

PD CEN/TS 16157-6:2015



BSI Standards Publication

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

Part 6: Parking Publications

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National foreword

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**Intelligent transport systems - DATEX II data exchange
specifications for traffic management and information -
Part 6: Parking Publications**

Systèmes de transport intelligents - Spécifications
DATEX II d'échange de données pour la gestion du
trafic et l'information routière - Partie 6: Publication de
parking

Intelligente Verkehrssysteme - Datex II
Datenaustauschspezifikationen für
Verkehrsmanagement und Verkehrsinformationen -
Teil 6: Publikation von Parkinformationen

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European foreword

This document (CEN/TS 16157-6:2015) 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 [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

CEN/TS 16157 consists of the following parts, under the general title “Intelligent transport systems — DATEX II data exchange specifications for traffic management and information”:

- Part 1: Context and framework
- Part 2: Location referencing
- Part 3: Situation publication

The following parts are under development:

- Part 4: Variable message Sign publication
- Part 5: Measured & elaborated data publication
- Part 6: Parking publications
- Part 7: Traffic view publication

As a user of this Technical Specification, 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.

Other parts may be developed in the future.

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey 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. Part one of this Technical Specification defines a methodology which is extensible.

The sixth part of the CEN/TS 16157- EN 16157 series (this Technical Specification) deals with the publication of parking information. It specifies the structures and definitions of information that may be exchanged to convey urban parking information or Truck Parking information.

A DATEX II profile for Truck Parking is specified in the normative Annex A, which is in accordance with [1] (further here within called “EU Truck Parking regulation”). The DATEX II profile for Truck Parking provided in this Technical Specification can be used to collect and provide the data required in Article 4 of the EU Truck Parking regulation. The informative Annex B shows how to do this.

Informative Annex C gives additional explanation to the Truck Parking profile for DATEX II, informative Annexes D and E present a comprehensive and a lean version of an urban parking profile.

Informative Annex F gives an overview about the Parking Publications model and its profiles.

In normative Annex G, the data dictionary for the Parking Publications is specified.

XML-Schemes to the Parking Publications model and the DATEX II Truck parking profile are provided in these annexes:

- normative Annex H: Referenced XML schema for Parking Publications model
- normative Annex I: Referenced XML schema for the Truck Parking profile

XML encoding examples can be found in informative Annex J.

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

CEN/TS 16157 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.

Part 6 of this Technical Specification is applicable to:

- Parking information – static and dynamic information about urban or interurban parking sites including Truck Parking information

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

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

Use of this Technical Specification may be applicable for use by other actors.

This Part of the Technical Specification includes the following type of information content:

- Parking information including static content (description and attribution of parking areas, parking sites and single parking spaces) and dynamic content (occupancy and vehicle measurement information). It covers urban parking information as well as Truck Parking information. It also covers a publication for information about specific parking vehicles.

Thus, this Part of CEN/TS 16157 specifies the informational structures, relationships, roles, attributes and associated data types required for publishing parking information within the DATEX II framework. This is specified as a DATEX II Parking Publications 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.

2 Conformance

The Parking Publications model is a Level-B extension of the DATEX II platform independent data model defined in CEN/TS 16157-1.

Conformance with Part 1 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 that 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 documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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, *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*

CEN/TS 16157-3, *Intelligent transport systems — DATEX II data exchange specifications for traffic management and information – Part 3: Situation Publication*

ISO/IEC 19501:2005-04, *Information technology — Open Distributed Processing — Unified Modeling Language (UML) Version 1.4.2*

ISO 639-2:1998, *Codes for the Representation of Names of Languages — Part 2: alpha-3 codes*

4 Terms and definitions

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

4.1
dynamic part [of the parking publications model]
the Parking Status Publication model. Can also express the Parking Status Publication part of one of the profiles specified in this document

4.2
eu truck parking regulation
short form for the “COMMISSION DELEGATED REGULATION (EU) No 885/2013 of 15 May 2013 supplementing ITS Directive 2010/40/EU of the European Parliament and of the Council with regard to the provision of information services for safe and secure parking places for trucks and commercial vehicles” [1]

4.3
group of parking spaces
combines and encompasses a number of parking spaces that can be logically reported together

4.4

group of parking sites

combines and encompasses a number of parking sites that can be logically reported together

4.5

label

a project on truck parking service and security classification, see [2] and [3]

4.6

lean urban profile

a lean DATEX II profile on urban parking information as specified in informative Annex E

4.7

level b extension

a method to extend the DATEX II Level A data model with new elements, ensuring backwards compatibility

4.8

parking publications model

entirety of the Parking Table Publication model, the Parking Status Publication model and the Parking Vehicles Publication model

4.9

parking record

a parking site or a group of parking sites. It is a logical construct with dedicated properties

4.10

parking site

a building, structure or identifiable (geographically bounded) space that is used for parking

4.11

parking space

a single space for parking, usually designed for one vehicle

4.12

profile

a DATEX II profile, i.e. a DATEX II compliant sub model of the DATEX II Level A model, possibly including extensions. Here in this document, a profile is always a DATEX II compliant sub model of the Parking Publications model

4.13

static part [of the parking publications model]

the Parking Table Publication model. Can also express the Parking Table Publication part of one of the profiles specified in this document

4.14

truck parking profile

the DATEX II profile for Truck Parking specified in normative Annex A

4.15

truck parking site

an urban or interurban parking site which is assigned to Truck Parking (but other vehicles might be allowed as well)

4.16

urban parking profile

a comprehensive DATEX II profile on urban parking information as specified in informative Annex D

5 Symbols and abbreviations

ETRS89 European Terrestrial Reference System 1989

EU	European Union
GUID	Globally Unique Identifier
HTML	Hyper text mark-up language
IP	Internet Protocol
ITS	Intelligent Transport Systems
ITP	Intelligent Truck Parking
LPG	Liquid Petroleum Gas
PDF	Portable document format created by Adobe
UML	Unified Modeling Language
URL	Uniform Resource Locator
VMS	Variable Message Sign

6 UML notation

The UML notation used in these Technical Specifications shall be as described in ISO/IEC 19501. A short summary explaining the notation used in this Technical Specification is provided in Annex A of Part 1 of CEN/TS 16157.

7 Integration of the Parking Publications model within DATEX II

7.1 Overview

The DATEX II top-level package “D2LogicalModel” defined in CEN/TS 16157-1 shall have a sub-package named “Extension”.

The package “Extension” shall have a sub-package named “Approved”.

The package “Approved” shall have a sub-package named “ParkingPublications”.

The Parking Publications model shall comprise the following packages, with the “ParkingPublications” package on top:

- ParkingTablePublication (see Clause 7.2)
- ParkingStatusPublication (see Clause 9)

- ParkingVehiclesPublication (see Clause 10)

As the DATEX II Level B mechanism shall be used for the integration of the Parking Publications model into the existing DATEX II Level A model, the following components shall have a tagged value “extension” - “levelb” and are therefore the entry points to Level B extensions:

- ParkingTablePublication
- ParkingStatusPublication
- ParkingVehiclesPublication
- PointExtended
- PeriodExtended
- AreaExtended
- VehicleCharacteristicsExtended

The data dictionary presented in normative Annex G specifies all of the elements of the Parking Publications model.

7.2 The “GenericPublication” package

7.2.1 Overview of the “GenericPublication” package

The “GenericPublication” package (see Figure 1) shall be a sub-package of the “PayloadPublication” package defined in CEN/TS 16157-1.

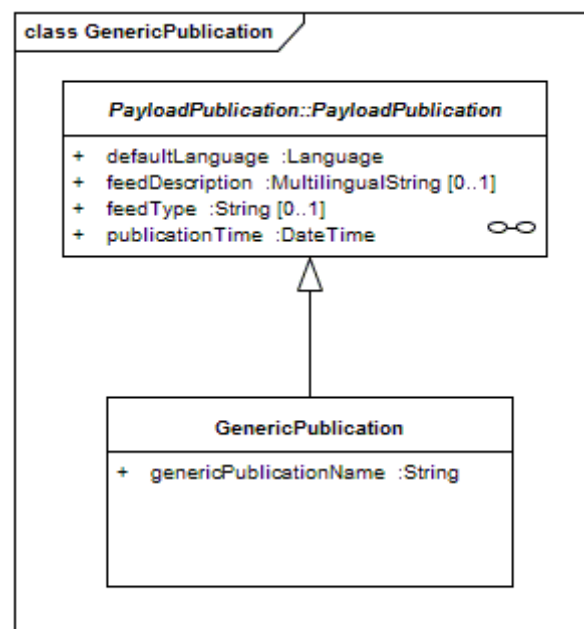


Figure 1 — The “GenericPublication” package class model

7.2.2 Semantics of the “GenericPublication” package

7.2.2.1 “GenericPublication” package semantics – general

The “GenericPublication” package shall comprise a publication used to make level B extensions at the publication level.

7.2.2.2 “GenericPublication” Class

The “GenericPublication” class is a specific realisable case of a “PayloadPublication” and used to make level B extensions at the publication level. Its attribute “genericPublicationName” is used to specify a name for any level B extended publication.

8 The Parking Table Publication model

8.1 Overview of the Parking Table Publication model

The Parking Table Publication model comprises a number of packages, with the “ParkingTablePublication” package providing the entry point to the static part of the Parking Publications model, which utilise some classes from the “GroupOfLocations” package and the “ReusableClasses” package defined in CEN/TS 16157-2 and CEN/TS 16157-3.

Each “ParkingTablePublication” instance shall contain one or more instances of a “ParkingTable”.

Each “ParkingTable” instance shall contain one or more “ParkingRecord”, which shall be an abstract class containing basic properties for a parking site or a group of parking sites such as location information, information on equipment and service facilities, assignments, tariffs, parking spaces and group of parking spaces, thresholds, permits and prohibitions, contact details for different roles, VMS, parking routes or a colour.

A “ParkingRecord” shall be further specialised as being either of type “GroupOfParkingSites” or “ParkingSite”. A group of parking sites (being an instance of “GroupOfParkingSites”) may contain zero, one or more “ParkingSite”, which shall be an abstract class.

A “ParkingSite” shall be further specialised as being either of type “InterUrbanParkingSite”, “UrbanParkingSite” or “SpecialLocationParkingSite”.

The corresponding schema for the Parking Table Publication model can be found in normative Annex H of this document.

8.2 The “ParkingTablePublication” package

8.2.1 Overview of the “ParkingTablePublication” package

The “ParkingTablePublication” package (see Figure 2) shall comprise a sub-model for defining one or more publishable “ParkingTable” which comprise records defining one or more “GroupOfParkingSites” or “ParkingSite” or both.

Each publication shall contain one or more “ParkingTable”, allowing logical partitioning of a group of parking sites and parking site (“ParkingSite”) information as deemed most appropriate for recipients of parking data information by the supplier (e.g. by road designation or other geographic criteria or by type of the parking site, etc.).

The value of the “genericPublicationName” attribute shall be defined as “ParkingTablePublication”.

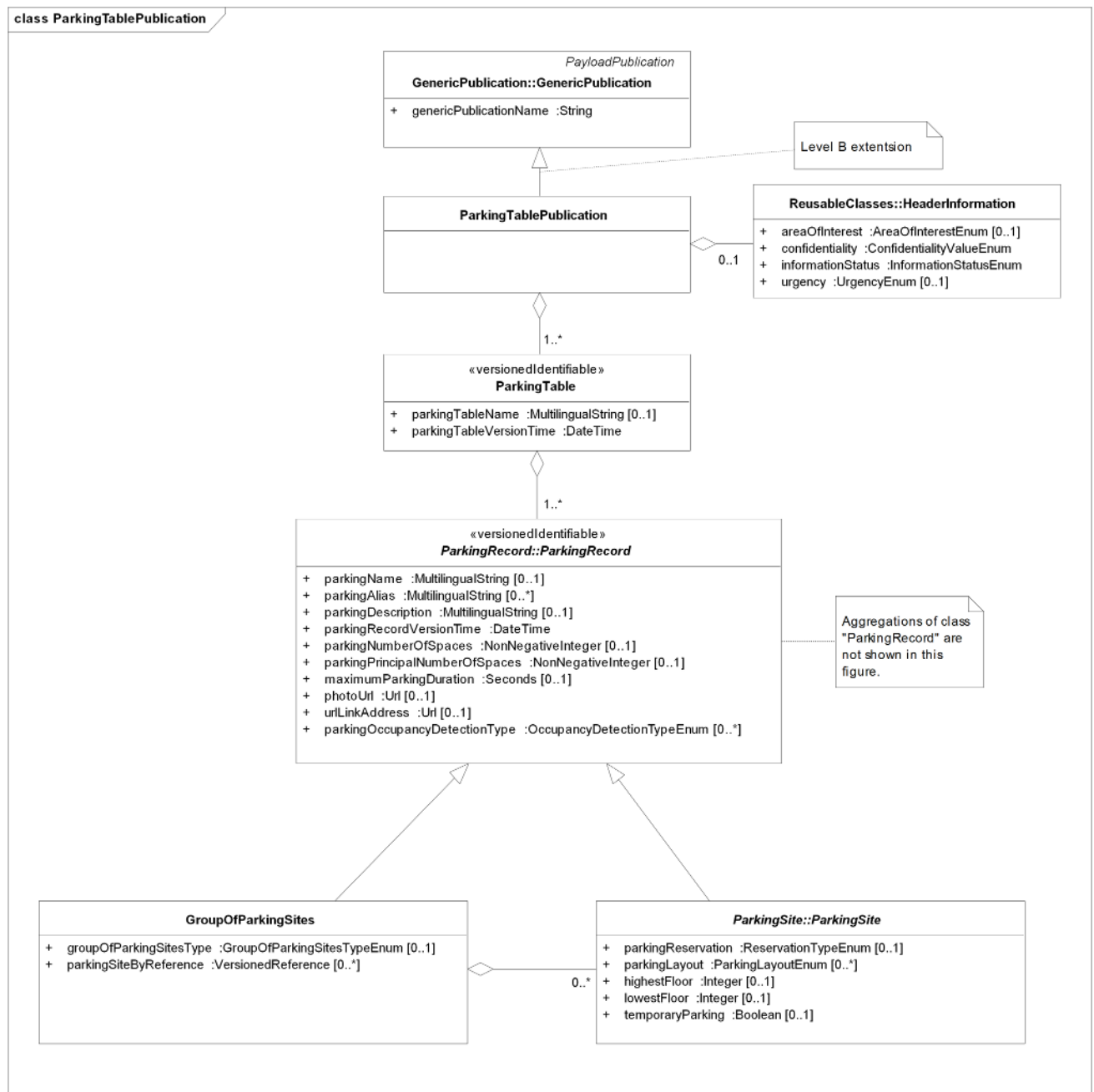


Figure 2 — The “ParkingTablePublication” package class model

8.2.2 Semantics of the “ParkingTablePublication” package

8.2.2.1 “ParkingTablePublication” package semantics – general

The “ParkingTablePublication” package shall support the definition of a hierarchy out of parking sites using a ParkingTable. Properties for these elements are specified in the following packages below.

