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Intelligent transport systems –
DATEX II data exchange specifications for traffic management and information –
Part 11: Publication of machine interpretable traffic regulations;
English version CEN/TS 16157-11:2022

Systèmes de transport intelligents –
Spécifications Datex II d'échange de données pour la gestion du trafic et l'information routière –
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Nationales Vorwort

Dieses Dokument (CEN/TS 16157-11:2022) wurde vom Technischen Komitee CEN/TC 278 „Intelligente Verkehrssysteme“ ausgearbeitet, dessen Sekretariat von NEN (Niederlande) gehalten wird.

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— oder in Papierform an den Normenausschuss Automobiltechnik, Behrenstr. 35, 10117 Berlin.

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Begriffe

Die Benummerung der folgenden Begriffe und Abkürzungen ist identisch mit der Benummerung in der englischen Fassung.

Für die Anwendung dieses Dokuments gelten die Begriffe aus EN 16157-1, EN 16157-2, EN 16157-7 und die folgenden Begriffe.

ISO und IEC stellen terminologische Datenbanken für die Verwendung in der Normung unter den folgenden Adressen bereit:

— ISO Online Browsing Platform: verfügbar unter https://www.iso.org/obp

— IEC Electropedia: verfügbar unter http://www.electropedia.org/

3.1
Verkehrsregelung
en traffic regulation
rechtliche Vereinbarung oder Anordnung, welche die Nutzung des Straßennetzes einschränkt oder verbietet

3.2
verkehrsrechtliche Anordnung
en traffic regulation order
rechtlich anerkanntes Dokument oder Veröffentlichung, das(die) von einer zuständigen Behörde ausgestellt wurde, um eine spezifische Verkehrsregelung oder Verkehrsregelungen anzuordnen

3.3
anordnende Behörde
en issuing authority
zuständige Behörde, die eine verkehrsrechtliche Anordnung ausstellt

3.4
ad-hoc-Verkehrsregelung
en ad hoc traffic regulation
Verkehrsregelung, welche von Straßenbetreibern ohne formelle Anordnung, aufgrund von dringenden Sicherheitsanforderungen umgesetzt wird

3.5
geplante dynamische Verkehrsregelung
en planned dynamic traffic regulation
Verkehrsregelung, die oftmals dynamische verändert werden kann und mittels eines automatisierten oder steuerbaren technischen Systems umgesetzt wird

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SPÉCIFICATION TECHNIQUE

TECHNISCHE SPEZIFIKATION

CEN/TS 16157-11

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English Version

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Systèmes de transport intelligents — Spécifications Datex II d'échange de données pour la gestion du trafic et l'information routière — Partie 11: Publication (électronique) des arrêtés de circulation

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This Technical Specification (CEN/TS) was approved by CEN on 24 January 2022 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.

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CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (CEN/TS 16157-11:2022) has been prepared by Technical Committee CEN/TC 278 “Intelligent transport systems”, 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 shall not be held responsible for identifying any or all such patent rights.

A list of all parts in the EN 16157 series can be found on the CEN website.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN/CENELEC Internal Regulations, the national standards organisations 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, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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Introduction

The EN/TS 16157 series 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.

EN/TS 16157 includes the framework and context for the modelling approach, data content, data structure and relationships.

It supports a methodology that is extensible.

This document deals with the publication sub-model within the DATEX II model that supports the exchange of traffic regulation information. This publication is intended to support the exchange of information from road traffic authorities issuing traffic regulation orders and organisations implementing these orders to other organisations providing ITS services or onward information exchange.

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1 Scope

This document specifies a publication sub-model within the DATEX II model that supports the publication of electronic traffic regulations.

This publication is intended to support the exchange of informational content from road traffic authorities issuing traffic regulation orders and organisations implementing these orders to other organisations providing ITS services or onward information exchange.

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*

EN 16157-2:2019, *Intelligent transport systems — DATEX II data exchange specifications for traffic management and information — Part 2: Location referencing*

EN 16157-7:2018, *Intelligent transport systems — DATEX II data exchange specifications for traffic management and information — Part 7: Common data elements*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 16157-1, EN 16157-7, EN 16157-2, and the following apply.

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

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
traffic regulation
legal agreement or order that restricts or prohibits the use of the highway network

3.2
traffic regulation order
legally recognised document or publication issued to enact a specific traffic regulation or regulations by a competent authority

3.3
issuing authority
competent authority that issued the traffic regulation order

3.4
ad hoc traffic regulation
traffic regulations implemented by road operators without formal order due to urgent safety requirements

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3.5
planned dynamic traffic regulation
traffic regulation, often dynamically changeable, implemented by means of an automated or controllable technical system

4 Symbols and abbreviations

UML Unified Modeling Language

XML eXtensible Markup Language

5 Conformance

This document specifies a DATEX II traffic regulation publication, except for the elements that relate to location information which are specified in EN 16157-2 and the common elements (i.e. shared between several publications) which are defined in EN 16157-7.

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

Conformance with this document 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 the sub-models which are expressed in this document:

— 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.

6 UML notation

The UML notation used in this document shall be as described in ISO/IEC 19505-1 [1].

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

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7 The "TrafficRegulation" namespace

This namespace gathers packages and classes related to traffic regulations. Figure 1 represents the different packages and classes belonging to the "TrafficRegulation" namespace, which uses the namespace prefix "tro".

