How to publish and interpret parking data in APDS on MODI

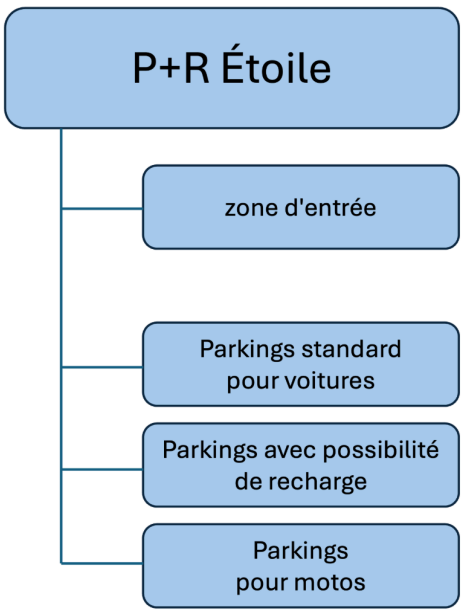
The Alliance for Parking Data Standard (APDS) has developed the global parking data standard in form of a comprehensive (UML) model. This model is the source for the APDS Specifications (overview, information model, data model, use cases). The following website gives additional examples.
The standard has been applied to the use case “find a parking spot” in Switzerland. The goal is to share parking and occupancy data on the Swiss National Access Platform MODI.
This document gives a quick insight on how the data is organized and structured.

The following information is available:

- Statical data about the parking :
    - parking structure : Place / Identified area / Access
    - parking usage : Rate / Right specification
- *Detailed occupation data*
- *Simplified occupation data (free, almost full, full)*

Statical data

In APDS, a parking physical organisation is described using a tree structure. A parking **place** is linked to **identified areas** to describe the structure. The objects “rate” and “right specification” describe the **use** of parking areas, like tariffs, opening times, access restrictions, vehicles…
Every object is referenced using an UID generated by the data producer that must be fixed over time.



Place

A place is the parent object. It describes the parking building and is referenced in the different children zones. It contains the general parking address.
The overall parking capacity is specified in the “characteristics” attribute.

Here are the typical data that can be contained in this object

Data	Description	Field
Parking name	The name of the parking	`"name”`
Paking address	The general address of the parking (building)	`"placeStreetAddress"`
Parking position	The general position of the parking (coordinates in decimal degrees, the first field is the longitude and the second is the latitude)	`"coordinates": [ 6.14404833, 46.211454007 ]`
Capacity	The number of available parking spots (addition of all spots of the building, independently of the vehicles type)	`"characteristics" "spacesTotal"`
Open to public	Specifies if the parking is open to public	`"characteristics" "openToPublic"`
Charging points	Number of charging points in the parking	`"characteristics" "evChargingPoints"`
Operator	Specify which entity is operating the parking	`"responsibilityRoleAssignments"`

Identified Areas

Identified areas are used to map the parking zones. You need to createidentified areas every time you want to show different parking usage (tariffs, opening times, type of vehicles).
For instance, a parking lot with cars and motorbikes can be divided into two identified areas. Each area has a specific rate and occupancy.
The reference to the **rightSpecification** object allows linking the access rights and rate to the parking zone.
The reference to the **parent** object links the area to the corresponding place.

Here are the typical data that can be contained in this object

Data	Description	Field
Area name	The name of the parking	`"name”`
Capacity of the area	The number of available parking spots in the area	`"characteristics" "spacesTotal"`

Parent	Link to the place in order to get the building in which there is the zone	`"parent"`
RightSpecification	Link to the rightSpecification object in order to get information on the **usage** of the area	`"rightSpecification"`

Access

A specific identified area is used to describe the parking access. It is typed as an access. The GPS coordinates and the address can be specified. If the coordinates are unknown, the indicativePointLocation is left blank.

Here are the typical data that can be contained in this object

Data	Description	Field
Area name	The name of the access	`"name"`
Access type	Type of access : entry, exit	`"accessType"`
Parent	Link to the place in order to get the building in which there is the zone	`"parent"`
Access address	The address of the access	`"placeStreetAddress"`
Access position	The access position (coordinates in decimal degrees, the first field is the longitude and the second is the latitude)	`"coordinates": [ 6.14404833, 46.211454007 ]`

RightSpecification

The rightSpecification links the objects together to specify the use.
The hiereachyElement gives the reference to the identifiedArea concerned.
The rateTable gives the reference to the corresponding tariff.

