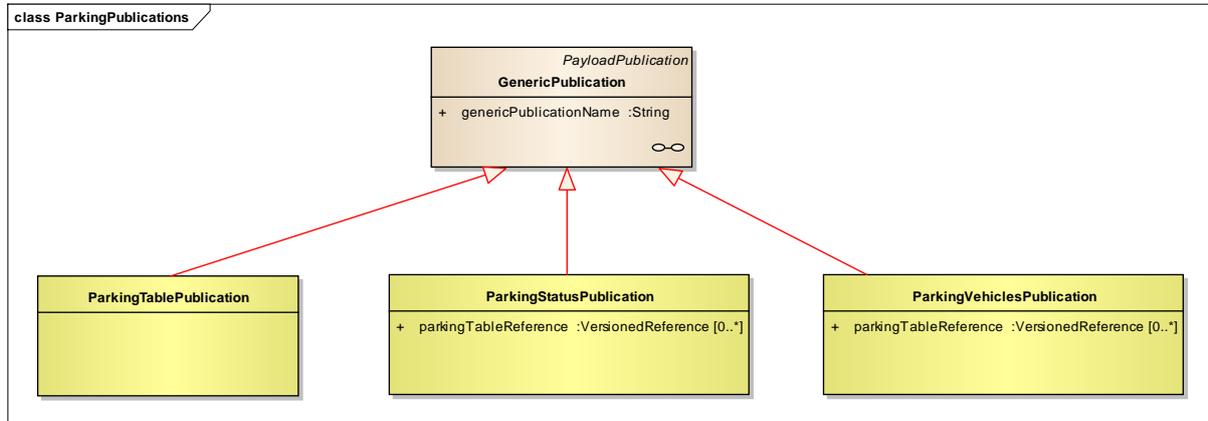


# Parking Publications Extension

Version 1.0a



The DATEX II Parking Publications are three publications derived from GenericPublication (i.e. Level B extensions), which allow to specify static and dynamic information about parking sites as well as information on individual parking vehicles:

- ParkingTablePublication
- ParkingStatusPublication
- ParkingVehiclePublication

The three Publications are introduced on a higher level, afterwards a technical section with UML diagrams follows. A data dictionary for the new elements is added at the end of his document.

## ParkingTablePublication

### Objectives and utilisation mechanisms

This publication is used to publish static information of parking sites or groups of parking sites. This comprises urban or interurban parking sites as well as special facility and (secure) truck parking information. It covers on street parking as well as off street parking (car parks, parking places, motorway parking, ...). Within a parking site, information can be specified down to groups of parking spaces or even for individual parking spaces.

In DATEX Version 2.3, this publication is located in the “Extension/Approved/ParkingPublications” package. Thus it is modelled as a Level B extension using the GenericPublication.

There are four minor Level B extensions entailed in this publication:

- Area is extended to specify a PolygonArea
- Point is extended to specify Junctions
- Period is extended to specify special days and holidays
- VehicleCharacteristics is extended to specify additional vehicle types, loads and emission information

The static information forms the base for dynamic occupancy information, for which you should use the ParkingStatusPublication – see below.

ParkingTablePublication and ParkingStatusPublication are in accordance with the Commission Delegated Regulation (EU) No 885/2013 about the provision of information services for safe and secure parking places for trucks and commercial vehicles.

## Content

Because of the size of this publication, it is not described on attribute level here. The description is focussed on included subjects instead:

- For parking sites, groups of parking spaces or individual parking spaces the following assignments can be specified as convenient, as allowed or as not allowed:
  - Specified type(s) of users
  - Specified type(s) of vehicles (incl. hazardous materials)
  - Time (for mixed usage of parking spaces, for example day usage for cars, night usage for lorries).
- Basic information (number of spaces, reservation information, short or long term parking, ...), each also possible for individual groups of parking spaces (i.e. for example it is possible to specify the possibility of reservation just for a part of the parking site or to specify the number of parking spaces for lorries).
- Special Permits for users or vehicles (e.g. disabled permit, government permit)
- Permitted or prohibited actions on the parking site (e.g. smoking, camping)
- Contact information (address, telephone number etc.) for the parking site as well as for several other stakeholders or services (e.g. owner, reservation service, ...)
- Entrances and exits with characteristics and georeference
- Opening times, expressed by the detailed validity model
- Additional equipment and additional service facilities (long list of items, like for example toilets, internet, restaurants, police station) optional each with opening times, tariffs, location, validity or restriction to users or vehicles
- Electric charging stations (incl. technical parameters and connector types)
- Information on the LABEL-categorisation and on security measures.
- Tariff information in a complex structure, for different charge bands, depending on user or vehicle type and for different seasons (incl. different types and modes of payment, payment cards and reservation fees)
- Thresholds, i.e. defined fill grades of a parking site for which the dynamic status information should change between different states (incl. overcrowding states)
- Parking Routes incl. georeference, direction and colour information
- A colour mapping to occupancy states
- Parking scenario (truck parking, rest area, car sharing, mechanical drop off, ...)
- Georeference information (all methods which are available in DATEX) for all elements

The following two pictures show information on assignments, dimensions and Georeferencing, which can be specified with the ParkingTable Publication:

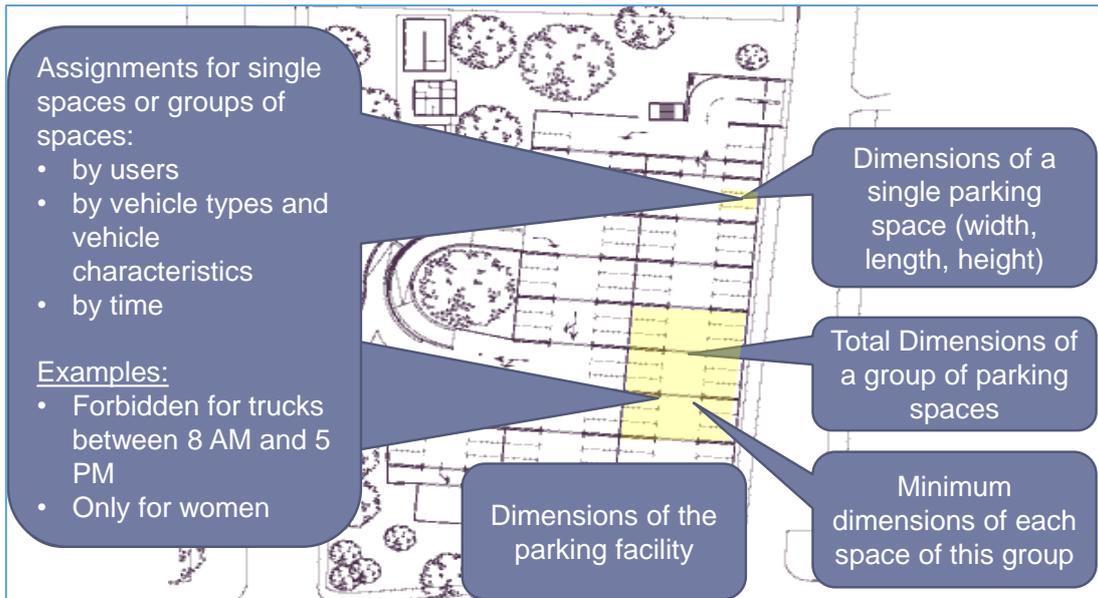


Figure 1: Assignments and Dimensions in ParkingTablePublication

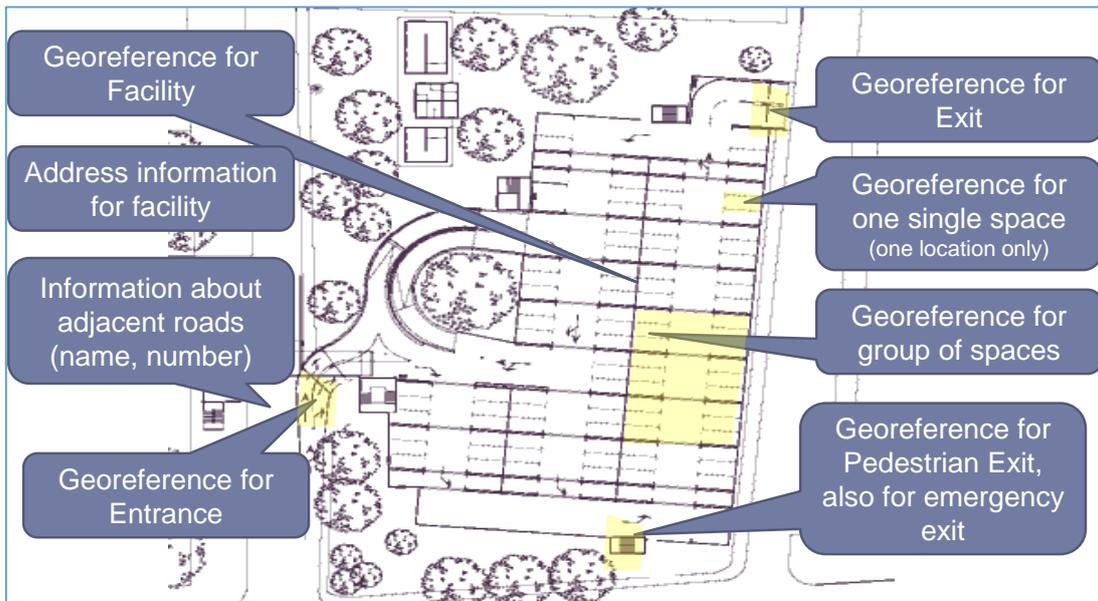


Figure 2: Georeference in ParkingTablePublication

## ParkingStatusPublication

### Objectives and utilisation mechanisms

This publication is used to give information on dynamic data of parking sites or groups of parking sites (e.g. free spaces, trends, vehicle count on the parking site, ...). The publication refers to static information about a parking site or groups of parking sites prior published with the ParkingTablePublication (by using the concept of versioned references).

In DATEX Version 2.3, the ParkingStatusPublication is located in the “Extension/Approved/ParkingPublications” package. Thus it is modelled as a Level B extension using the GenericPublication.

ParkingTablePublication and ParkingStatusPublication are in accordance with the Commission Delegated Regulation (EU) No 885/2013 about the provision of information services for safe and secure parking places for trucks and commercial vehicles.

## Content

The following topics can be covered by this publication:

- Occupancy information for a parking site, a group of parking sites or a group of parking spaces (all declared in the static model and referenced in this publication):
  - Number of spaces (as an override in case of dynamic changes)
  - Number of vacant spaces (as a number, as a 'higher than' or 'lower than' information as well as in an enumerated form)
  - Number of occupied spaces (as a number, in enumerated form as well as in trend form)
  - Number of parking vehicles
- Information on individual parking spaces (occupied or free, temporary closed)
- Overriding thresholds: It is possible to override the static threshold information, i.e. the defined fill grades of a parking site for which the dynamic status information should change between different states (incl. overcrowding states)
- Status information: A state information on the fill grade of a parking site incl. overcrowding information (in limited form also for a group of parking sites)
- Validity of parking space- and group of parking space-declarations: Spaces might be temporary closed or defined for mixed usage (i.e. declaration not valid all the time).
- Information about the availability of additional equipment or additional service facilities (overriding the amount, current availability, opening and vacancy information).
- Fill- and exit rates (sensor data, which can be based on a static MeasurementSiteTable information)
- Vehicle count within interval, i.e. incoming or outgoing vehicles or change of occupancy within time

By defining the validity of the dynamic information, it is possible to publish real time data, historical data or forecasts. It is also possible to publish series over time.

## ParkingVehiclesPublication

The ParkingVehiclesPublication allows to specify information on specific parking vehicles. The publication refers to static information about a parking site or groups of parking sites prior published with the ParkingTablePublication (by using the concept of versioned references).

In DATEX Version 2.3, this publication is located in the "Extension/Approved/ParkingPublications" package. Thus it is modelled as a Level B extension using the GenericPublication.