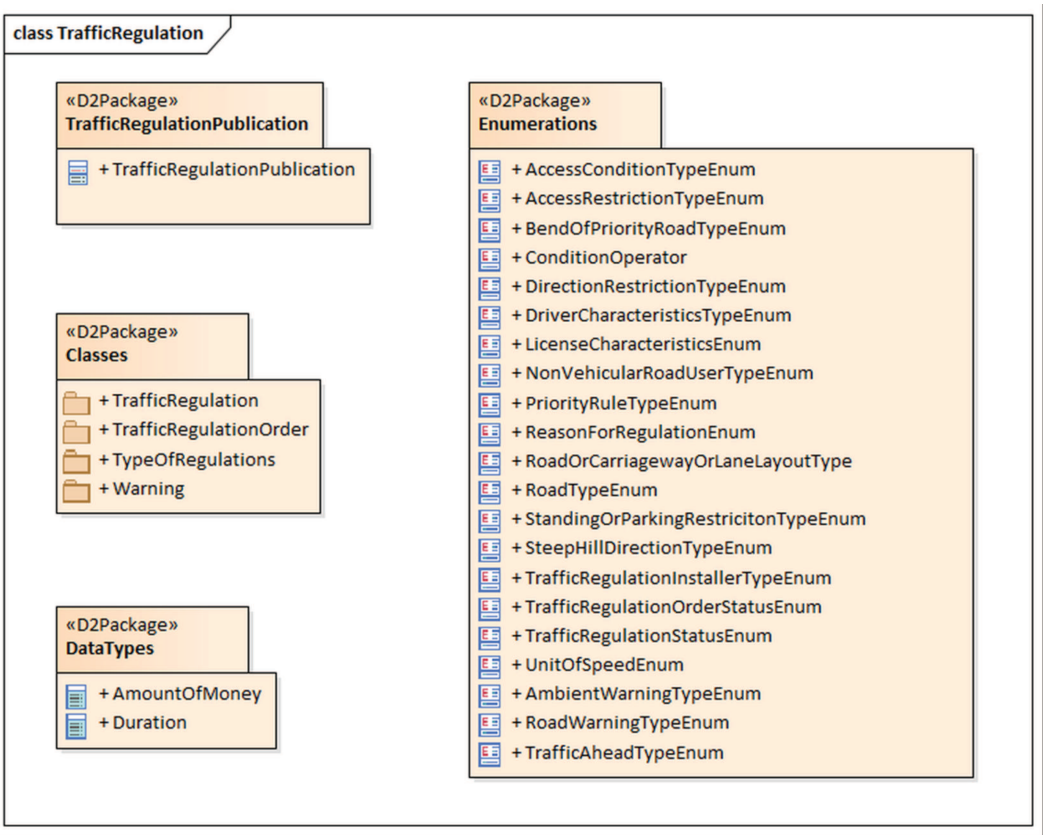

Figure 1 — The "TrafficRegulation" model

The "TrafficRegulation" namespace shall include the following four packages:

— TrafficRegulationPublication,

— Classes,

— DataTypes,

— Enumerations.

The classes, attributes, data types and enumerations that are specific to this document are defined in Annex A.

The XML schema corresponding to this document is provided in Annex B.

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8 The traffic regulation publication model

8.1 Overview of the traffic regulation publication model

The traffic regulation publication model comprises one top-level package, "TrafficRegulationPublication" containing the "TrafficRegulationPublication" class, which is a specialisation of the "PayloadPublication" class and hence forms the top of the hierarchy of the traffic regulation publication sub-model. The "TrafficRegulationPublication" is composed of four different classes specifying different ways of publishing traffic regulations, located in the "TrafficRegulationOrder" package. The "TrafficRegulation" package contains all information on traffic regulations specified by a type of regulation, defined in the "TypeOfRegulation" package, and conditions for the applicability of the regulation.

8.2 The "TrafficRegulationPublication" package

8.2.1 Overview of the "TrafficRegulationPublication" package

The "TrafficRegulationPublication" package shall comprise a sub-model for defining traffic regulations. The following Figure 2 represents the sub-model including the relationship between classes.

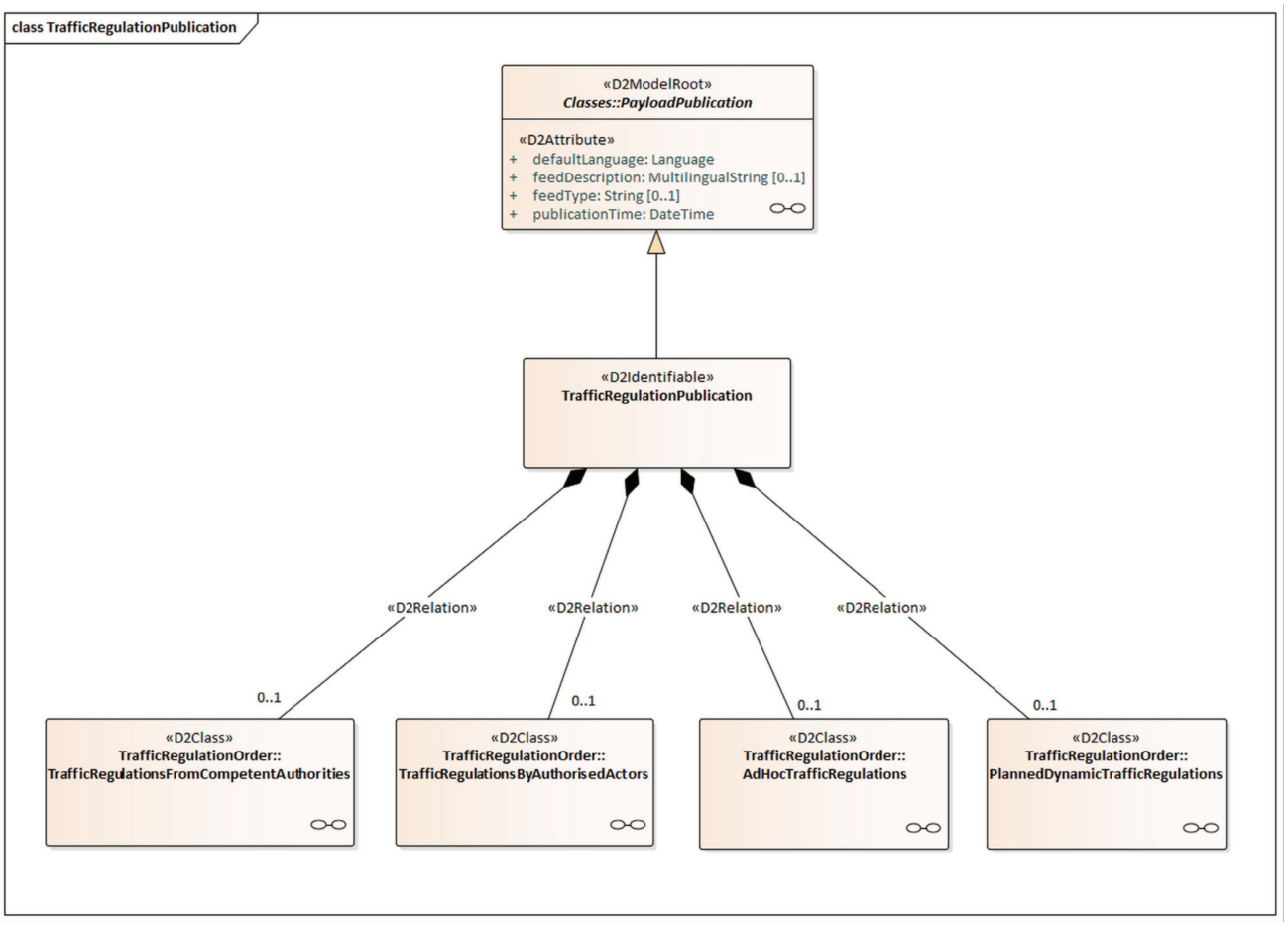

Figure 2 — The "TrafficRegulationPublication" package class model

8.2.2 Semantics of the "TrafficRegulationPublication" package

8.2.2.1 "TrafficRegulationPublication" class

The "TrafficRegulationPublication" class is a specific instantiable case of the "PayloadPublication" class.