Here are the typical data that can be contained in this object

Data	Description	Field
HierachyElements	Link to the identified area/place for which we want to describe the use	`"hierarchyElements"`
Rate	Link to the tariff applied in the area	`"rateTable"`
Vehicles	Type of vehicles that can park in the area	`"vehicleTypes"`
Opening times	Specify the parking opening times	`"validity"`

Issuer	Allows to specify which entity is issuing rights in the area	`"issuer"`

Rate

APDS allows a very comprehensive way of describing the tariff.
For the MODI use case it is enough to give the 1h and 1 day tariff.
The following convention was applied :
The tariff name contains the string “(indicative)” to state that the tariff is only indicative and in the rateLineCollection we specify that the tariff is for 1 hour and 1 day.
In this case the attribute “value” gives the 1h tariff and “maxValue” the 1 day tariff.
If one of these information is not available or not relevant the attribute is left.

Here are the typical data that can be contained in this object **for a simplified tariff version**

Data	**Description**	**Field**
Name	Tariff name	`"name"`
Value for 1h	Value for 1h (ISO-8601)	`"incrementPeriod": "PT1H"` `"value"`
Value for 1day		`"maxValue"`

The following webpage give examples of more complicated tariff descriptions in APDS.

Dynamic data

The dynamic data representing the occupancy of the parking lot is published in a different dataset. APDS foresees to publish the number of occupied places (rather than the number of free spots).
The hiereachyElement gives the reference to the Place (if the parkings contains only cars) or the IdentifiedArea (if you want to get multiple counters, for instance if you need to separate cars and motorbikes) concerned by the occupancy.
The supplyQuantity gives the total number of spots whereas the occupancy is detailed in the demandTable object.

Here are the typical data that can be contained in this object

Data	Description	Field
HierachyElement Reference	Link to the identified area/place for which the occupancy is published	`"hierarchyElementReference"`
Capacity	Capacity of the zone	`"supplyQuantity"`
Frequency	Frequency of update in ISO-8601	`"frequency"`
Calculation	Method to get the occupancy: >Count = Counted >Derived=Space occupancy is estimated by using related data >Expected= prediction >Verified = verified report	`"occupancyCalculation"`
Occupancy	Number of occupied spots	`"count"`
DateTime	Last update datetime	`"recordDateTime"`

We are also planning to publish an occupancy gauge (free / medium / full).
Some examples are available here:
https://sandbox.parking-data-standards.org/examples/occupancy

Example of data for each object

Place


```
{
    "id": "db5f63f6-f340-5362-aa3e-eff3a52197e2",
    "version": 1,
    "type": "place",
    "layer": 1,
    "name": [
      {
        "language": "fr",
        "string": "Gazomètres"
      }
    ],
    "description": [
      {
        "language": "fr",
        "string": ""
      }
    ],
    "timeZone": "Europe/Zurich",
    "indicativePointLocation": {
      "type": "Point",
      "coordinates": [
        6.132909993,
        46.201835633
      ]
    },
    "placeStreetAddress": {
      "countryCode": "CH",
      "postCode": "1205",
      "city": [
        {
          "language": "fr",
          "string": "Genève"
        }
      ],
      "addressLines": [
        {
          "order": 0,
          "type": "street",
          "text": [
            {
              "language": "fr",
              "string": "Rue des Gazomètres 3"
            }
          ]
        }
      ]
    },
    "characteristics": {
      "spacesTotal": 309,
      "openToPublic": true
    },
    "responsibilityRoleAssignments": [
      {
        "type": "operator",
        "contactPoints": [
          {
            "id": "FONDATION_DES_PARKINGS",
            "version": 1,
            "organisationName": [
              {
                "language": "fr",
```

```
              "string": "Fondation des parkings"
            }
          ],
          "contactType": "contactPoint"
        }
      ]
    }
  ]
}
```

