Data examples NETEX Belgium

woensdag 22 februari 2023 14:16

These are examples of how to use the NETEX Belgium data standards for describing public transport. The examples are set in JSON-LD.

The data standards are:

- AP Timetables
- AP Stop Places
- AP Vehicle Scheduling
- VOC Timetables and Planning

And the examples cover:

- Data example 1: describing a Line
- Data example 2: describing patterns to operate the line
- Data example 3: describing a timetable at a particular stop
- Data example 4: describing the passing times of a particular vehicle journey
- Data example 5: describing a physical stop place and the corresponding logical stop places
- Data example 6: describing a physical stop place and its physical sub stop places
- Data example 7: describing some physical characteristics of a physical stop place
- Data example 8: describing the schedule of a vehicle

Examples 1-4 are based on this documentation:

https://www.stib-mivb.be/irj/go/km/docs/horaires/5/Horaires/20221024/NL HL 5 202



NL_HL_5_2 0221024_... 21024 Col.pdf

Example 8 is based on this dataset provided by De Lijn:



delijn20210 4021546

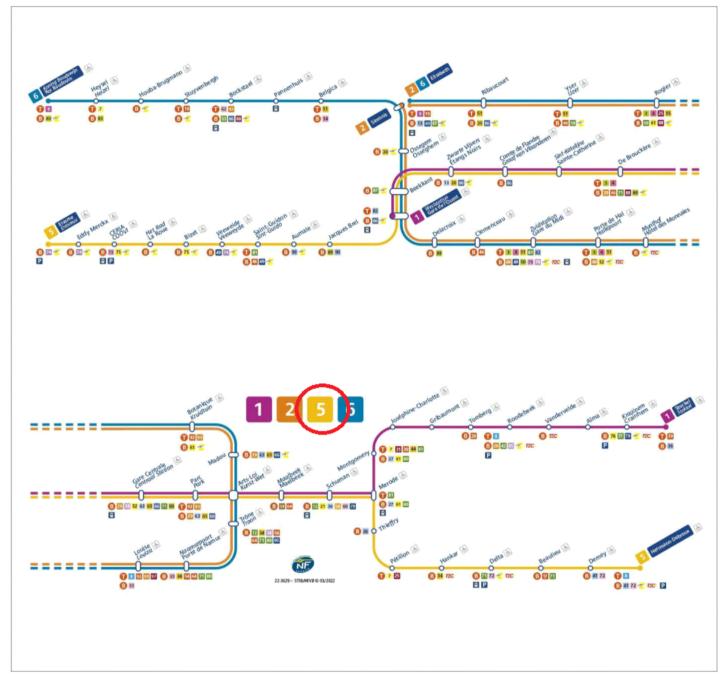
TODO:

• Currently there is no reference to the contextfiles on purl.eu which give an error. Reference are now to copies of the contextfiles hosted on my personal github repository.

Data example 1: describing a Line

woensdag 22 februari 2023 14:19

In this example we describe the spatial characteristics of metroline 5 in Brussels, part of the metronetwork, part of the MIVB-STIB public transport network.



We describe:

- The Line _:lgn001 with name "Lijn 5" and publicCode 5.
- It is part of the Brussels metronetwork _:lnet002, which is a part of the Brussels public transport Network _:net001, operated by the MIVB.
- It consists of 2 Routes: one going from Erasmus to Herman-Debroux (_:rou001) and another from Herman-Debroux to Erasmus (_:rou002).
- We will only describe _:rou001 in further detail.
- First we describe the RoutePoints that it goes through, for illustrative purposes only the beginpoint (order 1, _:rtp001) and endpoint (order 1, _:rtp027).
- These RoutePoints are Erasmus and Herman-Debroux respectively as it can be expected that begin- and endpoint of the Route coincide with these StopPlaces.
- This also goes for some of the points in-between, but in practice further points that are not StopPlaces could be added to describe the the actual path followed by the Line in further detail.
- The geometry of the RoutePoints is described by corresponding Points like _:pnt001, _:pnt027 etc.
- How the Routes of Line 5 are operated is described in <u>Data example describing patterns to</u> operate the line.

