.4.2.5 Source class

(from Common namespace)

The Source class may be used to identify details of the source from which the information contained in the instance/version of the SituationRecord was obtained. The details can include the source's statement about the reliability of the information.

The Source class and its components is defined in EN 16157-7.

7.4.2.6 UriLink class

(from Common namespace)

The UriLink class may be used to allow any number of Uniform Resource Locators (URL) to be specified where further information relating to the instance of the SituationRecord may be found. A URL may point to additional documentation in PDF format or HTML format, image data, video or voice streams or an RSS feed.

The UriLink class and its components is defined in EN 16157-7.

7.4.2.7 Cause class

7.4.2.7.1 General

The Cause class may be used to allow a supplier to provide information about the cause of the situation element which is defined by the SituationRecord.

7.4.2.7.2 DetailedCauseType class

The DetailedCauseType class may be used to allow a supplier a more detailed and structured way to provide information about the cause of the situation element. All types used in the SituationPublication that are relevant can be used.

7.4.2.8 SituationRecordReference class

The SituationRecordReference class in the managedCause role may be used to allow a supplier to provide information about the cause of the situation element when it is something that is also managed by the supplier himself or another supplier which is providing this data exchange service (i.e. the publication creator). Hence the cause should be identified by a reference (the managedCause) to another managed SituationRecord produced by a supplier.

- **Attribute objectReference** shall be used to provide the related SituationRecord. In case of a reference to a specific version, the attribute version may be used. In case a generic reference to that SituationRecord is made, the attribute version shall be omitted.

7.5 The Impact package

7.5.1 Overview of the Impact package

The package Impact shall comprise a sub-model for defining an assessment of the impact that the situation element described in the SituationRecord will have or is having on the driving conditions on the road (see Figure 3). The specified impact is deemed to hold true for all the valid periods of the SituationRecord as defined by the associated Validity class and over the full length of the location defined for the SituationRecord. If the impact (e.g. delay) varies over the valid periods of the SituationRecord or over separate locations within the SituationRecord then separate SituationRecords should be created instead for each of the different levels of impact over time or space.

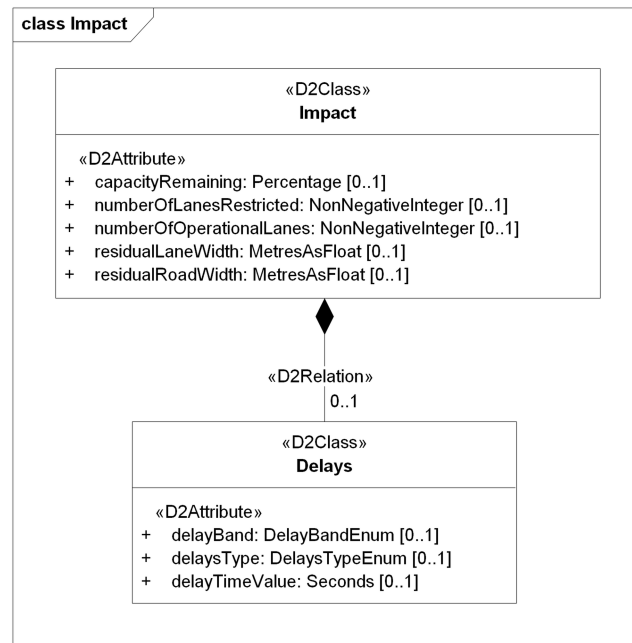


Figure 3 — The Impact package class model

7.5.2 Semantics of the Impact package

7.5.2.1 Impact package semantics – general

The Impact package shall model the details of the assessed impact that an event or operator action will have or is having on the driving conditions in terms of the roads ability to carry traffic and in terms of delays on that traffic. The impact shall be deemed to be constant through the validity periods and locations defined for the whole SituationRecord.

7.5.2.2 Impact class

The Impact class shall contain the basic impact information in terms of the constraints imposed by the situation element defined in the SituationRecord instance on the road network. This may be expressed in terms of remaining flow capacity, reductions in the physical road and lane availability and their respective widths in the direction of traffic as given in the LocationReference package.

In case an event has impact on the road/carriageway/lane availability in the opposite direction as the one stated in the LocationReference package, the Impact class may be used the role of impactOnOppositeDirection to give the impact.

7.5.2.3 Delays class

The Delays class may be used to detail the delays being or expected to be caused by the situation element defined in the SituationRecord instance within the validity periods and locations defined for the situation element. Delays may be expressed in terms which are relative to normal conditions, in terms of a course classification and as absolute times. It is recommended that only one of these options should be used to avoid confusion.

7.6 The Validity package — Overview of Validity package

(from Common namespace)

The package, Validity, shall comprise a sub-model for defining the temporal validity of a situation element described in the SituationRecord instance, or the impact of such a situation element, where validity in this context means the time period in which the real-world event, activity, action or impact being described actually occurs or is predicted or scheduled to occur.

The Validity package and its components is defined in EN 16157-7.

7.7 The ServiceInformation package

7.7.1 Overview of the ServiceInformation package

The package, ServiceInformation, may be used which shall comprise a sub-model for defining information about events which are not directly located on or directly affecting the road, but which may never the less indirectly influence the behaviour of drivers and hence the characteristics of traffic flow (see Figure 4).

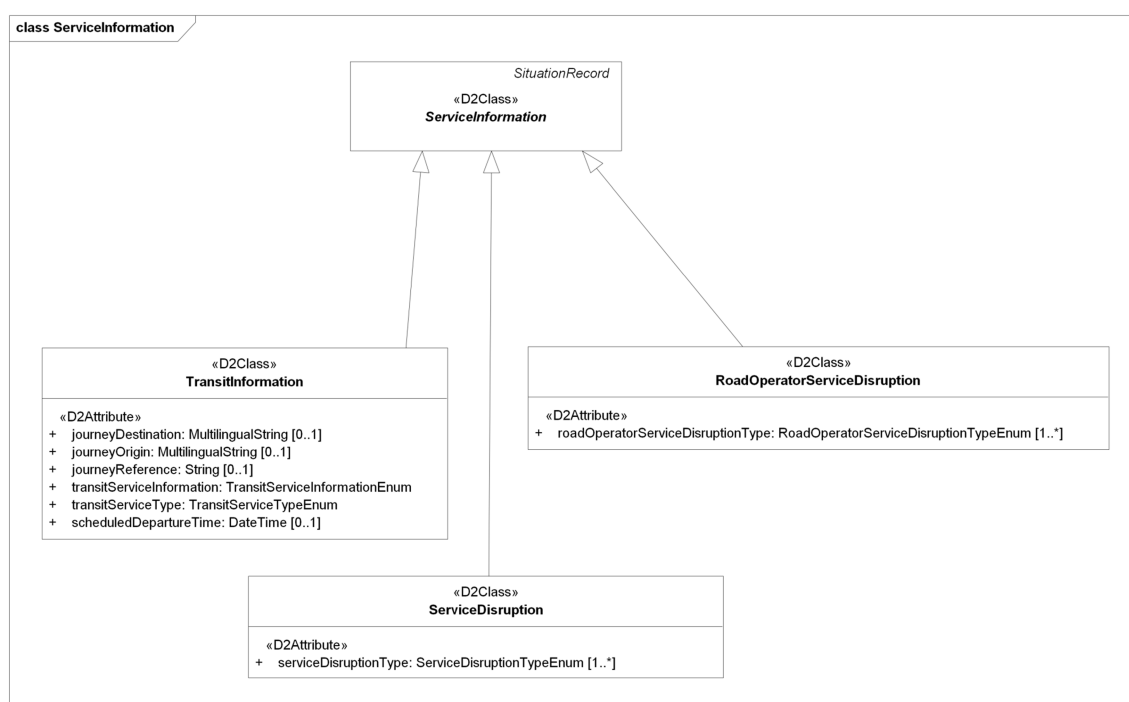


Figure 4 — The ServiceInformation package class model

7.7.2 Semantics of the ServiceInformation package

7.7.2.1 ServiceInformation package semantics – general

The ServiceInformation package shall comprise an abstract ServiceInformation class which shall be realized as one of four specializations which are used to model the details of information relating to events which are not directly located on or directly affecting the road.

7.7.2.2 ServiceInformation class

The ServiceInformation class is abstract and shall be realized as an instance of one of TransitInformation, ServiceDisruption or RoadOperatorServiceDisruption.

7.7.2.3 TransitInformation class

The TransitInformation class may be used which shall allow a supplier to provide information relating to transit services, such as their availability and their departure times/delays, which might be of direct interest to road users, e.g. connecting rail or ferry services. It is not intended to be used as a means of publishing general public transport information, but only that which might be of direct relevance to road users.

7.7.2.4 ServiceDisruption class

The ServiceDisruption class may be used which shall allow a supplier to provide information about disruption to normal services on the road or roadside (e.g. specific services at a service area, or the unavailability of parkingplaces in general).

7.7.2.5 RoadOperatorServiceDisruption class

The RoadOperatorServiceDisruption class may be used which shall allow a supplier to provide information about disruption to normal services provided by the road operator such as traffic officer patrol services or telephone information services.

7.8 The TrafficElement package

7.8.1 Overview of the TrafficElement package

The package, TrafficElement, may be used which shall comprise a sub-model for defining information about events or activities which are located on the road network or which may directly affect a section of the road network but which are not planned or instigated by the road operator as part of traffic management activities (see Figure 5). Note that some activities may be planned by others (e.g. the police, civil authorities or dissident groups).