8.2.2.2 “ParkingTablePublication” Class

The “ParkingTablePublication” class is a specific realisable case of a “GenericPublication” (see Clause 7.2). It shall be specified as a DTEX II “Level B extension”. Each “ParkingTablePublication” shall contain one or more separate “ParkingTable”.

The “ParkingTablePublication” class is the base class for containing the published “ParkingTable”.

Each instance of a “ParkingTablePublication” may have associated metadata contained in an instance of the “HeaderInformation” class, which allows the supplier of the “ParkingTablePublication” to specify how the recipient should treat the information contained in it. This class is defined in Part 3 of CEN/TS 16157.

8.2.2.3 “ParkingTable” Class

The “ParkingTable” class shall be of stereotype “versionedIdentifiable” to be referenced in the dynamic part of the model.

Each instance of a “ParkingTable” may contain one or more instances of the “ParkingRecord” class, which shall contain characteristics, and information both for a group of parking sites and parking sites. Details about the “ParkingRecord” class are found in Clause 8.3.

8.2.2.4 “GroupOfParkingSites” Class

An instance of the “GroupOfParkingSites” class shall be a specialisation of the “ParkingRecord” class. A group of parking sites is a logical composition of parking sites with common properties that can be aggregated (such as the number of parking spaces).

The type of the group of parking sites can be specified with the “groupOfParkingSitesType” attribute. Examples of a “GroupOfParkingSites” are an urban parking zonal area (for example called “city west”) or all truck parking sites along a specific motorway.

Each instance of the “GroupOfParkingSites” class may contain zero, one or more instances of the “ParkingSite” class, i.e. it is allowed (but not mandatory) to specify the enclosed parking sites of this group of parking sites. With the attribute “parkingSiteReference”, it is also possible to reference enclosed parking sites that have been specified earlier.

8.3 The “ParkingRecord” package

8.3.1 Overview of the “ParkingRecord” package

The “ParkingRecord” package (see Figure 3 up to Figure 6) shall support provision of common information on a group of parking sites and parking sites.

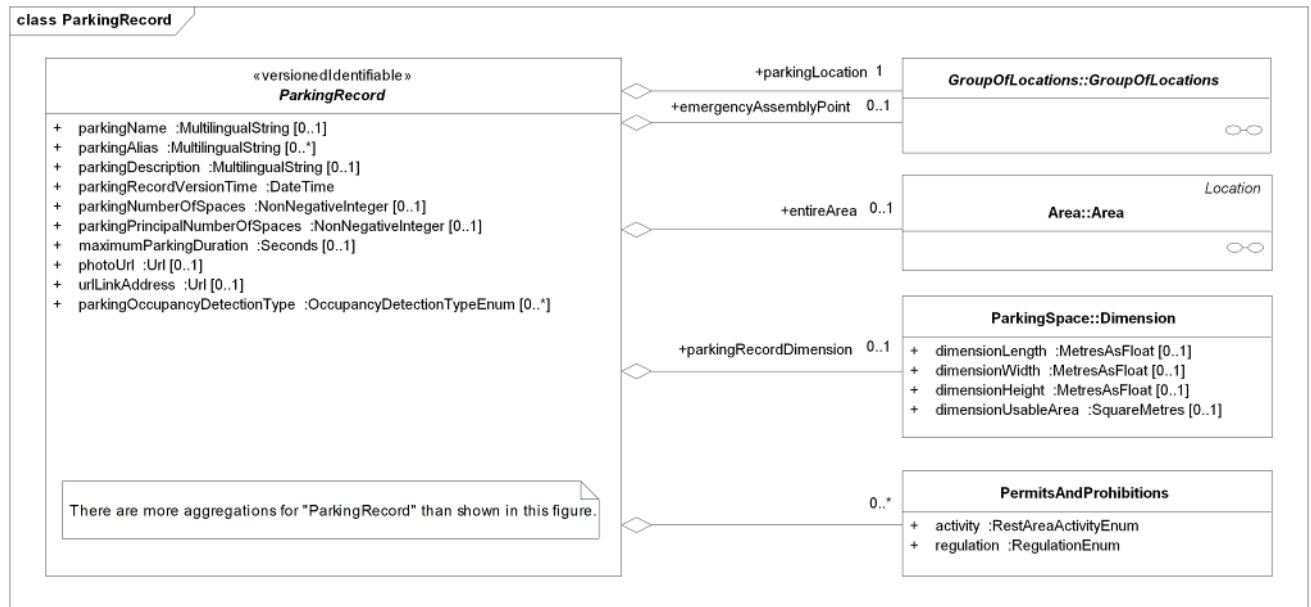


Figure 3 — The “ParkingRecord” package class model (I)

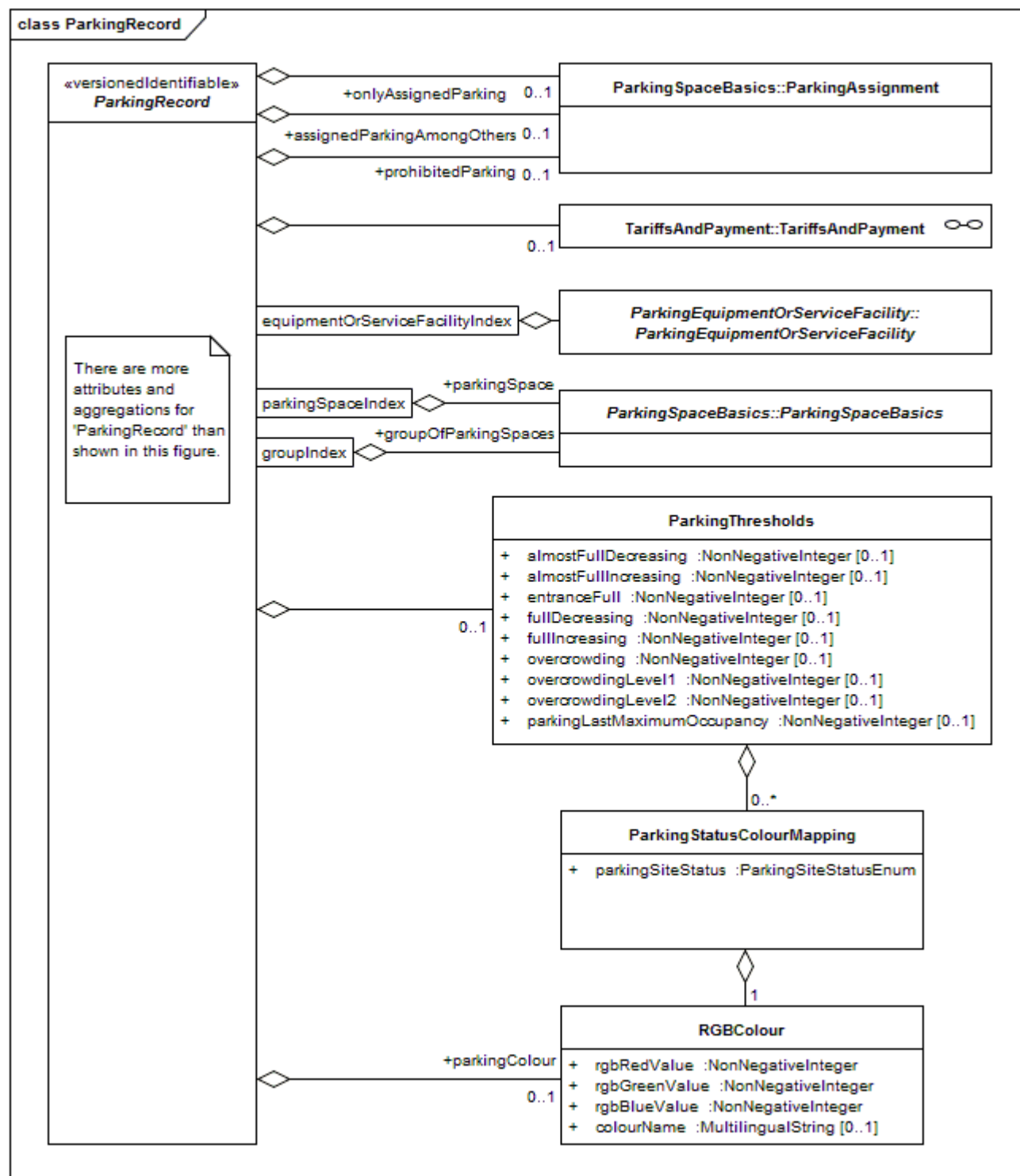


Figure 4 — The “ParkingRecord” package class model (II)

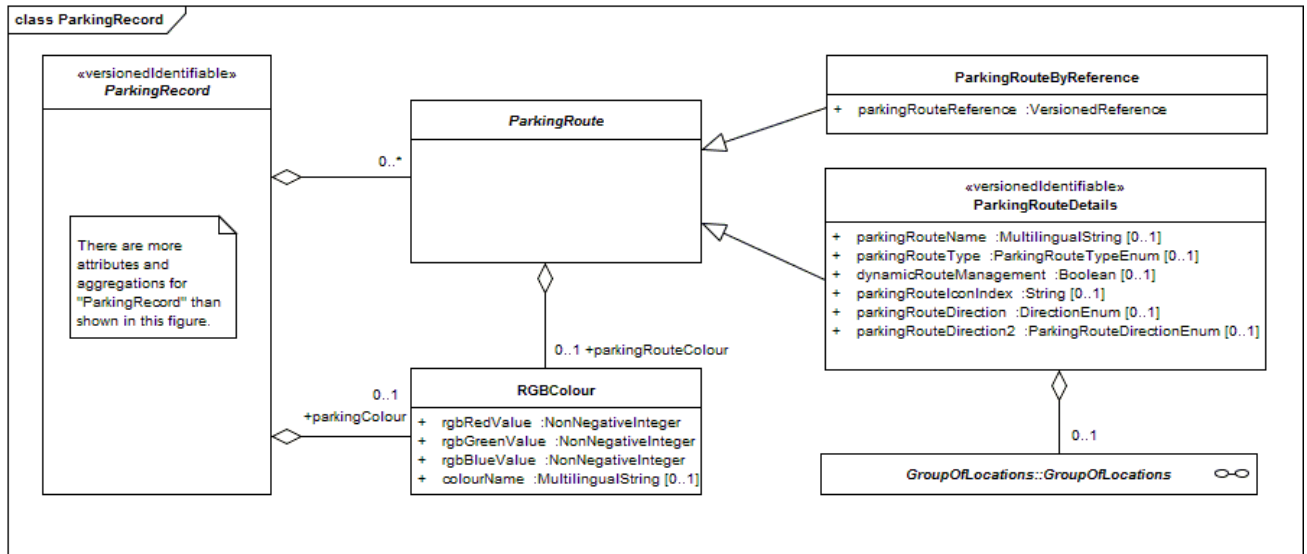


Figure 5 — The “ParkingRecord” package class model (III) - (focus Route)

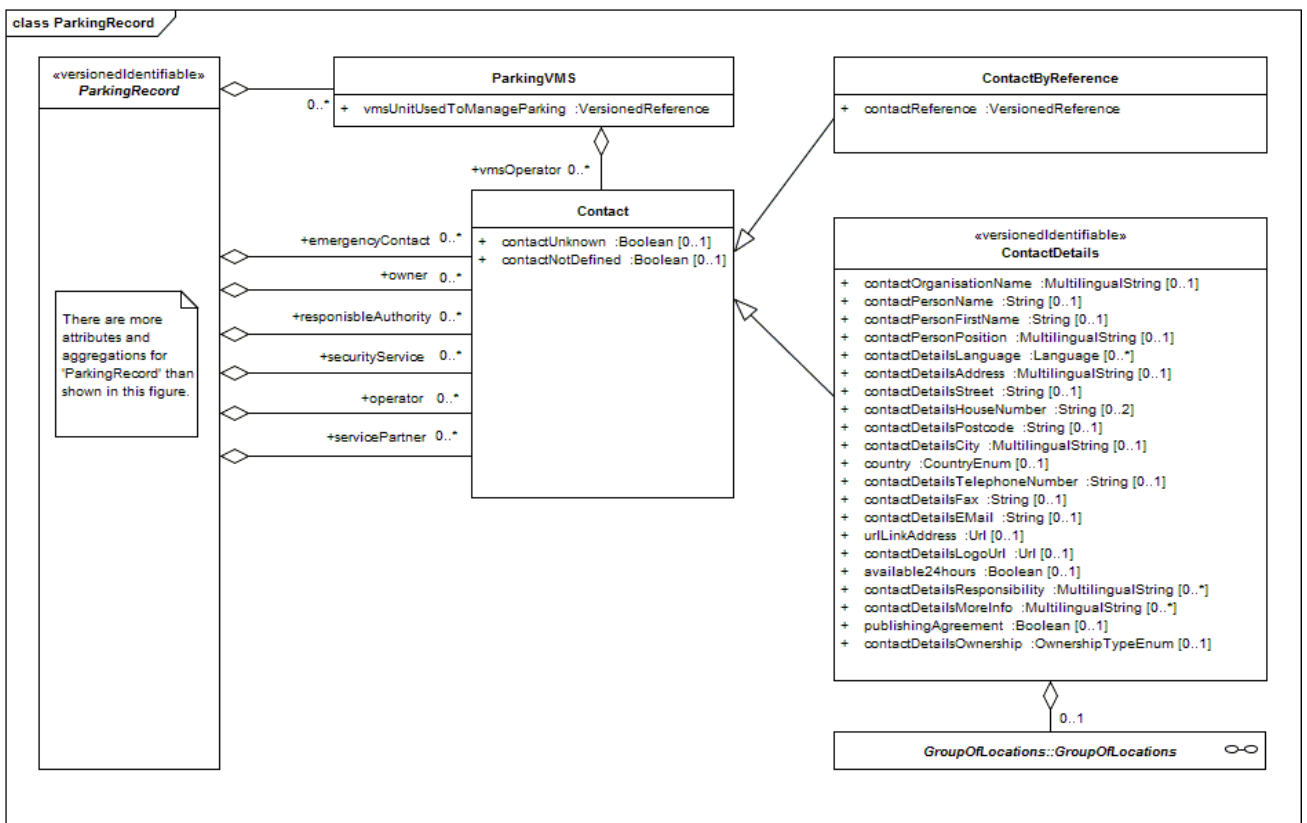


Figure 6 — The “ParkingRecord” package class model (IV) - (focus Contact)

8.3.2 Semantics of the “ParkingRecord” package

8.3.2.1 “ParkingRecord” package semantics – general

The “ParkingRecord” package shall allow the specification of basic information for parking sites or group of parking sites, including (among others) information concerning:

- name, number of spaces, methods of detection, etc.
- thresholds for the applicability of enumeration values in the dynamic part of the Parking Publications model including the definition of a mapping for colours to different occupancy states
- defined sets of contact information (e.g. for owners, operators, responsible authorities, emergency services, etc.)
- sets of allowed and prohibited activities
- related parking guidance systems (variable message signs) and routes.

