

TECHNICAL SPECIFICATION
SPÉCIFICATION TECHNIQUE
TECHNISCHE SPEZIFIKATION

CEN/TS 16157-3

October 2011

ICS 35.240.60

Supersedes ENV 13106:2000, ENV 13777:2000

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 Transportsysteme - DATEX II Datenaustausch
Spezifikationen für Verkehrsmanagement und
Informationen - Teil 3: Situationsveröffentlichungen

This Technical Specification (CEN/TS) was approved by CEN on 10 April 2011 for provisional application.

The period of validity of this CEN/TS is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the CEN/TS can be converted into a European Standard.

CEN members are required to announce the existence of this CEN/TS in the same way as for an EN and to make the CEN/TS available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the CEN/TS) until the final decision about the possible conversion of the CEN/TS into an EN is reached.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

	Page
Introduction	7
1 Scope	8
2 Conformance.....	8
3 Normative references	9
4 Terms and definitions	9
5 Symbols and abbreviations	10
6 UML notation	11
7 The Situation Publication model	11
7.1 Overview of the Situation Publication model	11
7.2 The “SituationPublication” package.....	11
7.2.1 Overview of the “SituationPublication” package	11
7.2.2 Semantics of the “SituationPublication” package	12
7.3 The “SituationRecord” package.....	13
7.3.1 Overview of the “SituationRecord” package	13
7.3.2 Semantics of the “SituationRecord” package	14
7.4 The “Impact” package.....	16
7.4.1 Overview of the “Impact” package	16
7.4.2 Semantics of the “Impact” package	17
7.5 The “Validity” package.....	18
7.5.1 Overview of “Validity” package.....	18
7.5.2 Semantics of the “Validity” package	20
7.6 The “TimePeriodOfDay” package	21
7.6.1 Overview of the “TimePeriodOfDay” package.....	21
7.6.2 Semantics of the “TimePeriodOfDay” package	21
7.7 The “NonRoadEventInformation” package.....	22
7.7.1 Overview of the “NonRoadEventInformation” package	22
7.7.2 Semantics of the “NonRoadEventInformation” package	22
7.8 The “TrafficElement” package	23
7.8.1 Overview of the “TrafficElement” package	23
7.8.2 Semantics of the “TrafficElement” package	24
7.9 The “Conditions” package.....	25
7.9.1 Overview of the “Conditions” package	25
7.9.2 Semantics of the “Conditions” package	25
7.10 The “WeatherRelated” package	26
7.10.1 Overview of the “WeatherRelated” package.....	26
7.10.2 Semantics of the “WeatherRelated” package.....	27
7.11 The “Humidity” package	27
7.11.1 Overview of the “Humidity” package	27
7.11.2 Semantics of the “Humidity” package	27
7.12 The “Temperature” package.....	28
7.12.1 Overview of the “Temperature” package	28
7.12.2 Semantics of the “Temperature” package	28
7.13 The “Visibility” package.....	29
7.13.1 Overview of the “Visibility” package	29
7.13.2 Semantics of the “Visibility” package	29
7.14 The “Wind” package.....	30
7.14.1 Overview of the “Wind” package	30
7.14.2 Semantics of the “Wind” package	30