The data example:

```
"@context": [
"https://raw.githubusercontent.com/GeertThijs/MyFiles/master/ContextfileTim
etables.jsonld",
              "geosparql": "http://www.opengis.net/ont/geosparql#",
"Line.partOf": {
                    "@reverse": "https://purl.eu/ns/mobility/timetables-and-
planning#composedOf"
               },
               "GroupOfLines.partOf": {
    "@reverse": "https://purl.eu/ns/mobility/timetables-and-
planning#Network.madeUpOf"
    ],
     "@graph": [
              "@id": "_:lgn001",
"@type": "Line",
              "Line.name": {
    "@value": "Lijn 5",
    "@language": "nl"
               "Line.partOf": {
                   "@id": "_:net002"
              "Line.publicCode": "5",
              "Line.madeUpOf": [
                   "_:rou001",
"_:rou002"
              ]
          },
              "@id": "_:rou001",
"@type": "Route",
               "Route.name": {
                   "@value": "Lijn 5 Erasmus - Herman Debroux",
"@language": "nl"
              },
"Route.through": [
                    {
                        "@type": "PointOnRoute",
                        "PointOnRoute.order": 1,
"PointOnRoute.aViewOf": "_:rtp001"
                    },
                    { } ,
                        "@type": "PointOnRoute",
                        "PointOnRoute.order": 28,
"PointOnRoute.aViewOf": "_:rtp028"
               "Route.coveredBy": [
                   {
                        "@type": "ServiceJourneyPattern",
                        "JourneyPatter.destinationDisplay": {
                             "@type": "DestinationDisplay",
                             "DestinationDisplay.frontText": {
    "@value": "5 Herman Debroux",
                                  "@language": "nl"
                             }
                        },
"ServiceJourneyPattern.madeUpOf": [
                                  "@type": "StopPointInJourneyPattern",
                                  "StopPointInJourneyPattern.order": 1,
"StopPointInJourneyPattern.aViewOf": "_:ssp001"
                             },
                             { },
                                  "@type": "StopPointInJourneyPattern",
                                  "StopPointInJourneyPattern.order": 28
                                  "StopPointInJourneyPattern.aViewOf": "_:ssp028"
                        ]
                    },
                        "@type": "ServiceJourneyPattern",
                        "JourneyPatter.destinationDisplay":
                             "@type": "DestinationDisplay",
                             "DestinationDisplay.frontText": {
                                  "@value": "5 Delta",
                                  "@language": "nl"
                         "ServiceJourneyPattern.madeUpOf": [
                                  "@type": "StopPointInJourneyPattern",
```

```
"StopPointInJourneyPattern.order": 1,
"StopPointInJourneyPattern.aViewOf": "_:ssp001"
                               },
                               { } ,
                                     "@type": "StopPointInJourneyPattern",
                                     "StopPointInJourneyPattern.order": 25,
                                     "StopPointInJourneyPattern.aViewOf": ":ssp025"
                               }
                        ]
                    }
               1
          },
               "@id": "-:rou002",
"@type": "Route",
               "Route.name": {
    "@value": "Lijn 5 Herman Debroux - Erasmus",
    "@language": "nl"
               "Route.through": [
                          "@type": "PointOnRoute",
                          "PointOnRoute.order": 1,
"PointOnRoute.aViewOf": "_:rtp028"
                     },
                     {
                          ...
                     },
                          "@type": "PointOnRoute",
                          "PointOnRoute.order": 28,
"PointOnRoute.aViewOf": ":rtp001"
               ]
          },
               "@id": "_:rtp001",
"@type": "RoutePoint",
               "Point (class).name": {
    "@value": "Erasmus",
                     "@language": "nl"
               },
"Point.location": "_:pnt001"
          { } ,
               "@id": "_:rtp028",
"@type": "RoutePoint",
"Point (class).name": {
    "@value": "Herman Debroux",
    "@language": "nl"
               },
"Point.location": "_:pnt028"
          },
               "@id": "_:ssp001",
"@type": "ScheduledStopPoint",
               "ScheduledStopPoint.name": {
                    "@value": "Erasmus",
                    "@language": "nl"
                "ScheduledStopPoint.location": "_:pnt001",
               "ScheduledStopPoint.stopType":
"https://example.com/concept/stopplacetype/metrostation"
          },
{},
               "@id": "_:ssp025",
"@type": "ScheduledStopPoint",
               "ScheduledStopPoint.name": {
    "@value": "Delta",
                    "@language": "nl"
               "ScheduledStopPoint.location": "_:pnt025",
               "ScheduledStopPoint.stopType":
"https://example.com/concept/stopplacetype/metrostation"
          { } ,
               "@id": "_:ssp028",
"@type": "ScheduledStopPoint",
               "ScheduledStopPoint.name": {
                     "@value": "Herman Debroux",
                    "@language": "nl"
               "ScheduledStopPoint.location": "_:pnt028",
               "ScheduledStopPoint.stopType":
"https://example.com/concept/stopplacetype/metrostation"
          }.
```

```
"@id": "_:pnt001",
"@type": "Point (datatype)",
                "Geometry.gml": {
                     "@value": "<gml:Point srsName=\"http:
\\//www.opengis.net/def/crs/EPSG/0/31370\"><gml:coordinates>x1
y1</gml:coordinates><gml:Point>",
                      "@type": "geosparql:gmlliteral"
          },
{},
                "@id": "_:pnt025",
"@type": "Point (datatype)",
"@type": "geosparql:gmlliteral"
           },
           { },
                "@id": "_:pnt028",
"@type": "Point (datatype)",
"Geometry.gml": {
    "@value": "<gml:Point srsName=\"http:
\\//www.opengis.net/def/crs/EPSG/0/31370\"><gml:coordinates>x28
y28</gml:coordinates><gml:Point>",
                     "@type": "geosparql:gmlliteral"
           },
                "@id": "_:net002",
"@type": "Network",
                "Network.name": {
    "@value": "metronet",
                     "@language": "nl"
},

"GroupOfLines.transportMode":

"https://example.com/concept/transportmode/metro",

"GroupOfLines.partOf": {

"@id": "_:net001"
           },
                "@id": "_:net001",
"@type": "Network",
                "Network.name": {
    "@value": "MIVBnet",
                      "@language": "nl"
                },
"Network.transportOrganisation": {
                      "@type": [
                           "Authority",
                           "RegisteredOrganization"
                      "RegisteredOrganization.legalName": {
                           "@value": "Maatschappij voor het Intercommunaal Vervoer
te Brussel",
                           "@language": "nl"
                     },
"RegisteredOrganization.registration": {
    "@type": "Identifier",
    "Identifier.identifier": {
        "@value": "0247.499.953",
        ""."
"@type":
"https://example.com/concept/identifiertype/cbe-number"
                           }
               }
          }
     ]
```

Data example 2: describing patterns to operate the line

vrijdag 24 februari 2023 10:05

In this example we describe some of the patterns (sequences of stop places) followed by vehicles operating line 5.