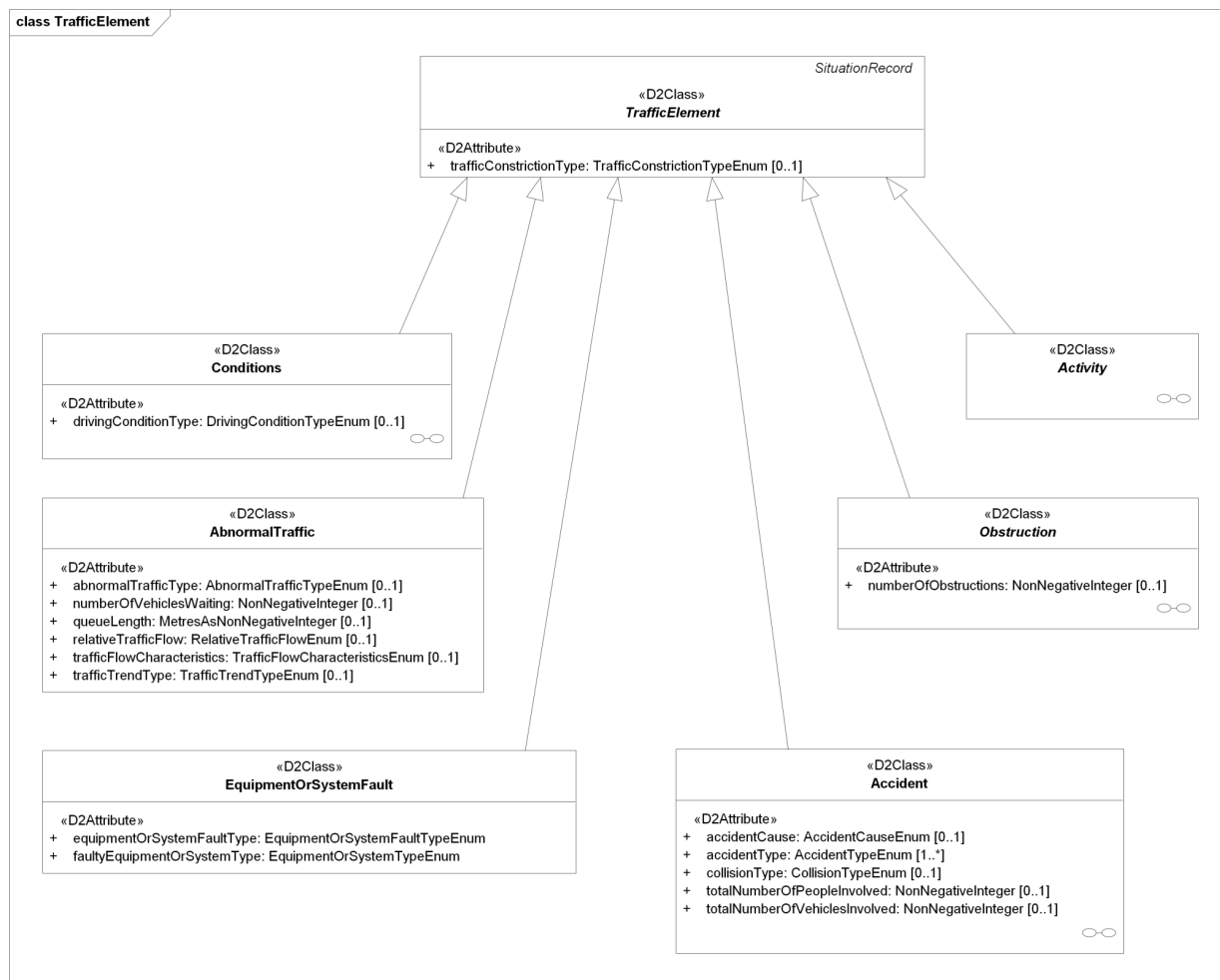


Figure 5 — The TrafficElement package class model

7.8.2 Semantics of the TrafficElement package

7.8.2.1 TrafficElement package semantics – general

The TrafficElement package shall comprise the TrafficElement class which shall be realized as one of six specializations which are used to model the details of the different types of events.

7.8.2.2 TrafficElement class

The TrafficElement class is abstract and shall be realized as an instance of either Conditions, AbnormalTraffic, EquipmentOrSystemFault, Accident or as one of the specializations of the Obstruction or Activity classes.

- **Attribute trafficConstrictionType** may be used to provide the constriction the event in this class has on traffic in terms of lane/carriageway/road blockages and obstructions.¹

¹ Take note: a blockage or obstruction is not an action taken by authorities. The result of a blockage can be a road/carriageway/lane closure measure by the authorities.

7.8.2.3 AbnormalTraffic class

An instance of the AbnormalTraffic class may be used which shall allow a supplier to provide information about instances of abnormal traffic conditions at locations on the road network. These conditions can be described in a number of ways, including relative to normally expected conditions at the point on the network and at that date/time.

7.8.2.4 EquipmentOrSystemFault class

An instance of the EquipmentOrSystemFault class may be used which shall allow a supplier to provide information about an equipment or system which is faulty, malfunctioning or not in a fully operational state that may be of interest or concern to road operators and road users. This shall be used for conveying information about electrical/electronic equipment and systems, not about damaged civil infrastructure (see 7.13, the Obstruction package for details).

7.9 The Conditions package

7.9.1 Overview of the Conditions package

The package Conditions shall comprise a sub-model for defining information about conditions which may affect driving, and specifically for defining details of road surface conditions or environmental conditions (see Figure 6). The package contains concrete SituationRecord subclasses within a SituationPublication, some of which may have associated quantitative measures relating to the conditions on the road e.g. wind speed or depth of snow.

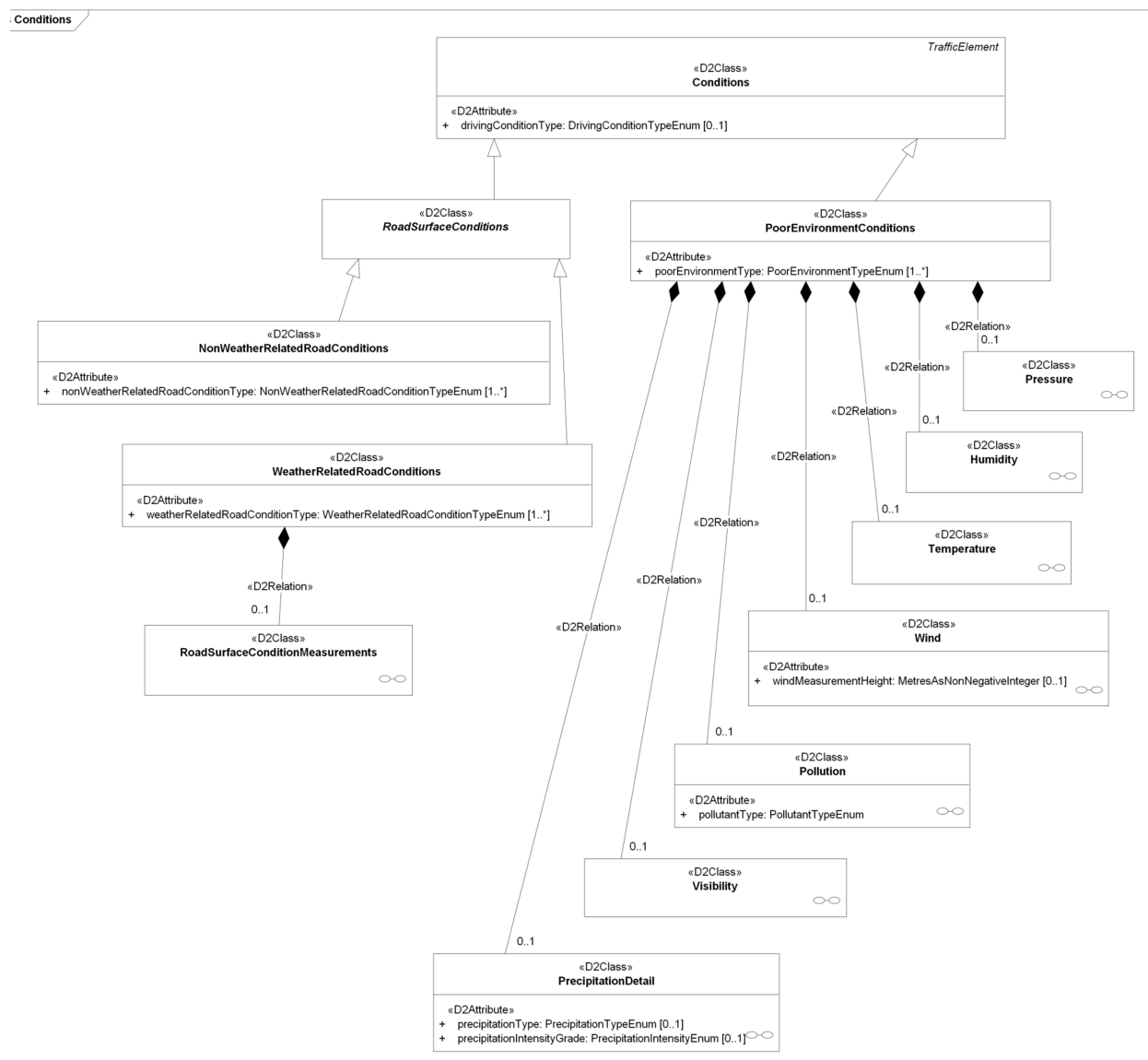


Figure 6 — The Conditions package class model

7.9.2 Semantics of the Conditions package

7.9.2.1 Conditions package semantics – General

The information that is modelled in the Conditions package is a general assessment of the driving conditions plus details of the road surface conditions and poor environmental conditions (including weather). The base class, Conditions, is a realizable class which shall be specialized as either RoadSurfaceConditions or PoorEnvironmentConditions.