With classes from other packages (as defined below), the semantics of the “ParkingRecord” package may be enhanced by:

- a range of information about the physical characteristics of the parking site(s), accessibility or special assignments either for a single parking space or a group of parking spaces (see the “ParkingSpaceBasics” package, Clause 8.12)
- usage assignments for parking site(s) (i.e. prohibited for special users or vehicles, particularly suitable for special users or vehicles, definition of availability timeslots, ...) (see “ParkingSpaceBasics” package, Clause 8.12)
- information about tariffs (see “TariffsAndPayment” package, Clause 8.10.2)
- available equipment (e.g. toilets, showers etc.) or service facilities (e.g. restaurants, shops, ...). All this information can be provided in a more complex and detailed manner (see “ParkingEquipmentOrServiceFacility” package, Clause 8.8).
- the dimensions of the Parking site(s) (see class “Dimension” in Clause 8.11.2.4), including the available space for parking given in square metres.

8.3.2.2 “ParkingRecord” Class

The “ParkingRecord” class shall be abstract and shall be of stereotype “versionedIdentifiable”. It shall be specialised by using the “GroupOfParkingSites” class or the “ParkingSite” class.

The abstract “ParkingRecord” class may provide basic information for parking site(s) in the form of attributes, for instance, name and alias name, description, timestamp and capacity (number of places) may be specified.

A parking record may be assigned with a colour and associated with routes and parking guidance VMS.

Special usage assignments may be specified (for example for special users or vehicles, combined with accepted forms of validity). It is also possible to prohibit the usage for special assignments. Instances of the “ParkingAssignment” class may be created for the roles “onlyAssignedParking”, “assignedParkingAmong Others” or “prohibitedParking”.

Tariffs and payment for the parking record may be specified as well as available equipment (e.g. toilets, showers etc.) or available service facilities (e.g. restaurants, shops etc.). All this information can be provided in a more complex and detailed manner. Instances of “ParkingEquipmentOrServiceFacility” shall be indexed to be referenced in the “ParkingEquipmentOrServiceFacilityStatus” class.

Complex information about single parking spaces as well as grouped parking spaces may be specified using the class “ParkingSpaceBasics” (with the specialisation “ParkingSpace” or “GroupOfParkingSpaces”). Instances of “ParkingSpaceBasics” shall be indexed to be referenced in the “ParkingSpaceStatus” or the “GroupOfParkingSpacesStatus” class.

8.3.2.3 “ParkingThresholds” Class

An instance of the “ParkingThresholds” class may provide configuration parameters of the parking record used (amongst others) for the dynamic attribute “parkingSiteStatus” (in the class “ParkingSiteStatus”) or for overcrowding levels:

- “almostFullDecreasing” indicates the number of available spaces above which the state of the parking site is considered to change from 'almost full' to 'spaces available' as the site's occupancy decreases. The value of the “almostFullDecreasing” threshold must be greater than or equal to 'almostFullIncreasing' threshold value.
- “almostFullIncreasing” indicates the number of available spaces below which the state of the parking site is considered to change from 'spaces available' to 'almost full' as the site's occupancy increases. The value of the “almostFullIncreasing” threshold must be lower than or equal to “almostFullDecreasing” threshold value and greater than the ‘fullDecreasing’ threshold value.
- “entranceFull” indicates the number of available spaces below which the parking site is considered to be 'full' at its entrance (e.g. full sign is displayed at entrance or on related VMS).
- “fullDecreasing” indicates the number of available spaces above which the state of the parking site is considered to change from 'full' to 'almost full' as the site's occupancy decreases. The “fullDecreasing” threshold value must be greater than or equal to 'fullIncreasing' value and lower than 'almostFullIncreasing' value.
- “fullIncreasing” indicates the number of available spaces below which the state of the parking site is considered to change from 'almost full' to 'full' as the site's occupancy increases. The “fullIncreasing” threshold value must be lower than or equal to 'fullDecreasing' value.
- “overcrowding” indicates the number of vehicles on the parking above which the overcrowding state of the parking site is considered to change to “overcrowding”. Can be used as an alternative to the following overcrowding level attributes.
- “overcrowdingLevel1” indicates the number of vehicles on the parking site above which the overcrowding state of the parking site is considered to change from “notOvercrowded” to “overcrowdingLevel1”. The “overcrowdingLevel1” threshold must be lower than the “overcrowdingLevel2” value.
- “overcrowdingLevel2” indicates the number of vehicles on the parking site above which the overcrowding state of the parking site is considered to change from “overcrowdingLevel1” to “overcrowdingLevel2”. The “overcrowdingLevel2” threshold must be greater than the “overcrowdingLevel1” value.
- “parkingLastMaximumOccupancy” indicates the last known occupancy (number of parked vehicles on the site) under safe conditions.

This class with all of its attributes may be overridden in the dynamic part of the model to adjust support frequent adjustment of the threshold values.

A mapping of parking site states to different colours may be done with the aggregation to “ParkingStatusColour Mapping”.

For further explanation on the semantics of these attributes, see Clause C.2.2.

8.3.2.4 “ParkingStatusColourMapping” Class

Each instance of this class shall define a pair of a 'parkingSiteStatus' enumeration literal and a corresponding colour.

8.3.2.5 “RGBColour” Class

Each instance of the “RGBColour” class shall define a colour by values of red, green and blue, each given by an integer value between 0 and 255. In addition, a common name for that colour may be specified.

8.3.2.6 “PermitsAndProhibitions” Class

Each instance of the “PermitsAndProhibitions” class shall define a pair of activity and regulation to specify permits and prohibitions valid for the parking record. Examples include 'open fire prohibited' or 'smoking only outside buildings'.

8.3.2.7 “ParkingVMS” Class

Each instance of the “ParkingVMS” class shall define a versioned reference to an instance of the class “VmsUnitRecord” (defined in CEN-TS 16157-4) to identify VMS related to this parking record. A “vmsOperator” role may be defined with address and contact information as defined in the “ContactDetails” class.

8.3.2.8 “Contact” Class

Instances of the “ContactDetails” class may be created for the following roles targeting the “ParkingRecord” class:

- “emergencyContact”
- “owner”
- “responsibleAuthority”
- “securityService”
- “operator”
- “servicePartner”

as well as for the following roles targeting the “ParkingSite” class:

- “parkingSiteAddress”
- “reservationService”

as well as for the role “vmsOperator” targeting the “ParkingVMS” class.

The “Contact” class may be specialised either by using the “ContactByReference” class to reference previously defined contact information or by using the “ContactDetails” class to specify a new set of contact information.

For each instance of the “Contact” class, a validity period may be specified by using the “validityOfContact” role.

8.3.2.9 “ContactByReference” Class

An instance of this class shall reference a previously defined set of contact information.

8.3.2.10 “ContactDetails” Class

The “ContactDetails” class shall be of stereotype “versionedIdentifiable”.

An instance of the “ContactDetails” class shall describe detailed contact and address information for an organisation or facility (including contact person information, location information, information about the ownership model, the 24 hour-availability or the corresponding logo URL).

8.3.2.11 “ParkingRoute” Class

The “ParkingRoute” class shall be abstract and shall be specialised either by using the “ParkingRouteByReference” class to reference a previously defined parking route or by using the “ParkingRouteDetails” class to specify a new parking route.

A corresponding colour may be defined for a parking route using the aggregation “parkingRouteColour”.

8.3.2.12 “ParkingRouteByReference” Class

An instance of this class shall reference a previously defined parking route.

8.3.2.13 “ParkingRouteDetails” Class

The “ParkingRouteDetails” class shall be of stereotype “versionedIdentifiable”.

An instance of the “ParkingRoute” class shall identify a route on which motorists are guided to this parking record (for instance with help of VMS, see above). A name, a type, an index for an icon, a location (“GroupOfLocation” class; the usage of an “Itinerary” location is suggested for this purpose) as well as the direction may be specified for this route. The Boolean attribute “dynamicRouteManagement” shall indicate, whether the route is part of some dynamic Truck Parking route management.

8.4 The “ParkingSite” package

8.4.1 Overview of the “ParkingSite” package

The “ParkingSite” package (see Figure 7 and Figure 8) shall comprise a sub-model for specifying details for a parking site.

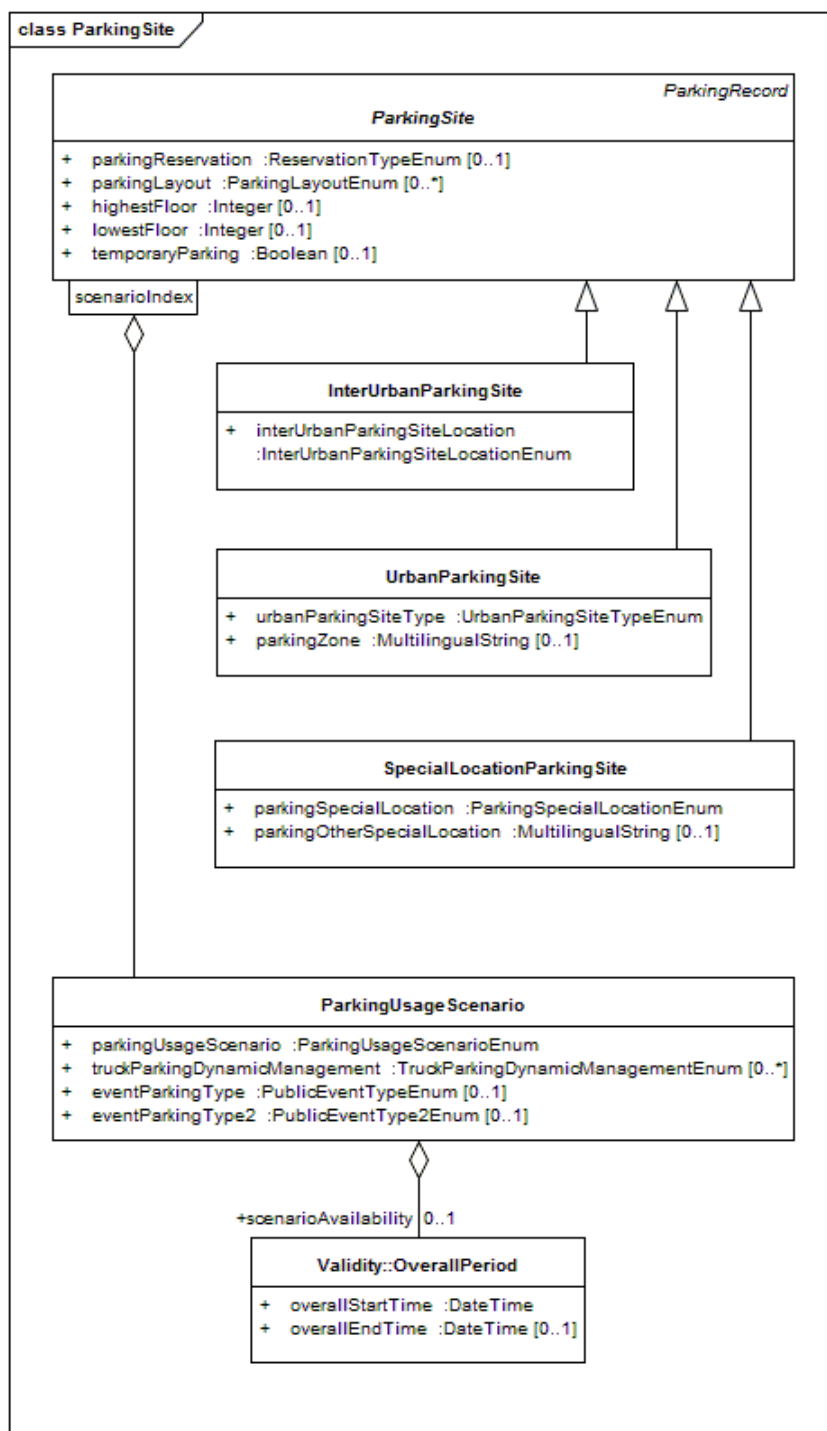


Figure 7 — The “ParkingSite” package class model (I)