In the timetables (see <u>Data examples NETEX Belgium</u>) we see that for the route Erasmus to Herman-Debroux most vehicles follow the entire route, but that there are some variants. So we have:

Erasmus	->	Herman-Debroux
Delta	->	Herman-Debroux
Weststation	->	Delta
Erasmus	->	Delta

We describe:

- Two of these so called ServiceJourneyPatterns, one that operates the entire Route from Erasmus to Herman-Debroux and another that just goes to Delta.
- In fact these are just ordered lists of StopPlaces (or rather ScheduledStopPoints as these are called) that are operated by the Line. Erasmus is the first in this list, Delta the 25th and Herman Debroux the 27th StopPlace.
- (For the Route going in the other direction from Herman-Debroux to Erasmus, Herman-Debroux would be number 1, Delta number 4 and Erasmus number 28.)
- For illustrative reasons only the first and the last ScheduledStopPoint are described here.
- We further describe the ScheduledStopPoints by their name, type and geometry (the latter much like the geometry of the Routepoints was described).
- The actual Passingtimes at the scheduledStoppoints individually or along the Line will be
 described in seperate data examples (see <u>Data example describing the timetable at a</u>
 particular stop and <u>Data example describing the passing times of a particular vehicle journey</u>).

```
The data example:
```

```
"@context": [
"https://raw.githubusercontent.com/GeertThijs/MyFiles/master/ContextfileTim
etables.jsonld",
            "geosparql": "http://www.opengis.net/ont/geosparql#"
    "@graph": [
            "@id": " :sip001",
            "@type": "ServiceJourneyPattern",
            "JourneyPattern.destinationDisplay": {
                "@type": "DestinationDisplay",
                "DestinationDisplay.frontText": {
                    "@value": "5 Herman-Debroux",
                    "@language": "nl"
                }
            },
            "JourneyPattern.route": " :rou001",
            "ServiceJourneyPattern.madeUpOf": [
                {
                    "@type": "StopPointInJourneyPattern",
                    "StopPointInJourneyPattern.order": 1,
                    "StopPointInJourneyPattern.aViewOf": " :ssp001"
                },
                { } ,
                    "@type": "StopPointInJourneyPattern",
                    "StopPointInJourneyPattern.order": 27,
                    "StopPointInJourneyPattern.aViewOf": " :ssp027"
```

```
]
        },
            "@id": " :sjp002",
            "@type": "ServiceJourneyPattern",
            "JourneyPatter.destinationDisplay": {
                "@type": "DestinationDisplay",
                "DestinationDisplay.frontText": {
                     "@value": "5 Delta",
                     "@language": "nl"
                }
            },
            "JourneyPattern.route": " :rou001",
            "ServiceJourneyPattern.madeUpOf": [
                {
                     "@tvpe": "StopPointInJourneyPattern",
                     "StopPointInJourneyPattern.order": 1,
                     "StopPointInJourneyPattern.aViewOf": " :ssp001"
                },
                {},
                 {
                     "@type": "StopPointInJourneyPattern",
                     "StopPointInJourneyPattern.order": 25,
                     "StopPointInJourneyPattern.aViewOf": " :ssp025"
            ]
        },
            "@id": " :rou001",
            "@type": "Route",
            "Route.name": {
                "@value": "Lijn 5 Erasmus - Herman-Debroux",
                 "@language": "nl"
            },
            "Route.through": [
                {
                     "@type": "PointOnRoute",
                     "PointOnRoute.order": 1,
                     "PointOnRoute.aViewOf": " :rtp001"
                },
                { } ,
                     "@type": "PointOnRoute",
                     "PointOnRoute.order": 27,
                     "PointOnRoute.aViewOf": " :rtp027"
            ]
        },
            "@id": "_:ssp001",
"@type": "ScheduledStopPoint",
            "ScheduledStopPoint.name": {
                "@value": "Erasmus",
                "@language": "nl"
            "ScheduledStopPoint.location": "_:pnt001",
            "ScheduledStopPoint.stopType":
"https://example.com/concept/stopplacetype/metrostation"
        },
        { } ,
            "@id": "_:ssp025",
            "@type": "ScheduledStopPoint",
            "ScheduledStopPoint.name": {
                "@value": "Delta",
                "@language": "nl"
            },
```

}

```
"ScheduledStopPoint.location": ":pnt025",
            "ScheduledStopPoint.stopType":
"https://example.com/concept/stopplacetype/metrostation"
        },
        {},
            "@id": " :ssp027",
            "@type": "ScheduledStopPoint",
            "ScheduledStopPoint.name": {
                "@value": "Herman-Debroux",
                "@language": "nl"
            },
            "ScheduledStopPoint.location": ":pnt027",
            "ScheduledStopPoint.stopType":
"https://example.com/concept/stopplacetype/metrostation"
        },
        {
            "@id": " :rtp001",
            "@type": "RoutePoint",
            "Point (class).name": {
                "@value": "Erasmus",
                "@language": "nl"
            "Point (class).location": " :pnt001"
        } ,
        { } ,
            "@id": " :rtp027",
            "@type": "RoutePoint",
            "Point (class).name": {
                "@value": "Herman-Debroux",
                "@language": "nl"
            "Point (class).location": " :pnt027"
        } ,
            "@id": " :pnt001",
            "@type": "Point (datatype)",
            "Geometry.gml": {
                "@value": "<gml:Point srsName=\"http:
\\//www.opengis.net/def/crs/EPSG/0/31370\"><gml:coordinates>x1
y1</gml:coordinates><gml:Point>",
                "@type": "geosparql:gmlliteral"
        },
        { } ,
        {
            "@id": " :pnt025",
            "@type": "Point (datatype)",
            "Geometry.gml": {
                "@value": "<gml:Point srsName=\"http:</pre>
\\//www.opengis.net/def/crs/EPSG/0/31370\"><qml:coordinates>x25
y25</gml:coordinates><gml:Point>",
                "@type": "geosparql:gmlliteral"
        },
        { } ,
        {
            "@id": "_:pnt027",
            "@type": "Point (datatype)",
            "Geometry.gml": {
                "@value": "<gml:Point srsName=\"http:</pre>
\\//www.opengis.net/def/crs/EPSG/0/31370\"><gml:coordinates>x28
y28</gml:coordinates><gml:Point>",
                "@type": "geosparql:gmlliteral"
        }
    ]
```