7.9.2.2 Conditions class

This is the base class that shall be used for detailing all conditions that may affect or degrade normal driving conditions on the road.

- **Attribute drivingConditionType** specifies a high-level assessment of the driving conditions which are being or may in the future be experienced on the road by travellers.

7.9.2.3 RoadSurfaceConditions class

This is an abstract class that shall be realized as an instance of either WeatherRelatedRoadConditions or NonWeatherRelatedRoadConditions. Road conditions in this context specifically relates to road surface conditions of any type.

7.9.2.4 WeatherRelatedRoadConditions class

This class shall allow road surface conditions which are related to weather conditions to be specified.

7.9.2.5 NonWeatherRelatedRoadConditions class

This class shall allow road surface conditions which are not related to weather conditions (e.g. diesel on the road or loose chippings) to be specified.

7.9.2.6 PoorEnvironmentConditions class

This class shall allow any environmental conditions that may affect driving on the road to be specified. These may be specified as simple poor environment types or may additionally be qualified by specific measurement data relating to the type of conditions (see 7.10, the WeatherData package for details).

- **Attribute poorEnvironmentType** shall be used to provide a description of the type of poor environmental conditions affecting the driving conditions on the road. There may be more than one type of poor environmental condition specified simultaneously.

7.10 The WeatherData package — Overview of the WeatherData package

The package, WeatherData is defined in EN 16157-7.

The allowed types in the PoorEnvironmentConditions class are:

- class Humidity
- class Wind
- class Temperature
- class Pollution
- class Visibility
- class PrecipitationDetail

7.11 The RoadSurfaceConditionMeasurements package — Overview of the RoadSurfaceConditionMeasurements package

(from WeatherData package within Common namespace)

The package, RoadSurfaceConditionMeasurements, shall allow road surface condition measurements which are related specifically to the weather to be specified.

The RoadSurfaceConditionMeasurements package and its components is defined in EN 16157-7, as a specialization of the weatherData class.

7.12 The Accident package

7.12.1 Overview of the Accident package

The package Accident shall comprise a sub-model for defining information about accident events involving vehicles which occur on the road network (see Figure 7).

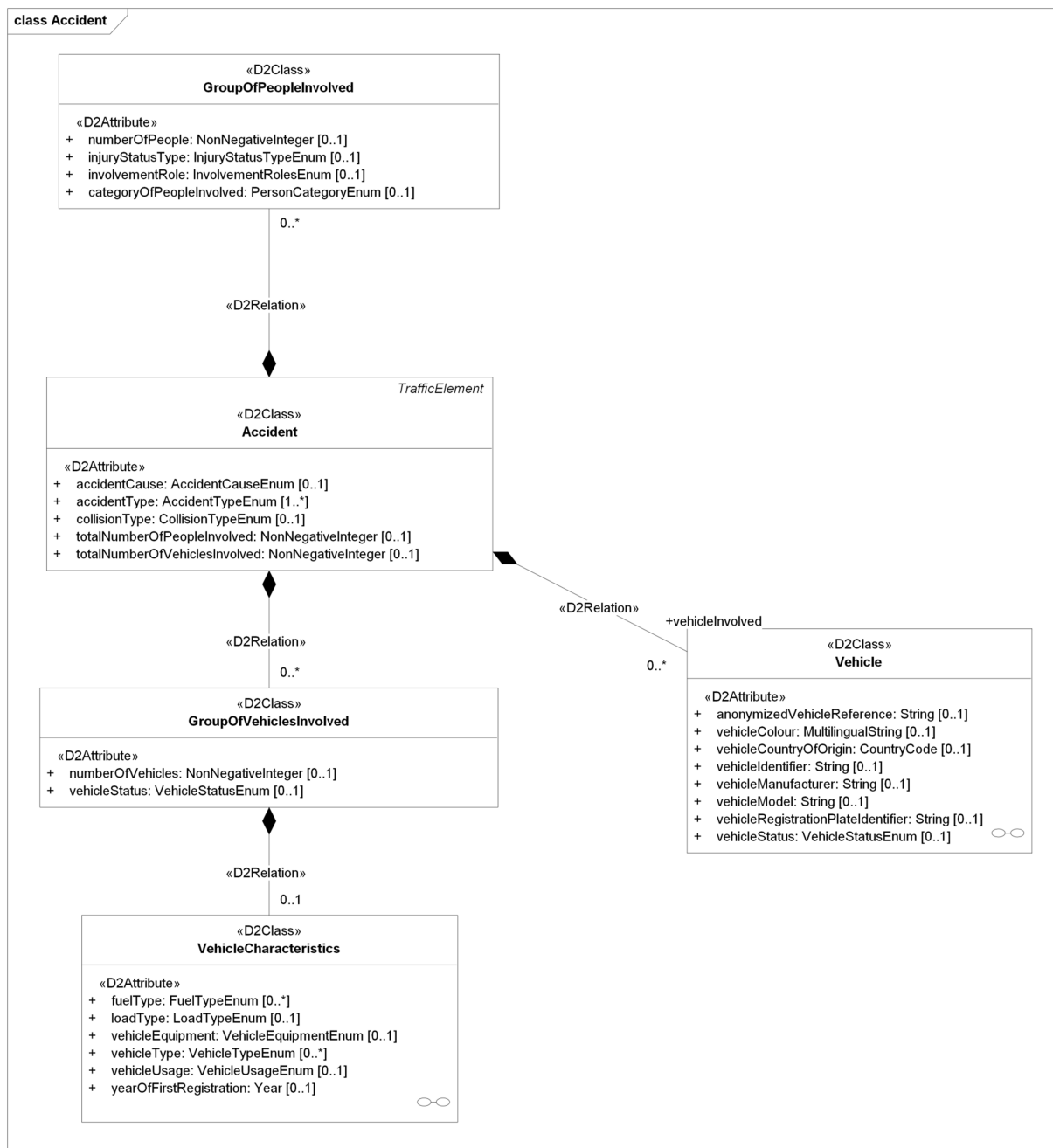


Figure 7 — The Accident package class model

7.12.2 Semantics of the Accident package

7.12.2.1 Accident package semantics – general

The information that is modelled in the Accident package shall identify the type and cause of the accident and the details of the vehicle(s) and people involved which may be of use to traffic managers and traffic information service providers. Details of vehicles involved can be provided as relating to a group of vehicles or as information specific to individual vehicles by using the associations with the GroupOfVehiclesInvolved class or the Vehicle class respectively.

7.12.2.2 Accident class

An instance of the Accident class shall allow a supplier to provide basic information about vehicle accidents which includes at a minimum the type of the accident.

7.12.2.3 GroupOfVehiclesInvolved class

(from Common namespace)

This class may be used to allow details of a group of vehicles involved in an accident which share common characteristics and/or status to be specified. There may be more than one group of vehicles involved in an accident, each having a common set of characteristics (e.g. lorries over a certain weight) and/or status (e.g. broken down). The number of vehicles belonging to each group can be specified.

The GroupOfVehiclesInvolved class and its components is defined in EN 16157-7.

7.12.2.4 GroupOfPeopleInvolved class

This class may be used to allow details of a group of people involved in an accident which share common attributes to be specified. There may be more than one group of people involved in an accident, each having a common role in the accident (e.g. vehicle passenger), status (e.g. seriously injured) and/or category (e.g. child). The number of persons belonging to each group can be specified.

7.12.2.5 Vehicle class

(from Common namespace)

This class is used with the vehicleInvolved role and may be used to allow details of individual vehicles involved in an accident. There may be more than one vehicleInvolved in an accident, each having a set of characteristics and/or status (e.g. broken down).

The Vehicle class and its components is defined in EN 16157-7.

7.13 The Obstruction package

7.13.1 Overview of the Obstruction package

The package Obstruction shall comprise a sub-model for defining information about obstructions of a physical nature on or adjacent to the roadway which may disrupt or endanger traffic (see Figure 8).