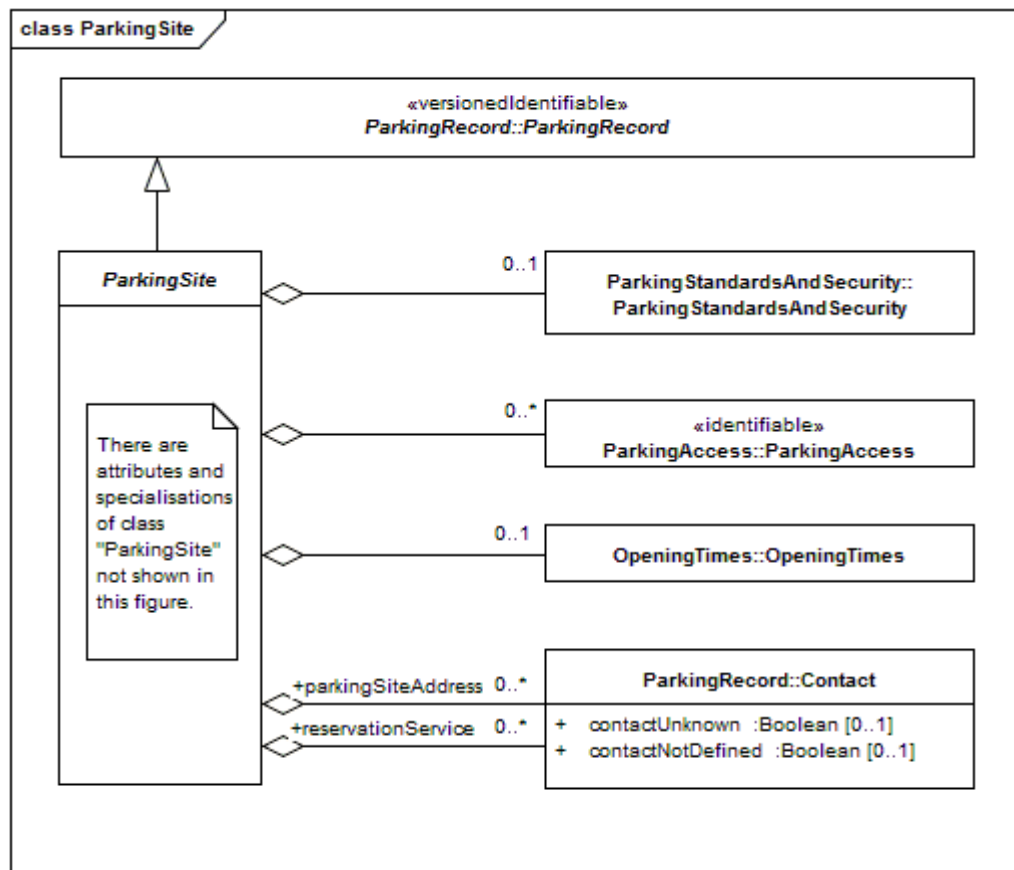


Figure 8 — The “ParkingSite” package class model (II)

8.4.2 Semantics of the “ParkingSite” package

8.4.2.1 “ParkingSite” package semantics – general

A parking site is a building, structure or identifiable (geographically bounded) space that is used for parking. In addition to the “ParkingRecord” class, of which the “ParkingSite” class shall be a specialisation, further characteristics can be specified. These are, for example, layout, standards and security measures (using the “ParkingStandardsAndSecurity” class defined in Clause 8.15), the address (using the “Contact” class defined in Clause 8.3.2.8), entrances and exits (using the “ParkingAccess” class defined in Clause 8.7) or opening times (using the “OpeningTimes” class defined in Clause 8.6).

8.4.2.2 “ParkingSite” Class

The “ParkingSite” class shall be abstract. It shall be specialised by using the “InterUrbanParkingSite” class, the “UrbanParkingSite” class or the “SpecialLocationParkingSite” class.

The “ParkingSite” class shall contain the characteristics information relating to one of the specialised types of parking site beyond the information given with the “ParkingRecord” generalisation.

Some characteristics for a parking site include:

- The address of the parking site may be specified using the “Contact” class defined in Clause 8.4.2.8

- “parkingReservation” may specify the possibility of making reservations for parking usage; in addition, “reservationService” may specify contact information for the reservation service using the “Contact” class defined in Clause 8.3.2.8.
- Opening times for the parking site may be specified using the “OpeningTimes” class defined in Clause 8.6.
- Standards and security measures of the parking site such as the LABEL security and service level [2], [3], fences or CCTV may be specified using the “ParkingStandardsAndSecurity” class defined in Clause 8.15.
- Entrances and exits of the parking site (with additional information like name, location, special assignments and characteristics) may be specified using the “ParkingAccess” class defined in Clause 8.7.
- The layout of the parking site (e.g. multi-storey, open space, etc.) may be specified with the attribute “parkingLayout”; in addition, the highest and lowest floor can be specified, if applicable.

NOTE Modeling a Truck Parking site is not limited to the use of the “InterUrbanParkingSite” specialisation, as there exist urban truck parkings, too, for example. Rather, a Truck Parking site shall be determined by the use of the “ParkingUsageScenario” class with “parkingUsageScenario” = “truckParking”.

8.4.2.3 “InterUrbanParkingSite” Class

An instance of the “InterUrbanParkingSite” class shall be used when specifying a parking site, which is located in an interurban environment. Its location can be specified as being directly adjacent or nearby a motorway, being a layby or interurban on street parking.

8.4.2.4 “UrbanParkingSite” Class

An instance of the “UrbanParkingSite” class with mandatory “urbanParkingSiteType” specifies an urban on-street parking site (at the side of the road) or an urban off-street parking site (any other type of urban car park or parking site).

A parking zone within a defined parking site may be specified in textual form with attribute “parkingZone”.

8.4.2.5 “SpecialLocationParkingSite” Class

An instance of the “SpecialLocationParkingSite” class shall be used when specifying a parking site, which is directly linked to some special location like a train station, leisure park, shopping centre etc.

8.4.2.6 “ParkingUsageScenario” Class

An instance of the “ParkingUsageScenario” class shall specify a special usage scenario for a parking site or for a (group of) parking space(s), optionally linked with a validity period. Examples for scenarios are Truck Parking, park & ride, car sharing or event parking.

Instances of the class “ParkingUsageScenario” shall be indexed in order to reference the corresponding objects in the dynamic part of the Parking Publications model in class “ParkingUsageScenarioStatus”.

When using the “truckParking” scenario, the attribute “truckParkingDynamicManagement” may specify compact parking or queue parking, which are special types of truck parking management (see Clause C.1.12 for details).

When using the “eventParking” scenario, the attributes “eventParkingType” or “eventParkingType2” may specify the corresponding event.

NOTE The enumeration “PublicEventTypeEnum”, which is used by the attribute “eventParkingType” is standardised in CEN/TS 16157 Part 3. Thus, it is part of DATEX Level A. As this list of elements is not sufficient for the purpose of this Part, a second enumeration “PublicEventType2Enum” with additional literals is specified here in this Part (used by attribute “eventParkingType2”).

8.5 The “PolygonArea” package

8.5.1 Overview of the “PolygonArea” package

The “PolygonArea” package (see Figure 9) shall provide possibilities to describe a geographical bounded area. The “Area” class defined in CEN/TS 16157-2 shall be extended for this purpose.

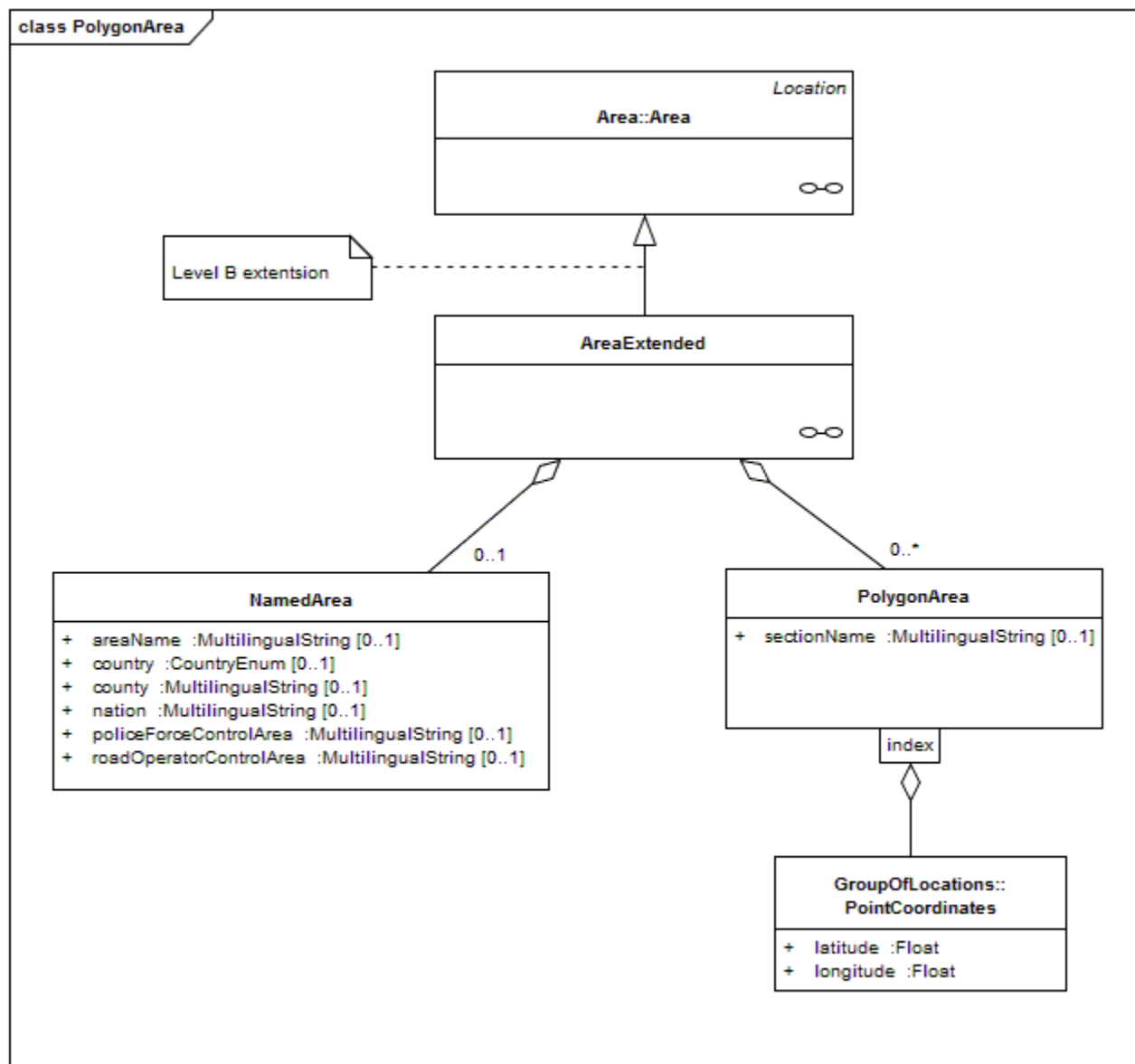


Figure 9 — The “PolygonArea” package class model

8.5.2 Semantics of the “PolygonArea” package

8.5.2.1 “PolygonArea” package semantics – general

An area – represented by an “AreaExtended” instance - may be described with instances of the “Polygon Area” and/or “GeographicArea” classes.

8.5.2.2 “AreaExtended” Class

The “AreaExtended” class is a helper class to attach the “GeographicArea” and “PolygonArea” classes. It shall be specified as a DATEX II “Level B extension”.

8.5.2.3 “PolygonArea” Class

An instance of the “PolygonArea” class shall describe the location of an area in terms of a closed polyline. This shall be done with a number of ordered coordinates (class “PointCoordinates”, defined in CEN/TS 16157-2).

8.5.2.4 “NamedArea” Class

An instance of the “NamedArea” class shall describe the location of an area in terms of the area name itself, a country, county, nation, police force control area or road operator control area. If more than one of these descriptors is used, the smallest geographic intersection of them defines the resulting area.

NOTE If this class is used together with a Georeference for an area, it is assumed that this class defines a name for the area given by the Georeference. You need to beware of creating ambiguities (e.g. the Polygon area of some city correlated to some false country).

8.6 The “OpeningTimes” package

8.6.1 Overview of the “OpeningTimes” package

The “OpeningTimes” package (see Figure 10) uses and extends the “Validity” package defined in CEN/TS 16157-3 to provide a generic structure for opening times. In the context of the Parking Publications, the “OpeningTimes” package may be used for specifying

- opening times for a parking site
- opening times for parking accesses
- and the availability times for equipment or opening times for service facilities.

NOTE In addition, the “OverallPeriod” class may be used to specify a validity for

- charge bands
- contacts
- parking status
- parking usage scenario
- and parking vehicle

directly (i.e. without using the “OpeningTimes” class).