7.15	The "Pollution" package	31
7.15.1	Overview of the "Pollution" package	31
7.15.2	Semantics of the "Pollution" package	31
7.16	The "PrecipitationDetail" package	32
7.16.1	Overview of the "PrecipitationDetail" package	32
7.16.2	Semantics of the "PrecipitationDetail" package	32
7.17	The "RoadSurfaceConditionMeasurements" package	33
7.17.1	Overview of the "RoadSurfaceConditionMeasurements" package	33
7.17.2	Semantics of the "RoadSurfaceConditionMeasurements" package	33
7.18	The "Accident" package	34
7.18.1	Overview of the "Accident" package	34
7.18.2	Semantics of the "Accident" package	35
7.19	The "Obstruction" package	36
7.19.1	Overview of the "Obstruction" package	36
7.19.2	Semantics of the "Obstruction" package	37
7.20	The "Activity" package	38
7.20.1	Overview of the "Activity" package	38
7.20.2	Semantics of the "Activity" package	39
7.21	The "Vehicle" package	40
7.21.1	Overview of the "Vehicle" package	40
7.21.2	Semantics of the "Vehicle" package	41
7.22	The "VehicleCharacteristics" package	42
7.22.1	Overview of the "VehicleCharacteristics" package	42
7.22.2	Semantics of the "VehicleCharacteristics" package	43
7.23	The "OperatorAction" package	43
7.23.1	Overview of the "OperatorAction" package	43
7.23.2	Semantics of the "OperatorAction" package	44
7.24	The "Roadworks" package	45
7.24.1	Overview of the "Roadworks" package	45
7.24.2	Semantics of the "Roadworks" package	46
7.25	The "NetworkManagement" package	47
7.25.1	Overview of the "NetworkManagement" package	47
7.25.2	Semantics of the "NetworkManagement" package	48
Annex A (normative) Data Dictionary	51	
A.1	Overview	51
A.2	Data Dictionary for "SituationPublication"	52
A.2.1	"Accident" package	52
A.2.2	"Activity" package	53
A.2.3	"Conditions" package	54
A.2.4	"DataValue" package	55
A.2.5	"Humidity" package	60
A.2.6	"Impact" package	61
A.2.7	"NetworkManagement" package	63
A.2.8	"NonRoadEventInformation" package	67
A.2.9	"Obstruction" package	70
A.2.10	"OperatorAction" package	72
A.2.11	"Pollution" package	73
A.2.12	"PrecipitationDetail" package	73
A.2.13	"ReusableClasses" package	75
A.2.14	"RoadSurfaceConditionMeasurements" package	79
A.2.15	"Roadworks" package	80
A.2.16	"SituationPublication" package	82
A.2.17	"SituationRecord" package	83
A.2.18	"Temperature" package	86
A.2.19	"TimePeriodOfDay" package	87
A.2.20	"TrafficElement" package	88
A.2.21	"Validity" package	90
A.2.22	"Vehicle" package	93
A.2.23	"VehicleCharacteristics" package	96

A.2.24	"Visibility" package	98
A.2.25	"WeatherRelated" package	99
A.2.26	"Wind" package	99
A.3	Data Dictionary of <<datatypes>> for "SituationPublication"	101
A.3.1	The <<datatype>> "AngleInDegrees"	101
A.3.2	The <<datatype>> "AxlesPerHour"	101
A.3.3	The <<datatype>> "ConcentrationKilogramsPerCubicMetre"	101
A.3.4	The <<datatype>> "ConcentrationMicrogramsPerCubicMetre"	101
A.3.5	The <<datatype>> "ConcentrationVehiclesPerKilometre"	101
A.3.6	The <<datatype>> "CubicMetres"	101
A.3.7	The <<datatype>> "IntensityKilogramsPerSquareMetre"	101
A.3.8	The <<datatype>> "IntensityMillimetresPerHour"	102
A.3.9	The <<datatype>> "KilometresPerHour"	102
A.3.10	The <<datatype>> "MetresAsFloat"	102
A.3.11	The <<datatype>> "MetresAsNonNegativeInteger"	102
A.3.12	The <<datatype>> "PassengerCarUnitsPerHour"	102
A.3.13	The <<datatype>> "Percentage"	102
A.3.14	The <<datatype>> "Seconds"	102
A.3.15	The <<datatype>> "TemperatureCelsius"	102
A.3.16	The <<datatype>> "Tonnes"	102
A.3.17	The <<datatype>> "VehiclesPerHour"	103
A.4	Data Dictionary of <<enumerations>> for "SituationPublication"	103
A.4.1	The <<enumeration>> "AbnormalTrafficTypeEnum"	103
A.4.2	The <<enumeration>> "AccidentCauseEnum"	104
A.4.3	The <<enumeration>> "AccidentTypeEnum"	105
A.4.4	The <<enumeration>> "AnimalPresenceTypeEnum"	108
A.4.5	The <<enumeration>> "AreaOfInterestEnum"	109
A.4.6	The <<enumeration>> "AuthorityOperationTypeEnum"	110
A.4.7	The <<enumeration>> "CarParkConfigurationEnum"	112
A.4.8	The <<enumeration>> "CarParkStatusEnum"	113
A.4.9	The <<enumeration>> "CauseTypeEnum"	114
A.4.10	The <<enumeration>> "CommentTypeEnum"	116
A.4.11	The <<enumeration>> "ComparisonOperatorEnum"	117
A.4.12	The <<enumeration>> "ComplianceOptionEnum"	117
A.4.13	The <<enumeration>> "ComputationMethodEnum"	118
A.4.14	The <<enumeration>> "ConfidentialityValueEnum"	118
A.4.15	The <<enumeration>> "ConstructionWorkTypeEnum"	119
A.4.16	The <<enumeration>> "CountryEnum"	120
A.4.17	The <<enumeration>> "DangerousGoodsRegulationsEnum"	122
A.4.18	The <<enumeration>> "DayEnum"	123
A.4.19	The <<enumeration>> "DelayBandEnum"	123
A.4.20	The <<enumeration>> "DelaysTypeEnum"	124
A.4.21	The <<enumeration>> "DirectionCompassEnum"	125
A.4.22	The <<enumeration>> "DirectionEnum"	126
A.4.23	The <<enumeration>> "DisturbanceActivityTypeEnum"	127
A.4.24	The <<enumeration>> "DrivingConditionTypeEnum"	129
A.4.25	The <<enumeration>> "EnvironmentalObstructionTypeEnum"	130
A.4.26	The <<enumeration>> "EquipmentOrSystemFaultTypeEnum"	131
A.4.27	The <<enumeration>> "EquipmentOrSystemTypeEnum"	132
A.4.28	The <<enumeration>> "FuelTypeEnum"	133
A.4.29	The <<enumeration>> "GeneralInstructionToRoadUsersTypeEnum"	134
A.4.30	The <<enumeration>> "GeneralNetworkManagementTypeEnum"	136
A.4.31	The <<enumeration>> "InformationStatusEnum"	137
A.4.32	The <<enumeration>> "InfrastructureDamageTypeEnum"	138
A.4.33	The <<enumeration>> "InjuryStatusTypeEnum"	139
A.4.34	The <<enumeration>> "InvolvedRolesEnum"	140
A.4.35	The <<enumeration>> "LoadTypeEnum"	141
A.4.36	The <<enumeration>> "MaintenanceVehicleActionsEnum"	143
A.4.37	The <<enumeration>> "MobilityEnum"	143