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Each "TrafficRegulationPublication" class instance may be composed of one of the following classes:

— TrafficRegulationsFromCompetentAuthorities,

— TrafficRegulationsByAuthorisedActors,

— AdHocTrafficRegulations,

— PlannedDynamicTrafficRegulations.

The "TrafficRegulationPublication" class is the base class for containing the published traffic regulations.

9 The "Classes" package

9.1 Introduction

This package contains all the packages and classes used by the traffic regulation publication model defined in this document.

9.2 The "TrafficRegulation" package

9.2.1 Overview of the "TrafficRegulation" package

This package describes data relating to the publication of traffic regulation information. Each traffic regulation is defined by a type of regulation (e.g. an overtaking ban or a speed limit) and conditions for the applicability of the regulation. The structure of the condition model is based on the condition model defined in CEN/TS 17268:2018 [5].

It is represented including the relationships between classes in Figure 3.

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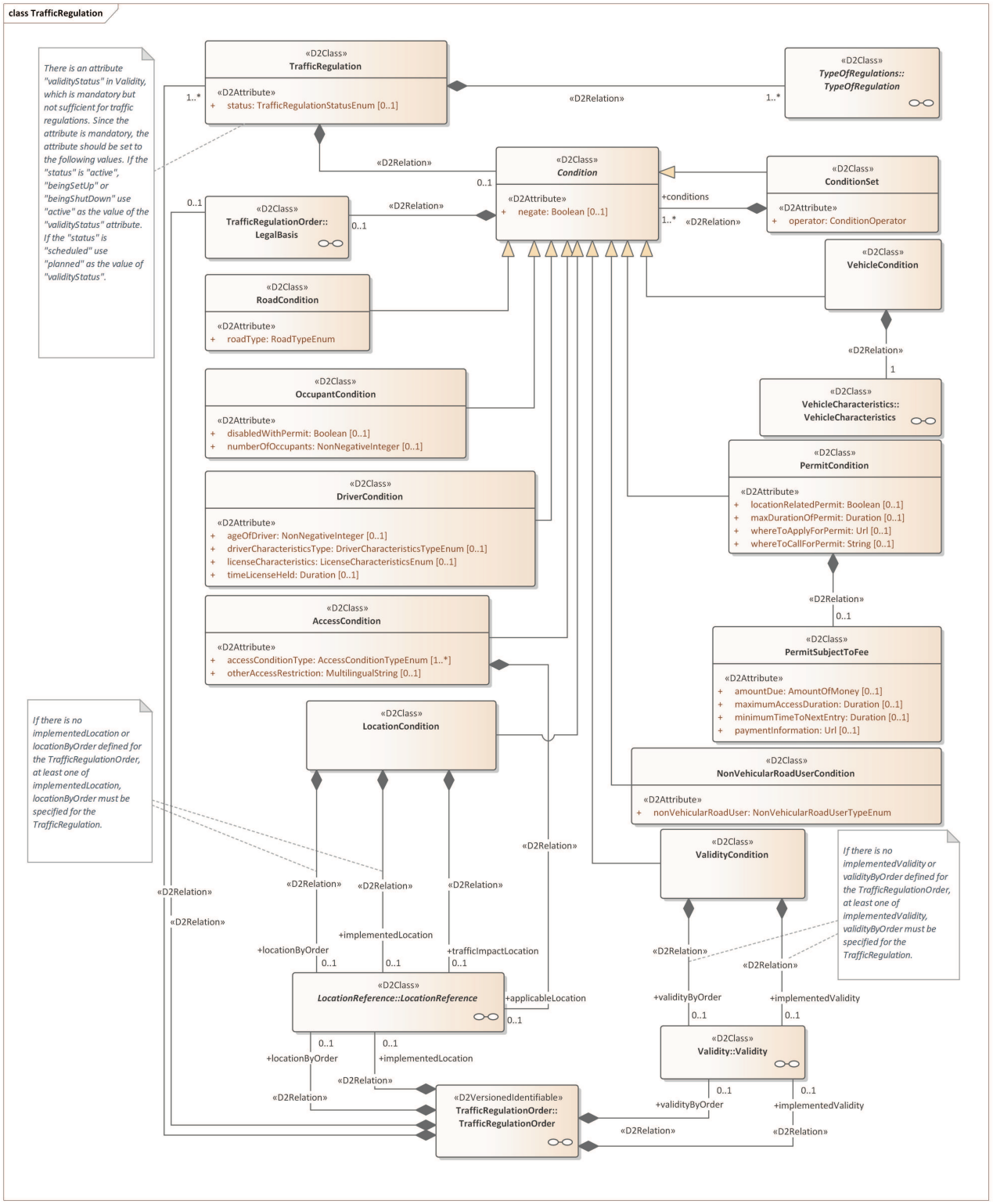

Figure 3 — The "TrafficRegulation" package class model

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9.2.2 Semantics of the "TrafficRegulation" package

9.2.2.1 "TrafficRegulation" class

The "TrafficRegulation" class describes any kinds of traffic regulations, defined by the type of regulation via the "TypeOfRegulation" class (see 9.4.2.1) and conditions for applicability via the "Condition" class.

The implementation status of the traffic regulation may be described by the "status" attribute.

9.2.2.2 "Condition" class

The abstract "Condition" class describes conditions for the applicability of traffic regulations. It shall be specialised in one of the possible types given below:

— RoadCondition,

— OccupantCondition,

— DriverCondition,

— AccessCondition,

— LocationCondition,

— ValidityCondition,

— NonVehicleRoadUserCondition,

— PermitCondition,

— VehicleCondition,

— ConditionSet.

A specialisation of the "Condition" class may have an optional legal basis defined by the "LegalBasis" class, which belongs to the "TrafficRegulationOrder" package (see 9.3).

9.2.2.3 "ConditionSet" class

The "ConditionSet" class specified a set of conditions. The "operator" attribute shall be used to specify the operator to be applied between the conditions. It is composed of one or more "conditions" specified by the "Condition" class.

9.2.2.4 "RoadCondition" class

The "RoadCondition" class describes different types of roads (e.g. motorway, express road).