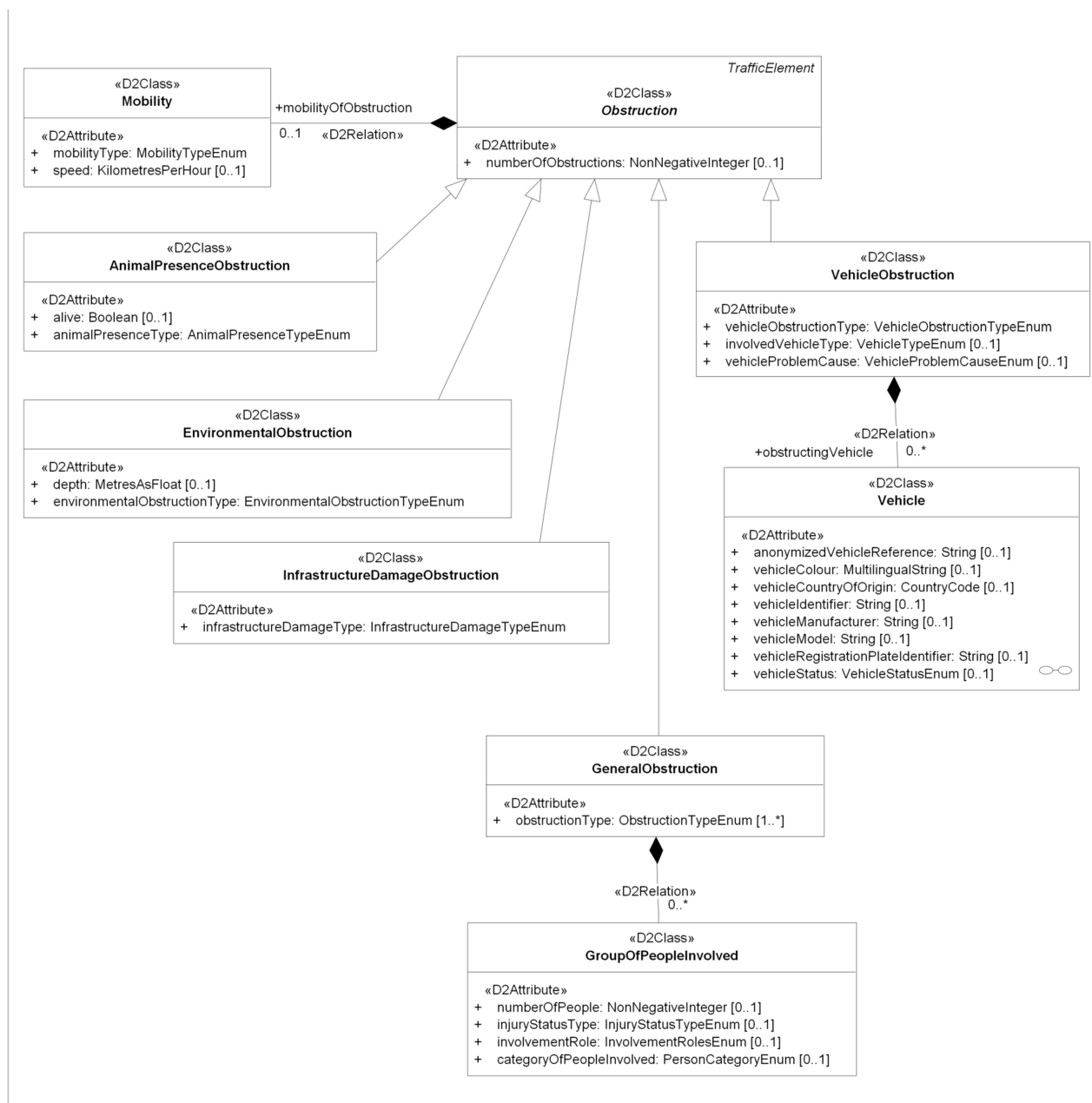


Figure 8 — The Obstruction package class model

7.13.2 Semantics of the Obstruction package

7.13.2.1 Obstruction package semantics – General

The information that is modelled in the Obstruction package shall identify details of obstructions of a variety of types which may be either stationary or mobile. The obstructions modelled shall be of type general, animal presence, environmental, infrastructure or vehicle-related. Obstructions are things of a

physical nature which are having, or potentially may have, a material impact on the traffic flowing on the road network. Usually these physical things occur on the road itself, but not always. For instance a house fire or a rail crash close to the road may have a material effect on traffic flows and would therefore be classed as an obstruction.

7.13.2.2 Obstruction class

The Obstruction class is abstract and shall be realized as an instance of either GeneralObstruction, AnimalPresenceObstruction, EnvironmentalObstruction, InfrastructureDamageObstruction or VehicleObstruction.

7.13.2.3 GeneralObstruction class

An instance of the GeneralObstruction class shall allow a supplier to identify the nature of the obstruction(s) as being one of a number of general types.

7.13.2.4 AnimalPresence class

An instance of the AnimalPresence class shall allow a supplier to specify details of obstruction(s) which involve animals on the road.

7.13.2.5 EnvironmentalObstruction class

An instance of the EnvironmentalObstruction class shall allow a supplier to specify details of obstruction(s) which are the result of environmental conditions.

7.13.2.6 InfrastructureDamageObstruction class

An instance of the InfrastructureDamageObstruction class shall allow a supplier to specify details of obstruction(s) which are the result of failures or damage to the road infrastructure. This is specifically the civil infrastructure, not the electronic/system infrastructure which is covered by the EquipmentOrSystemFault class. It may be on, under or above the road itself.

7.13.2.7 VehicleObstruction class

An instance of the VehicleObstruction class shall allow a supplier to specify details of obstruction(s) which are caused by one or more vehicles.

7.13.2.8 Vehicle class

(from Common namespace)

This class is used with the obstructingVehicle role and may be used to allow details of individual vehicles causing the obstruction. There may be more than one obstructingVehicle causing the obstruction, each having a set of characteristics and/or status (e.g. broken down).

The Vehicle class and its components is defined in EN 16157-7.

7.13.2.9 Mobility class

The Mobility class in this case shall allow a supplier to specify whether the obstruction is mobile or stationary. In case of a mobile obstruction, the speed at which the obstruction is moving may be specified.

7.14 The Activity package

7.14.1 Overview of the Activity package

The package Activity shall comprise a sub-model for defining information about human activities other than relating to the traffic stream which are causing or may cause traffic disruption (see Figure 9).

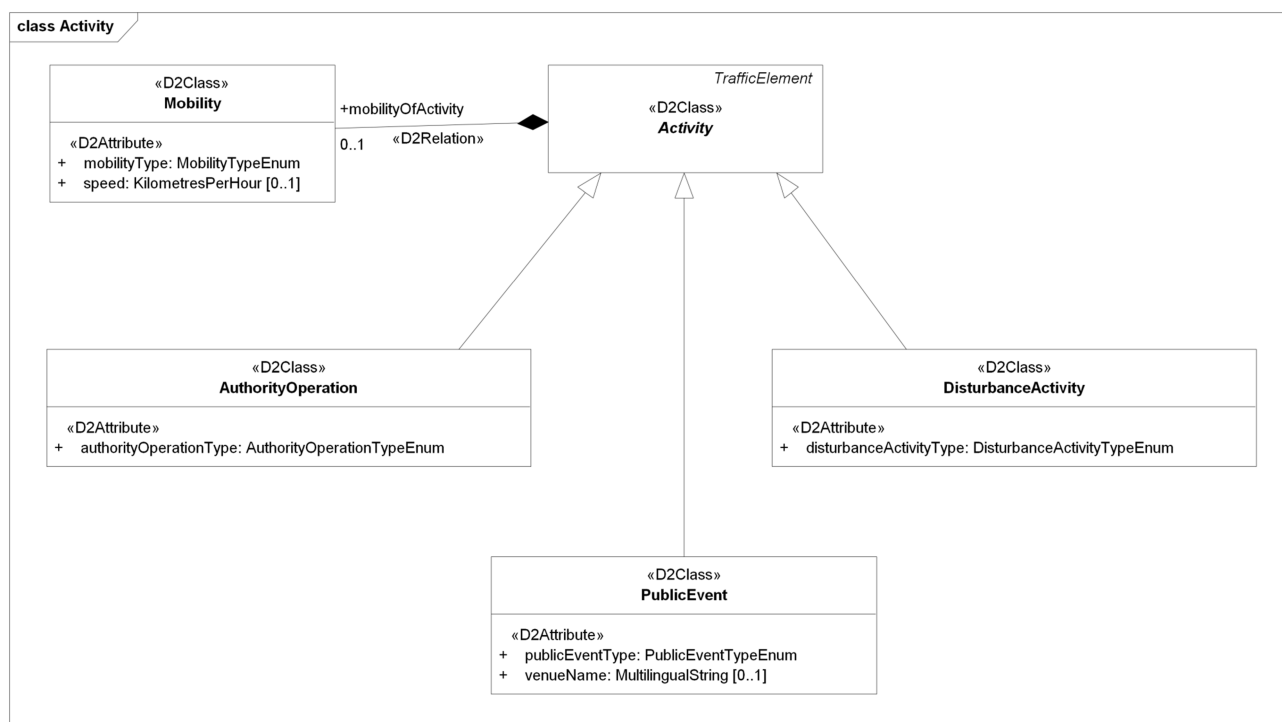


Figure 9 — The Activity package class model

7.14.2 Semantics of the Activity package

7.14.2.1 Activity package semantics – general

The information that is modelled in the Activity package shall identify details of human activities of a variety of types which may be either stationary or mobile. The activities modelled relate to those organized or initiated by official authorities (other than the road operator itself), those relating to public events or those activities which are of a disturbance nature.

7.14.2.2 Activity class

The Activity class is abstract and shall be realized as an instance of either AuthorityOperation, PublicEvent or DisturbanceActivity.

7.14.2.3 AuthorityOperation class

An instance of the AuthorityOperation class shall allow a supplier to identify a type of activity organized or initiated by an official authority. This does not include road operator initiated activities that are normally used to ameliorate dangerous or poor driving conditions (see 7.23, the OperatorActions package for details).

7.14.2.4 PublicEvent class

An instance of the PublicEvent class shall allow a supplier to identify a type of public event activity which may cause traffic disruption, typically because it may be a traffic generator or because it may disrupt the flow of traffic such as in the case of a parade or procession.