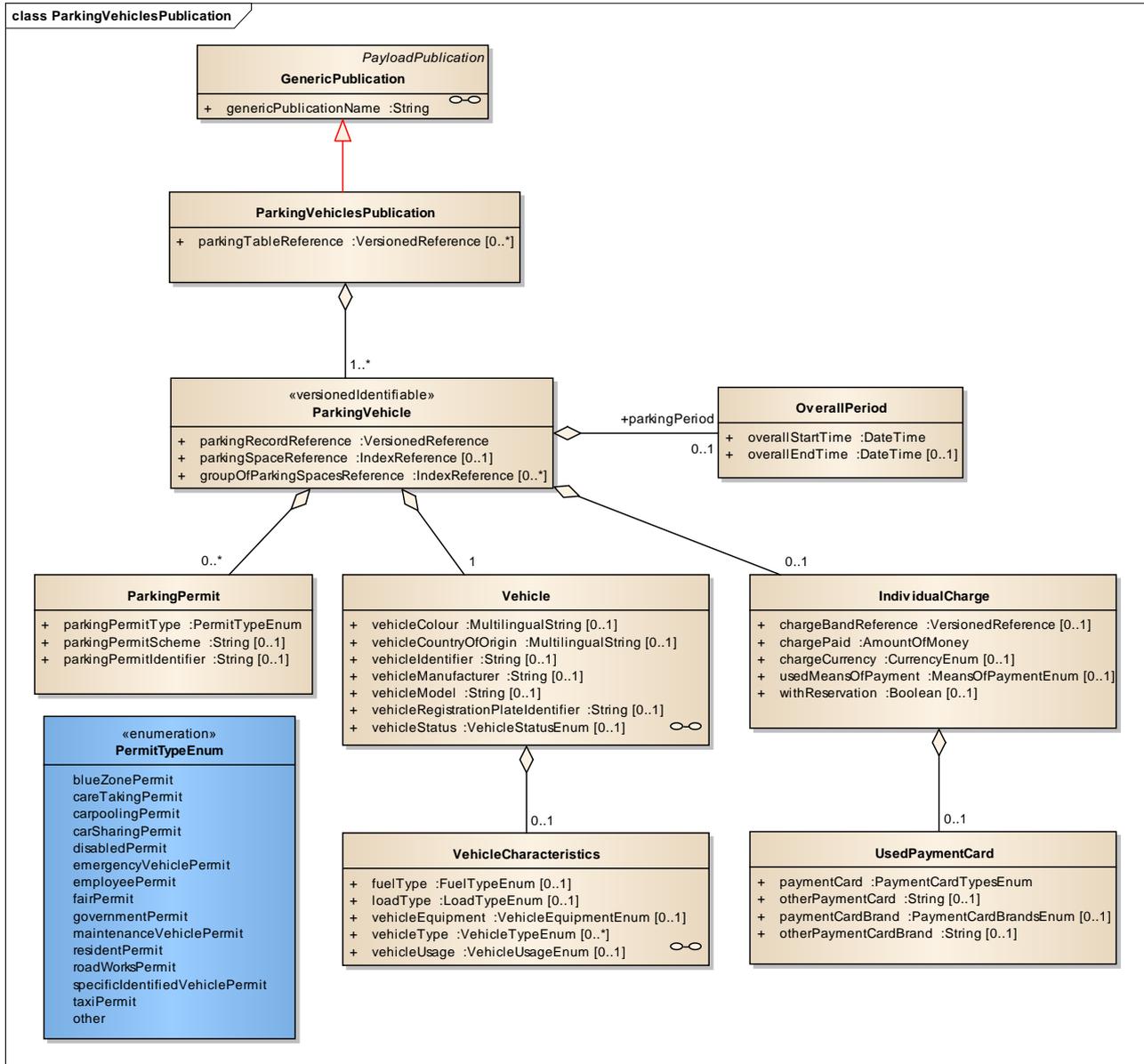
For a parking vehicle, the following information can be specified:

- Reference to the parking space used
- The parking period
- The parking permit
- Information about the vehicle, like licence plate information or vehicle characteristics
- Information on the individual charge, including the paid amount or the method of payment

The process of parking must not yet be finished; it is possible to omit the end of the parking period.

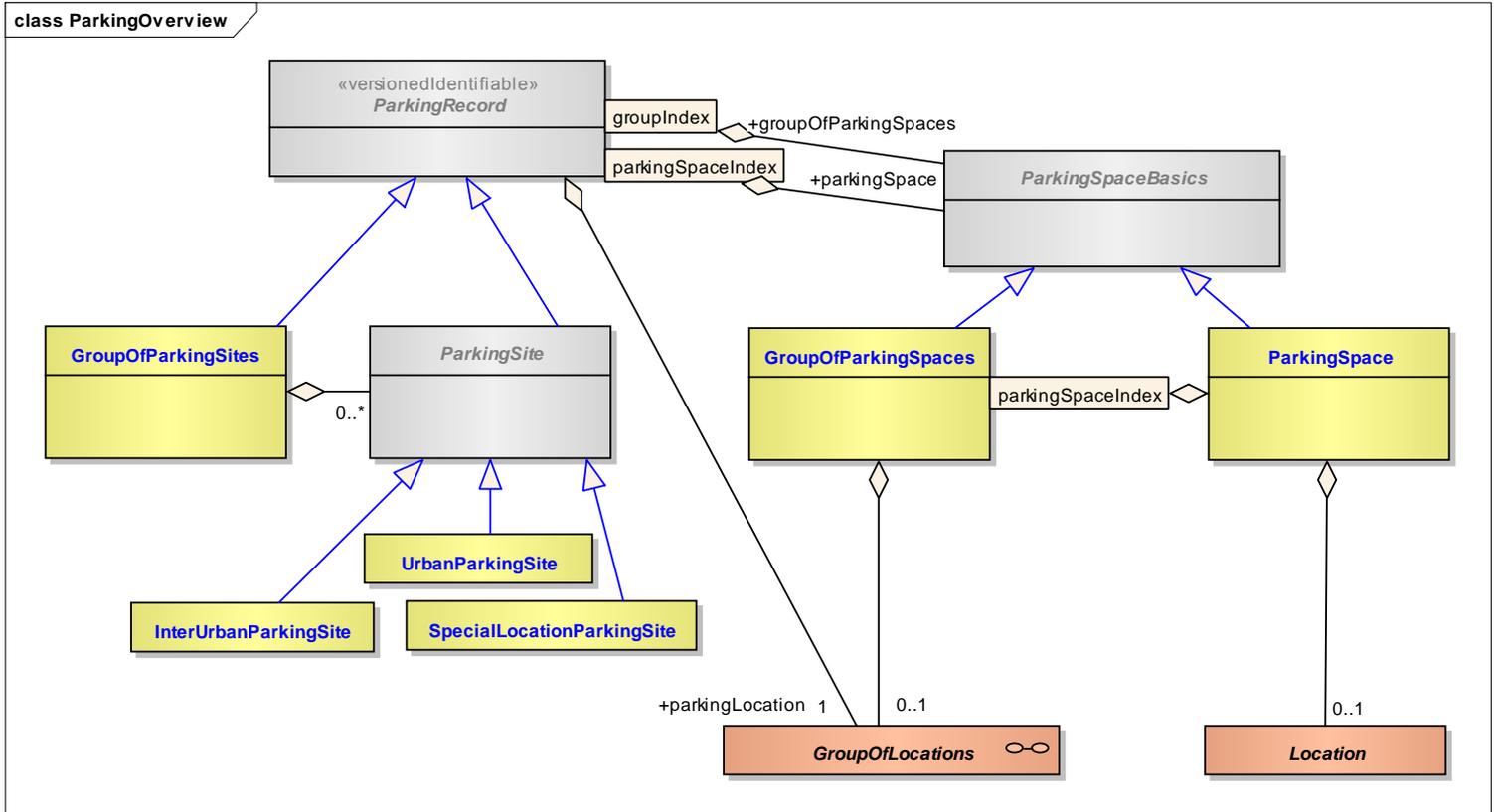
# UML diagrams

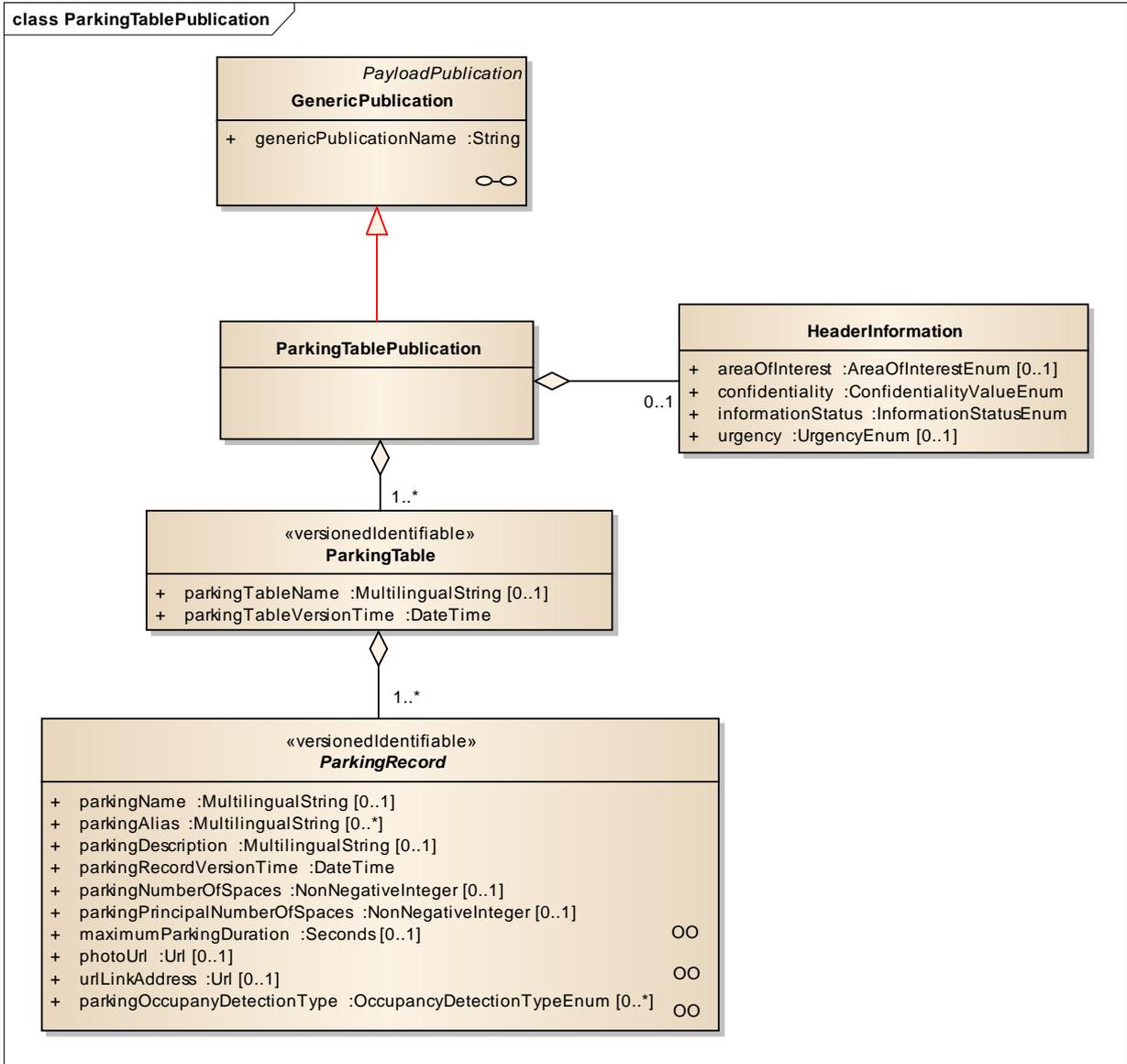
## ParkingVehiclesPublication



### ParkingTablePublication – Static part of the model

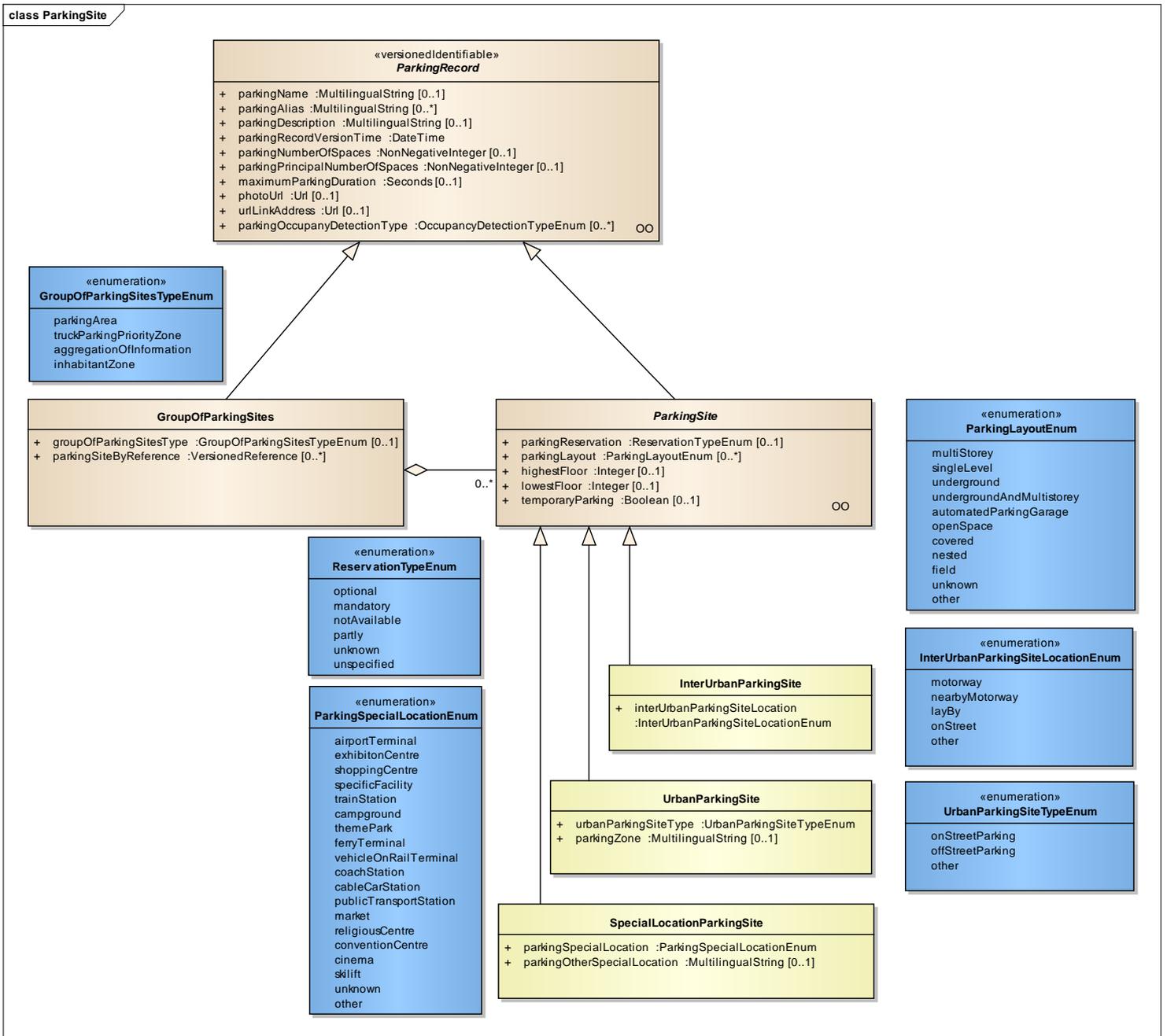
The following picture gives an overview on the basic structure (i.e. only main classes) of the ParkingTablePublication. Grey classes are abstract, they need to be specialised by the yellow classes. Location Referencing is coloured red.