Data example 3: describing a timetable at a particular stop

donderdag 23 februari 2023 14:52

In this example we describe the passing times of line 5 in De Brouckere in the direction of Herman-Debroux.

This corresponds to one row in the timetable:

ERASMUS			5:12	5:29	5:39		5:49	5:54	6:00	6:05	6:09	6:14	6:19	6:24	6:28	6:34
ERASMUS	-	-	5:12	5:29	5:39	-	5:49	5:54	6:00	6:05	6:09	6:14	6:19	6:24	6:28	6:34
SINT-GUIDO	-	-	5:22	5:37	5:47	-	5:57	6:02	6:08	6:13	6:17	6:22	6:27	6:32	6:37	6:42
WESTSTATION	-	-	5:27	5:41	5:51	-	6:02	6:07	6:12	6:17	6:22	6:26	6:31	6:36	6:42	6:47
BEEKKANT	-	-	5:29	5:42	5:53		6:03	6:08	6:13	6:18	6:23	6:28	6:33	6:38	6:43	6:48
DE BROUCKERE	-	-	5:36	5:48	5:58	-	6:08	6:13	6:19	6:24	6:28	6:33	6:38	6:44	6:49	6:54
KUNST-WET	-	-	5:40	5:51	6:01	-	6:12	6:17	6:22	6:27	6:32	6:37	6:42	6:47	6:53	6:58
MERODE	-	-	5:45	5:55	6:05	-	6:16	6:21	6:26	6:31	6:36	6:42	6:47	6:52	6:57	7:02
DELTA	5:29	5:41	5:51	6:00	6:10	6:16	6:21	6:26	6:31	6:36	6:42	6:47	6:52	6:57	7:02	7:07
HERRMANN-DEBROUX	5:34	5:44	5:55	6:04	6:14	6:19	6:24	6:30	6:35	6:40	6:46	6:51	6:56	7:01	7:06	7:11
	906	914	902	910	916	924	918	904	908	920	912	922	926	906	928	914

ERASMUS	22:23	22:33	22:43	22:53	23:03	23:13	23:23	23:33	23:43	23:53	0:03	0:13	0:23
ERASMUS	22:23	22:33	22:43	22:53	23:03	23:13	23:23	23:33	23:43	23:53	0:03	0:13	0:23
SINT-GUIDO	22:31	22:41	22:51	23:01	23:11	23:21	23:31	23:41	23:51	0:01	0:11	0:21	0:31
WESTSTATION	22:35	22:45	22:55	23:05	23:15	23:25	23:35	23:45	23:55	0:05	0:15	0:25	0:35
BEEKKANT	22:36	22:46	22:56	23:06	23:16	23:26	23:36	23:46	23:56	0:06	0:16	0:26	0:36
DE BROUCKERE	22:42	22:52	23:02	23:12	23:22	23:32	23:42	23:52	0:02	0:12	0:22	0:32	0:42
KUNSI-WEI	22:45	22:55	23:05	23:15	23:25	23:35	23:45	23:55	0:05	0:15	0:25	0:35	0:45
MERODE	22:49	22:59	23:09	23:19	23:29	23:39	23:49	23:59	0:09	0:19	0:29	0:39	0:49
DELTA	22:54	23:04	23:14	23:24	23:34	23:44	23:54	0:04	0:14	0:24	0:34	0:44	0:54
HERRMANN-DEBROUX	22:58	23:08	23:18	23:28	23:38	23:48	23:58	0:08	0:18	0:28	0:38	0:48	0:58
	904	938	922	940	930	902	934	916	944	904	938	922	940

We describe:

- De Brouckere as a ScheduledStopPoint, with its name "De Brouckere", location, stopType "metrostation".
- A ScheduledStopPoint can be used in a one or more ServiceJourneyPatterns, but here we refer
 to only one of them (_:sjp001, following a Route from Line 5 in the direction of Herman-Debroux).
- Our ScheduledStopPoint is the 15th in that pattern.
- We then describe the timetable, the list of the so called consecutiveTimeTabledPassingTimes
 of trains riding this pattern of Line 5 through De Brouckere.
- This starts at 5:36 hours in de morning and (after several intermediate passings of the Line) ends at 00:42 hours the following day.
- Each TimeTabledPassingTime is the result of a seperate ServiceJourney, we only describe here the journeys of the first passing (_:svj001 with id 902 in the table above) and of the last passing (_:svj0NN with id 940).
- Each ServiceJourney refers to the pattern it is following (here both follow the same pattern :sip001).
- Further reference to the Route, Line and Network were left out in this example, see <u>Data example describing a Line</u> for this.