7.14.2.5 DisturbanceActivity class

An instance of the DisturbanceActivity class shall allow a supplier to identify a type of human action either of a public disorder nature or of a situation alert type which may cause traffic disruption. Usually

these are of an unplanned nature, although not necessarily unplanned by the perpetrators of the disturbance.

7.14.2.6 Mobility class

The Mobility class in this case shall allow a supplier to specify whether the activity is mobile or stationary. In case of a mobile obstruction, the speed at which the obstruction is moving may be specified.

7.15 The OperatorAction package

7.15.1 Overview of the OperatorAction package

The package OperatorAction may be used which shall comprise a sub-model for defining information about road operator actions which affect the road network or the users of the road network and are intended to help prevent or correct dangerous or poor driving conditions or maintain the road infrastructure (see Figure 10).

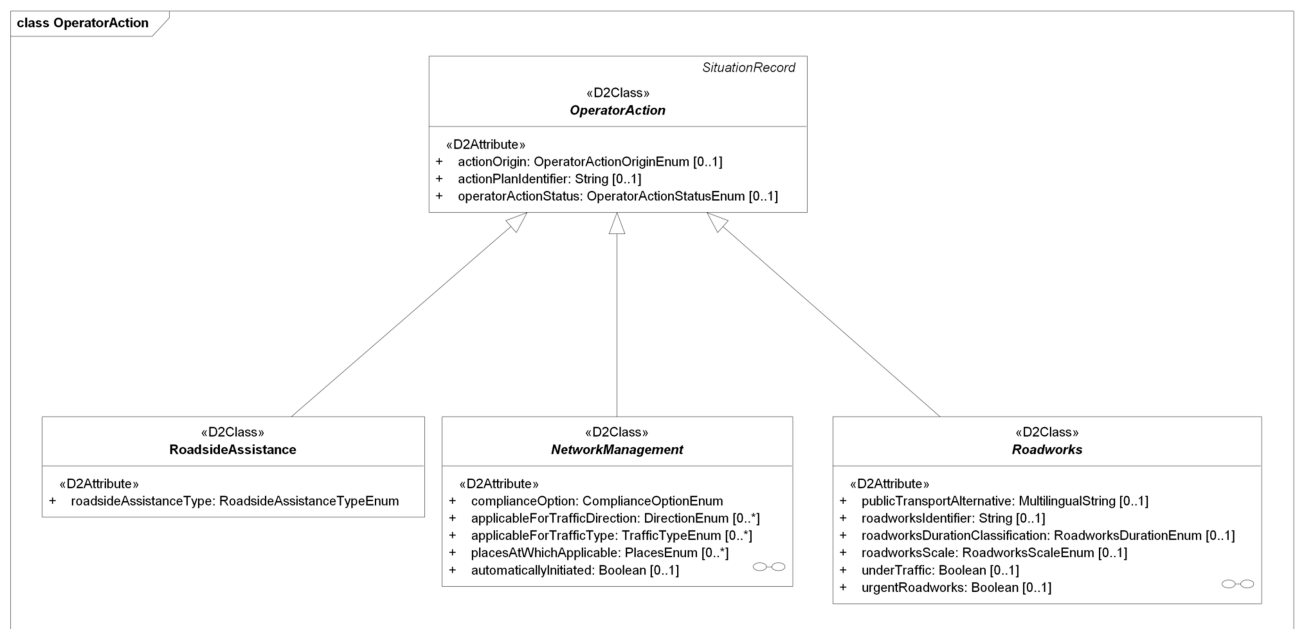


Figure 10 — The OperatorAction package class model

7.15.2 Semantics of the OperatorAction package

7.15.2.1 OperatorAction package semantics – general

The OperatorAction package shall comprise an OperatorAction class which shall be specialized as one of four types which are used to model the details of the different road operator actions.

7.15.2.2 OperatorAction class

The OperatorAction class is a realizable class which may be further specialized as instances of RoadsideAssistance or as one of the specializations of the Roadworks or NetworkManagement abstract classes.

- **Attribute actionOrigin** indicates whether the action has been instigated by the road operator (internal) or by someone or some system external to the road operator, e.g. an adjacent road authority/operator requesting the action.

- **Attribute `actionPlanIdentifier`** provides the identification of the traffic management action plan to which the action relates, if it is part of such a plan.
- **Attribute `operatorActionStatus`** provides information about the status of the operator action in terms of whether it is actually now only a request, is approved but not yet implemented, is in the process of being implemented (i.e. not yet fully implemented), is fully implemented, is rejected by the road operator, has had its termination requested, or is in the process of being terminated. If this attribute is not present then it should be assumed that the action is implemented in accordance with the information in the Validity package.

7.15.2.3 RoadsideAssistance class

An instance of the RoadsideAssistance class may be used to allow a supplier to provide information about assistance that is required or being given at the roadside, for example, vehicle repair.

7.16 The Roadworks package

7.16.1 Overview of the Roadworks package

The package Roadworks shall comprise a sub-model for defining information about road works, either maintenance or construction works, instigated by the road operator or authority or instigated by an authorized organization such as a utility company (see Figure 11).

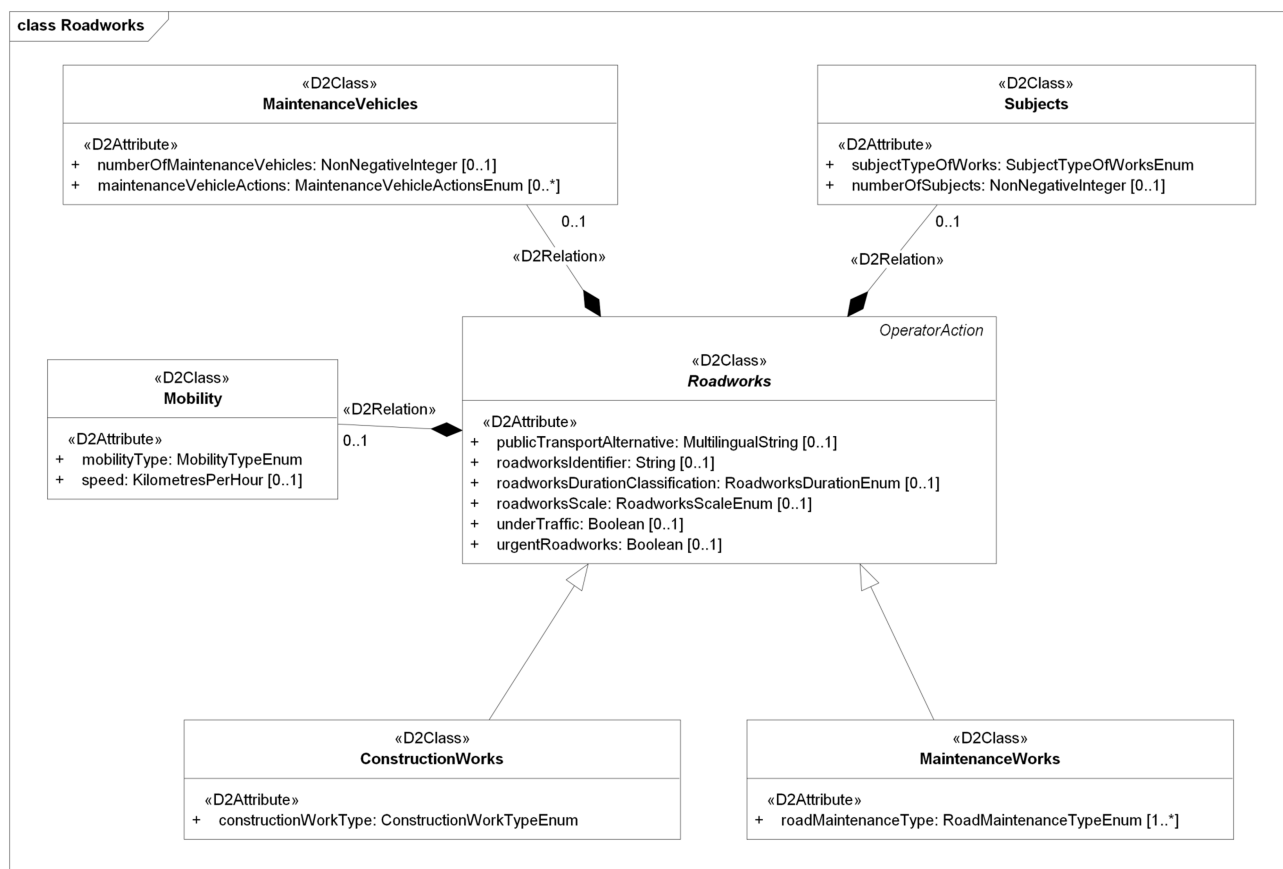


Figure 11 — The Roadworks package class model

7.16.2 Semantics of the Roadworks package

7.16.2.1 Roadworks package semantics – general

The Roadworks package shall comprise an abstract Roadworks class which is realized as one of two specializations which are used to model the details of the different types of road works activities (i.e. construction works and maintenance works).

7.16.2.2 Roadworks class

The Roadworks class is abstract and shall be realized as an instance of either ConstructionWorks or MaintenanceWorks.

- **Attribute publicTransportAlternative** may be used to provide information about (special) public transport arrangements that are available to avoid the roadworks.
- **Attribute underTraffic** may be used to identify whether the road section where the road works are located is open or closed to traffic. A value of true indicates that the road section is still open to traffic.