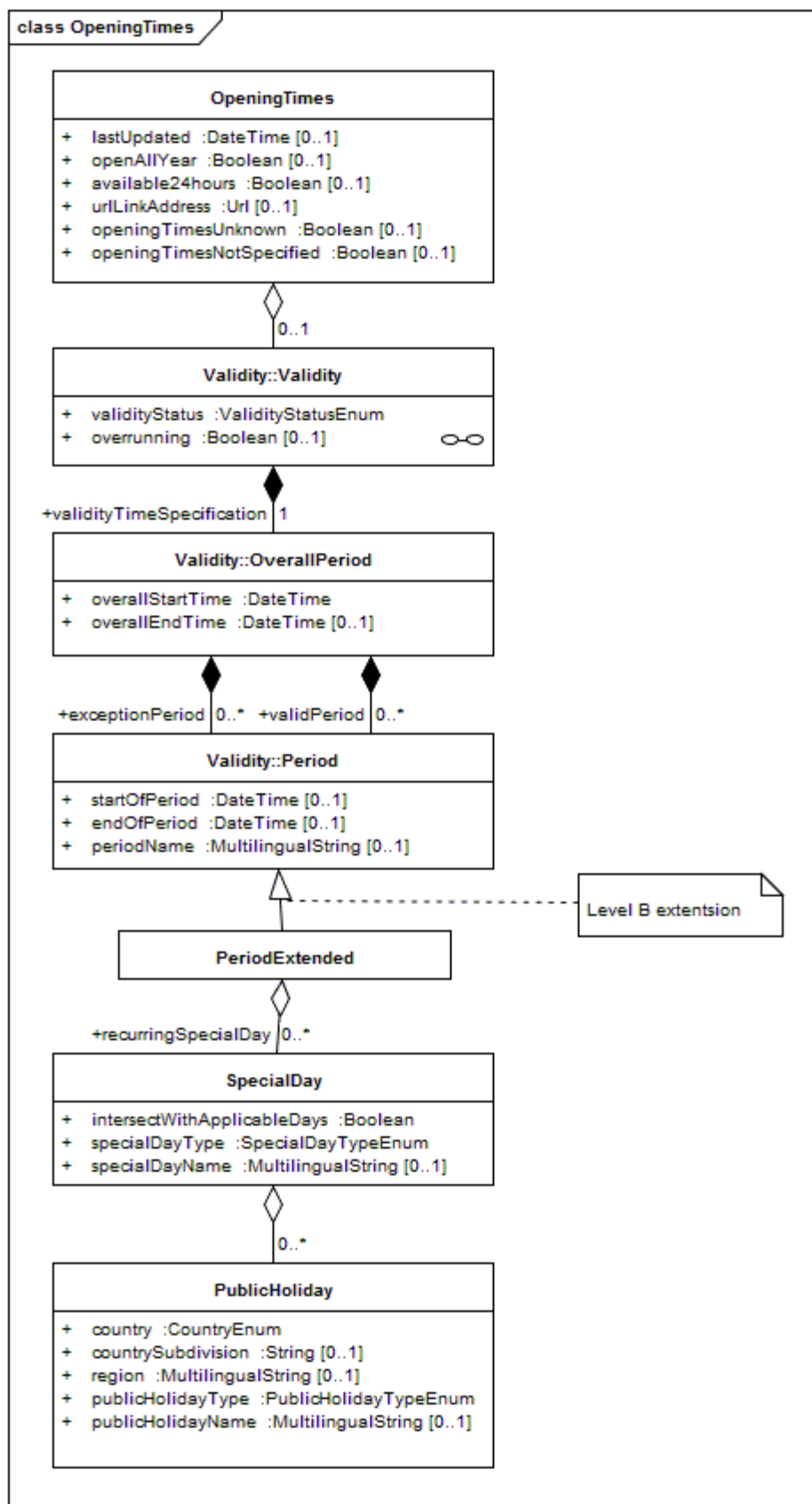


Figure 10 — The “OpeningTimes” package class model

8.6.2 Semantics of the “OpeningTimes” package

8.6.2.1 “OpeningTimes” package semantics – general

The “OpeningTimes” package shall support provision of information to describe opening times, i.e. valid times for the availability or usability of a building, service facility etc.

8.6.2.2 “OpeningTimes” Class

An instance of the “OpeningTimes” class shall describe the availability or usability ('opening times') of a building, service facility etc. in terms of the “Validity” class defined in CEN/TS 16157-3. In the context of the Parking Publications, opening times may be specified for a parking site, for parking accesses or for service facilities as well as for the availability times of equipment.

The class shall provide attributes for a timestamp of the last update, for the indication of 24 hour or all-year opening, for a URL with further opening time information as well as for the indication of unknown or unspecified opening times.

8.6.2.3 “PeriodExtended” Class

The “PeriodExtended” class shall be a technical construct to attach the “SpecialDay” and “PublicHoliday” classes to the DATEX II Level A model. It shall be specified as a DATEX II “Level B extension”.

8.6.2.4 “SpecialDay” Class

In addition to CEN/TS 16157-3, periods may also be specified in terms of recurring special days (e.g. market day, school day, Election Day, etc.) with one or more instances of the “SpecialDay” class. The special day shall be defined out of an enumeration or by a custom name.

The attribute “intersectWithApplicableDays” shall specify, whether the intersection or the union of special day(s) and other recurring day specifications of DATEX II Level A is considered.

EXAMPLE Together with the DATEX II Level A part (not completely shown in Figure 10), you can specify examples like “on Sundays and public holidays” or “on Thursdays, Fridays but not on market days” now.

If the special day is a public holiday, it may be further specified with the “PublicHoliday” class.

8.6.2.5 “PublicHoliday” Class

An instance of the “PublicHoliday” class may specify a day as a holiday in a specific country and region.

8.7 The “ParkingAccess” package

8.7.1 Overview of the “ParkingAccess” package

The “ParkingAccess” package (see Figure 11) shall support information about entrances, exits or both belonging to parking sites. It uses an aggregation to the “Location” class defined in CEN/TS 16157-2.

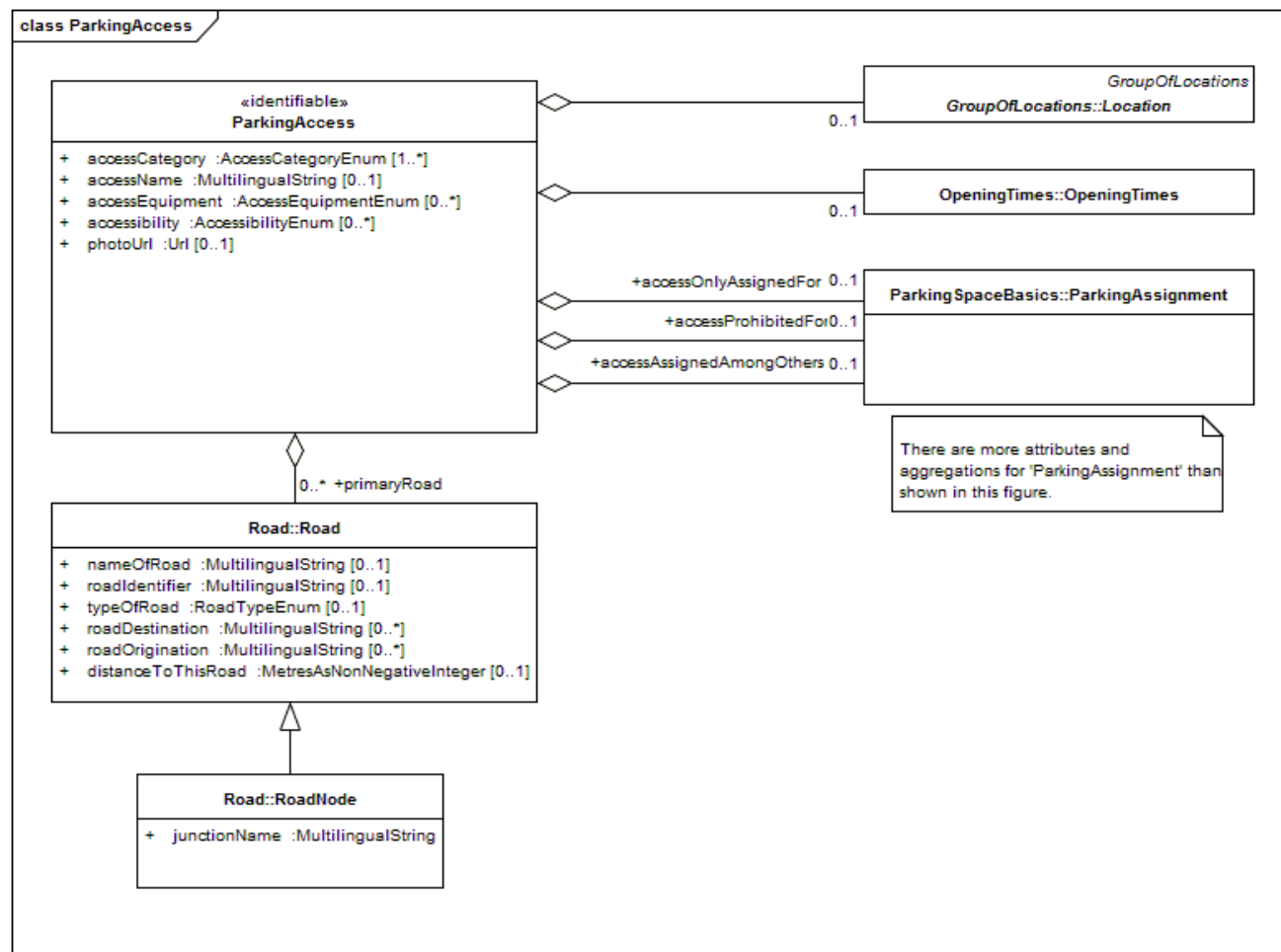


Figure 11 — The “ParkingAccess” package class model and the “Road” package class model

8.7.2 Semantics of the “ParkingAccess” package

8.7.2.1 “ParkingAccess” package semantics – general

The package “ParkingAccess” shall provide information about entrances, exits or both belonging to parking sites.

8.7.2.2 “ParkingAccess” Class

Each instance of the “ParkingAccess” class shall describe one entrance, one exit or both in one. The location shall be given in form of a “Location” (defined in CEN/TS 16157 Part 2) and may be supplemented by information of the “Road” class (see Clause 8.8).

The access shall be detailed by one or more categories (vehicle entrance, pedestrian exit, rental car return, emergency exit etc.) and may be enriched by information about accessibility (barrier free, wheelchair accessible etc.), a name, equipment (barrier, ticket machine etc.), or a photo URL.

Using the “ParkingAssignment” class defined in Clause 8.12.2.4 specific allowed or not allowed assignment for this access may be specified, such as specific user groups (for example long- or short-term parkers) or vehicles with specific characteristics etc.

8.8 The “Road” package

8.8.1 Overview of the “Road” package

The “Road” package (see Figure 11 in Clause 8.7.2.1) shall support provision of information about one road or a road node on this road.

8.8.2 Semantics of the “Road” package

8.8.2.1 “Road” package semantics – general

The package “Road” shall provide information about one road or a road node on this road.

8.8.2.2 “Road” Class

An instance of the “Road” class may support provision of information about the name of the road, the road identifier, the road type, its destination and origin (in form of multilingual strings) and the distance to this road (the reference point for this distance depends on the target object).

The “Road” class may be specialised using the “RoadNode” class.

In the context of the Parking Publications, a number of primary neighbouring roads may be specified (i.e. primary roads, from which the parking site is accessible).

8.8.2.3 “RoadNode” Class

The “RoadNode” class shall be a specialisation of the “Road” class and shall define a road node of type junction on the road given by the “Road” class’s elements. As the primary use for this class is to describe a road node of type junction (e.g. on a motorway), the road node shall be specified by the corresponding junction name.

8.9 The “ParkingEquipmentOrServiceFacility” package

8.9.1 Overview of the “ParkingEquipmentOrServiceFacility” package

The “ParkingEquipmentOrServiceFacility” package (see Figure 12) may support providing detailed information about available equipment or service facilities on the parking site or on a (group of) parking space(s).

It may provide additional information about electric charging stations.

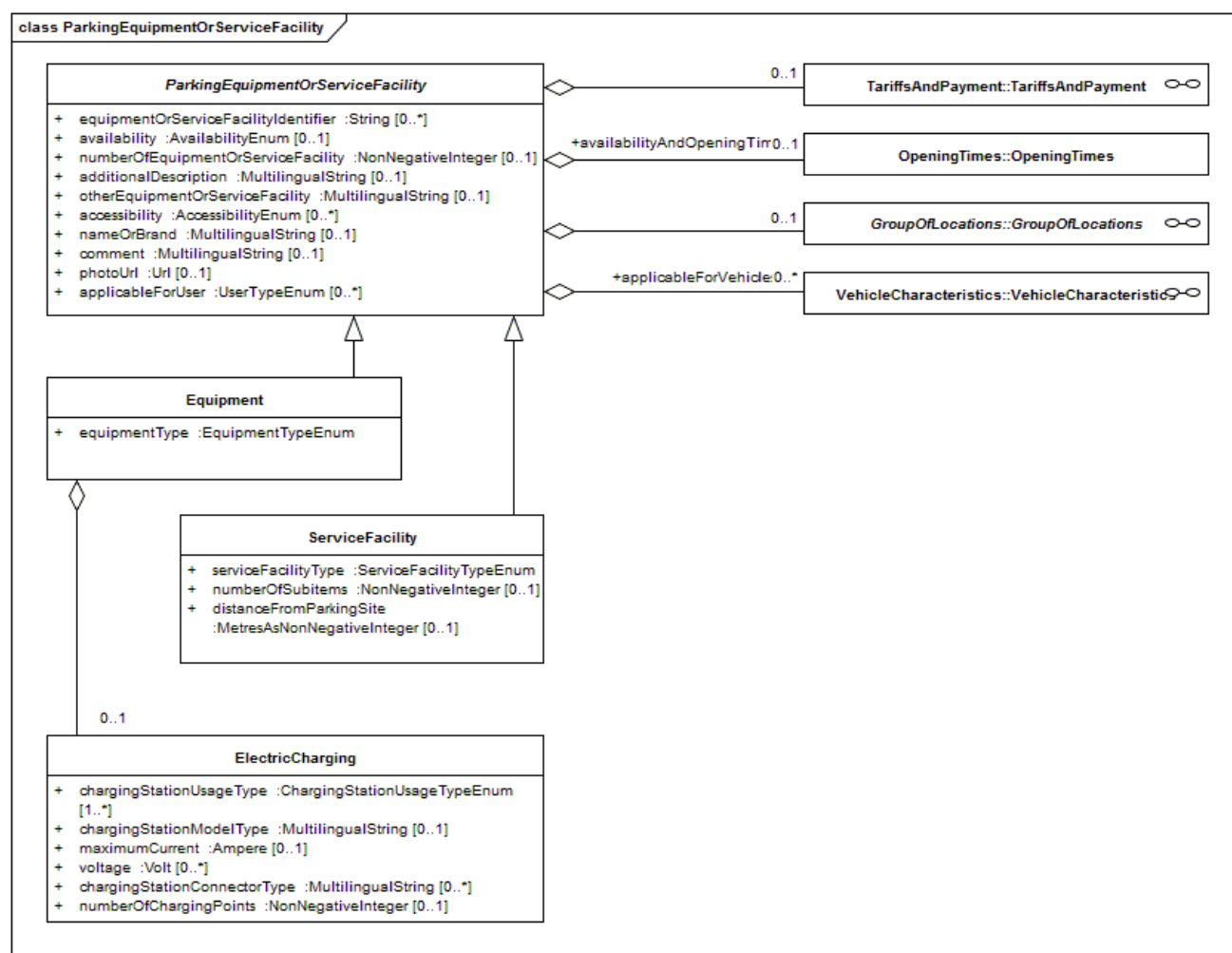


Figure 12 — The “ParkingEquipmentOrServiceFacility” package class model

8.9.2 Semantics of the “ParkingEquipmentOrServiceFacility” package

8.9.2.1 “ParkingEquipmentOrServiceFacility” package semantics – general

The package “ParkingEquipmentOrServiceFacility” shall describe exactly one type of available equipment or one type of service facility that is available on the parking site or on a (group of) parking space(s).