9.2.2.5 "OccupantCondition" class

The "OccupantCondition" class describes conditions for occupants of a vehicle (e.g. number of occupants, disability).

9.2.2.6 "DriverCondition" class

The "DriverCondition" class describes conditions for the driver of a vehicle (e.g. disability, information on the driver's license, age of driver).

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9.2.2.7 "AccessCondition" class

The "AccessCondition" class describes conditions for the access to a road or carriageway or lane (e.g. access only for loading and unloading or source traffic). It is composed of an optional "applicableLocation" defined by the "LocationReference" class, which belongs to the "LocationReferencing" package specified in EN 16157-2:2019. The "applicableLocation" shall be used to specify the location, where the access condition applies.

9.2.2.8 "LocationCondition" class

The "LocationCondition" class specifies location conditions. It is composed of an optional "implementedLocation", "locationByOrder" and/or "trafficImpactLocation" defined by the "LocationReferencing" class, which belongs to the "LocationReferencing" package specified in EN 16157-2:2019.

NOTE If there is no "implementedLocation" or "locationByOrder" defined for the "TrafficRegulationOrder" class (see 9.3.2.11) at least one of "implementedLocation" or "locationByOrder" must be specified for the "TrafficRegulation" class.

9.2.2.9 "ValidityCondition" class

The "ValidityCondition" class specifies validity conditions. It is composed of an optional "implementedValidity" and/or "validityByOrder" defined by the "Validity" class, which belongs to the "Validity" package specified in EN 16157-7:2018.

NOTE If there is no "implementedValidity" or "ValidityByOrder" defined for the "TrafficRegulationOrder" class (see 9.3.2.11) at least one of "implementedValidity" or "ValidityByOrder" must be specified for the "TrafficRegulation" class.

9.2.2.10 "NonVehicularRoadUserCondition" class

The "NonVehicularRoadUserCondition" class specifies condition for non-vehicular road users (e.g. pedestrians).

9.2.2.11 "PermitCondition" class

The "PermitCondition" class describes conditions for which a permit is required. It is composed of the "PermitSubjectToFee" class, which describes the permission of access if a fee is paid.

9.2.2.12 "PermitSubjectToFee" class

The "PermitSubjectToFee" class describes permits for which a payment is required. The attributes of this class shall be used to define information about the amount of the fee, the maximum access duration, the minimum time to the next entry and a link to the information on the payment.

9.2.2.13 "VehicleCondition" class

The "VehicleCondition" class specifies conditions for vehicles. It is composed of the "VehicleCharacteristics" class, which belongs to the "VehicleCharacteristics" package specified in EN 16157-7:2018.

9.3 The "TrafficRegulationOrder" package

9.3.1 Overview of the "TrafficRegulationOrder" package

The "TrafficRegulationOrder" package shall comprise a collection of data relating to the publication of traffic regulation orders. The publication of traffic regulation orders can be separated in the three logical entities, ad hoc traffic regulations, planned dynamic traffic regulations and traffic regulations from competent authorities.

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These are represented including the relationships between classes in the following sections.

9.3.1.1 The "AdHocTrafficRegulations" class model

The "AdHocTrafficRegulations" class model describes traffic regulations which are implemented without a formal traffic regulation order. Traffic regulations can either be implemented by actors like police or road operators without formal order due to urgent or safety requirements or by an actor that has received a general permission from a competent authority.

It is represented including the relationship between the classes in Figure 4.

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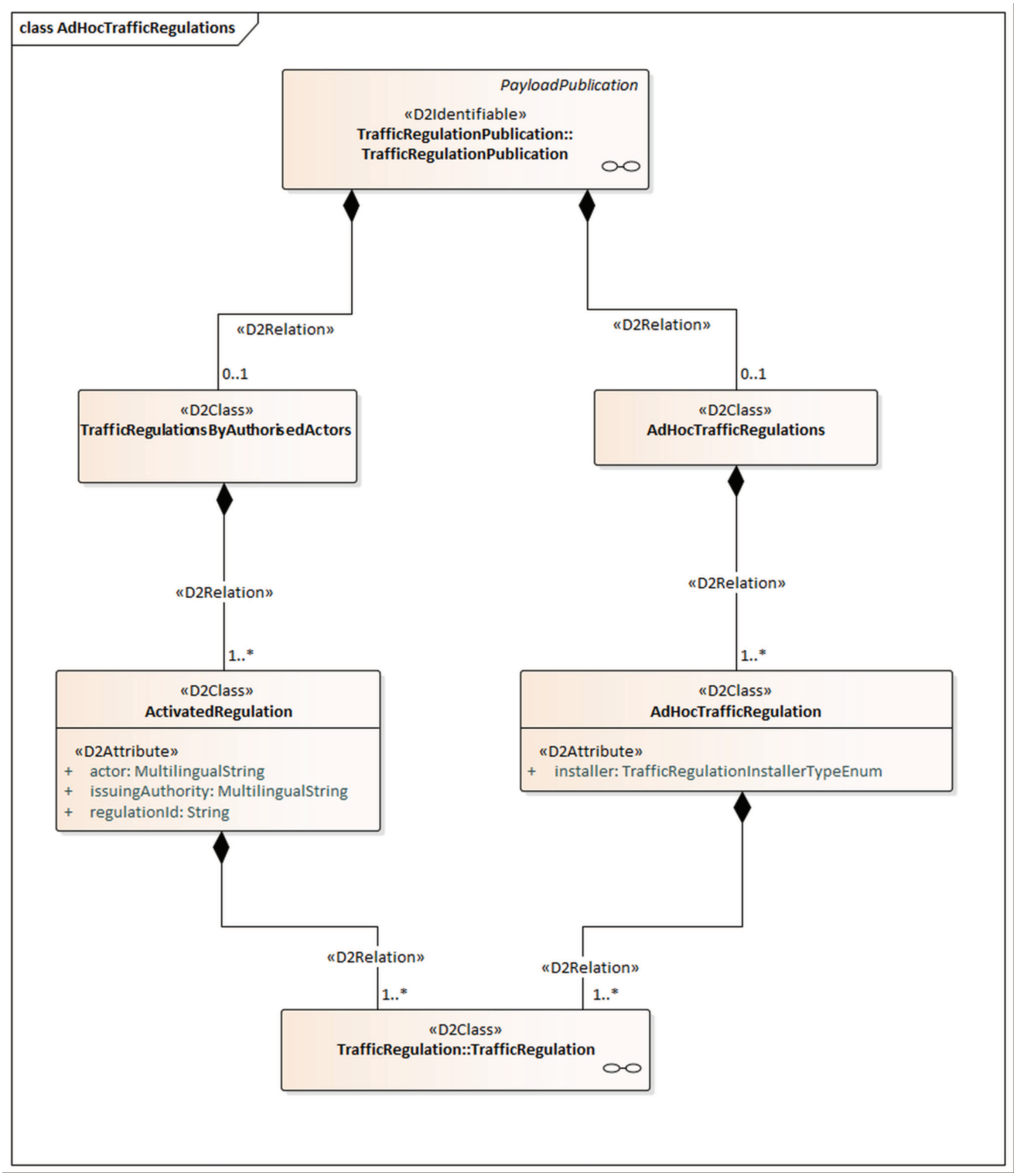

Figure 4 — The "AdHocTrafficRegulations" class model

9.3.1.2 The "PlannedDynamicTrafficRegulations" class model

The "PlannedDynamicTrafficRegulations" class model describes traffic regulations which are often dynamically changeable and implemented by means of an automated or controllable technical system.