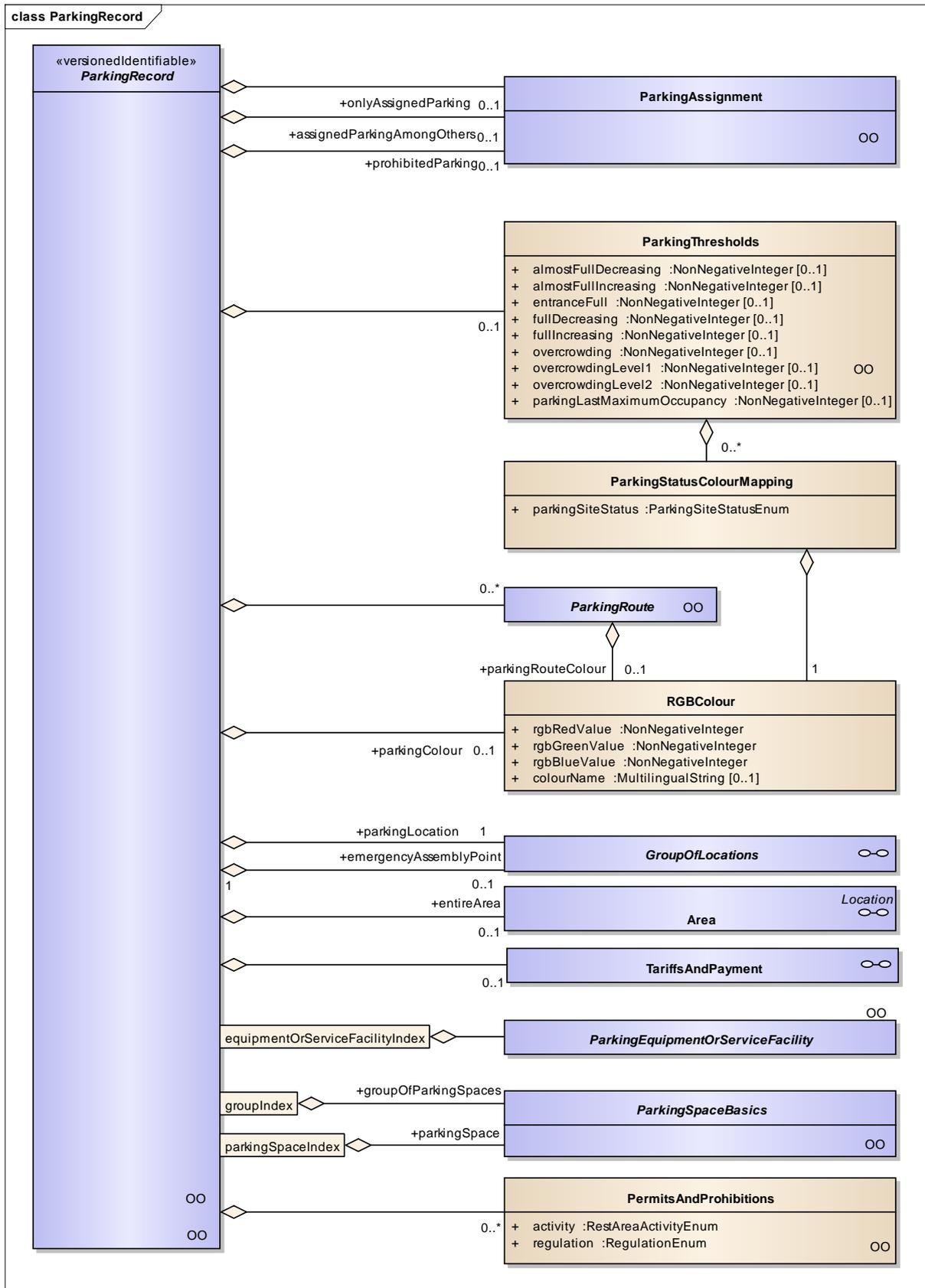


The following figures show more details and submodels of the ParkingTablePublication.