Available equipment is some infrastructure element that provides a service or capability to users; Examples are toilets, elevators, internet access or waste bins. Example of service facilities are restaurants, petrol stations or a truck wash.

The class “ParkingEquipmentOrServiceFacility” shall be abstract and shall be specialised by one instance out of “Equipment” or “ServiceFacility”.

For the specification of further details of the equipment ‘electric charging station’, the class “ElectricCharging” may be used.

In the dynamic part of the model, a reference to each element may be used to give explicit information about the availability of the specific element.

8.9.2.2 “ParkingEquipmentOrServiceFacility” Class

Each instance of the “ParkingEquipmentOrServiceFacility” class shall describe exactly one type of available equipment or one type of service facility that is available on the parking site or on a (group of) parking space(s) (here within further called ‘element’).

The element may be enhanced with additional information, for example

- its number or its availability in boolish terms,
- a description and a comment,
- the name or brand of the service provided,
- accessibility information (e.g. handicapped or wheelchair accessible),
- restriction to particular users,
- opening times (class “OpeningTimes”, see Clause 8.6.2.2),
- a fee (class “TariffsAndPayment” in Clause 8.10),
- its location (class “GroupOfLocations”, defined in CEN/TS 16157-2)
- or applicable vehicles, defined by their characteristics (class “VehicleCharacteristics”, defined in CEN/TS 16157-3).

The number of the element – with respect to the restrictions mentioned above - may be defined for each element by the attribute “numberOfEquipmentOrServiceFacility”.

EXAMPLES 5 toilets, 1 restaurant, 2 toilets for handicapped people, 2 toilets for men; note that for each example one instance of the class “ParkingEquipmentOrServiceFacility” is necessary.

Opening times for the element may be specified (i.e. a regular time schedule, at which the element should be available or open). Examples would be the opening times of toilets or restaurants. Please note that different opening times (e.g. for more than one restaurant) require multiple instances of the “ParkingEquipmentOrServiceFacility” class.

The current availability of the element may be specified in the dynamic part of the Parking Publications model in the class “ParkingEquipmentOrServiceFacilityStatus”.

NOTE For service facilities, it is possible to define the amount of sub items within the specialisation class. Thus, for example, it is possible to define that there are 5 restaurants with 300 restaurant places in total or 1 medical facility with 2 surgeries. See Table 1 for details.

8.9.2.3 “Equipment” Class

Each instance of the “Equipment” class shall define exactly one type of equipment (e.g. toilets, elevators, wireless internet etc.) available on the parking site or on a (group of) parking space(s).

8.9.2.4 “ServiceFacility” Class

Each instance of the “ServiceFacility” class shall define exactly one type of service facility (e.g. restaurants, shops etc.) available on or accessible from the parking site. For the latter case, the distance between parking site and service facility may be specified with attribute “distanceFromParkingSite”.

The number of subitems for this service facility may be specified (example: total number of restaurant places). Table 1 shall specify the usage of the attributes “numberOfEquipmentOrServiceFacility” and “numberOfSubitems” for each literal of “ServiceFacilityTypeEnum”. If there is a hyphen character in the table, use of the “numberOfSubitems” attribute is not permitted in this case.

Table 1 — Semantics of the amount of additional service facility sub items

"serviceFacilityType"	"numberOfEquipmentOrServiceFacility"	"numberOfSubitems"
hotel	number of hotels	total number of hotel rooms
motel	number of motels	total number of motel rooms
overnightAccommodation	number of overnight accommodations	total number of overnight accommodation spaces
shop	number of shops	-
kiosk	number of kiosks	-
foodShopping	number of food shopping facilities	-
cafe	number of cafes	total number of cafe places
restaurant	number of restaurants	total number of restaurant places
restaurantSelfService	number of self-service restaurants	total number of self-service restaurant places
motorwayRestaurant	number of motorway restaurants	total number of motorway restaurant places
motorwayRestaurantSmall	number of small motorway restaurants	total number of small motorway restaurant places
sparePartsShopping	number of spare parts shopping facilities	-
petrolStation	number of petrol stations	total number of fuel dispensers
vehicleMaintenance	number of vehicle maintenance facilities	total number of vehicle maintenance places
tyreRepair	number of tyre repair facilities	total number of tyre repair places
truckRepair	number of truck repair facilities	total number of truck repair places
truckWash	number of truck wash facilities	total number of truck washing lines
carWash	number of car wash facilities	total number of car washing lines
pharmacy	number of pharmacies	-
medicalFacility	number of medical facilities	total number of surgeries
police	number of police stations	total number of police station counters
touristInformation	number of tourist information	total number of tourist information counters
bikeSharing	number of bike sharing facilities	total number of available bikes (roughly)
docstop	number of doc stop facilities	total number of surgeries
laundry	number of laundries	total number of washing machines
leisureActivities	number of leisure activity facilities	-
unknown	-	-
other	<i>depends on "otherEquipmentOrServiceFacility" (free text)</i>	

Note: The number of sub items always implies that they can be used simultaneously.

Thus for most elements this means a sufficient number of employees (tourist information, police, vehicle maintenance, ...)

8.9.2.5 “ElectricCharging” Class

An instance of the class “ElectricCharging” may be only used in case the value of the attribute “equipmentType” (in class “Equipment”) is specified as “electricChargingStation”. Additional information like the usage (charging for vehicles, motorcycles, motorhomes, etc.), type and connector type as well as voltage and maximum current may be specified with this class. In the case where

information concerning more than one electric charging station with different parameters are to be published, the class “Equipment” has to be specified more than once.

The number of vehicles or devices, which can be charged simultaneously (sum over all electric charging stations specified with the “numberOfEquipmentOrServiceFacility” attribute) may be specified with the attribute “numberOfChargingPoints”.

8.10 The “TariffsAndPayment” package

8.10.1 Overview of the “TariffsAndPayment” package

The “TariffsAndPayment” package (see Figure 13) shall support provision of information about tariffs and payment. In the context of the Parking Publications model, these can be fees for using a parking record or for using equipment or service facilities (e.g. toilets).

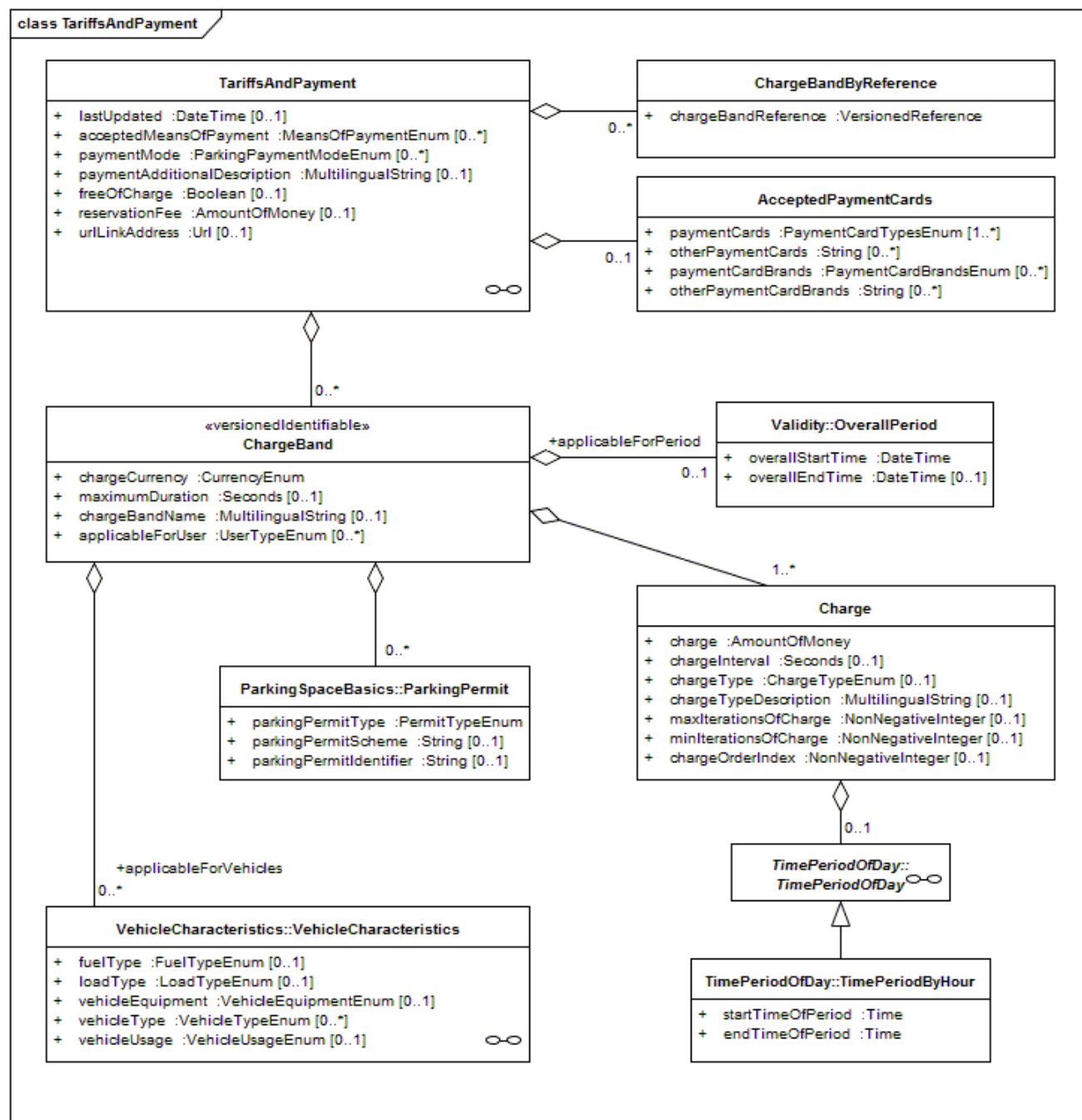


Figure 13 — The “TariffsAndPayment” package class model

8.10.2 Semantics of the “TariffsAndPayment” package

8.10.2.1 “TariffsAndPayment” package semantics – general

The package “TariffsAndPayment” provides a model for (parking) fees, including reservations and season tickets. Different types of charges can be defined according to periods, groups of persons or for different types of vehicles.

8.10.2.2 “TariffsAndPayment” Class

An instance of the “TariffsAndPayment” class shall provide basic information about the (parking) fees such as the accepted means of payment (e.g. cash, payment card etc.), the mode for payment operations (e.g. pay and display, pay by prepaid token, etc.), free parking, etc. Information about a reservation fee and details of accepted payment cards may be also provided. The information may be enhanced by defining the exact fees using the following classes.

Either a charge band may be defined using the class “ChargeBand” or a previously defined charge band may be referenced by using the class “ChargeBandByReference”.

8.10.2.3 “ChargeBandByReference” Class

An instance of this class shall reference a previously defined charge band.

8.10.2.4 “ChargeBand” Class

An instance of the “ChargeBand” class shall define a set of charges (a ‘charge band’). It shall comprise at least one charge element.

The applicability of the charge band may depend on a period (class “OverallPeriod”, defined in CEN/TS 16157-3), on user types and/or on vehicle types (class “VehicleCharacteristics”, defined in CEN/TS 16157-3).

The applicability of the charge band may be further linked to special parking permits defined in the class “ParkingPermit” (see Clause 8.12.2.5).

8.10.2.5 “Charge” Class

Each instance of the “Charge” class shall define one charge that is valid for the corresponding “ParkingChargeBand”. Forcing a special order or follow up of the charges within the charge band may be specified with the three attributes “chargeOrderIndex”, “minIterationsOfCharge” and “maxIterationsOfCharge”. Thus it may be possible to define constructs like ‘first three hours free’, or ‘first 24 hours for 10 Euro, afterwards 5 Euro per day, but not longer than 10 days’.

The charge may be linked to an interval and may be defined within a specified period by hour (class “TimePeriodByHour”, defined in CEN/TS 16157-3).

8.11 The “ParkingSpace” package

8.11.1 Overview of the “ParkingSpace” package

The “ParkingSpace” package (see Figure 14) shall support provision of information about an individual parking space (class “ParkingSpace”) as well as groups of parking spaces (class “GroupOfParkingSpaces”). Both classes shall be specializations of the class “ParkingSpaceBasics” defined in Clause 8.12.2.2.

A group of parking spaces may define its sub elements in form of instances of “ParkingSpace”.

Using an instance of “ParkingSpaceBasics” with specialisation “GroupOfParkingSpaces” shall force the usage of role “groupOfParkingSpaces” from class “ParkingRecord” in combination with quantifier “groupIndex”.