It is represented including the relationship between the classes in Figure 5.

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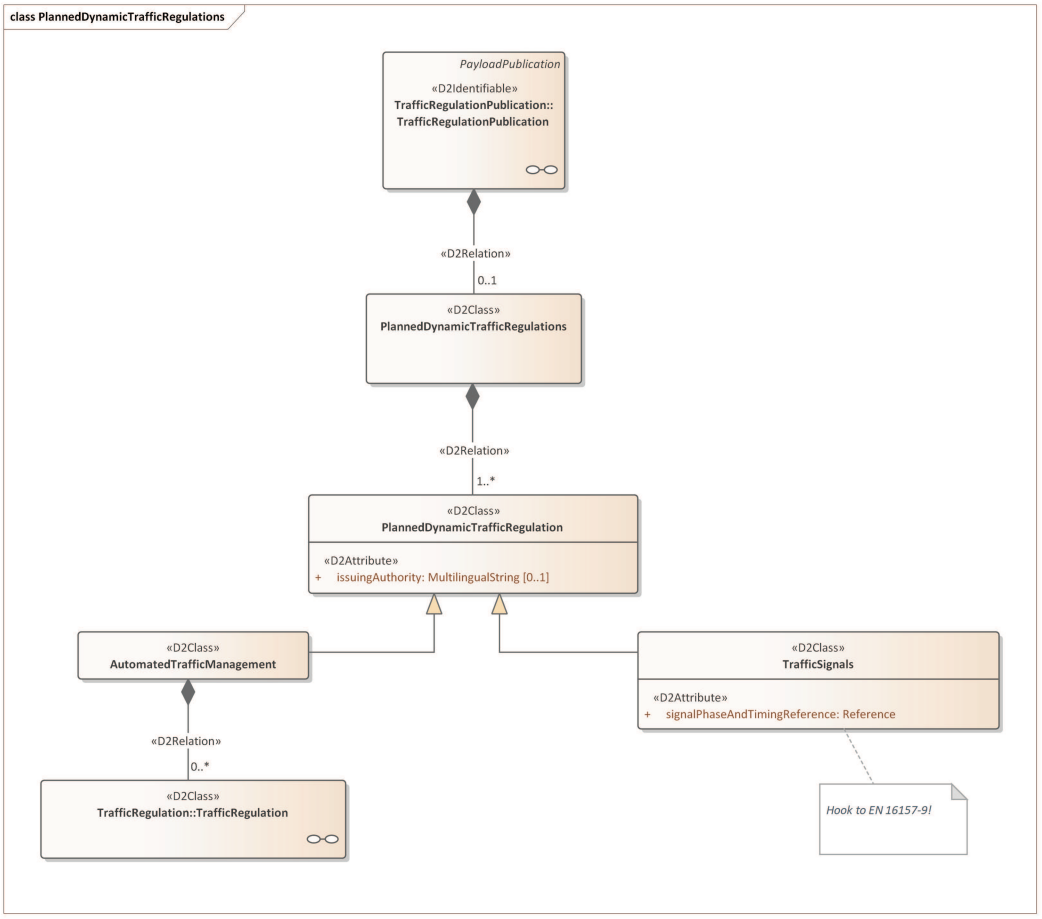

Figure 5 — The "PlannedDynamicTrafficRegulations" class model

9.3.1.3 The "TrafficRegulationsFromCompetentAuthorities" class model

The "TrafficRegulationsFromCompetentAuthorities" class model describes traffic regulations ordered by a competent authority.

It is represented including the relationship between the classes in Figure 6.

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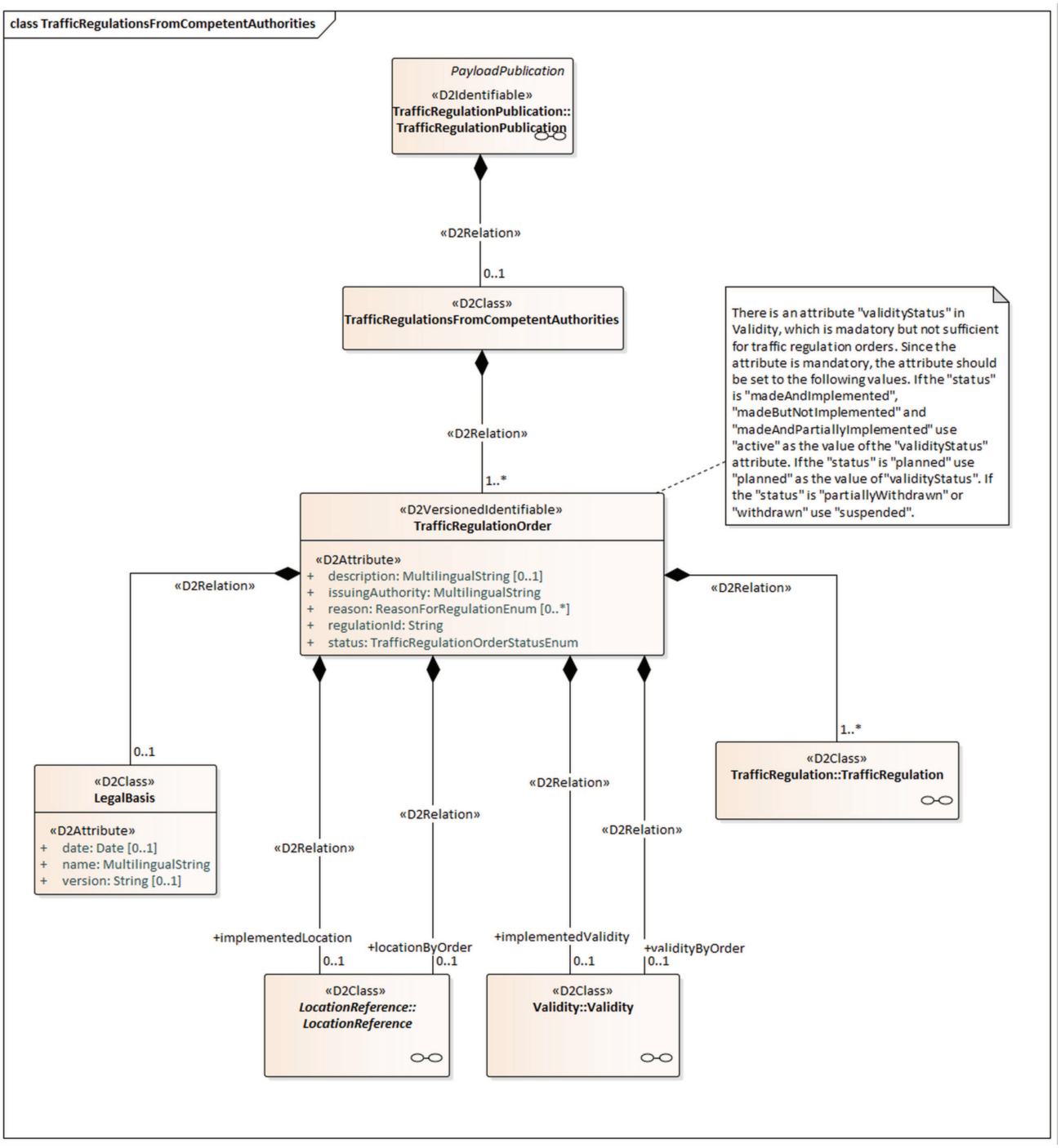