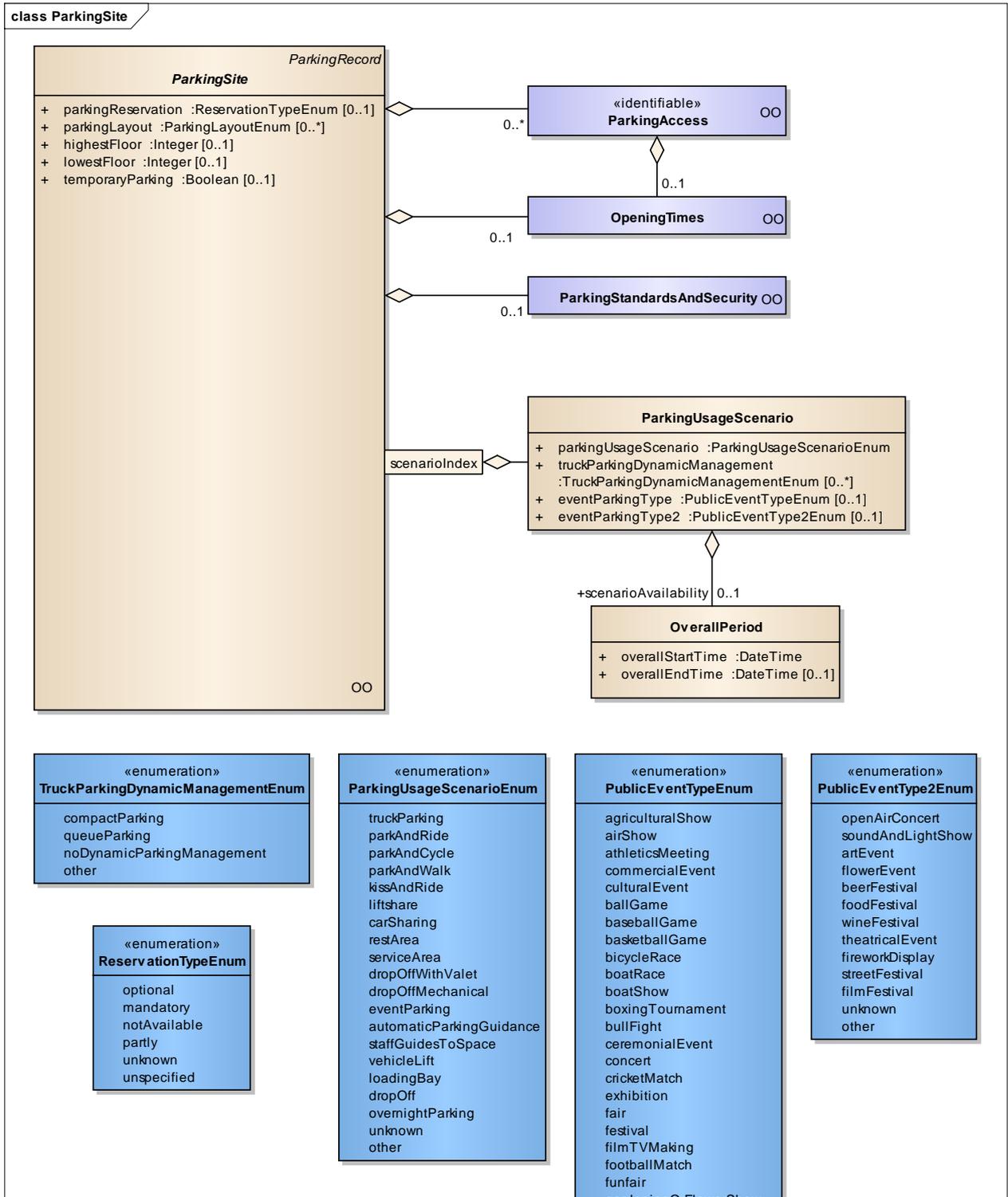
## ParkingRecord and ParkingSite



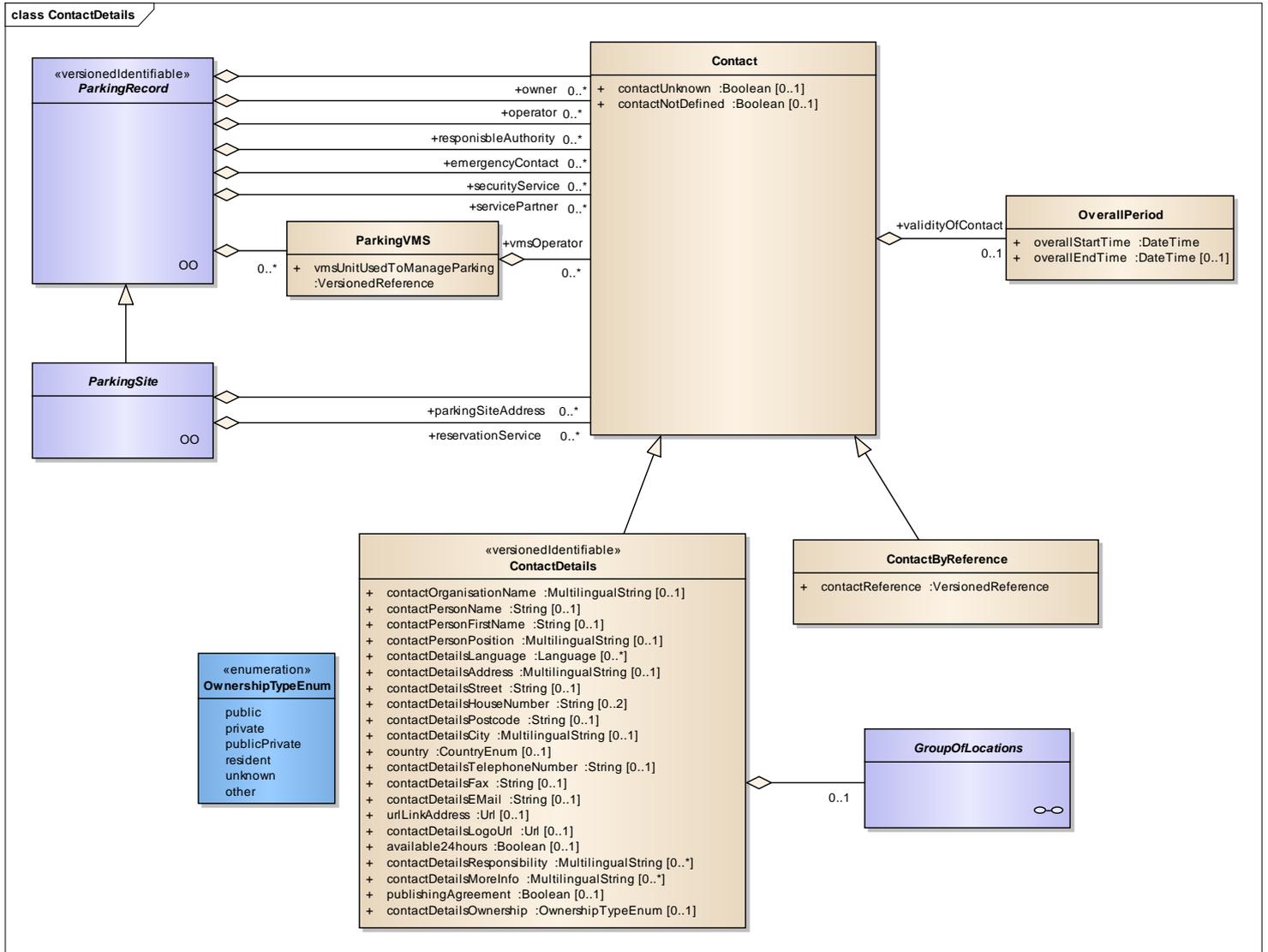
## ParkingRecord



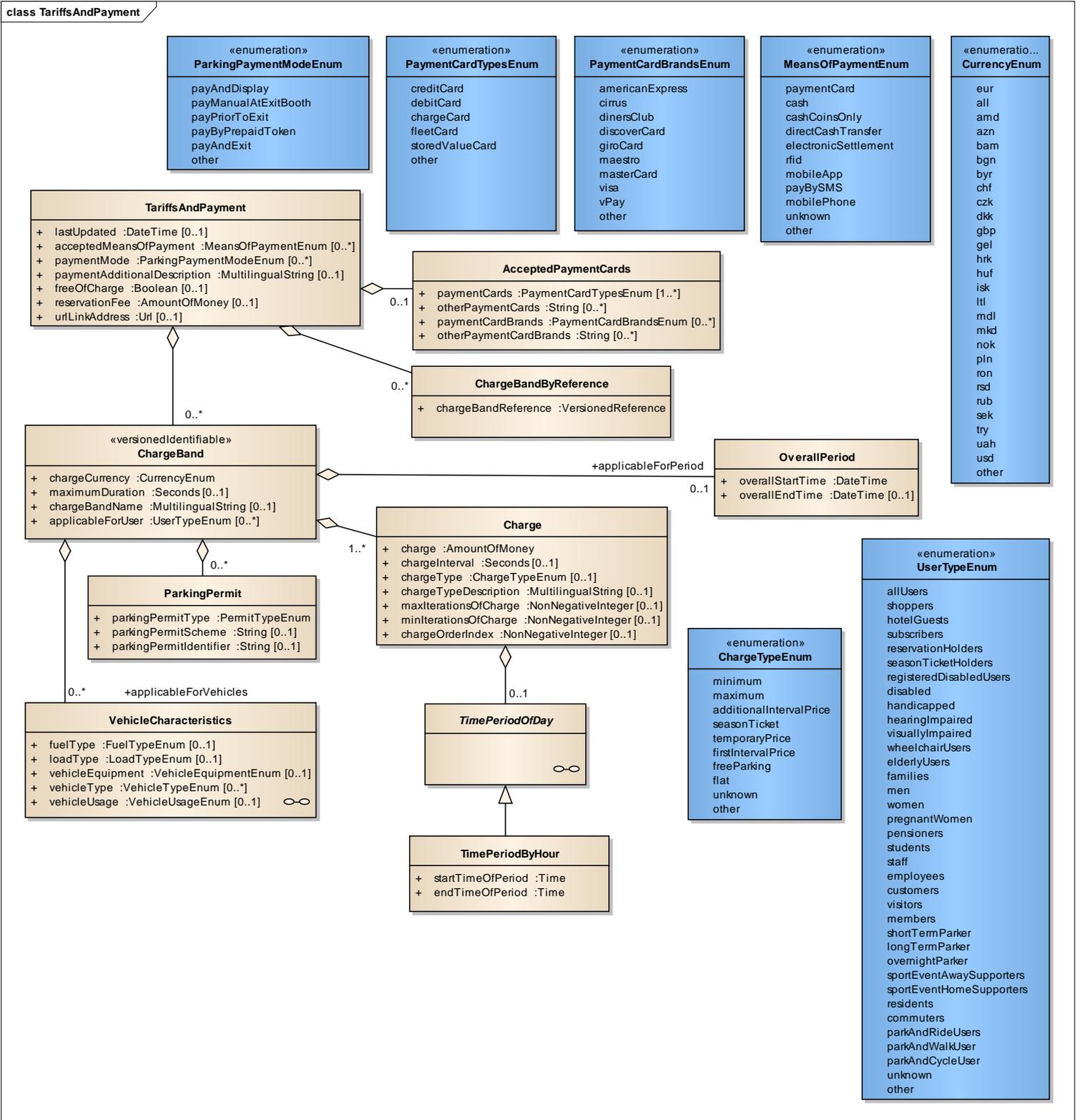
ParkingSite



### ContactDetails

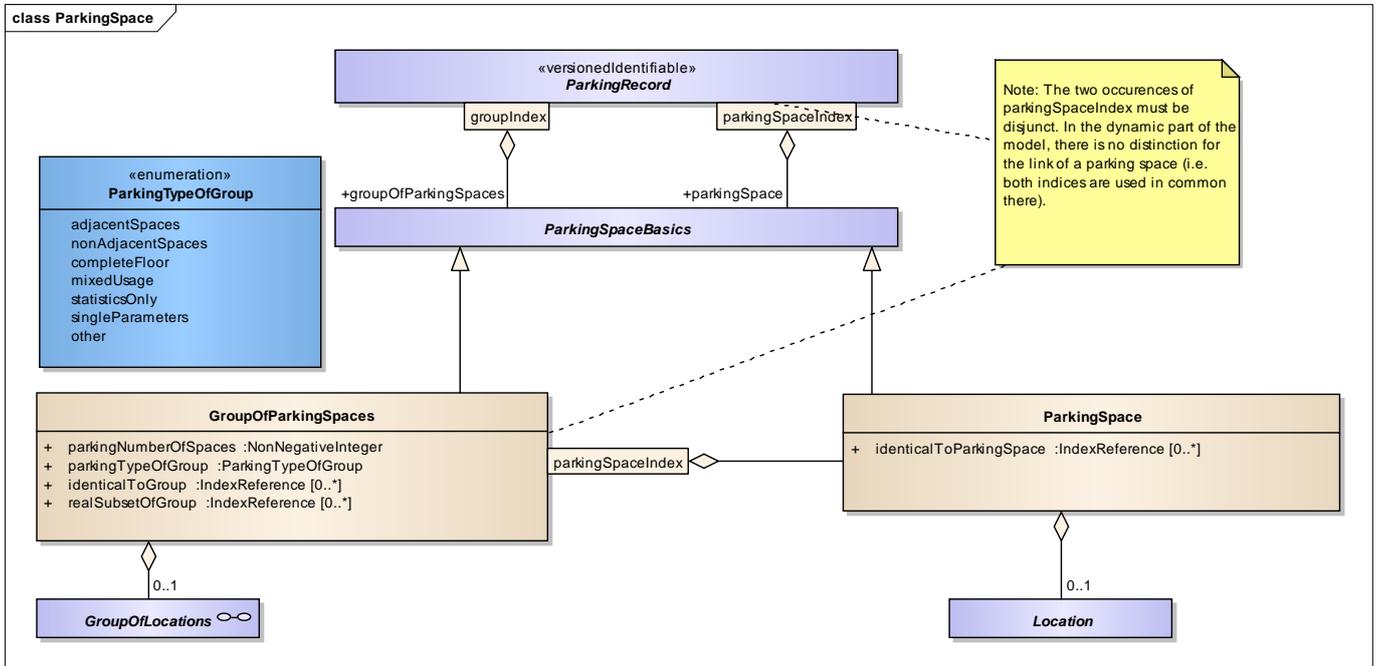


TariffsAndPayment

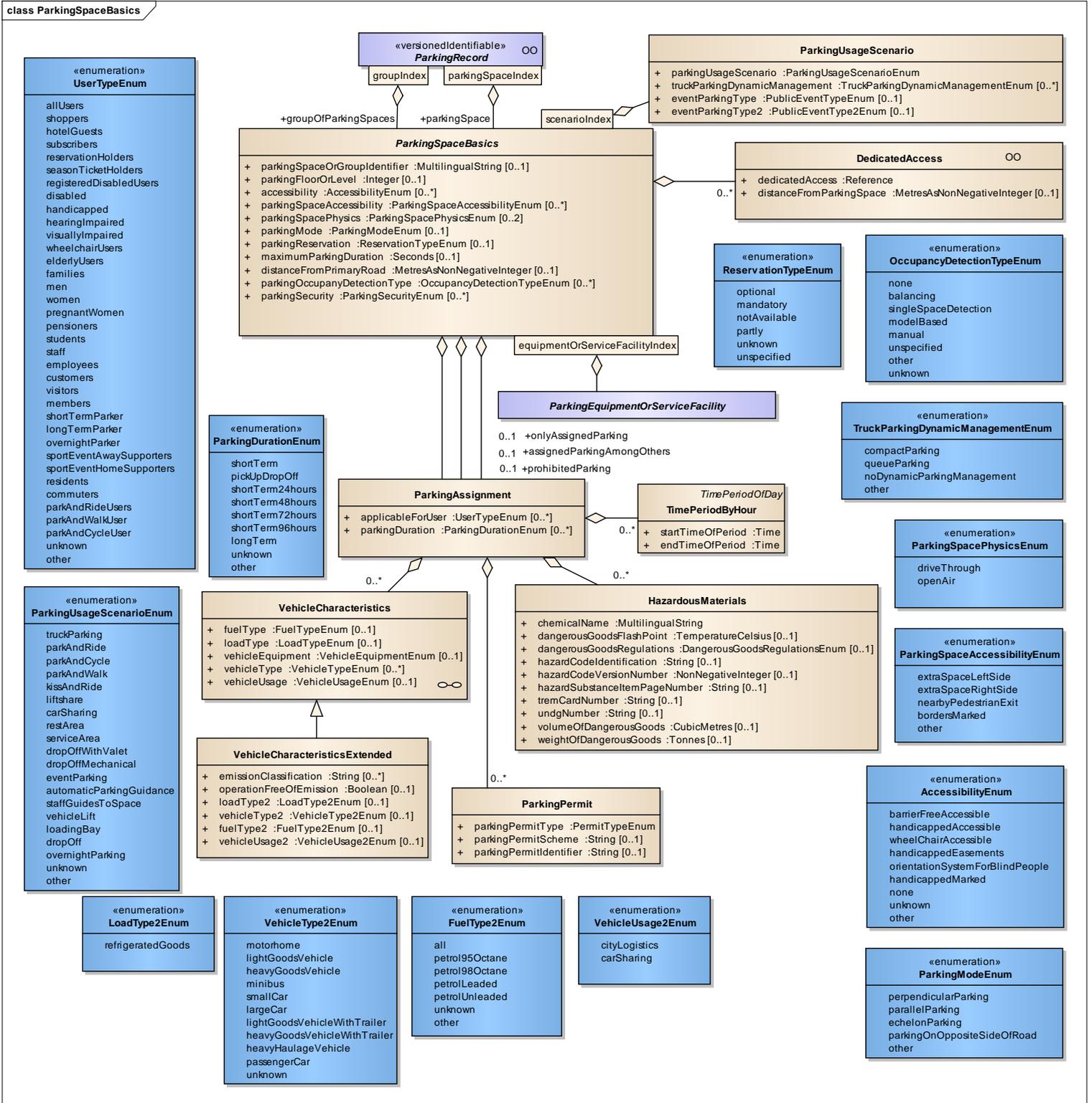


### ParkingSpace / GroupOfParkingSpaces

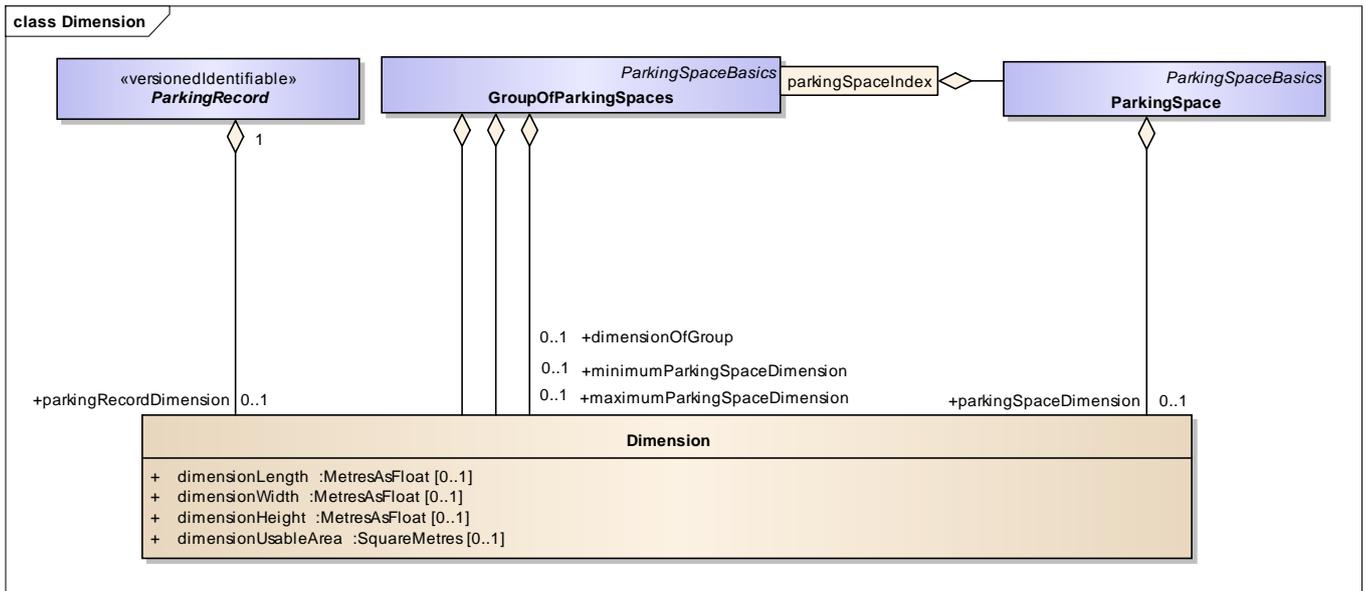
Both parking spaces and groups of parking spaces are based on the class “ParkingSpaceBasics”, which is shown in the overnext picture in chapter “Assignment”. With indices, it is possible to reference both parking spaces as well as groups of parking spaces in the dynamic part of the model.