Using an instance of “ParkingSpaceBasics” with specialisation “ParkingSpace” shall force the usage of role “parkingSpace” from class “ParkingRecord” in combination with quantifier “parkingSpaceIndex”.

Using the aggregation between “GroupOfParkingSpaces” and “ParkingSpace” shall force the usage of the quantifier “parkingSpaceIndex”.

Each value for the “parkingSpaceIndex” quantifier shall be unique within the common scope of its two occurrences.

NOTE Instances defined with qualifiers may be referenced in the dynamic part of the model. There will be no distinction in the dynamic part, whether a parking space was defined within a parking record or within a group of parking spaces.

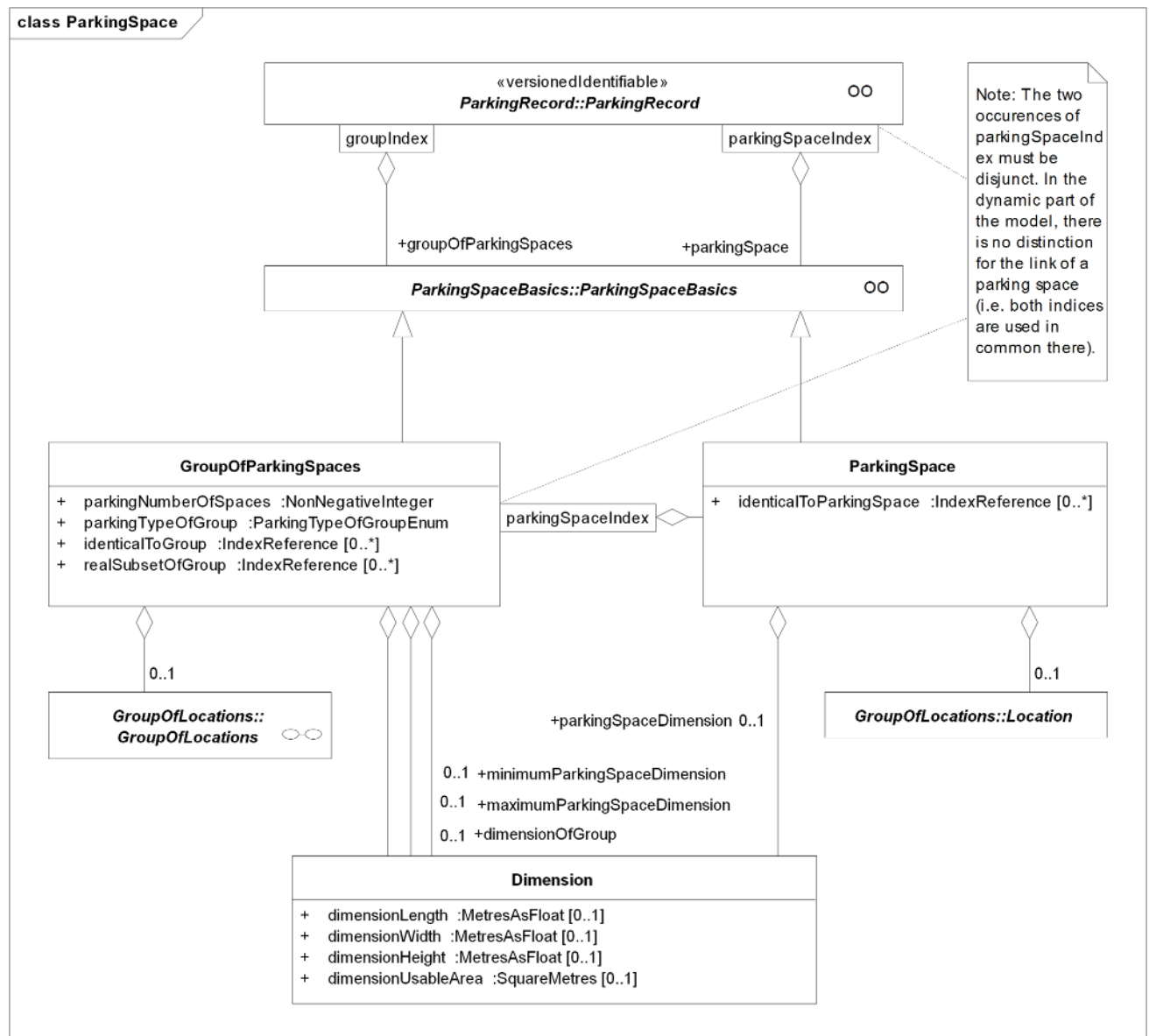


Figure 14 — The “ParkingSpace” package class model

8.11.2 Semantics of the “ParkingSpace” package

8.11.2.1 “ParkingSpace” package semantics – general

The “ParkingSpace” package shall be used to define single parking spaces (class “ParkingSpace”) or groups of parking spaces (class “GroupOfParkingSpaces”). For both classes, common properties may be specified in the class “ParkingSpaceBasics” (see Clause 8.12.2.2).

Parking spaces may be defined as being part of a parking record or as being part of a group of parking spaces.

Both parking spaces and groups of parking spaces may be referenced in the dynamic part of the model.

8.11.2.2 “ParkingSpace” Class

Each instance of this class shall describe a single parking space, i.e. a place envisaged for one vehicle. Its dimensions may be specified with an instance of the class “Dimension”. All further properties of a parking space are defined in class “ParkingSpaceBasics” (see Clause 8.12.2.2). There may be multiple specifications of the same parking space in case its assignment differs over time. Therefore, the attribute “identicalToParkingSpace” may be used to create references between several logical specifications of the same physical parking space.

Information about the occupancy of each space may be given in the dynamic part of the Parking Publications model in the class “ParkingSpaceStatus” (see Clause 9.3.2.6).

8.11.2.3 “GroupOfParkingSpaces” Class

Each instance of this class shall describe a group of parking spaces including their number.

Grouped parking spaces are parking spaces with a set of identical properties that can be considered as a coherent group. These identical properties shall be defined in the package “ParkingSpaceBasics” (see Clause 8.12). Properties, which are not identical across the group, shall not be specified.

The intention for creating the group shall be specified with attribute “parkingTypeOfGroup”. Examples are adjacent or nonadjacent parking spaces, specifying a complete floor etc.

The minimum dimension values of all included parking spaces may be specified with an instance of the class “Dimension”.

NOTE There is no need for a physical space of this minimum dimension.

The dimensions of the largest space of all included parking spaces may be specified with an instance of the class “Dimension”.

There must be at least one space of this maximum dimension. If the comparison of dimension values is not unique, the length is decisive.

The dimension of a virtual rectangle encapsulating the group of parking spaces may be specified with an instance of the class “Dimension”.

There may be multiple specifications of the same group of parking spaces or overlapping groups of parking spaces in case their assignment differs over time. Therefore, the attributes “identicalToGroup” or “realSubsetOfGroup” may be used to create references between several logical specifications of the same group of parking spaces or real subsets of other groups.

Detailed information about the occupancy of the group of parking spaces may be given in the dynamic part of the Parking Publications model in the class “ParkingOccupancy” (see Clause 9.3.2.7).

8.11.2.4 “Dimension” Class

Each instance of the “Dimension” class may be used to define dimensions (length, width, height, usable area) of some object. In the context of the Parking Publications, these may be the dimensions of a (group of) parking space(s), the dimensions of the parking record or minimum/maximum dimensions for parking spaces within a group.

NOTE The dimension of a parking record is not visualised in Figure 14, but in Figure 3.

8.12 The “ParkingSpaceBasics” package

8.12.1 Overview of the “ParkingSpaceBasics” package

The “ParkingSpaceBasics” package (see Figure 15) shall support provision of information for a single parking spaces (class “ParkingSpace”, see Clause 8.11.2.2) as well as for single parking spaces forming a group of parking spaces (class “GroupOfParkingSpaces”, see Clause 8.11.2.3).

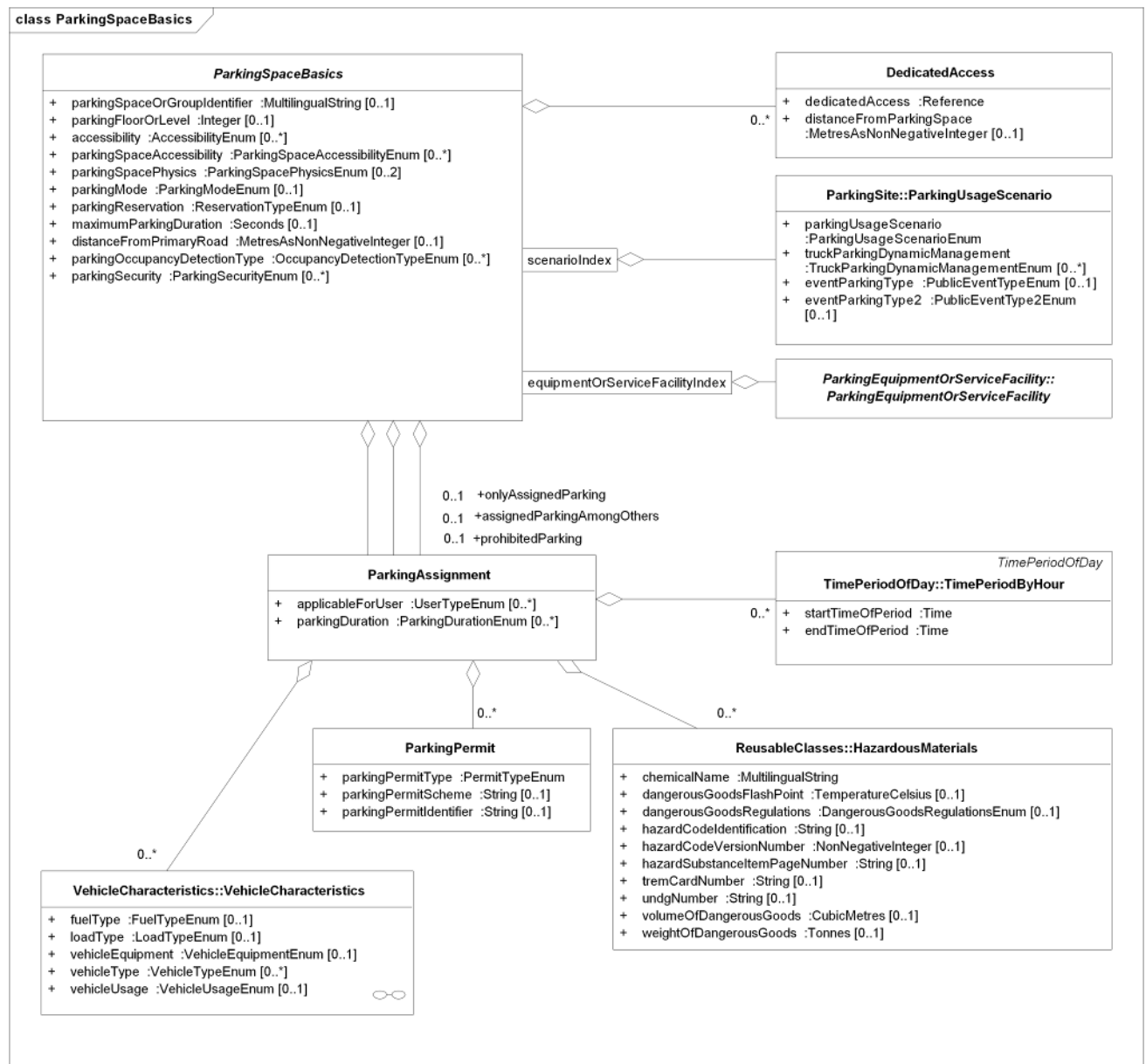


Figure 15 — The “ParkingSpaceBasics” package class model

8.12.2 Semantics of the “ParkingSpaceBasics” package

8.12.2.1 “ParkingSpaceBasics” package semantics - general

The “ParkingSpaceBasics” package describes basic properties of a parking space (see class ParkingSpaceBasics), assigned entrances or exits (class DedicatedAccess), assigned equipment or service facilities (see class ParkingEquipmentOrServiceFacility).

Furthermore, special assignments (users, vehicles, time-based) may be specified to qualify specific validity or prohibition (class `ParkingAssignment`).

Using an instance of the `"ParkingUsageScenario"` class shall force the usage of quantifier `"scenarioIndex"`.

Each value for the `"scenarioIndex"` quantifier shall be unique within the common scope of its two occurrences in class `"ParkingSite"` and all instances of `"ParkingSpaceBasics"`.

NOTE 1 Instances defined with qualifiers may be referenced in the dynamic part of the model. There will be no distinction in the dynamic part, whether a usage scenario was defined within a parking site or within a (group of) parking space(s).

Using an instance of the `"ParkingEquipmentOrServiceFacility"` class shall force the usage of quantifier `"equipmentOrServiceFacilityIndex"`.

Each value for the `"equipmentOrServiceFacilityIndex"` quantifier shall be unique within the common scope of its two occurrences in class `"ParkingRecord"` and all instances of `"ParkingSpaceBasics"`.

NOTE 2 Instances defined with qualifiers may be referenced in the dynamic part of the model. There will be no distinction in the dynamic part, whether an equipment or service facility was defined within a parking record or within a (group of) parking space(s).

8.12.2.2 `"ParkingSpaceBasics"` Class

An instance of the `"ParkingSpaceBasics"` class shall give information about the parking space such as reservation requirements, security measures or accessibility. The physical characteristics of the parking site (e.g. open air), parking mode (e.g. parallel) or the maximum parking duration may also be specified.

NOTE For a group of parking spaces (class `GroupOfParkingSpaces`), all information provided in class `ParkingSpaceBasics` shall be identical for all parking spaces within the group. Only information that has not been provided may differ within the group.

8.12.2.3 `"DedicatedAccess"` Class

An instance of the `"DedicatedAccess"` class may point to an instance of an assigned access (class `ParkingAccess`, see Clause 8.7.2.2), i.e. the parking spaces in question are accessible from this entrance or exit.