Figure 6 — The "TrafficRegulationsFromCompetentAuthorities" class model

9.3.2 Semantics of the "TrafficRegulationOrder" package

9.3.2.1 "TrafficRegulationsByAuthorisedActors " class

The "TrafficRegulationsByAuthorisedActors" class is a container for activated regulations.

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9.3.2.2 "ActivatedRegulation" class

The "ActivatedRegulation" class describes a general permission used currently to implement traffic regulations. Each instance is composed of one or more instances of the "TrafficRegulation" class (see 9.2.2.1).

9.3.2.3 "AdHocTrafficRegulations" class

The "AdHocTrafficRegulations" class is a container for ad hoc traffic regulations.

9.3.2.4 "AdHocTrafficRegulation" class

The "AdHocTrafficRegulation" class describes an ad hoc traffic regulation in urgent (usually safety relevant) situations without a traffic regulation order. It is composed of one or more instances of the "TrafficRegulation" class (see 9.2.2.1).

9.3.2.5 "PlannedDynamicTrafficRegulations" class

The "PlannedDynamicTrafficRegulations" class is a container for planned dynamic traffic regulations.

9.3.2.6 "PlannedDynamicTrafficRegulation" class

The "PlannedDynamicTrafficRegulation" class describes a traffic regulation which is often dynamically changeable and implemented by means of an automated or controllable technical system.

9.3.2.7 "AutomatedTrafficManagement" class

The "AutomatedTrafficManagement" class is a specialisation of the "PlannedDynamicTrafficRegulation" class and describes technical systems that perform traffic regulations automatically to manage traffic. Each instance of this class may be associated with zero or more traffic regulations (see 9.2.2.1).

9.3.2.8 "TrafficSignals" class

The "TrafficSignals" class is empty and shall offer an entry point to the "SignalPhaseAndTiming" class from CEN/TS 16157-9:2020 [2].

9.3.2.9 "TrafficRegulationsFromCompetentAuthorities" class

The "TrafficRegulationsFromCompetentAuthorities" class is a container for traffic regulation orders.

9.3.2.10 "LegalBasis" class

The "LegalBasis" class defines a legal text which is e.g. referenced in a traffic regulation order.

9.3.2.11 "TrafficRegulationOrder" class

The "TrafficRegulationOrder" class describes a regulation ordered by a competent authority. It is composed of the following components:

— optional "implementedValidity" and/or "validityByOrder" defined by the "Validity" class, which belongs to the "Validity" package specified in EN 16157-7:2018,

— optional "implementedLocation" and/or "locationByOrder" defined by the "LocationReference" class, which belongs to the "LocationReferencing" package specified in EN 16157-2:2019,

— at least one traffic regulation(s) defined by the "TrafficRegulation" class (see 9.2.2.1),

— optional legal basis defined by the "LegalBasis" class.

NOTE There is an attribute "validityStatus" in Validity, which is mandatory but not sufficient for traffic regulation orders. Since the attribute is mandatory, the attribute should be set to the following values. If the "status"

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is "madeAndImplemented", "madeButNotImplemented" and "madeAndPartiallyImplemented" use "active" as the value of the "validityStatus" attribute. If the "status" is "planned" use "planned" as the value of "validityStatus". If the "status" is "partiallyWithdrawn" or "withdrawn" use "suspended".

9.4 The "TypeOfRegulations" package

9.4.1 Overview of the "TypeOfRegulations" package

The "TypeOfRegulations" package shall comprise a sub-model for defining traffic regulations.

It is represented including the relationships between the classes in Figure 7.