A.4.38 The <<enumeration>> "MonthOfYearEnum"	144
A.4.39 The <<enumeration>> "NonWeatherRelatedRoadConditionTypeEnum"	145
A.4.40 The <<enumeration>> "ObstructionTypeEnum"	146
A.4.41 The <<enumeration>> "OperatorActionOriginEnum"	148
A.4.42 The <<enumeration>> "OperatorActionStatusEnum"	149
A.4.43 The <<enumeration>> "PersonCategoryEnum"	150
A.4.44 The <<enumeration>> "PlacesEnum"	151
A.4.45 The <<enumeration>> "PollutantTypeEnum"	153
A.4.46 The <<enumeration>> "PoorEnvironmentTypeEnum"	154
A.4.47 The <<enumeration>> "PrecipitationTypeEnum"	157
A.4.48 The <<enumeration>> "ProbabilityOfOccurrenceEnum"	157
A.4.49 The <<enumeration>> "PublicEventTypeEnum"	158
A.4.50 The <<enumeration>> "RelativeTrafficFlowEnum"	161
A.4.51 The <<enumeration>> "ReroutingManagementTypeEnum"	162
A.4.52 The <<enumeration>> "RoadMaintenanceTypeEnum"	163
A.4.53 The <<enumeration>> "RoadOperatorServiceDisruptionTypeEnum"	164
A.4.54 The <<enumeration>> "RoadOrCarriagewayOrLaneManagementTypeEnum"	165
A.4.55 The <<enumeration>> "RoadsideAssistanceTypeEnum"	167
A.4.56 The <<enumeration>> "RoadsideServiceDisruptionTypeEnum"	168
A.4.57 The <<enumeration>> "RoadworksDurationEnum"	170
A.4.58 The <<enumeration>> "RoadworksScaleEnum"	170
A.4.59 The <<enumeration>> "SeverityEnum"	171
A.4.60 The <<enumeration>> "SourceTypeEnum"	172
A.4.61 The <<enumeration>> "SpeedManagementTypeEnum"	174
A.4.62 The <<enumeration>> "SubjectTypeOfWorksEnum"	175
A.4.63 The <<enumeration>> "TrafficConstrictionTypeEnum"	176
A.4.64 The <<enumeration>> "TrafficFlowCharacteristicsEnum"	177
A.4.65 The <<enumeration>> "TrafficStatusEnum"	177
A.4.66 The <<enumeration>> "TrafficTrendTypeEnum"	178
A.4.67 The <<enumeration>> "TrafficTypeEnum"	179
A.4.68 The <<enumeration>> "TransitServiceInformationEnum"	180
A.4.69 The <<enumeration>> "TransitServiceTypeEnum"	182
A.4.70 The <<enumeration>> "UrgencyEnum"	182
A.4.71 The <<enumeration>> "UrlLinkTypeEnum"	183
A.4.72 The <<enumeration>> "ValidityStatusEnum"	183
A.4.73 The <<enumeration>> "VehicleEquipmentEnum"	184
A.4.74 The <<enumeration>> "VehicleObstructionTypeEnum"	185
A.4.75 The <<enumeration>> "VehicleStatusEnum"	187
A.4.76 The <<enumeration>> "VehicleTypeEnum"	188
A.4.77 The <<enumeration>> "VehicleUsageEnum"	190
A.4.78 The <<enumeration>> "WeatherRelatedRoadConditionTypeEnum"	191
A.4.79 The <<enumeration>> "WeekOfMonthEnum"	193
A.4.80 The <<enumeration>> "WinterEquipmentManagementTypeEnum"	193
Annex B (normative) Referenced XML Schema for "SituationPublication"	194
B.1 Overview	194
B.2 Schema	194
Annex C (informative) Examples of Situation Publications In XML	258
C.1 Example Traffic Element	258
C.2 Example Operator Action	261
C.3 Example NonRoadEventInformation	267
Bibliography	270