TODO:

```
"@value": "De Brouckere",
                  "@language": "nl"
             "ScheduledStopPoint.location": " :pnt015",
             "ScheduledStopPoint.stopType":
"https://example.com/concept/stopplacetype/metrostation",
             "Point (class).viewedAs": [
                 {
                      "@type": "PointInJourneyPattern",
                      "PointInJourneyPattern.order": 15,
                      "PointInJourneyPattern.journeyPattern": {
                          "@id": " :sjp001"
                      "PointInJourneyPattern.at": [
                           {
                               "@type": "TimeTabledPassingTime",
                               "TimeTabledPassingTime.departureTime":
"05:36:00.000",
                               "TimeTabledPassingTime.vehicleJourney": {
                                    "@id": " :svj001"
                           { } ,
                               "@type": "TimeTabledPassingTime",
                               "TimeTabledPassingTime.departureDayOffset": 1,
                               "TimeTabledPassingTime.departureTime":
"00:42:00.000",
                               "TimeTabledPassingTime.vehicleJourney": {
                                    "@id": "_:svj0nn"
                          }
                     ]
             ]
             "@id": "_:svj001",
"@type": "ServiceJourney",
             "ServiceJourney.madeUsing": " :sjp001"
         { } ,
             "@id": "_:svj0NN",
"@type": "ServiceJourney",
             "ServiceJourney.madeUsing": "_:sjp001"
             "@id": "_:sjp001",
"@type": "ServiceJourneyPattern",
             "JourneyPattern.destinationDisplay": {
                 "@type": "DestinationDisplay",
"DestinationDisplay.frontText": {
                      "@value": "5 Herman-Debroux",
                      "@language": "nl"
        },
             "@id": "_:pnt015",
"@type": "Point (datatype)",
"Geometry.gml": {
                 "@value": "<gml:Point srsName=\"http:
\\//www.opengis.net/def/crs/EPSG/0/31370\"><gml:coordinates>x1
y1</gml:coordinates><gml:Point>",
                 "@type": "geosparql:gmlliteral"
        }
    ]
```

Data example 4: describing the passing times of a particular vehicle journey

vrijdag 24 februari 2023 9:1

In this example we describe the passing times at consecutive stop places of one particular vehicle journey of line 5 from Erasmus to Herman-Debroux.

This corresponds to one columnin the timetable:

ERASMUS	8:01	8:07	8:12	8:17	8:22	8:27	8:32	8:38	8:43	8:48	8:53	8:58	9:03	9:09	9:14	9:19
ERASMUS	8:01	8:07	8:12	8:17	8:22	8:27	8:32	8:38	8:43	8:48	8:53	8:58	9:03	9:09	9:14	9:19
SINT-GUIDO	8:10	8:15	8:20	8:25	8:31	8:36	8:41	8:46	8:51	8:56	9:02	9:07	9:12	9:17	9:22	9:27
WESTSTATION	8:15	8:20	8:25	8:30	8:35	8:40	8:46	8:51	8:56	9:01	9:06	9:11	9:17	9:22	9:27	9:32
BEEKKANT	8:16	8:21	8:26	8:31	8:37	8:42	8:47	8:52	8:57	9:02	9:08	9:13	9:18	9:23	9:28	9:33
DE BROUCKERE	8:22	8:27	8:32	8:37	8:42	8:48	8:53	8:58	9:03	9:08	9:13	9:19	9:24	9:29	9:34	9:39
KUNST-WET	8:26	8:31	8:36	8:41	8:46	8:51	8:57	9:02	9:07	9:12	9:17	9:22	9:28	9:33	9:38	9:43
MERODE	8:30	8:35	8:40	8:46	8:51	8:56	9:01	9:06	9:11	9:17	9:22	9:27	9:32	9:37	9:42	9:48
DELTA	8:35	8:40	8:46	8:51	8:56	9:01	9:06	9:11	9:17	9:22	9:27	9:32	9:37	9:42	9:48	9:53
HERRMANN-DEBROUX	8:39	8:44	8:50	8:55	9:00	9:05	9:10	9:15	9:21	9:26	9:31	9:36	9:41	9:46	9:52	9:57
	928	914	930	902	932	910	934	916	936	924	918	904	908	920	912	922

We describe:

- ServiceJourney _:svj045 with id 908 in the timtables.
- The vehicles operate ServiceJourneyPattern _:sjp001 follows the Route of Line 5 from Erasmus to Herman-Debroux.
- This ServiceJourney departs at 9:03 hours in Erasmus.
- It passes then several other ScheduledStoppoints (passes not described here) until it arrives at 09:41 hours in Herman-Debroux.
- Further reference to the Route, Line and Network were left out in this example, see <u>Data example describing a Line</u> for this.