8.12.2.4 `"ParkingAssignment"` Class

Instances of the `"ParkingAssignment"` class may be created for the roles `"assignedParkingAmongOthers"`, `"onlyAssignedParking"` or `"prohibitedParking"`. These roles may be invoked with restrictions regarding types of persons, parking duration, vehicle characteristics (class `"VehicleCharacteristics"`, defined in CEN/TS 16157-3), time (class `"TimePeriodByHour"`, defined in CEN/TS 16157-2) or hazardous materials (class `"HazardousMaterials"`, defined in CEN/TS 16157-3).

8.12.2.5 `"ParkingPermit"` Class

Each Instance of the `"ParkingPermit"` class shall define one specific parking permit with mandatory type and optional scheme and/or identifier.

8.13 The “VehicleCharacteristicsExtension” package

8.13.1 Overview of the “VehicleCharacteristicsExtension” package

The “VehicleCharacteristicsExtension” package (see Figure 16) shall support information in addition to the class “VehicleCharacteristics” defined in CEN/TS 16157-3.

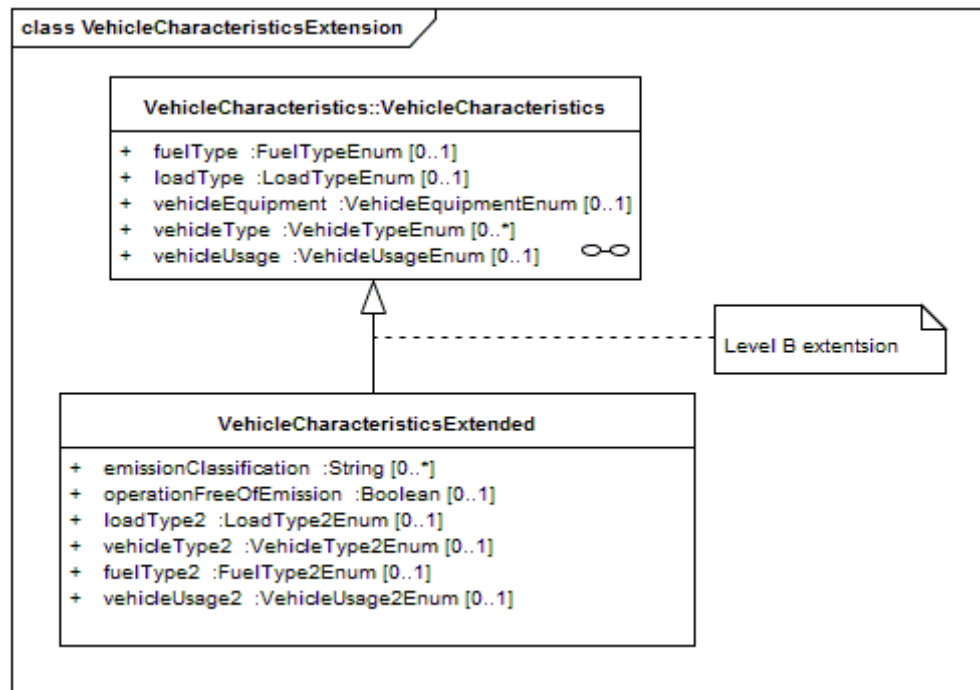


Figure 16 — The “VehicleCharacteristicsExtension” package class model

8.13.2 Semantics of the “VehicleCharacteristicsExtension” package

8.13.2.1 “VehicleCharacteristicsExtended” Class

The class “VehicleCharacteristicsExtended” shall be specified as a DATEX II “Level B extension”.

An instance of the “VehicleCharacteristicsExtended” class may provide additional information on the “vehicleType” (e.g. motorhome, minibuss), the “loadType” (e.g. refrigerated goods), the “fuelType” (e.g. information about different forms of engine propulsion), the “vehicleUsage” (e.g. city logistics), special permits (e.g. government parking permit) and emission characteristics currently not supported in class “VehicleCharacteristics”.

8.14 The “Junction” package

8.14.1 Overview of the “Junction” package

The “Junction” package (see Figure 17) shall support provision of additional information to describe a point (class “Point” defined in CEN-TS 16157-2).

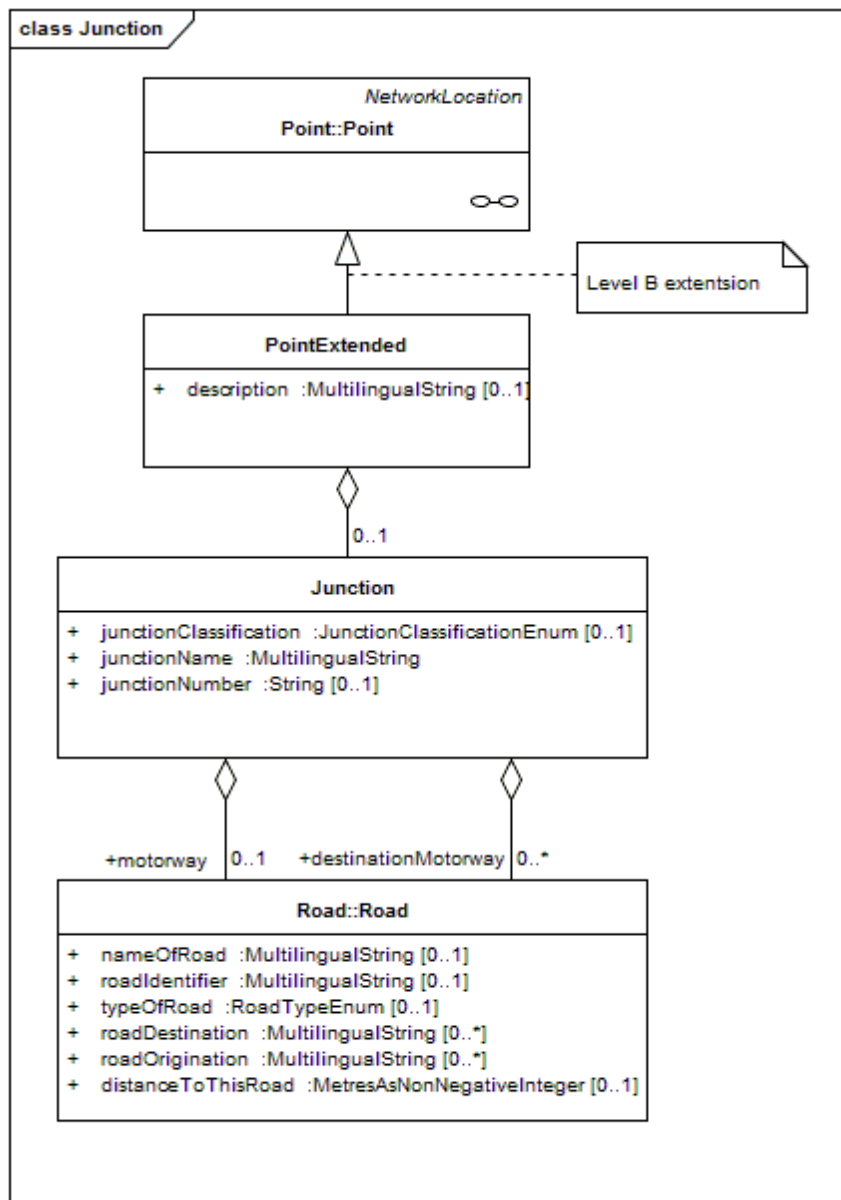


Figure 17 — The “Junction” package class model

8.14.2 Semantics of the “Junction” package

8.14.2.1 “Junction” package semantics – general

To specify a junction, the “Junction” class may be used as an additional method for point georeference defined in CEN/TS 16157-2.

8.14.2.2 “PointExtended” Class

The class “VehicleCharacteristicsExtended” shall be specified as a DATEX II “Level B extension” and shall be a technical helper class to attach the “Junction” class.

8.14.2.3 “Junction” Class

An instance of the “Junction” class may provide information about a (motorway-) junction: classification (i.e. its type), name and number. The motorway in question may be specified using the “Road” class (see Clause 8.8.2.2). If the junction type corresponds to any type of interchange, a destination motorway may be specified in addition.

8.15 The “ParkingStandardsAndSecurity” package

8.15.1 Overview of the “ParkingStandardsAndSecurity” package

The “ParkingStandardsAndSecurity” package (see Figure 18) shall support provision of information about security measures or the LABEL service and security classification [2, 3] of a parking site

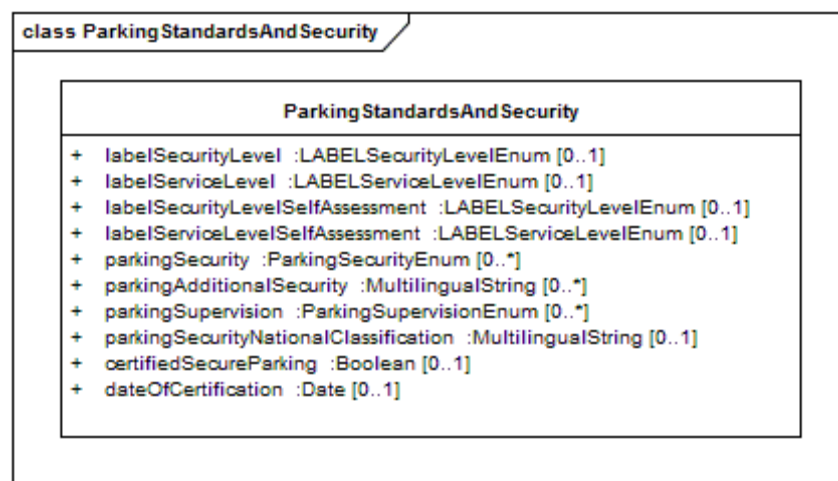


Figure 18 — The “ParkingStandardsAndSecurity” package class model

8.15.2 Semantics of the “ParkingStandardsAndSecurity” package

8.15.2.1 “ParkingStandardsAndSecurity” Class

An instance of the “ParkingStandardsAndSecurity” class may give information about security measures on the parking site (e.g. fences, security service, etc.), about the policy of supervision as well as about the “LABEL”¹ classification (formal assessment as well as self-assessment).

¹ <http://truckparkinglabel.eu/>

9 The Parking Status Publication model

9.1 Overview of the Parking Status Publication model

The Parking Status Publication model comprises a number of packages, with the “ParkingStatusPublication” package providing the entry point to the dynamic part of the Parking Publications model, which utilise some classes from the “ReusableClasses” package defined in CEN/TS 16157-3.

The corresponding schema for the Parking Status Publication model can be found in normative Annex H of this document.

9.2 The “ParkingStatusPublication” package

9.2.1 Overview of the “ParkingStatusPublication” package

The “ParkingStatusPublication” package (see Figure 19) shall form the entry point for the dynamic part of the Parking Publications model.

The value of the “genericPublicationName” attribute shall be defined as “ParkingStatusPublication”.

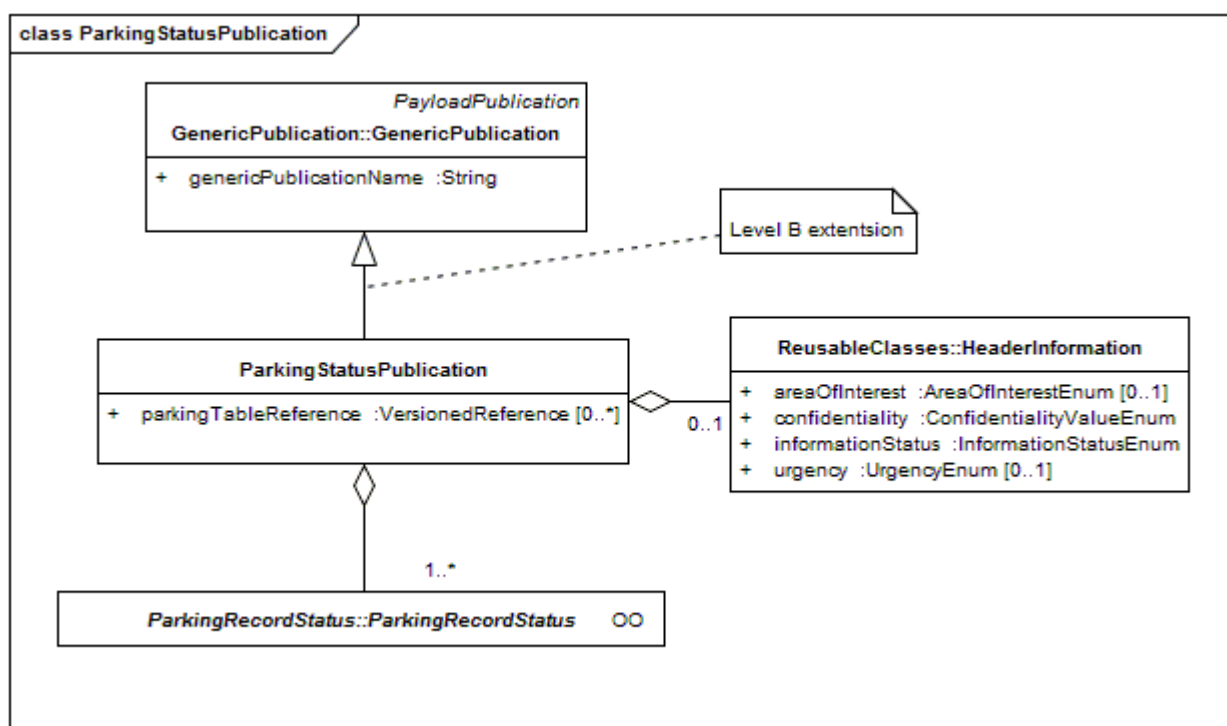


Figure 19 — The “ParkingStatusPublication” package class model

9.2.2 Semantics of the “ParkingStatusPublication” package

9.2.2.1 “ParkingStatusPublication” Class

The “ParkingStatusPublication” class is a specific realisable case of a “GenericPublication”. It shall be specified as a DATEX II “Level B extension”.

Each “ParkingStatusPublication” may reference to zero, one or more “ParkingTable” from the static part of the model.