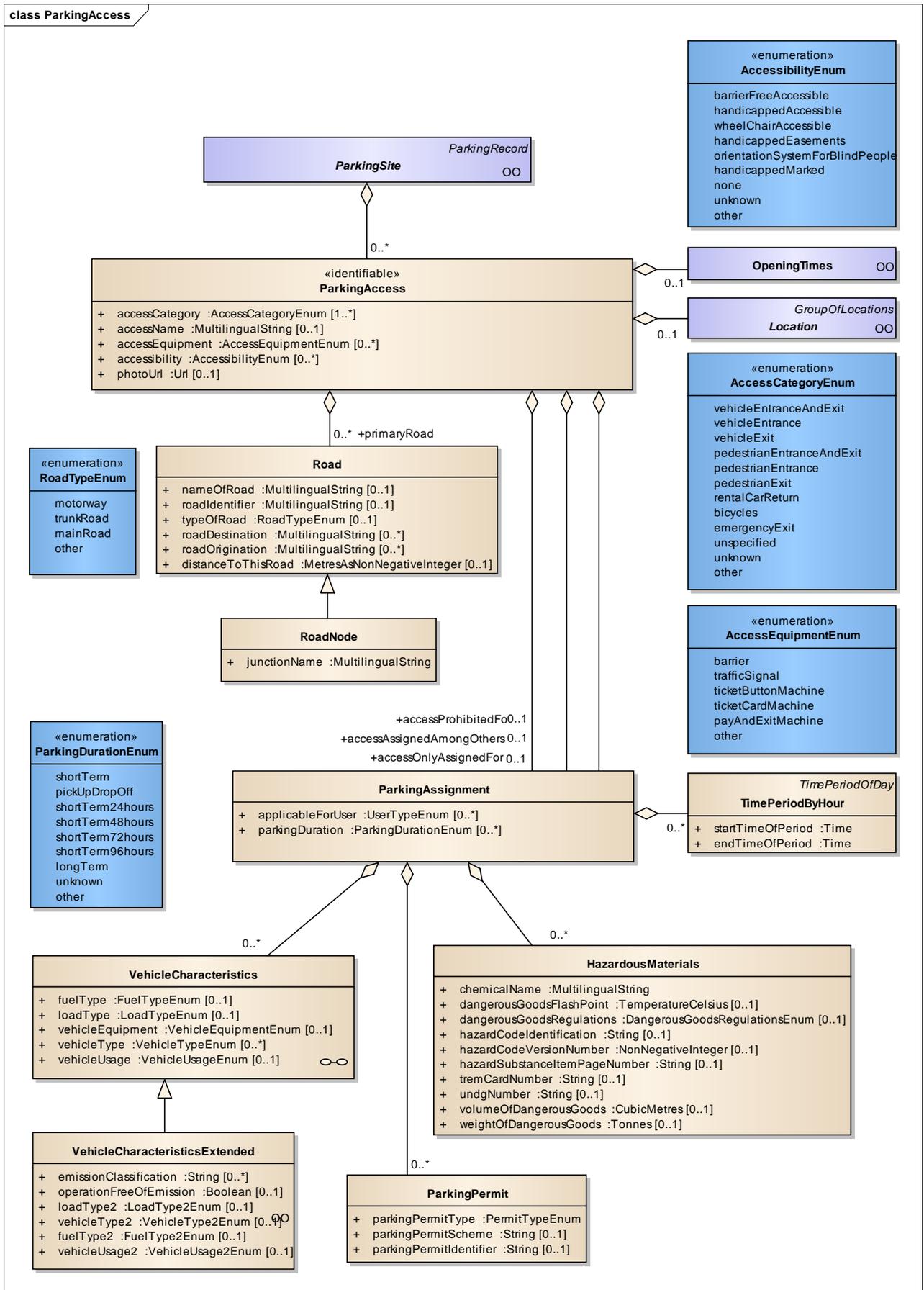
Assignment



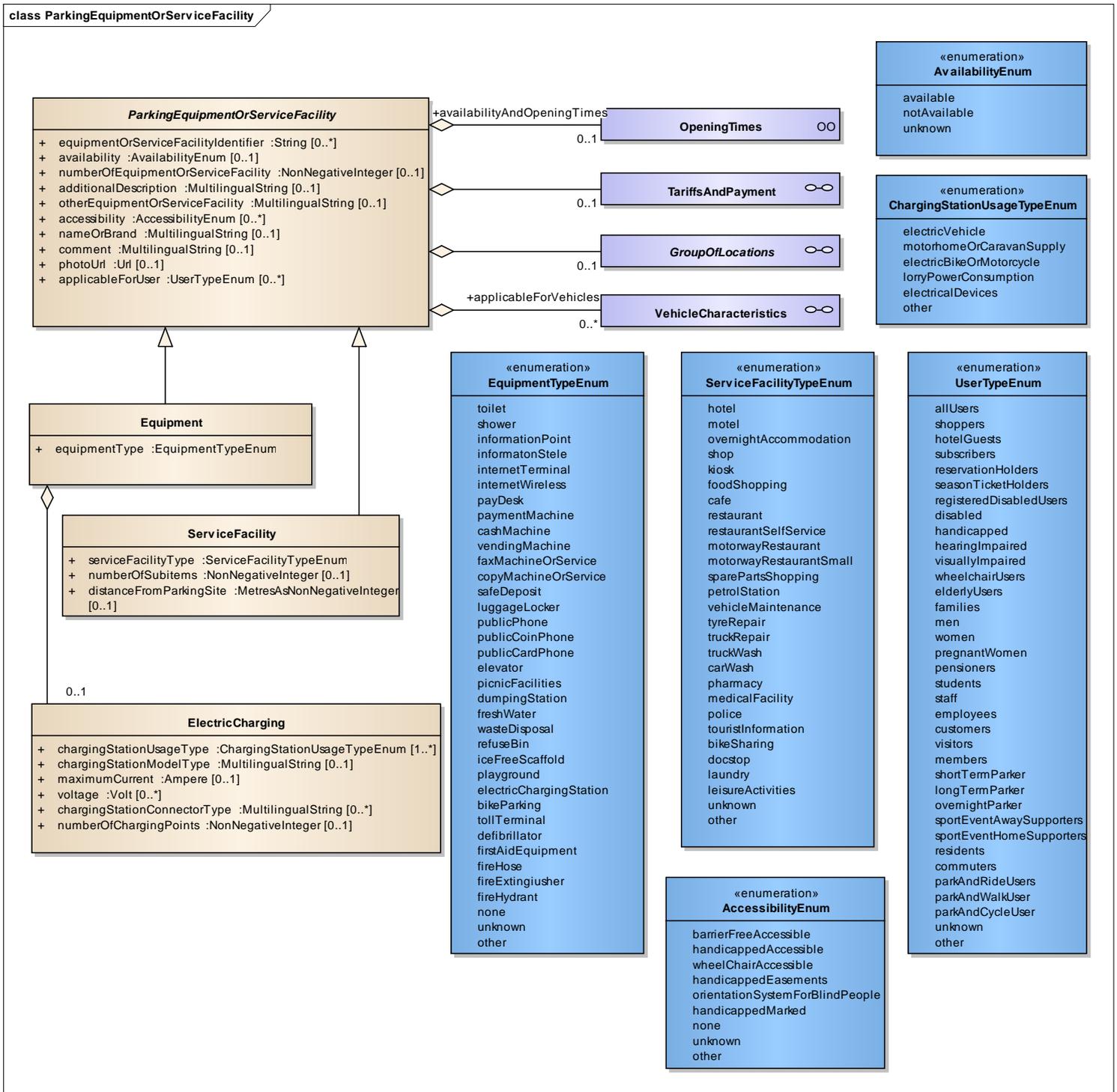
## Dimensions



### ParkingAccess



### ParkingEquipmentOrServiceFacility



This component represents exactly one sort of available equipment or one available service facility. It may be characterised as available / not available or specified with its number.

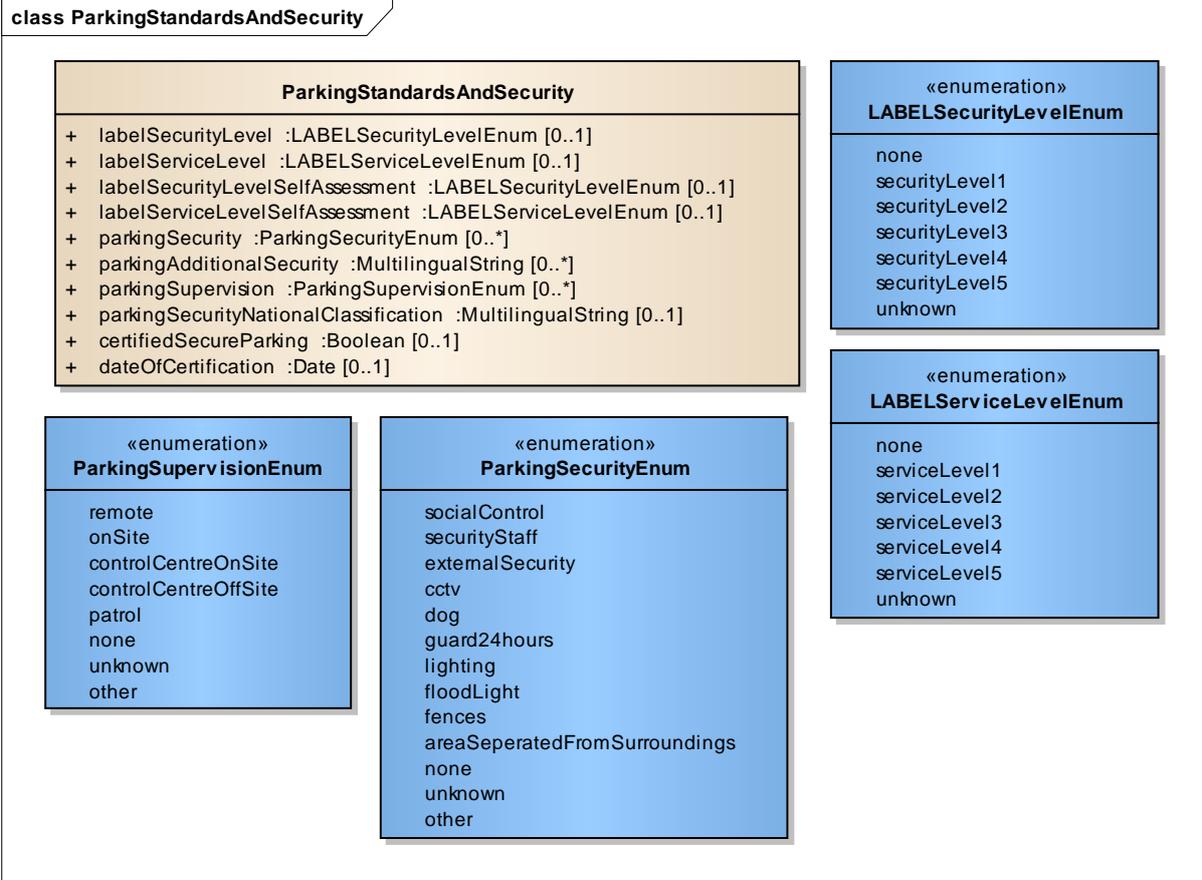
In addition, for service facilities the number of subitems can be specified according to the following table:

"serviceFacilityType"	"numberOfEquipmentOrServiceFacility"	"numberOfSubitems"
hotel	number of hotels	total number of hotel rooms
motel	number of motels	total number of motel rooms
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 trucks 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	-
other	<i>depends on "otherInfrastructureElement" (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, ...)