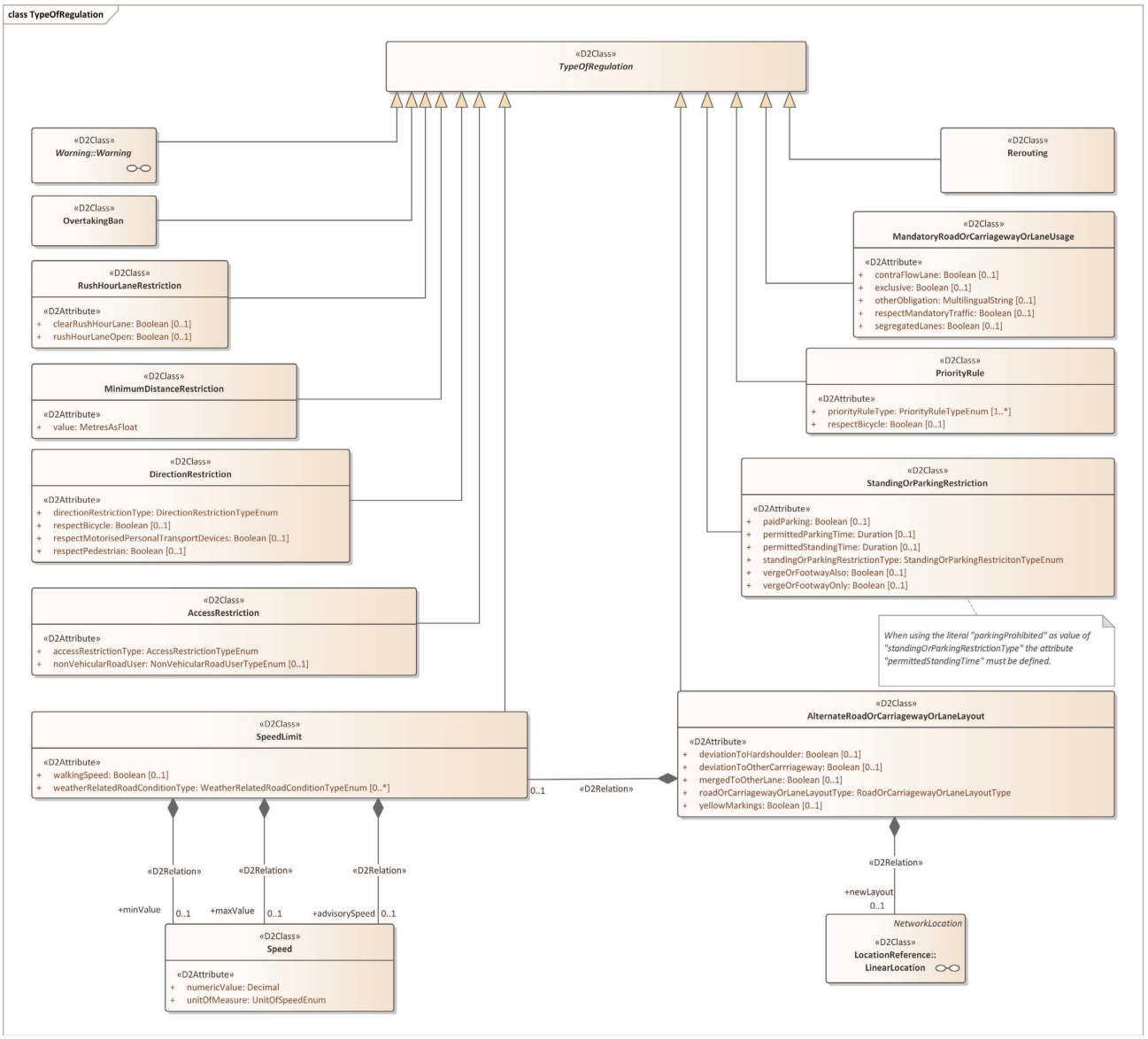

Figure 7 — The "TypeOfRegulation" package class model

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9.4.2 Semantics of the "TypeOfRegulation" package

9.4.2.1 "TypeOfRegulation" class

The "TypeOfRegulation" class is an abstract class, i.e. it shall be specialised in one of the possible types given below:

— Warning (see 9.5.2.1),

— OvertakingBan,

— RushHourLaneRestriction,

— MinimumDistanceRestriction,

— DirectionRestriction,

— AccessRestriction,

— SpeedLimit,

— AlternateRoadOrCarriagewayOrLaneLayout,

— StandingOrParkingRestriction,

— PriorityRule,

— MandatoryRoadOrCarriagewayOrLaneUsage,

— Rerouting.

9.4.2.2 "OvertakingBan" class

The "OvertakingBan" class describes an overtaking ban.

9.4.2.3 "RushHourLaneRestriction" class

The "RushHourLaneRestriction" class describes restrictions of the rush hour lane (e.g. traffic to clear rush hour lane).

9.4.2.4 "MinimumDistanceRestriction" class

The "MinimumDistanceRestriction" class describes the restriction of the minimum distance between vehicles.

9.4.2.5 "DirectionRestriction" class

The "DirectionRestriction" class describes restrictions of the direction of the traffic flow (e.g. turn left).

9.4.2.6 "AccessRestriction" class

The "AccessRestriction" class describes access restrictions (e.g. no access for motor vehicles) for either special vehicles types via the "VehicleCharacteristics" class or for non-vehicular road users (e.g. ridden or accompanied horses) via the corresponding "nonVehicularRoadUser" attribute.

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9.4.2.7 "SpeedLimit" class

The "SpeedLimit" class describes traffic speed limits. It may contain a "minValue", "maxValue" or "advisorySpeed" defined by the "Speed" class.

9.4.2.8 "Speed" class

The "Speed" class describes a speed value by defining a numeric value and a corresponding unit of measure.

9.4.2.9 "Rerouting" class

The "Rerouting" class describes a regulated rerouting of traffic. The mechanism of the traffic regulation model allows the definition of an actual/ordered location and further conditions, e.g. a vehicle type for which the rerouting applies.

9.4.2.10 "MandatoryRoadOrCarriagewayOrLaneUsage" class

The "MandatoryRoadOrCarriagewayOrLaneUsage" class describes a mandatory road or carriageway or lane for different types of traffic (e.g. mandatory bus lanes).

9.4.2.11 "PriorityRule" class

The "PriorityRule" class describes priority rules (e.g. priority at next junction).

9.4.2.12 "StandingOrParkingRestriction" class

The "StandingOrParkingRestriction" class describes restrictions of standing or parking permissions on roads, verge, or footway.

9.4.2.13 "AlternateRoadOrCarriagewayOrLaneLayout" class

The "AlternateRoadOrCarriagewayOrLaneLayout" class describes the alternate layout of a road or carriageway or lane. Further information on the layout and markings of the road or carriageway or lane can be specified using the attributes of this class.

The new layout of the road or carriageway or lane shall be specified with the "LinearLocation" class. This class belongs to the "LocationReferencing" package specified in EN 16157-2:2019.

9.5 The "Warning" package

9.5.1 Overview of the "Warning" package

The "Warning" package shall comprise a sub-model for traffic warnings.

NOTE Warnings are not subject to traffic regulation orders in all countries and therefore may be profiled out.

It is represented including the relationships between the classes in Figure 8.