7.16.2.3 ConstructionWorks class

An instance of the ConstructionWorks class shall allow a supplier to identify the road works as being associated with a type of road infrastructure construction.

7.16.2.4 MaintenanceWorks class

The MaintenanceWorks class shall allow a supplier to identify the road works as being associated with a type of maintenance of the road infrastructure.

7.16.2.5 MaintenanceVehicles class

The MaintenanceVehicles class may be used to allow a supplier to identify the number of maintenance vehicles involved with the road works and their types of actions, e.g. slow moving.

7.16.2.6 Subjects class

The Subjects class may be used to allow a supplier to identify the type and number of road infrastructure items that are the subject of the road works.

7.16.2.7 Mobility class

The Mobility class in this case may be used to allow a supplier to specify whether the road works activity is mobile or stationary. In case of a mobile roadwork, the speed at which the MaintenanceVehicle is moving may be specified.

7.17 The NetworkManagement package

7.17.1 Overview of the NetworkManagement package

The package NetworkManagement shall comprise a sub-model for defining an individual road operator action that is specifically related to managing the usage of the road network or for controlling the behaviour of road users on the road network (see Figure 23). This includes road usage restrictions, whether by legal order or by operator decision, road, carriageway and lane closures, weight and dimension limits, contraflows, rerouting, specific instructions to drivers and other general management actions. These actions may be identified as being automatically or manually initiated and marked as requiring either mandatory or advisory driver compliance.

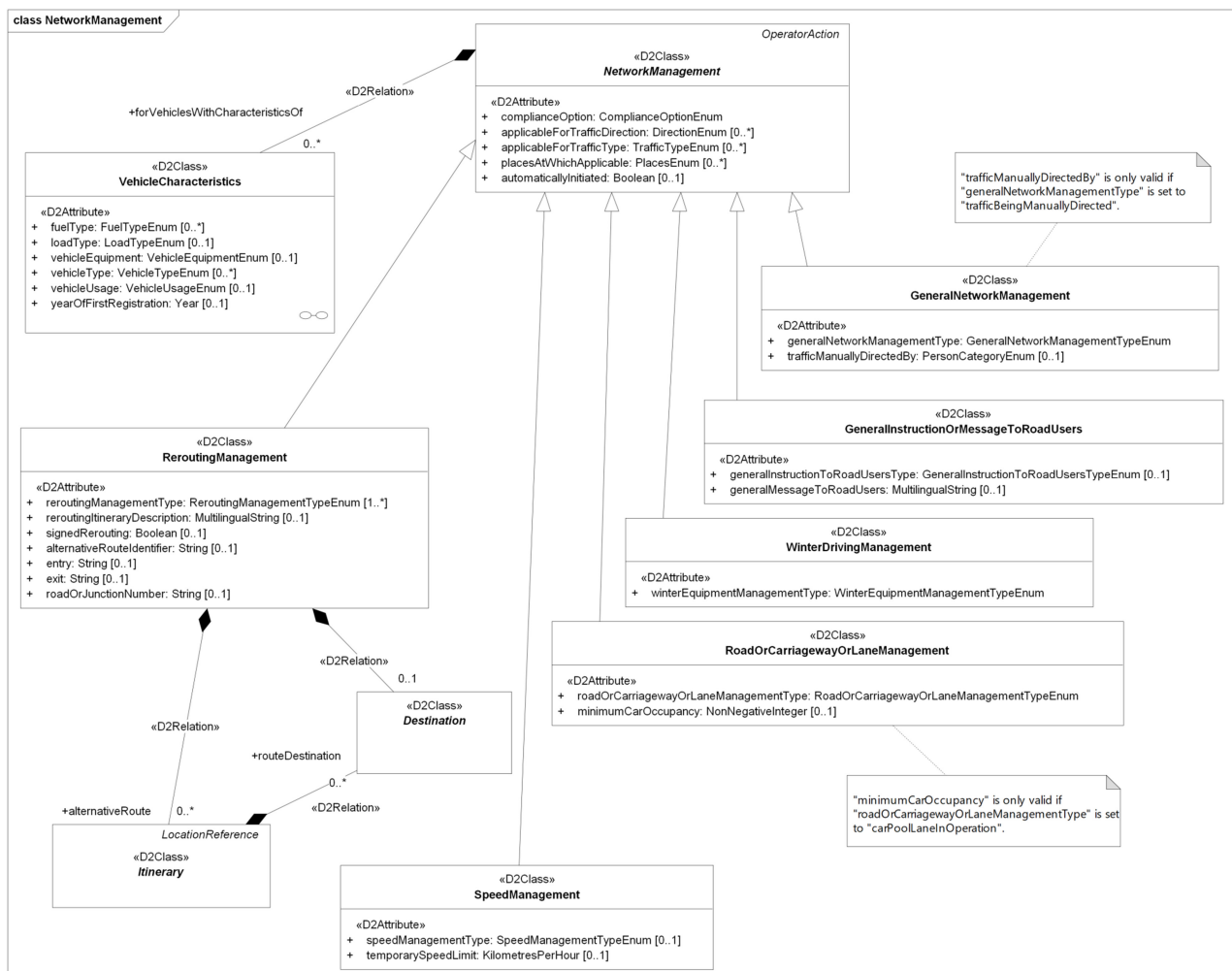


Figure 12 — The NetworkManagement package class model

7.17.2 Semantics of the NetworkManagement package

7.17.2.1 NetworkManagement package semantics – general

The NetworkManagement package shall allow network management actions undertaken by a road operator to be modelled as one of a number of specific types. Network management actions range from specific actions which apply to the road network, such as the closure of a road, to a range of instructions, such as "no overtaking" which may be issued to users of the road network. The range of actions specifically covers the management of rerouting on the road network, management of speed, winter driving restrictions, instructions to road users, and general traffic management actions.

Each management action can be qualified as applying to vehicles with specific characteristics, and/or travelling towards a general direction or destination and can be specified as having mandatory or advisory compliance status.

7.17.2.2 NetworkManagement class

The NetworkManagement class is abstract and shall be realized as an instance of either ReroutingManagement, SpeedManagement, RoadOrCarriagewayOrLaneManagement, WinterDrivingManagement, GeneralInstructionToRoadUsers or GeneralNetworkmanagement.

Each NetworkManagement action may be qualified as being only relevant to vehicles with specific characteristics. This shall be specified by using one or more associations on the NetworkManagement class with instances of the VehicleCharacteristics class via the role name forVehiclesWithCharacteristicsOf.

- **Attribute complianceOption** shall define whether compliance with the network management action is advisory or mandatory. If it is set to be mandatory this implies that compliance is legally enforceable. Even though some network management actions are statements of fact and hence might be thought to be always mandatory, e.g. convoyService (is operating) within GeneralNetworkManagement, sometimes, as in this case compliance with the action may still be only advisory (i.e. there is a convoy service operating but it may not be mandatory to use it).
- **Attributes applicableForTrafficDirection** and **placesAtWhichApplicable** - These attributes may be used to provide information which is semantically different from that given in the SupplementaryPositionalDescription class within the LocationReference package. The information in the SupplementaryPositionalDescription class describes a specific location at which the action is taken, e.g. a point or linear section of road or even an area. On the other hand, the attribute placesAtWhichApplicable describes, in generic terms, where the network management action is applicable, e.g. on underground sections or on roundabouts. It does not specify one specific location. Hence you could specify that there is a speed limit on all underground sections of a specified section of road, or that there is no overtaking permitted in all tunnels on a specified section of road. Similarly, the applicableForTrafficDirection attribute may be used to identify to which traffic direction the network management action applies based on where they are ultimately heading, while the Location package information identifies where the action is taken. For instance, you could have an instruction which is issued at a specified location on the northbound carriageway (hence a location on the northbound carriageway would be specified in the LocationReference package), but it is only applicable for traffic heading northeast, rather than northwest (i.e. the road splits into two directions after the point at which the instruction is given or posted on the road).
- **Attribute applicableForTrafficType** may be used to allow the network management action to be qualified as being relevant to a specific type of traffic, mostly classified on the type of destinations, e.g. destined for airport, local traffic, etc.
- **Attribute automaticallyInitiated** may be used to indicate whether the network management action was automatically initiated by some system, possibly triggered by sensor data or historical traffic profile data or whether it was manually initiated by an operator. Sometimes automatic systems suggest actions for operators to approve. In this case, if an operator decision made the final approval then it should not be classed as an automatically initiated action.

7.17.2.3 ReroutingManagement class

This class may be used to define a rerouting management action/instruction that is issued by an operator at a specific location on the road network and potentially details one or more alternative routes or itineraries. Each alternative route may be specified by an associated instance of the Itinerary class (see FprEN 16157-2:2018, 7.1.1.2) via the role alternativeRoute and each alternative route may be associated with zero or multiple routeDestinations.

- **Attribute reroutingManagementType** shall identify the specific rerouting management instruction being given to drivers which may require reference to a road entry, exit, intersection or junction that is identified in another attribute within this class.