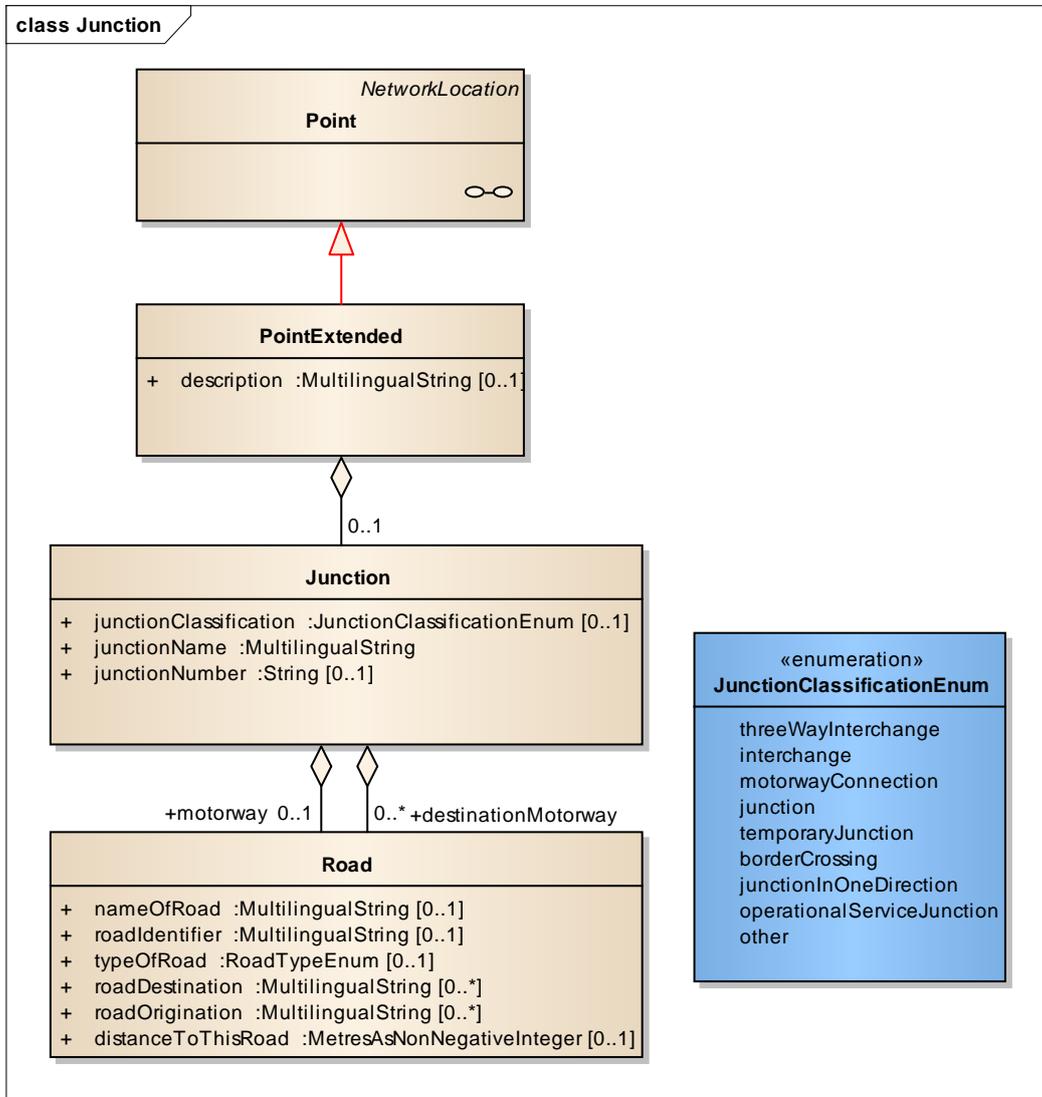
ParkingStandardsAndSecurity



Junction / Road

Note: Standard Georeference methods from DATEX Level A are not shown in this document.

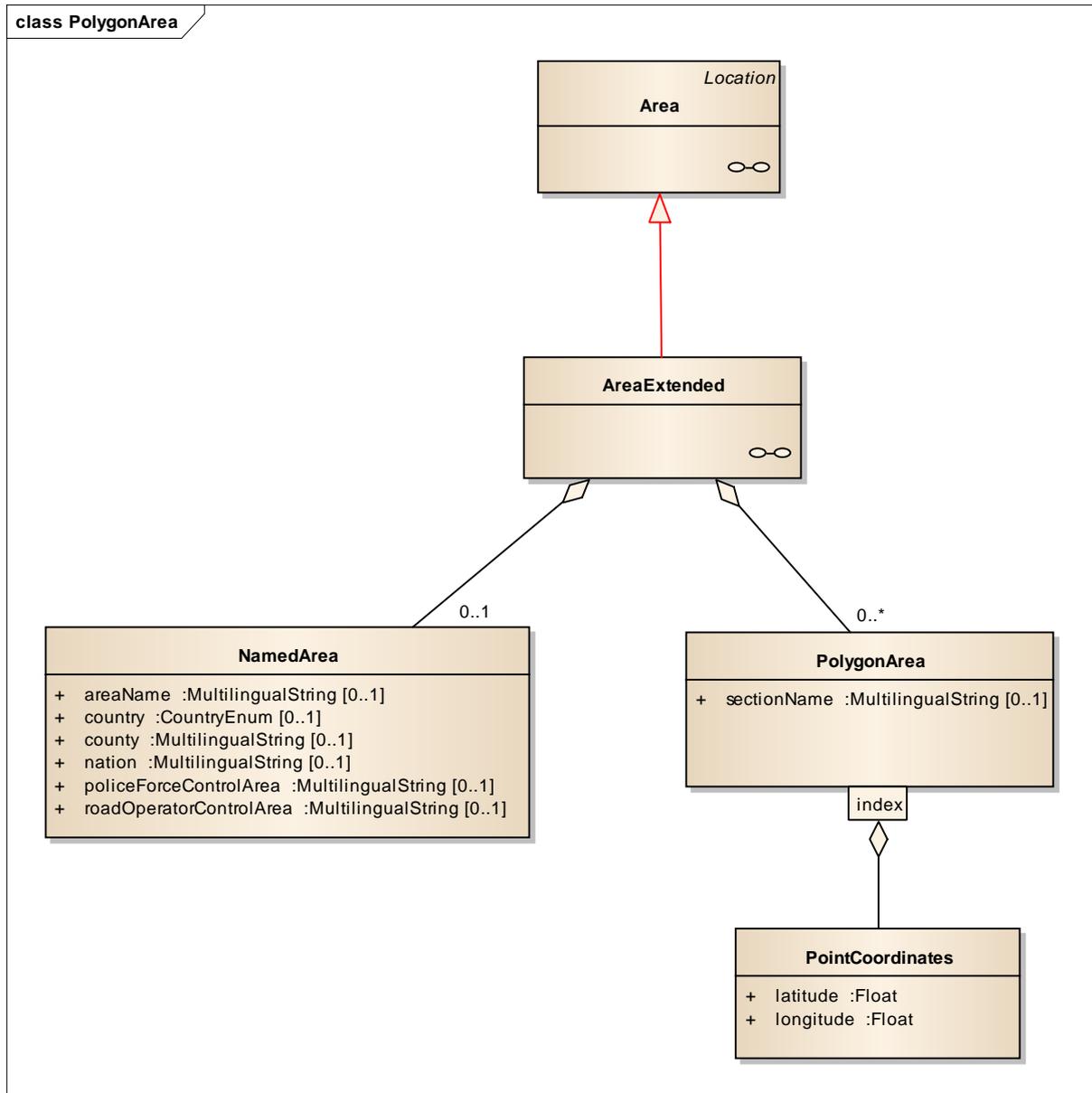
A Point can be expressed in form of a junction:



## PolygonArea

Note: Standard Georeference methods from DATEX Level A are not shown in this document.

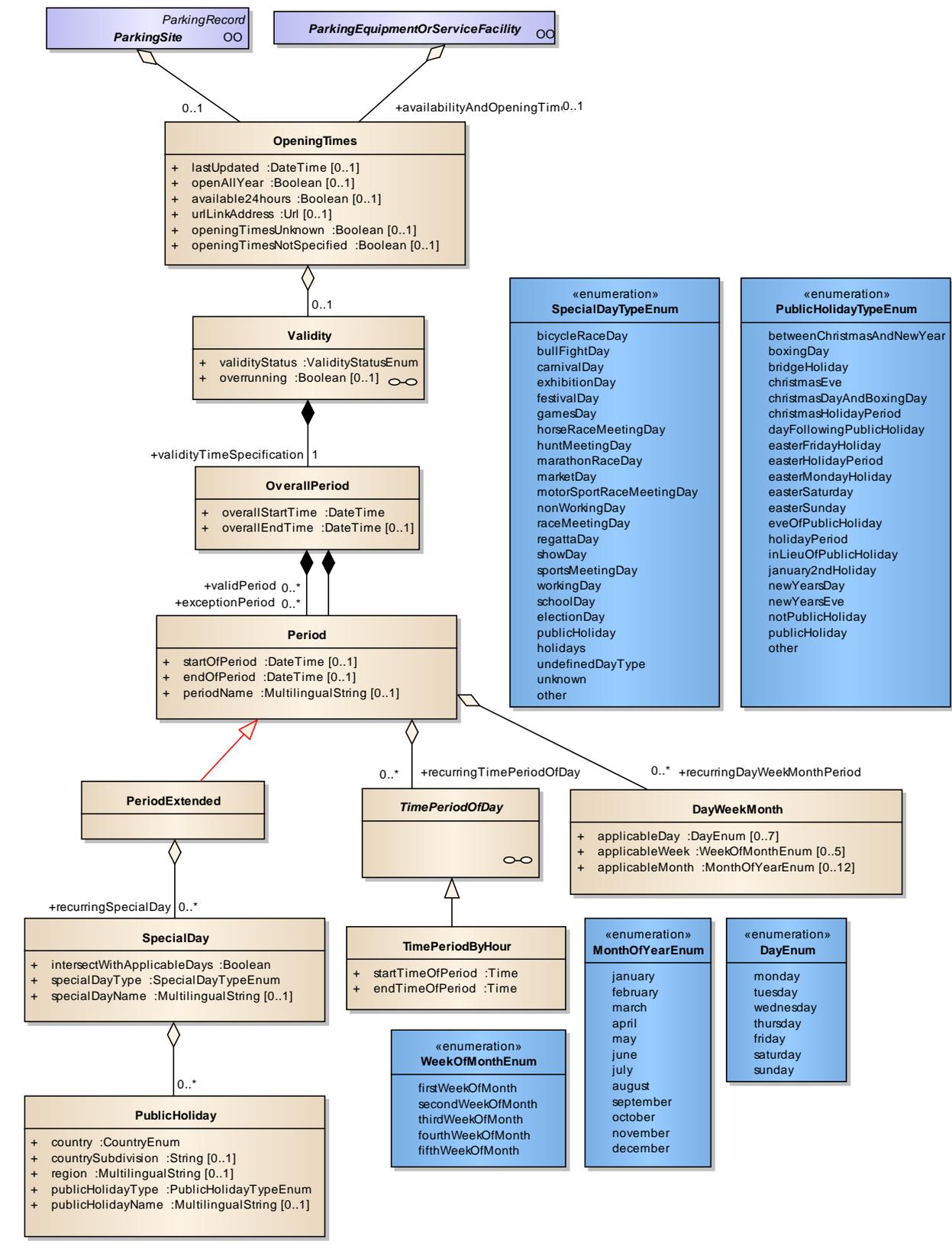
For the description of an area, a new possibility of a polygon area was introduced:



## OpeningTimes

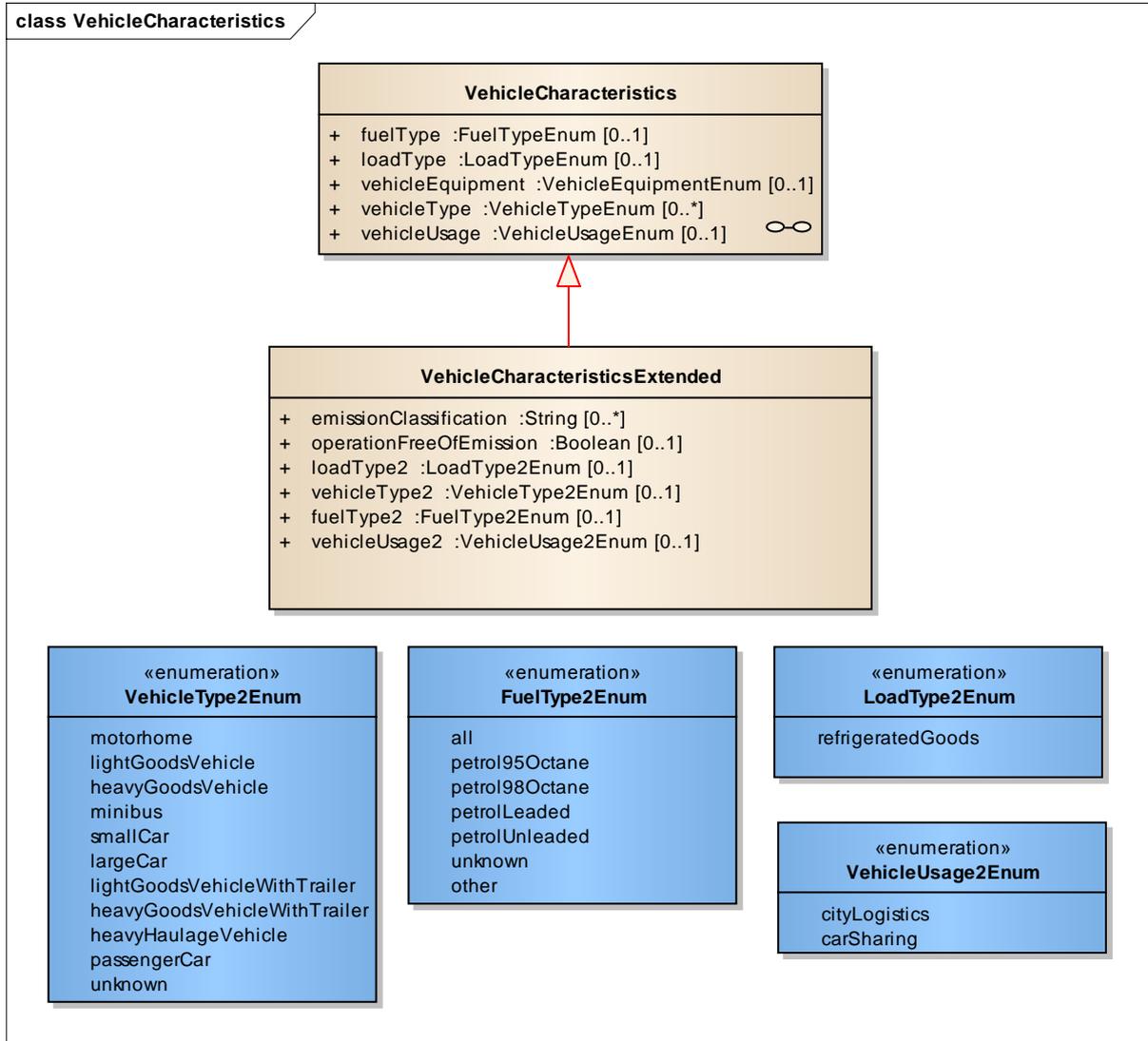
Note: There are more elements of Validity located in the standard DATEX Level A part which are not displayed here, but which are of course available for specification (e.g. specification of recurring days or times).