TODO

• Daytype?

```
The data example:
    "@context": [
"https://raw.githubusercontent.com/GeertThijs/MyFiles/master/ContextfileTim
etables.jsonld",
             "geosparql": "http://www.opengis.net/ont/geosparql#",
             "adms": "http://www.w3.org/ns/adms#",
             "skos": "http://www.w3.org/2004/02/skos/core#",
             "TimeTabledPassingTime.pointInJourneyPattern": {
                 "@reverse": "https://purl.eu/ns/mobility/timetables-and-
planning#at"
        }
    "@graph": [
             "@id": "_:svj045",
"@type": "ServiceJourney",
             "ServiceJourney.madeUsing": "_:sjp001",
             "adms:identifier": {
                 "@type": "adms:Identifier",
                 "skos:notation": {
    "@value": "908",
                     "@type":
"https://example.com/concept/identifiertype/mivbstib-journeynumber"
             "ServiceJourney.departureTime": "09:03:00.000",
             "VehicleJourney.passedAt": [
                     "@type": "TimeTabledPassingTime",
                     "TimeTabledPassingTime.departureTime": "09:03:00.000",
                     "TimeTabledPassingTime.pointInJourneyPattern": {
                          "@type": "StopPointInJourneyPattern",
                          "StopPointInJourneyPattern.order": 1
                          "StopPointInJourneyPatter.aViewOf": "_:ssp001"
                     "@type": "TimeTabledPassingTime",
                     "TimeTabledPassingTime.departureTime": "09:41:00.000",
                     "TimeTabledPassingTime.pointInJourneyPattern": {
                          "@type": "StopPointInJourneyPattern",
                          "StopPointInJourneyPattern.order": 2
                          "StopPointInJourneyPattern.order": 2/,
"StopPointInJourneyPatter.aViewOf": ":ssp027"
```

```
]
          },
               "@id": "_:sjp001",
"@type": "ServiceJourneyPattern",
                "JourneyPattern.destinationDisplay": {
                     "@type": "DestinationDisplay",
"DestinationDisplay.frontText": {
    "@value": "5 Herman-Debroux",
    "@language": "nl"
          },
               "@id": "_:ssp001",
"@type": "ScheduledStopPoint",
                "ScheduledStopPoint.name": {
                     "@value": "Erasmus",
                     "@language": "nl"
                },
"ScheduledStopPoint.location": "_:pnt001",
                "ScheduledStopPoint.stopType":
"https://example.com/concept/stopplacetype/metrostation"
           {},
               "@id": "_:ssp027",
"@type": "ScheduledStopPoint",
                "ScheduledStopPoint.name": {
                     "@value": "Herman-Debroux",
                     "@language": "nl"
                },
"ScheduledStopPoint.location": "_:pnt027",
                "ScheduledStopPoint.stopType":
"https://example.com/concept/stopplacetype/metrostation"
          },
"@id": "_:pnt001",
    "@type": "Point (datatype)",
    "Geometry.gml": {
        "@value": "<gml:Point srsName=\"http:
        \\//www.opengis.net/def/crs/EPSG/0/31370\"><gml:coordinates>x1
y1</gml:coordinates><gml:Point>",
                     "@type": "geosparql:gmlliteral"
          {},
               "@id": "_:pnt027",
"@type": "Point (datatype)",
                "Geometry.gml": {
                    "@value": "<gml:Point srsName=\"http:
\\//www.opengis.net/def/crs/EPSG/0/31370\"><gml:coordinates>x27
y27</gml:coordinates><gml:Point>",
                     "@type": "geosparql:gmlliteral"
     ]
```

Data example 5: describing a physical stop place and the corresponding logical stop places

maandag 27 februari 2023 21:09

In this data example we describe the physical stop place Centraal Station and the corresponding logical stop places of the same name in 3 public transport networks, more in particular the metronetwork, the train network and the bus network.

We describe:

- Stop Place :stp001 "Centraal Station"
- Which is primarily a trainstation.
- Of the general type (meaning that it incorporates other stations, see <u>Data example describing</u>
 a physical stop place and its physical sub stop places for a data example that describes this
 aspect)
- Centraal Station serves travelers in the Topographical Place "Brussels Hoofdstedelijk Gewest"
- And its official Address is "Europakruispunt 2, 1000 Brussel".
- The station as a physical StopPlace is served by at least 3 logical StopPlaces (so called ScheduledStopPoints):
 - ScheduledStoppingPoint _:spp016, a stopping point in the metro network (name "Centraal Station")
 - ScheduledStoppingPoint _:spp089, a stopping point in the rail network (name "Brussel-Centraal")
 - ScheduledStoppingPoint _:spp099, a stopping point in the bus network (name "Centraal Station")
- We only describe in some detail the metro network stopping point
- More in particular of the JourneyPatterns that include this stopping point.
- It is a stopping point in at least 2 JourneyPatterns:
 - _:sjp001 (which is Line 5 Erasmus -> Herman-Debroux in which it is the 16th stopping piunt)
 - _:spj002 (which is Line 5 Erasmus -> Delta in which it has the same position)
- See <u>Data example describing patterns to operate the line</u> for more detail on these patterns The data example:

```
"@context": [
"https://raw.githubusercontent.com/GeertThijs/MyFiles/master/ContextfileSto
pPlaces.jsonld",
"https://raw.githubusercontent.com/GeertThijs/MyFiles/master/ContextfileTim
etables.jsonld",
            "PointInJourneyPattern.journeyPattern": {
                "@reverse": "https://purl.eu/ns/mobility/timetables-and-
planning#JourneyPattern.madeUpOf"
    "@graph": {
        "@id": " :stp001",
        "@type": "StopPlace",
        "StopPlace.name": {
            "@value": "Centraal Station",
            "@language": "nl"
        "StopPlace.transportMode":
"https://example.com/concept/transportmode/train",
        "StopPlace.placeType":
"https://example.com/concept/placetype/general",
        "StopPlace.stopPlaceType":
"https://example.com/concept/stopplacetype/railstation",
        "StopPlace.scheduledStopPoint": [
```

```
{
                "@id": " :spp016",
                "@type": "ScheduledStopPoint",
                "ScheduledStopPoint.name": {
                    "@value": "Centraal Station",
                    "@language": "nl"
                },
                "ScheduledStopPoint.stopType":
"https://example.com/concept/stopplacetype/metrostation",
                "Point (class).viewedAs": [
                        "@type": "PointInJourneyPattern",
                        "PointInJourneyPattern.order": 16,
                        "PointInJourneyPattern.journeyPattern": {
                            "@id": " :sjp001"
                    },
                        "@type": "PointInJourneyPattern",
                        "PointInJourneyPattern.order": 16,
                        "PointInJourneyPattern.journeyPattern": {
                             "@id": " :sjp002"
                    },
                    { }
                1
            },
                "@id": " :spp089",
                "@type": "ScheduledStopPoint",
                "ScheduledStopPoint.name": {
                    "@value": "Brussel-Centraal",
                    "@language": "nl"
                "ScheduledStopPoint.stopType":
"https://example.com/concept/stopplacetype/trainstation"
            },
            {
                "@id": " :spp099",
                "@type": "ScheduledStopPoint",
                "ScheduledStopPoint.name": {
                    "@value": "Centraal Station",
                    "@language": "nl"
                "ScheduledStopPoint.stopType":
"https://example.com/concept/stopplacetype/busstation"
        "StopPlace.servesTopographicPlace": {
            "@type": "TopographicPlace",
            "TopographicPlace.name": {
                "@value": "Brussels Hoofdstedelijk Gewest",
                "@language": "nl"
        "StopPlace.roadAddress": {
            "@type": "AddressRepresentation",
            "AddressRepresentation.fullAddress": {
                "@value": "Europakruispunt 2, 1000 Brussel",
                "@language": "nl"
            }
        }
   }
}
```