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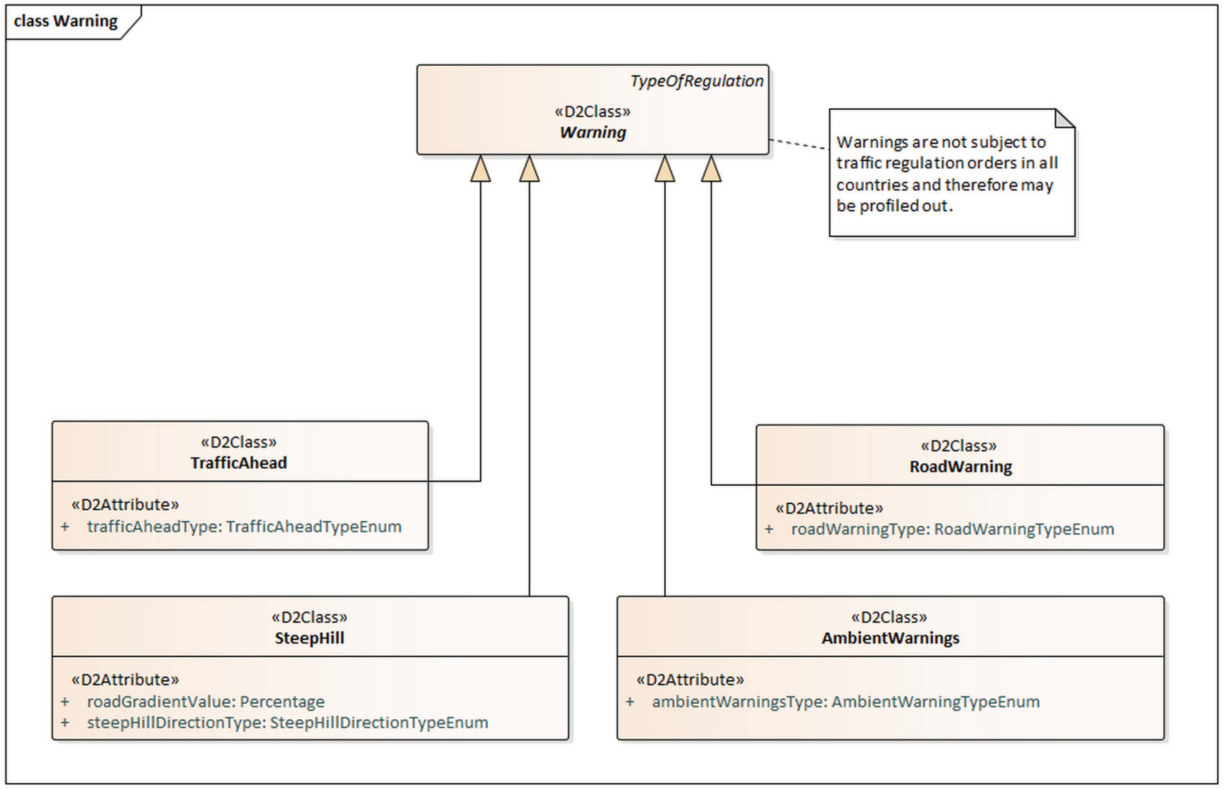

Figure 8 — The "Warning" package class model

9.5.2 Semantics of the "Warning" package

9.5.2.1 "Warning" class

The "Warning" class is an abstract class, i.e. it shall be specialised in one of the possible types given below:

— TrafficAhead,

— SteepHill,

— RoadWarning,

— AmbientWarning.

9.5.2.2 "TrafficAhead" class

The "TrafficAhead" class describes warnings of traffic ahead (e.g. traffic queues).

9.5.2.3 "SteepHill" class

The "SteepHill" class describes warnings of steep hills by defining the road gradient value and the direction of the road gradient.

9.5.2.4 "RoadWarning" class

The "RoadWarning" class defines warnings concerning the road or condition of the road (e.g. road narrows both sides, slippery road).

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9.5.2.5 "AmbientWarning" class

The "AmbientWarning" class defines warnings about ambient factors (e.g. falling rocks).

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Annex A
(normative)

Data Dictionary

A.1 Overview

This data dictionary identifies the definitions and characteristics of the different classes, attributes, association ends, data types and enumerations appearing in the data model defined in Clauses 7, 8 and 9. The data dictionary is specified as a whole, for the whole "TrafficRegulation" package.

The generic data types which are used throughout all publications are defined in EN 16157-7:2018.

The first part of the data dictionary for each publication is partitioned into subclauses which relate to each of the UML model packages and each subclause defines the contained classes, their attributes and any association ends 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 **Association end**: it provides the symbolic name (lower camel case) given to the corresponding association end.

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, association end or enumeration value.

6) Column **Definition**: it provides a comprehensive definition detailing the class, attribute or association end.

7) Column **Stereotype**: it provides a statement of the stereotype that is assigned to the class, if any - see EN 16157-1:2018, 6.2 for further details.

8) Column **Abstract**: it provides a statement as to whether the class is abstract (non-instantiable) or concrete (instantiable).

9) Column **Multiplicity**: it provides a statement of the allowed multiplicity for the attribute or association end.

10) Column **Target**: It provides the name of the class which is at the end of the association to which the association end applies.

11) Column **Type**: it provides the name of the class used to define the data type relating to the attribute of the class.

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A.2 Data Dictionary for "TrafficRegulation"

A.2.1 "TrafficRegulation" package

A.2.1.1 Location of "TrafficRegulation" package

The location of "TrafficRegulation" package is:

— D2Payload/PayloadPublication/TrafficRegulation/Classes/TrafficRegulation

A.2.1.2 Classes of the "TrafficRegulation" package

Table A.1 — Classes of the "TrafficRegulation" package

Class name	Designation	Definition	Stereotype	Abstract
AccessCondition	Access condition	Conditions for the access of a road or carriageway or lane.	D2Class	no
Condition	Condition	Abstract class that specifies a condition for applicabilities or exemptions of a traffic regulation.	D2Class	yes
ConditionSet	Condition set	Groups a number of conditions into a condition set.	D2Class	no
DriverCondition	Driver condition	Conditions for the driver, e.g. holding a disabled permit.	D2Class	no
LocationCondition	Location condition	Conditions for the location of a traffic regulation.	D2Class	no
NonVehicularRoadUserCondition	Non vehicular road user condition	Conditions for non vehicular road users.	D2Class	no
OccupantCondition	Occupant condition	Conditions for the occupants of a vehicle.	D2Class	no
PermitCondition	Permit condition	Condition for which a permit is required for vehicles with certain characteristics. Sometimes restricted to specific locations.	D2Class	no
PermitSubjectToFee	Permit subject to fee	Access permitted when fee is paid.	D2Class	no
RoadCondition	Road condition	Specification of road types (e.g. motorway, express way, etc.).	D2Class	no
TrafficRegulation	Traffic regulation	Legal agreement or order that restricts or prohibits the use of the highway network.	D2Class	no
ValidityCondition	Validity condition	Conditions for time validity of a traffic regulation.	D2Class	no

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