class OpeningTimes

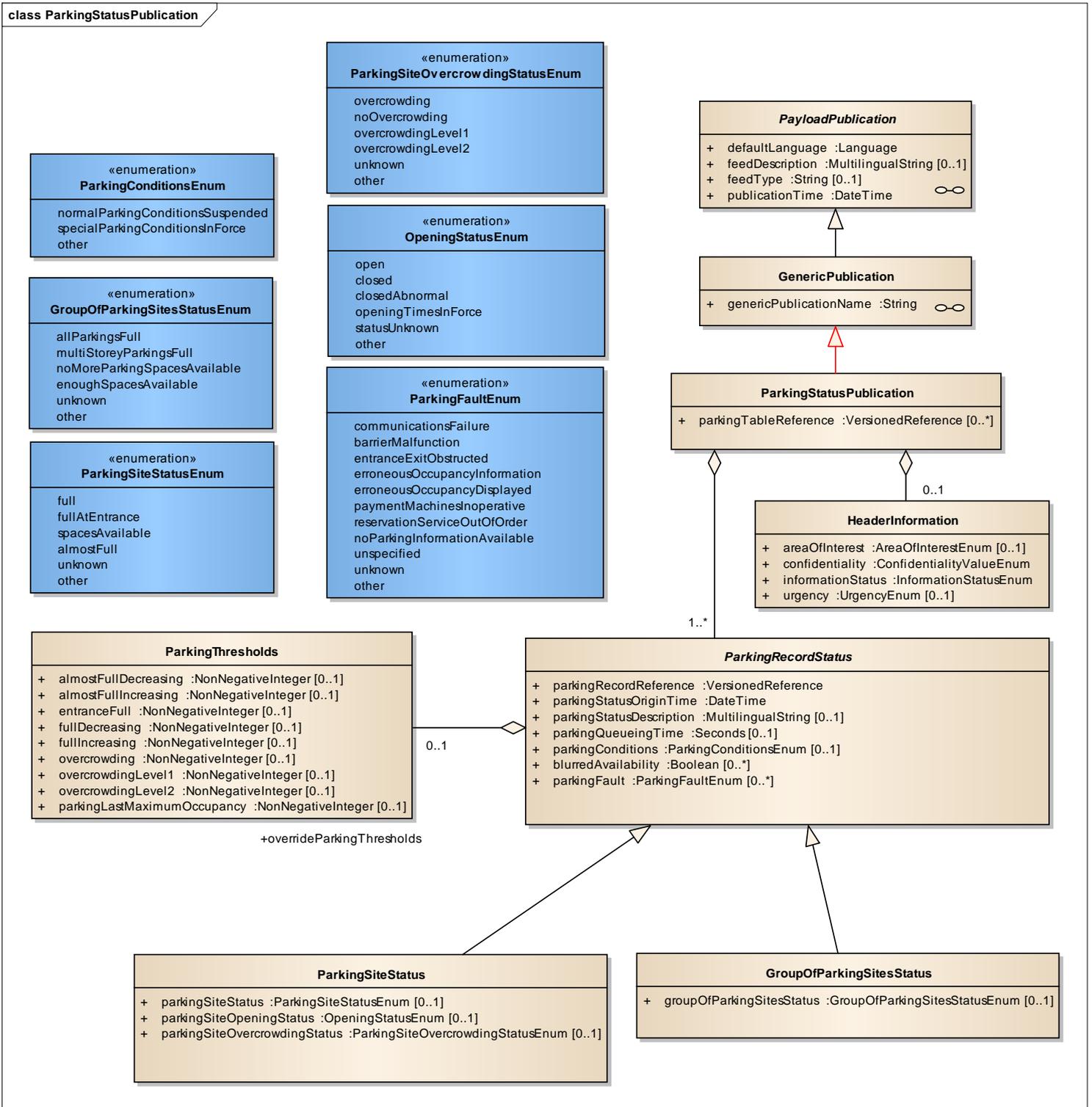


## VehicleCharacteristics

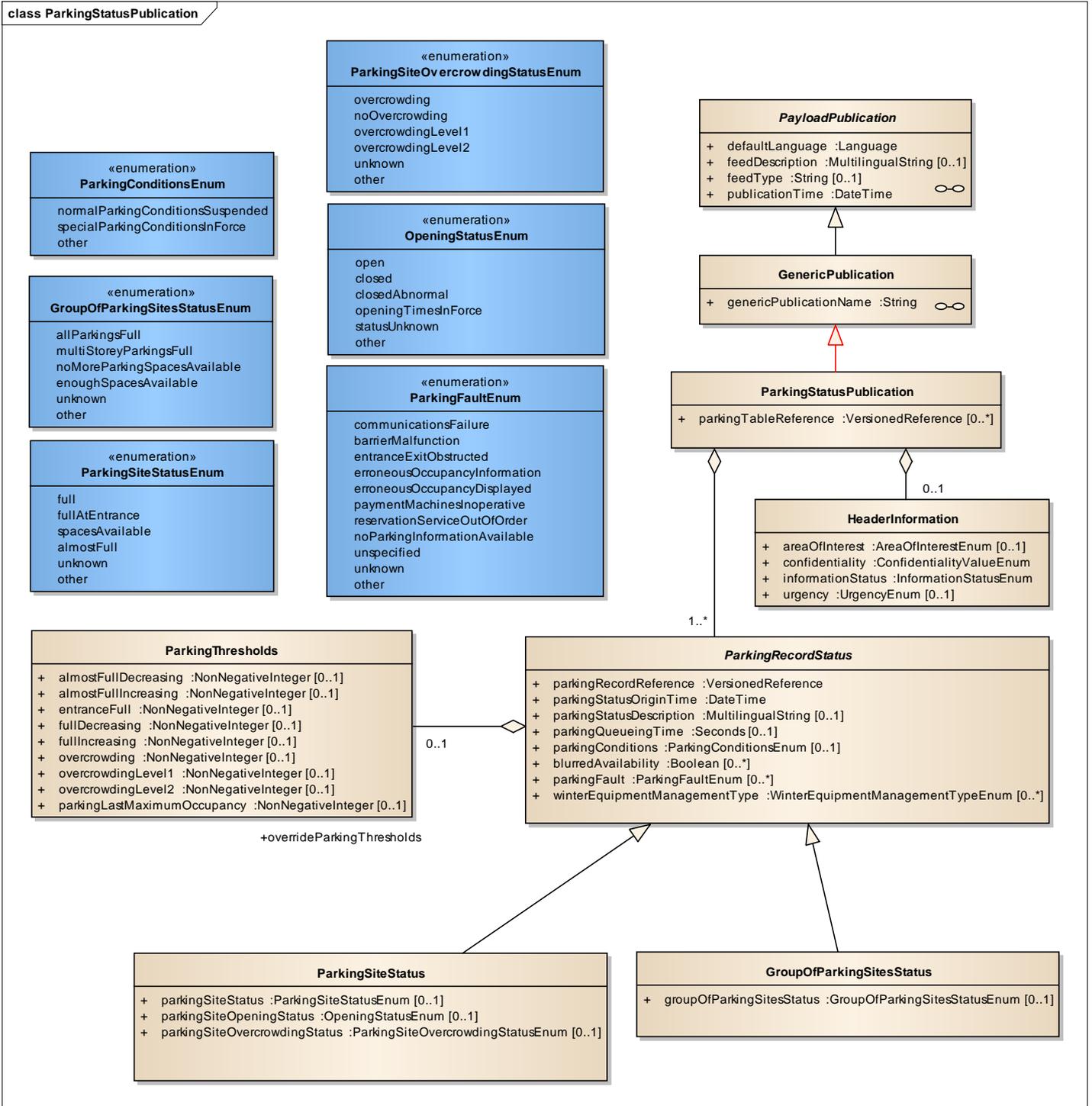
**Note:** There are more elements of VehicleCharacteristics located in the standard DATEX Level A part which are not displayed here, but which are of course available for specification (e.g. characterisation of width, height, weight). Standard enumerations are not displayed here either.



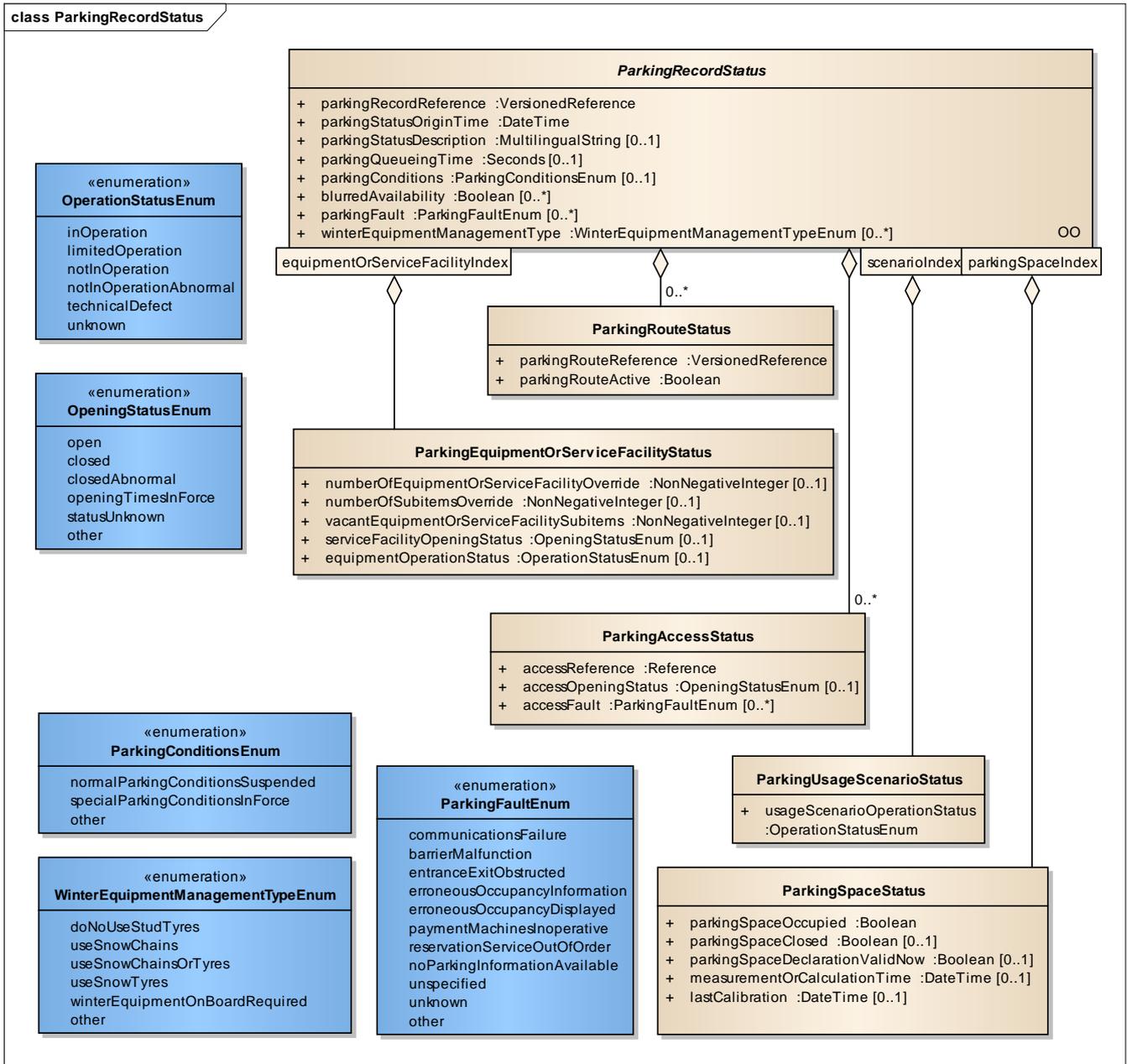
ParkingStatusPublication – Dynamic part of the model