Data example 6: describing a physical stop place and its physical sub stop places

maandag 27 februari 2023 21:19

In this data example we describe the physical stop place Centraal Station but as this station is a big station it can be seen as a complex of substations. The EPIP profile of NETEX allows to describe a hierarchy of physical stop places with two levels, a third level describes the quays:



We describe:

- Stop Place :stp001 "Centraal Station"
- Which is primarily a trainstation.
- Of the general type
- And includes 3 monomodal substations:
 - The trainstation :stp002 "Brussel-Centraal"
 - The metrostation :stp003 "Centraal Station"
 - o The busstation _:stp004 "Centraal Station"

"https://example.com/concept/placetype/general",

- And their corresponding logical StopPlaces (the so called ScgeduledStopPoints:_spp016, _:spp089 and _:spp099).
- Here we attach the logical StopPlaces (or ScheduledStopPoints) directly to the substations, which we could not yet do in <u>Data example 5: describing a physical stop place and the</u> corresponding logical stop places.
- We treated the substations as seperate monomodal StopPlaces that, because they are within
 walking distance of each other, together form the larger multimodal station or general
 StopPlace "Centraal Station".
- The Quays are the lowest level of

```
The data example:
```

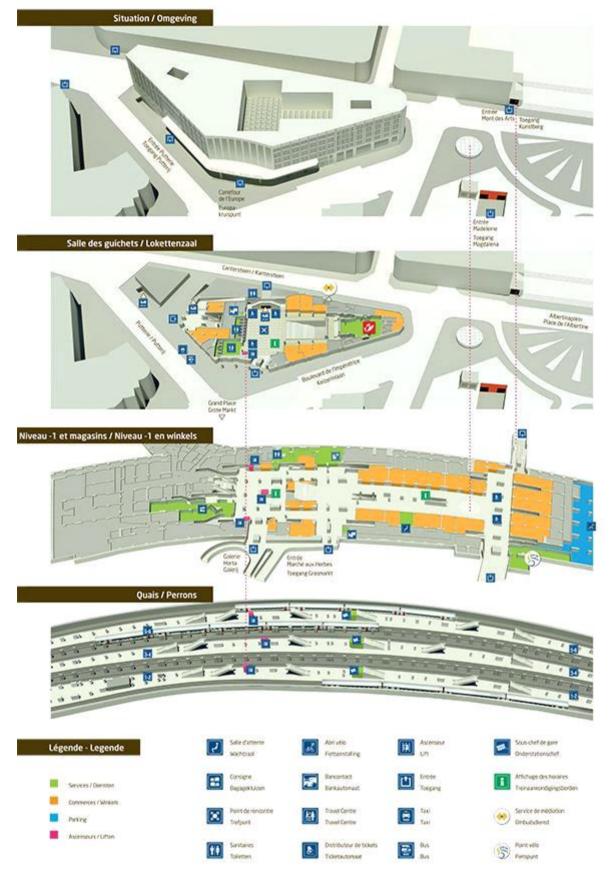
```
"StopPlace.stopPlaceType":
"https://example.com/concept/stopplacetype/railstation",
            "StopPlace.servesTopographicPlace": {
                "@type": "TopographicPlace",
                "TpographicPlace.name": {
                     "@value": "Brussels Hoofdstedelijk Gewest",
                     "@language": "nl"
                }
            },
            "StopPlace.roadAddress": {
                "@type": "AddressRepresentation",
                "AddressRepresentation.fullAddress": {
                    "@value": "Europakruispunt 2, 1000 Brussel",
                    "@language": "nl"
            }
        },
            "@id": " :stp002",
            "@type": "StopPlace",
            "StopPlace.name": {
                "@value": "Brussel-Centraal",
                "@language": "nl"
            },
            "StopPlace.transportMode":
"https://example.com/concept/transportmode/train",
            "StopPlace.placeType":
"https://example.com/concept/placetype/monomodal",
            "StopPlace.stopPlaceType":
"https://example.com/concept/stopplacetype/railstation",
            "StopPlace.parentSite": "_:stp001",
            "StopPlace.scheduledStopPoint": [
                    "@id": " :spp016",
                     "@type": "ScheduledStopPoint",
                     "ScheduledStopPoint.name": {
                         "@value": "Brussel-Centraal",
                         "@language": "nl"
                     "ScheduledStopPoint.stopType":
"https://example.com/concept/stopplacetype/trainstation"
        },
            "@id": "_:stp003",
"@type": "StopPlace",
            "StopPlace.name": {
                "@value": "Centraal Station",
                "@language": "nl"
            } ,
            "StopPlace.transportMode":
"https://example.com/concept/transportmode/metro",
            "StopPlace.placeType":
"https://example.com/concept/placetype/monomodal",
            "StopPlace.stopPlaceType":
"https://example.com/concept/stopplacetype/metrostation",
            "StopPlace.parentSite": "_:stp001",
            "StopPlace.scheduledStopPoint": [
                     "@id": " :spp089",
                     "@type": "ScheduledStopPoint",
                     "ScheduledStopPoint.name": {
                         "@value": "Centraal Station",
                         "@language": "nl"
                     "ScheduledStopPoint.stopType":
"https://example.com/concept/stopplacetype/trainstation"
```

```
}
            ]
        },
            "@id": "_:stp004",
"@type": "StopPlace",
            "StopPlace.name": {
                "@value": "Centraal Station",
                "@language": "nl"
            } ,
            "StopPlace.transportMode":
"https://example.com/concept/transportmode/bus",
            "StopPlace.placeType":
"https://example.com/concept/placetype/monomodal",
            "StopPlace.stopPlaceType":
"https://example.com/concept/stopplacetype/busstation",
            "StopPlace.parentSite": " :stp001",
            "StopPlace.scheduledStopPoint": [
                     "@id": " :spp099",
                     "@type": "ScheduledStopPoint",
                     "ScheduledStopPoint.name": {
                         "@value": "Centraal Station",
                         "@language": "nl"
                     "ScheduledStopPoint.stopType":
"https://example.com/concept/stopplacetype/busstation"
            ]
        }
   ]
}
```