- **Attribute reroutingItineraryDescription** may be used to provide the textual description that describes the alternative route in a human interpretable way. It can be provided in several languages, because it is of the type MultilingualString.
- **Attribute signedRerouting** may be used to provide the information whether the alternative route is marked with signs.
- **Attribute alternativeRouteIdentifier** may be used to provide an identity used on signs to identify (or mark) the alternative route. Usually a short sequence of letters, or digits.
- **Attribute entry** may be used to identify a specific entry to another road. Depending on what is specified in the reroutingManagementType attribute this entry should or should not be used for the rerouting.
- **Attribute exit** may be used to identify a specific exit from the normal route/road. Depending on what is specified in the reroutingManagementType attribute this exit should or should not be used for the rerouting.
- **Attribute roadOrJunctionNumber** may be used to identify a specific intersecting road or junction on the normal route/road. Depending on what is specified in the reroutingManagementType attribute this intersection or junction should or should not be used for the rerouting.

7.17.2.4 SpeedManagement class

This class may be used to define a management action/instruction relating to speed that is issued by an operator which is applicable to one or more specific locations on the road network as defined in the LocationReference package.

7.17.2.5 RoadOrCarriagewayOrLaneManagement class

This class may be used to define a management action/instruction relating to road or carriageway or lane usage on the road network that is issued by an operator which is applicable to one or more specific locations on the road network as defined in the LocationReference package.

- **Attribute minimumCarOccupancy** may be used to specify the minimum number of persons required in a vehicle in order for it to be allowed to transit the road section(s) specified in the LocationReference package. Population of this attribute is only valid if the roadOrCarriagewayOrLaneManagementType attribute is set to carPoolLaneInOperation.

7.17.2.6 WinterDrivingManagement class

This class may be used to define a management action/instruction relating to winter driving that is issued by an operator which is applicable to one or more specific locations on the road network as defined in the LocationReference package.

7.17.2.7 GeneralInstructionOrMessageToRoadUsers class

This class may be used to define a general instruction or a message that is issued by an operator to road users which is applicable to one or more specific locations on the road network as defined in the LocationReference package.

7.17.2.8 GeneralNetworkManagement class

This class may be used to define a management action which is applicable to one or more specific locations on the road network which does not fall into any of the other types of network management described previously. Each of these actions directly affect the usage of the road network (e.g. a bridge

swing is in operation or traffic is being held). Usually there is no issue about compliance since these actions are statements of fact (e.g. ramp metering is in operation). However, it is possible for compliance to be advisory as in the case of `convoyService` which indicates that a convoy service is operating, for instance when there is very bad weather, but it may be only advisory to use the convoy service.

Annex A (normative)

Data Dictionary

A.1 Overview

This data dictionary the definitions and characteristics of the different classes, attributes, association roles, data types and enumerations appearing in the data model defined in Clause 7. The data dictionary is specified in three parts, one for packages, one for datatypes>> and one for <<enumerations>>, each ordered alphabetically.

The generic data types which are used throughout all publications are defined in EN 16157-7.

The first part of the data dictionary is partitioned into subclauses which relate to each of the UML model packages and each subclause defines the contained classes, their attributes and any roles defined for associations between the classes within that package.

The Data Dictionary tables use the following columns:

- 1) Column **Class name**: it provides the symbolic name (Upper Camel Case) given to the corresponding class.
- 2) Column **Role name**: it provides the symbolic name (Lower Camel Case) given to the corresponding role of an association.
- 3) Column **Attribute name**: it provides the symbolic name (Lower Camel Case) given to the corresponding attribute of a class.
- 4) Column **Enumerated value name**: It provides the symbolic name (Lower Camel Case) given to the corresponding enumerated value.
- 5) Column **Designation**: it provides the corresponding name in natural language of the corresponding class, attribute, role or enumeration value.
- 6) Column **Definition**: it provides a comprehensive definition detailing the class, attribute or role.
- 7) Column **Stereotype**: it provides a statement of the stereotype that is assigned to the class, if any – see EN 16157-1 for further details.
- 8) Column **Abstract**: it provides a statement as to whether the class is abstract (non-realizable) or concrete (realizable).
- 9) Column **Multiplicity**: it provides a statement of the allowed multiplicity for the attribute or role.
- 10) Column **Target**: It provides the name of the class which is at the end of the association to which the role applies.
- 11) Column **Type**: it provides the name of the class used to define the data type relating to the attribute of the class.

A.2 Data Dictionary for Situation

A.2.1 Accident package

A.2.1.1 General

D2Payload/PayloadPublication/Situation/Classes/TrafficElement/Accident

A.2.1.2 Accident package classes

Table A.1— Classes of the Accident package

Class name	Designation	Definition	Stereotype	Abstract
Accident	Accident	Accidents are events where one or more vehicles are involved in collisions or in leaving the roadway. These include collisions between vehicles or with other road users or obstacles.	D2Class	no

A.2.1.3 Associations of Accident package

Table A.2— Associations of the Accident package

Class name	Association end	Designation	Definition	Multiplicity	Target
Accident	groupOfVehiclesInvolved	Group of vehicles involved		0..*	GroupOfVehiclesInvolved
	groupOfPeopleInvolved	Group of people involved		0..*	GroupOfPeopleInvolved
	vehicleInvolved	Vehicle involved	The vehicle involved in the accident.	0..*	Vehicle

A.2.1.4 Accident package attributes

Table A.3— Attributes of the Accident package

Class name	Attribute name	Designation	Definition	Multiplicity	Type
Accident	accidentCause	Accident cause	A descriptor indicating the most significant factor causing an accident.	0..1	AccidentCauseEnum
	accidentType	Accident type	A characterization of the nature of the accident.	1..*	AccidentTypeEnum
	collisionType	Collision type	Identifies a type of collision	0..1	CollisionTypeEnum
	totalNumberOfPeopleInvolved	Total number of people involved	The total number of people that are involved.	0..1	NonNegativeInteger
	totalNumberOfVehiclesInvolved	Total number of vehicles involved	The total number of vehicles that are involved.	0..1	NonNegativeInteger

A.2.2 Activity package

A.2.2.1 General

D2Payload/PayloadPublication/Situation/Classes/TrafficElement/Activity

A.2.2.2 Activity package classes

Table A.4— Classes of the Activity package

Class name	Designation	Definition	Stereotype	Abstract
Activity	Activity	Deliberate human action external to the traffic stream or roadway which could disrupt traffic.	D2Class	yes
AuthorityOperation	Authority operation	Authority initiated operation or activity that could disrupt traffic.	D2Class	no
DisturbanceActivity	Disturbance activity	Deliberate human action of either a public disorder nature or of a situation alert type which could disrupt traffic.	D2Class	no
PublicEvent	Public event	Organized public event which could disrupt traffic.	D2Class	no

A.2.2.3 Associations of Activity package

Table A.5— Associations of the Activity package

Class name	Association end	Designation	Definition	Multiplicity	Target
Activity	mobilityOfActivity	Mobility of activity	Mobility of the activity.	0..1	Mobility

A.2.2.4 Activity package attributes

Table A.6— Attributes of the Activity package

Class name	Attribute name	Designation	Definition	Multiplicity	Type
AuthorityOperation	authorityOperationType	Authority operation type	Type of authority-initiated operation or activity that could disrupt traffic.	1..1	AuthorityOperationTypeEnum
DisturbanceActivity	disturbanceActivityType	Disturbance activity type	Includes all situations of a public disorder type or of an alert type, with potential to disrupt traffic.	1..1	DisturbanceActivityTypeEnum
PublicEvent	publicEventType	Public event type	Type of public event which could disrupt traffic.	1..1	PublicEventTypeEnum
	venueName	Venue name	Name of the venue at which the public event is being held	0..1	MultilingualString

A.2.3 Classes package

A.2.3.1 General

D2Payload/PayloadPublication/Situation/Classes

A.2.3.2 Classes package classes

Table A.7— Classes of the Classes package

Class name	Designation	Definition	Stereotype	Abstract
Cause	Cause	Contains details of the cause of a record within a situation	D2Class	no
Comment	Comment	A free text comment with an optional date/time stamp that can be used by the operator to convey un-coded observations/information.	D2Class	no
DetailedCauseType	Detailed cause type	The type of influence that may be the cause of components of a situation. At least one attribute shall be populated.	D2Class	no
GenericSituationRecord	Generic situation record	A generic SituationRecord for use when adding level B extensions at the SituationRecord level.	D2Class	no
GroupOfPeopleInvolved	Group of people involved	Group of people involved in the event having common characteristics and/or status.	D2Class	no
Mobility	Mobility	An indication of whether the associated instance of a SituationRecord is mobile (e.g. a march or parade moving along a road) or stationary.	D2Class	no
Situation	Situation	An identifiable instance of a traffic/travel situation comprising one or more traffic/travel circumstances which are linked by one or more causal relationships. Each traffic/travel circumstance is represented by a Situation Record.	D2Class	no
SituationRecord	Situation record	An identifiable versioned instance of a single record/element within a situation.	D2Class	yes

A.2.3.3 Associations of Classes package

Table A.8— Associations of the Classes package

Class name	Association end	Designation	Definition	Multiplicity	Target
Cause	detailedCauseType	Detailed cause type	The type of cause, expressed in more detail than the causeType. If both are present then they shall be consistent.	0..1	DetailedCauseType
	managedCause	Managed cause	A reference to another situation record which defines a cause of the event defined here.	0..1	SituationRecordReference
Situation	headerInformation	Header information		1..1	HeaderInformation
	informationManager	Information manager	Organization that manages the information content (is responsible for updates of this information) typically the organization that first made the DATEX II publication of this content.	0..1	InternationalIdentifier
	situationRecord	Situation record	Details of the Situation	1..*	SituationRecord
	situationSummary	Situation summary	A SituationRecord that provides a summary of the information described by the corresponding Situation, i.e. a superset of at least the location and validity information of all (other) SituationRecords in this Situation.	0..1	SituationRecord
	relatedSituation	Related situation	Reference to related situations via unique identifiers.	0..*	SituationReference