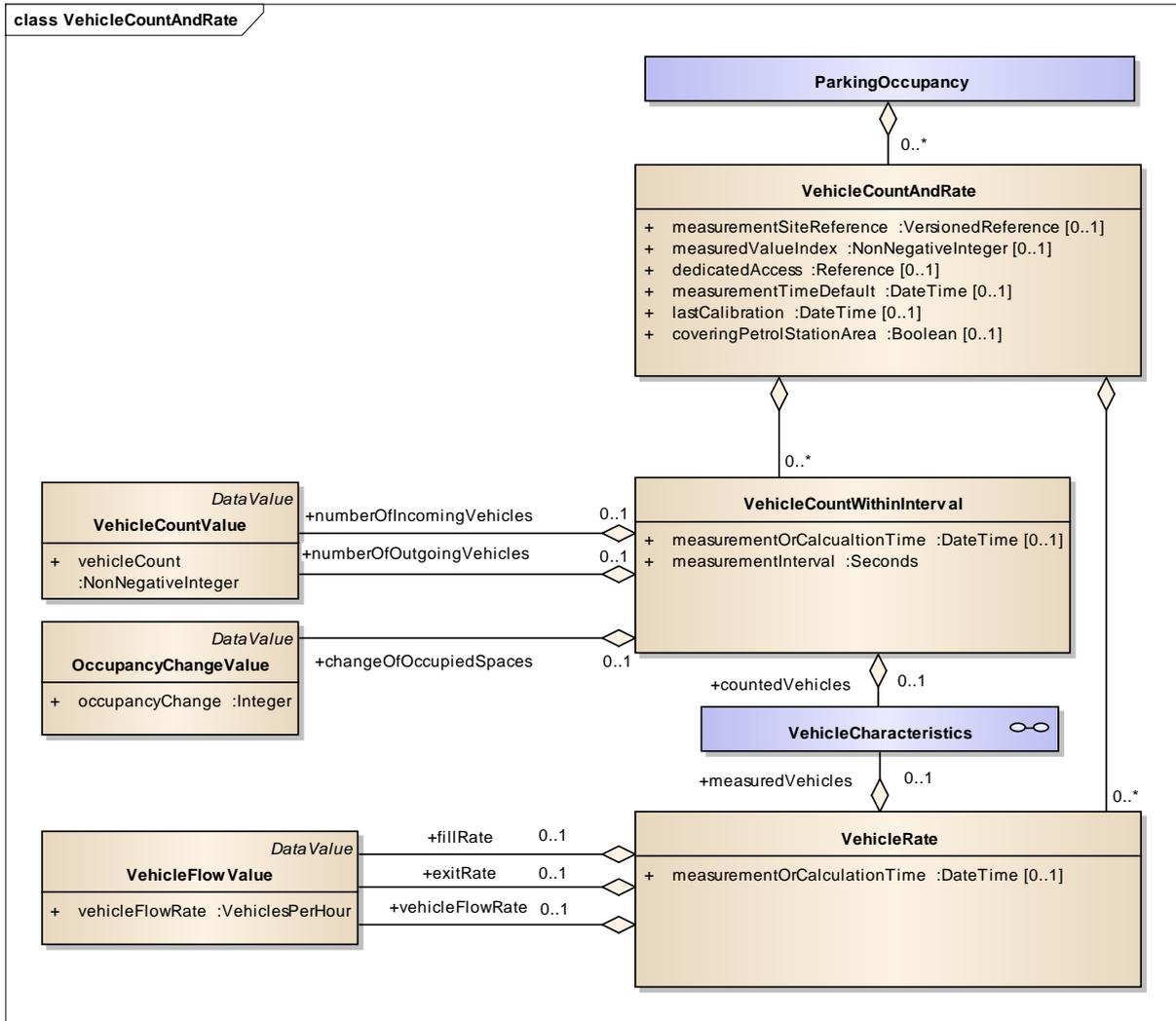
### ParkingRecordStatus



ParkingRecordStatus (cont.)



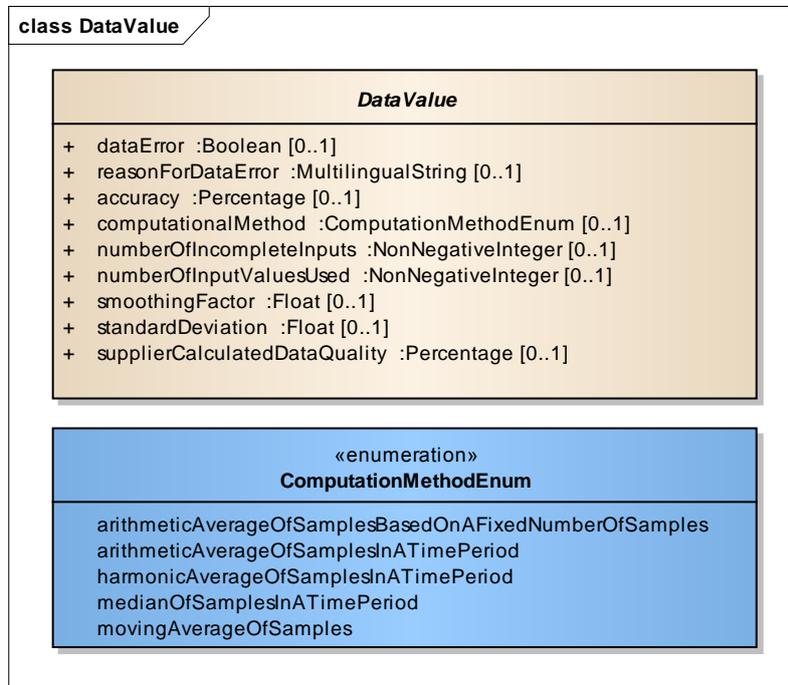
### VehicleCountAndRate



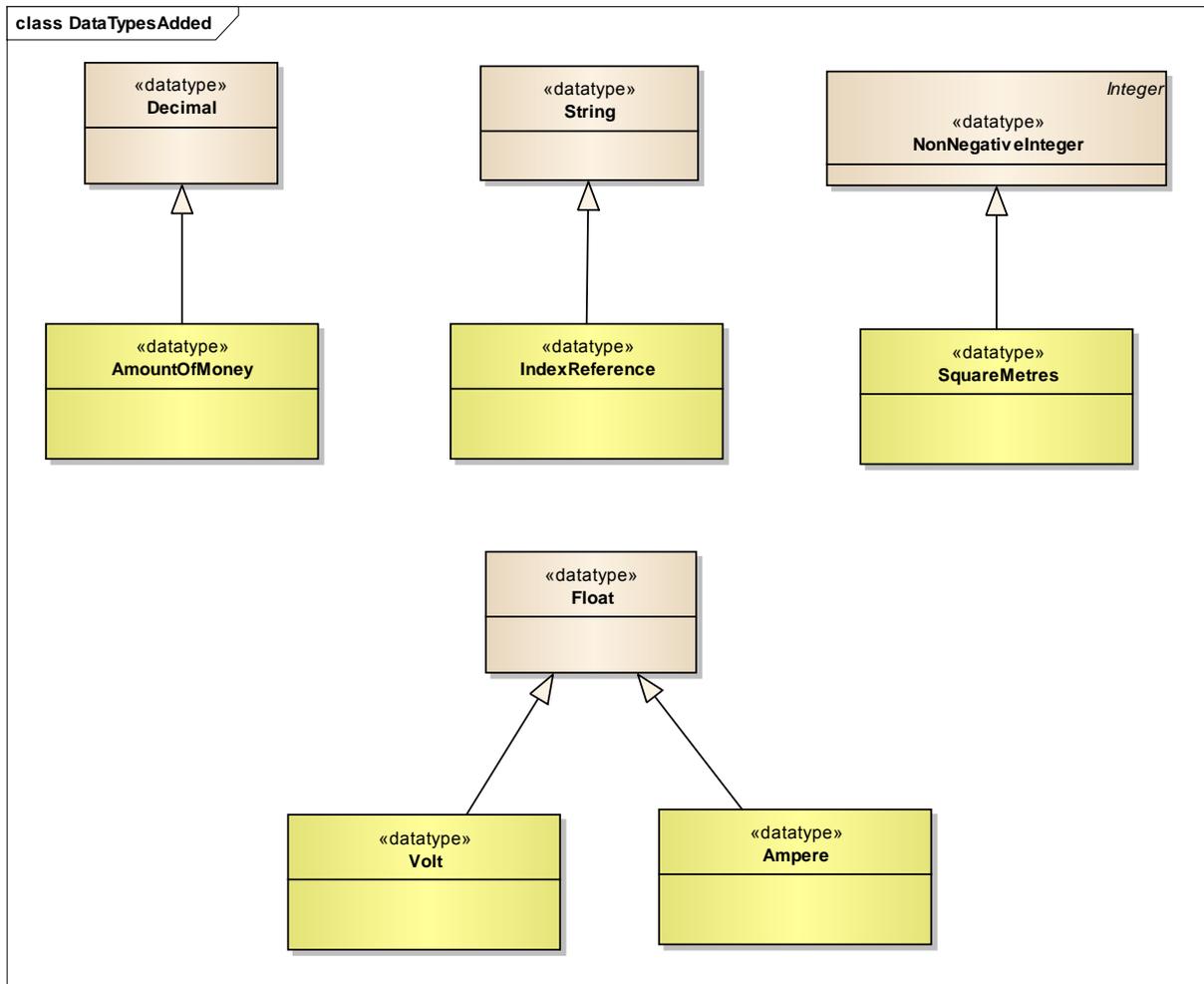
For **VehicleCountAndRate**, there is no static correspondence in the parking model. But there are attributes, which allow to point on a measurement site instead, i.e. it is possible to define detectors with a **MeasurementSiteTablePublication** and to reference them here. Of course, this is not compulsory.

## DataValue

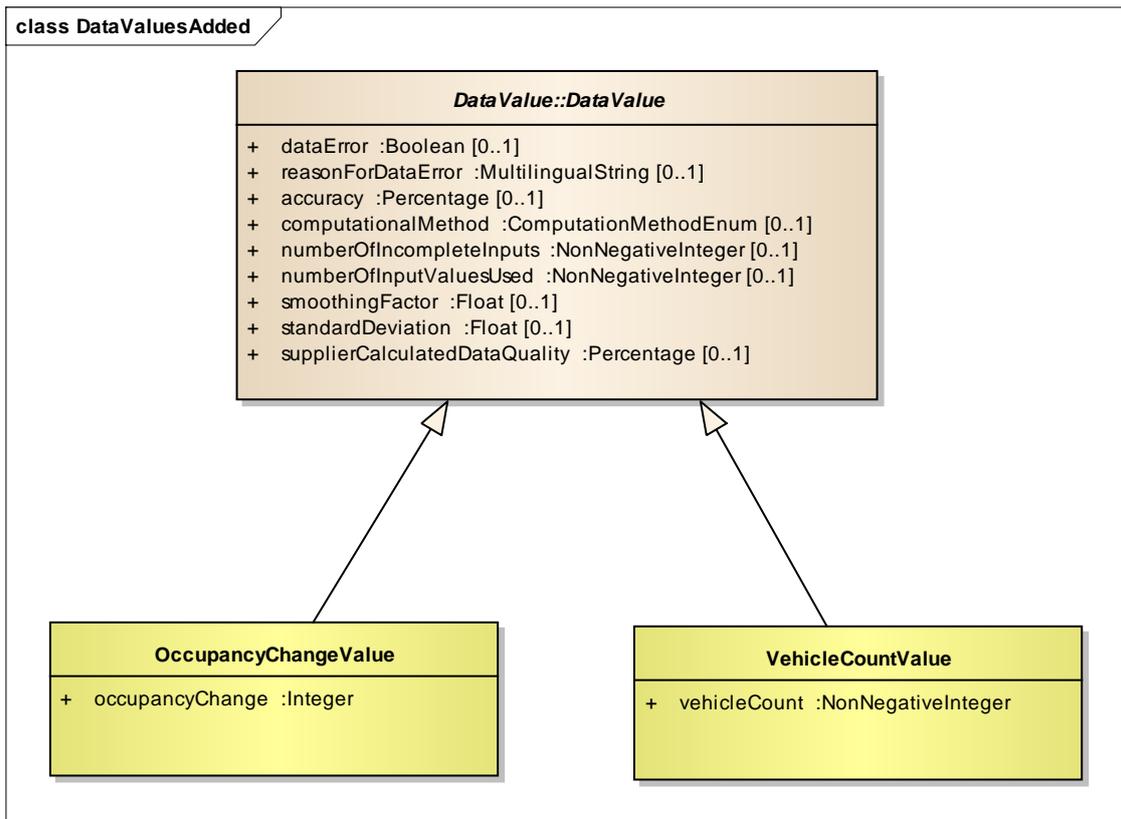
The measurement- and count values mentioned above are of type **DataValue** (from DATEX Level A; see the small mark in their classes in figure above). Thus they all have the following optional attributes, by which you can set tolerances and errorstates:



Overview of data types introduced with the ParkingPublications



Overview of data values introduced with the ParkingPublications



Contact for further information:

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[joerg.freudenstein@albrechtConsult.com](mailto:joerg.freudenstein@albrechtConsult.com)