Foreword

This document (CEN/TS 16157-3:2011) has been prepared by Technical Committee CEN/TC 278 “Road transport and traffic telematics”, the secretariat of which is held by NEN.

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

This document supersedes ENV 13106:2000, ENV 13777:2000.

As a user of the standard, attention is drawn to the resources of www.datex2.eu. This web site contains related software tools and software resources that aid the implementation of CEN/TS 16157 DATEX II.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to announce this Technical Specification: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

This Technical Specification 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. Standardisation in this context is a vital constituent to ensure that interoperability, reduction of risk, reduction of the cost base and promotion of open marketplace objectives are achieved that will lead to many social, economic and community benefits as a result of 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 the 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 standardisation of DATEX II there is a real basis for common exchange between the actors of the traffic and travel information sector.

This Technical Specification includes the framework and context for exchanges, the modelling approach, data content, data structure and relationships and communications specification.

This Technical Specification supports a methodology that is extensible.

The third part of this Technical Specification 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.

The European Committee for Standardisation (CEN) draws attention to the fact that it is claimed that compliance with this document may involve the use of a patent concerning procedures, methods and/or formats given in this document.

CEN takes no position concerning the evidence, validity and scope of patent rights.

1 Scope

This Technical Specification (CEN/TS 16157-3) 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, the data content, the data structure and relationships and the communications specification.

This Technical Specification 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).

This Technical Specification 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 Technical Specification may be applicable for use by other actors.

This Technical Specification includes the following types of information 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 part of the CEN/TS 16157 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 CEN/TS 16157-2 and those elements that relate to VMS settings which are specified in Part 4 of CEN/TS 16157 [4].

2 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 CEN/TS 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 CEN/TS 16157-1 and with the following requirements of this sub-model which are expressed in this part:

- comply with all stipulated minimum and maximum multiplicity requirements for UML elements and relationships;
- comply with all definitions, types and ordering;
- employ optional elements as specified;
- comply with all expressed constraints.

It should be noted that conformance of a publication service with all the structural requirements stated above does not necessarily ensure that the informational content of that service will be semantically comprehensible.

3 Normative references

The following referenced documents are indispensable for the application 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.

CEN/TS 16157-1:2011, *Intelligent transport systems — DATEX II data exchange specifications for traffic management and information — Part 1: Context and framework*

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

ISO 639-2: 1998, *Codes for the representation of names of languages — Part 2: Alpha-3 code*

4 Terms and definitions

For the purposes of this document, the terms and definitions given in CEN/TS 16157-1:2011 and the following apply.

4.1

destination

specification of the end point of a defined route or itinerary

NOTE This may be either a location on a road network or an area location.

4.2

location

identifiable geographic place

NOTE It is either on a road network (as a point or a linear location) or as an area. This may be provided in one or more referencing systems.

[EN ISO 19112:2005]

4.3

Itinerary

route

navigable ordered sequence of locations with a start point and an end point

4.4

RSS

really simple syndication

Really Simple Syndication comprises a Web feed format used to publish frequently updated sources of information