



SLOVENSKI STANDARD SIST EN 16157-3:2019

01-februar-2019

Nadomešča:

SIST-TS CEN/TS 16157-3:2011

Inteligentni transportni sistemi - Specifikacije za izmenjavo podatkov DATEX II pri upravljanju prometa in informiranju - 3. del: Objava situacije

Intelligent transport systems - DATEX II data exchange specifications for traffic management and information - Part 3: Situation Publication

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

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

Ta slovenski standard je istoveten z: EN 16157-3:2018

ICS:

35.240.60	Uporabniške rešitve IT v prometu	IT applications in transport
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SIST EN 16157-3:2019

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EUROPEAN STANDARD

EN 16157-3

NORME EUROPÉENNE

EUROPÄISCHE NORM

December 2018

ICS 35.240.60

Supersedes CEN/TS 16157-3:2011

English Version

Intelligent transport systems - DATEX II data exchange 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

This European Standard was approved by CEN on 3 September 2018.

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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of an identical text or by endorsement, at the latest by June 2019, and conflicting national standards shall be withdrawn at the latest by June 2019.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.

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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.

EN 16157-3:2018 (E)**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.

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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.

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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).

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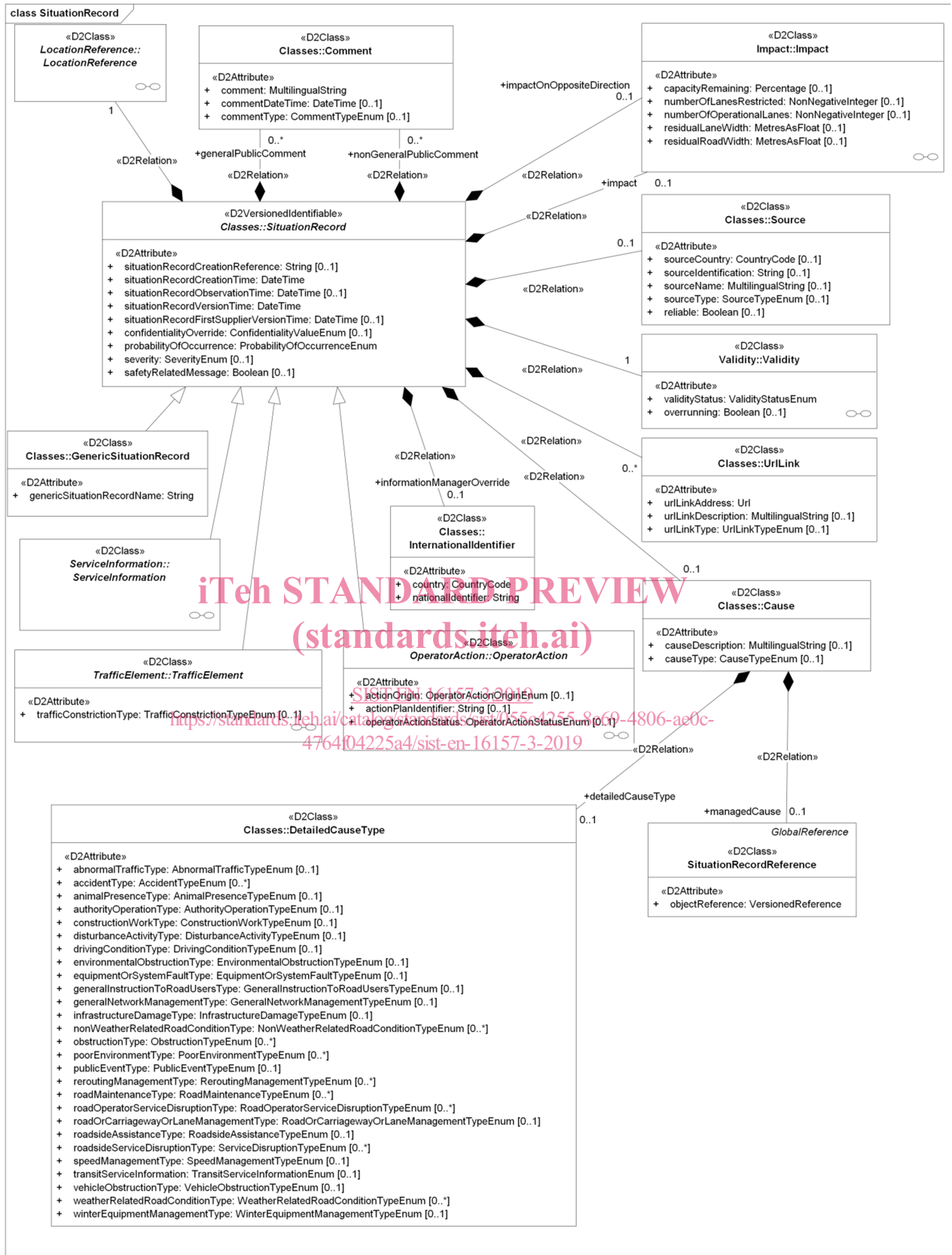


Figure 2 — The SituationRecord package class model