Class name	Association end	Designation	Definition	Multiplicity	Target
SituationRecord	informationManagerOverride	Information manager override	Organization that manages the information content (is responsible for updates of this information) typically the organization that first made the DATEX II publication of this content. This value overrides any value specified at a more general level.	0..1	International Identifier
	source	Source		0..1	Source
	urlLink	URL link		0..*	URL link
	validity	Validity		1..1	Validity
	locationReference	Location reference		1..1	Location Reference
	cause	Cause		0..1	Cause
	nonGeneralPublicComment	Non-general comment	A comment which should not be distributed to the general public.	0..*	Comment
	generalPublicComment	General comment	A comment which may be freely distributed to the general public	0..*	Comment
	impactOnOppositeDirection	Impact on opposite direction	impact of the situation element on driving conditions in the opposite direction	0..1	Impact
	impact	Impact	Impact of the situation element	0..1	Impact

A.2.3.4 Classes package attributes

Table A.9— Attributes of the Classes package

Class name	Attribute name	Designation	Definition	Multiplicity	Type
Cause	causeDescription	Cause description	Description of a cause which is not managed by the publication creator (e.g. an off-network cause).	0..1	MultilingualString
	causeType	Cause type	Indicates an external influence that may be the causation of components of a situation.	0..1	CauseTypeEnum
Comment	comment	Comment	A free text comment that can be used by the operator to convey un-coded observations/information.	1..1	MultilingualString
	commentDateTime	Comment date time	The date/time at which the comment was made.	0..1	DateTime
	commentType	Comment type	A classification of the type of comment.	0..1	CommentTypeEnum
DetailedCauseType	abnormalTrafficType	Abnormal traffic type	A characterization of the nature of abnormal traffic flow, i.e. specifically relating to the nature of the traffic movement.	0..1	AbnormalTrafficTypeEnum
	accidentType	Accident type	A characterization of the nature of the accident.	0..*	AccidentTypeEnum
	animalPresenceType	Animal presence type	Indicates the nature of animals present on or near the roadway.	0..1	AnimalPresenceTypeEnum
	authorityOperationType	Authority operation type	Type of authority-initiated operation or activity that could disrupt traffic.	0..1	AuthorityOperationTypeEnum
	constructionWorkType	Construction work type	The type of construction work being performed.	0..1	ConstructionWorkTypeEnum

Class name	Attribute name	Designation	Definition	Multiplicity	Type
	disturbanceActivityType	Disturbance activity type	Includes all situations of a public disorder type or of an alert type, with potential to disrupt traffic.	0..1	DisturbanceActivityTypeEnum
	drivingConditionType	Driving condition type	Description of the driving conditions at the specified location.	0..1	DrivingConditionTypeEnum
	environmentalObstructionType	Environmental obstruction type	Characterization of an obstruction on the road resulting from an environmental cause.	0..1	EnvironmentalObstructionTypeEnum
	equipmentOrSystemFaultType	Equipment or system fault type	Failure, malfunction or non-operational condition of equipment or system.	0..1	EquipmentOrSystemFaultTypeEnum
	generalInstructionToRoadUsersType	General instruction to road users type	General instruction that is issued by the network/road operator which is applicable to drivers and sometimes passengers.	0..1	GeneralInstructionToRoadUsersTypeEnum
	generalNetworkManagementType	General network management type	The type of traffic management action instigated by the network/road operator.	0..1	GeneralNetworkManagementTypeEnum
	infrastructureDamageType	Infrastructure damage type	Characterization of an obstruction on the road resulting from the failure or damage of infrastructure on, under, above or close to the road.	0..1	InfrastructureDamageTypeEnum
	nonWeatherRelatedRoadConditionType	Non-weather-related road condition type	The type of road conditions which are not related to the weather.	0..*	NonWeatherRelatedRoadConditionTypeEnum
	obstructionType	Obstruction type	Characterization of the type of general obstruction.	0..*	ObstructionTypeEnum
	poorEnvironmentType	Poor environment type	The type of environment condition which is affecting driving conditions.	0..*	PoorEnvironmentTypeEnum

Class name	Attribute name	Designation	Definition	Multiplicity	Type
	publicEventTy pe	Public event type	Type of public event which could disrupt traffic.	0..1	PublicEventTy peEnum
	reroutingManagement Type	Rerouting management type	Type of rerouting management action instigated by operator.	0..*	ReroutingManagementTypeEnum
	roadMaintenanceType	Road maintenance type	The type of road maintenance or installation work at the specified location.	0..*	RoadMaintenanceTypeEnum
	roadOperatorServiceDisruptionType	Road operator service disruption type	The type of road operator service which is disrupted.	0..*	RoadOperatorServiceDisruptionTypeEnum
	roadOrCarriagewayOrLaneManagementType	Road or carriageway or lane management type	Type of road, carriageway or lane management action instigated by operator.	0..1	RoadOrCarriagewayOrLaneManagementTypeEnum
	roadsideAssistanceType	Roadside assistance type	Indicates the nature of the road side assistance that will be, is or has been provided.	0..1	RoadsideAssistanceTypeEnum
	roadsideServiceDisruptionType	Roadside service disruption type	The type of roadside service which is disrupted.	0..*	ServiceDisruptionTypeEnum
	speedManagementType	Speed management type	Type of speed management action instigated by operator.	0..1	SpeedManagementTypeEnum
	transitServiceInformation	Transit service information	Information about transit services.	0..1	TransitServiceInformationEnum
	vehicleObstructionType	Vehicle obstruction type	Characterization of an obstruction on the road caused by one or more vehicles.	0..1	VehicleObstructionTypeEnum

Class name	Attribute name	Designation	Definition	Multiplicity	Type
	weatherRelatedRoadConditionType	Weather-related road condition type	The type of road surface condition that is related to the weather which is affecting the driving conditions.	0..*	WeatherRelatedRoadConditionTypeEnum
	winterEquipmentManagementType	Winter equipment management type	Type of winter equipment management action instigated by operator.	0..1	WinterEquipmentManagementTypeEnum
GenericSituationRecord	genericSituationRecordName	Generic situation record name	The name of the GenericSituationRecord.	1..1	String
GroupOfPeopleInvolved	categoryOfPeopleInvolved	Category of people involved	The category of persons involved.	0..1	PersonCategoryEnum
	injuryStatusType	Injury status type	The injury status of the people involved.	0..1	InjuryStatusTypeEnum
	involvementRole	Involvement role	The involvement role of the people.	0..1	InvolvementRolesEnum
	numberOfPeople	Number of people	The number of people of this group that are involved.	0..1	NonNegativeInteger
Mobility	mobilityType	Mobility type	An indication of whether the associated instance of a SituationRecord is mobile (e.g. a march or parade moving along a road) or stationary.	1..1	MobilityTypeEnum
	speed	Speed	Speed of the mobile entity.	0..1	KilometresPerHour
Situation	overallSeverity	Overall severity	The overall assessment of the impact (in terms of severity) that the situation as a whole is having, or will have, on the traffic flow as perceived by the supplier.	0..1	SeverityEnum

Class name	Attribute name	Designation	Definition	Multiplicity	Type
	situationVersionTime	Situation version time	The date/time that this current version of the Situation was written into the database of the supplier which is involved in the data exchange. Identity and version of the situation are defined by the class stereotype implementation.	0..1	DateTime
SituationRecord	confidentialityOverride	Confidentiality override	The extent to which the related information may be circulated, according to the recipient type. Recipients shall comply with this confidentiality statement. This overrides any confidentiality defined for the situation as a whole in the header information.	0..1	ConfidentialityValueEnum
	probabilityOfOccurrence	Probability of occurrence	An assessment of the degree of likelihood that the reported event will occur.	1..1	ProbabilityOfOccurrenceEnum
	safetyRelatedMessage	Safety related message	Indicates, whether this SituationRecord specifies a safety related message according to Commission Delegated Regulation (EU) No 886/2013.	0..1	Boolean
	severity	Severity	The assessment of the impact (in terms of severity) that this element of the situation is having, or will have, on the traffic flow as perceived by the supplier.	0..1	SeverityEnum
	situationRecordCreationReference	Situation record creation reference	A unique alphanumeric reference (either an external reference or GUID) of the SituationRecord object (the first version of the record) that was created by the original supplier.	0..1	String

Class name	Attribute name	Designation	Definition	Multiplicity	Type
	situationRecordCreationTime	Situation record creation time	The date/time that the SituationRecord object (the first version of the record) was created by the original supplier.	1..1	DateTime
	situationRecordFirstSupplierVersionTime	Situation record first supplier version time	The date/time that the current version of the Situation Record was written into the database of the original supplier in the supply chain.	0..1	DateTime
	situationRecordObservationTime	Situation record observation time	The date/time that the information represented by the current version of the SituationRecord was observed by the original (potentially external) source of the information.	0..1	DateTime
	situationRecordVersionTime	Situation record version time	The date/time that this current version of the SituationRecord within the situation was written into the database of the supplier which is involved in the data exchange. Identity and version of record are defined by the class stereotype implementation.	1..1	DateTime

A.2.4 Conditions package

A.2.4.1 General

D2Payload/PayloadPublication/Situation/Classes/TrafficElement/Conditions