IdentifiedArea

```
{
    "id": "b0dce330-64bc-51ca-bc1c-2aa43071071c",
    "version": 1,
    "type": "identifiedArea",
    "layer": 2,
    "name": [
      {
        "language": "fr",
        "string": "Gazomètres Public Autos"
      }
    ],
    "parent": {
      "id": "db5f63f6-f340-5362-aa3e-eff3a52197e2",
      "version": 1
    },
    "timeZone": "Europe/Zurich",
    "characteristics": {
      "spacesTotal": 191
    },
    "rightSpecification": {
      "id": "b57febf6-7ccb-5867-b428-1b1433eb2828",
      "version": 1
    },
    "hierarchyElementReference": {
      "elementId": {
        "id": "b0dce330-64bc-51ca-bc1c-2aa43071071c",
        "version": 1
      }
    }
  }
```

IdentifiedArea of type=Access


```
{
    "id": "d462d1cc-b5b5-5a6f-8da1-d1e4d1659e48",
    "version": 1,
    "type": "identifiedArea",
    "accessType": "entry",
    "layer": 2,
    "name": [
      {
        "language": "fr",
        "string": "Zone d'entrée"
      }
    ],
    "parent": {
      "id": "db5f63f6-f340-5362-aa3e-eff3a52197e2",
      "version": 1
    },
    "timeZone": "Europe/Zurich",
    "indicativePointLocation": {
      "type": "Point",
      "coordinates": [
        6.133391,
        46.201919
      ]
    },
    "placeStreetAddress": {
      "countryCode": "CH",
      "postCode": "1205",
      "city": [
        {
          "language": "fr",
          "string": "Genève"
        }
      ],
      "addressLines": [
        {
          "order": 0,
          "type": "street",
          "text": [
            {
              "language": "fr",
              "string": "Rue des Gazomètres 7"
            }
          ]
        }
      ]
    }
  }
```

RightSpecification


```
{
    "id": "b57febf6-7ccb-5867-b428-1b1433eb2828",
    "version": 1,
    "type": "oneTimeUseParking",
    "hierarchyElements": [
      {
        "id": "b0dce330-64bc-51ca-bc1c-2aa43071071c",
        "version": 1
      }
    ],
    "rateEligibility": [
      {
        "id": "9b1153e0-6cc4-5e9f-b5e4-db4afaa06e1c",
        "version": 1,
        "rateTable": {
          "id": "48852da4-4b5f-5507-b111-409eb090a2cc",
          "version": 1
        },
        {
            "eligibility": {
                "qualifications": [
                    {
                        "vehicleTypes": ["motorcycle","bicycle"]
                    }
                ]
            }
        }
      }
    ],
    "issuer": {
      "id": "FONDATION_DES_PARKINGS",
      "version": 1,
      "className": "Operator"
    }
  }
```


Rate


```
{
    "id": "48852da4-4b5f-5507-b111-409eb090a2cc",
    "version": 1,
    "name": [
      {
        "language": "fr",
        "string": "Gazomètres Public Autos (indicatif)"
      }
    ],
    "rateLineCollections": [
      {
        "id": "dfc106c3-ad0b-532c-b50b-ba1284f75ccf",
        "version": 1,
        "collectionSequence": 0,
        "applicableCurrency": "CHF",
        "rateLines": [
          {
            "id": "8e8bc507-d16a-56d5-856d-96ce34001f6c",
            "version": 1,
            "sequence": 0,
            "rateLineType": "flatRateTier",
            "incrementPeriod": "PT1H",
            "usageCondition": "unlimited",
            "description": [
              {
                "language": "fr",
                "string": "par heure et par jour"
```

```
            }
          ],
          "value": 2.0,
          "maxValue": 24.0
        }
      ]
    }
  ]
}
```


Occupancy


```
{
      "id": "43294939-13b5-4a98-9062-acd7b8ec5499",
      "version": 1,
      "name": [
        {
          "language": "fr",
          "string": "Gazomètres Public Autos"
        }
      ],
      "hierarchyElementReference": {
        "elementId": {
          "id": "43294939-13b5-4a98-9062-acd7b8ec5499",
          "version": 1
        },
        "supply": [
          {
            "supplyViewType": "spaceView",
            "supplyQuantity": 191
          }
        ],
        "demandTable": [
          {
            "frequency": "PT3M",
            "timestamp": "2026-06-04T09:45:10Z",
            "demandType": [
              {
                "occupancyCalculation": "counted",
                "count": 175,
                "recordDateTime": "2026-06-04T09:45:10Z"
              }
            ]
          }
        ]
      }
```