Data example 7: describing some physical characteristics of a physical stop place

dinsdag 28 februari 2023 20:42

In this data example we describe some physical components of the physical stop place Centraal Station. More in particular we describe the Quays and the Entrances of the railstation. The example is based on this diagram:



We describe:

- The 6 Quays of the railstation, numbered 1 to 6.
- The 7 Entrances of the railstation.
- We kept the description minimal for this example.

The data example:

```
{
   "@context": [
```

[&]quot;https://raw.githubusercontent.com/GeertThijs/MyFiles/master/ContextfileSto

```
"https://raw.githubusercontent.com/GeertThijs/MyFiles/master/ContextfileTim
etables.jsonld"
    ],
    "@graph": [
        {
            "@id": " :stp002",
            "@type": "StopPlace",
            "StopPlace.name": {
                "@value": "Brussel-Centraal",
                "@language": "nl"
            },
            "StopPlace.transportMode":
"https://example.com/concept/transportmode/train",
            "StopPlace.placeType":
"https://example.com/concept/placetype/monomodal",
            "StopPlace.stopPlaceType":
"https://example.com/concept/stopplacetype/railstation",
            "StopPlace.scheduledStopPoint": [
                     "@id": " :spp016",
                     "@type": "ScheduledStopPoint",
                     "ScheduledStopPoint.name": {
                         "@value": "Brussel-Centraal",
                         "@language": "nl"
                     "ScheduledStopPoint.stopType":
"https://example.com/concept/stopplacetype/trainstation"
            ],
            "StopPlace.containing": [
                     "@type": "Quay",
                     "Quay.publicCode": "1"
                },
                     "@type": "Quay",
                     "Quay.publicCode": "2"
                },
                     "@type": "Quay",
                     "Quay.publicCode": "3"
                },
                     "@type": "Quay",
                     "Quay.publicCode": "4"
                },
                     "@type": "Quay",
                     "Quay.publicCode": "5"
                },
                {
                     "@type": "Quay",
                     "Quay.publicCode": "6"
            "StopPlace.enteredThrough": [
                {
                     "@type": "StopPlaceEntrance",
                     "Entrance.name": {
                         "@value": "Europakruispunt",
                         "@language": "nl"
                },
                {
                     "@type": "StopPlaceEntrance",
                     "Entrance.name": {
```

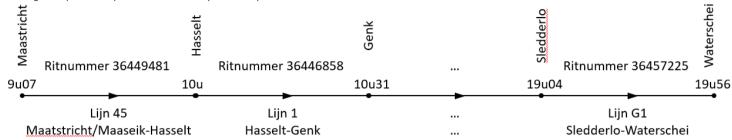
```
"@value": "Kantersteen",
                         "@language": "nl"
                    }
                },
                    "@type": "StopPlaceEntrance",
                    "Entrance.name": {
                        "@value": "Putterij",
                        "@language": "nl"
                    }
                },
                    "@type": "StopPlaceEntrance",
                    "Entrance.name": {
                        "@value": "Hortagalerij",
                        "@language": "nl"
                    }
                },
                    "@type": "StopPlaceEntrance",
                    "Entrance.name": {
                        "@value": "Grasmarkt",
                        "@language": "nl"
                },
                    "@type": "StopPlaceEntrance",
                    "Entrance.name": {
                        "@value": "Kunstberg",
                        "@language": "nl"
                    }
                },
                    "@type": "StopPlaceEntrance",
                    "Entrance.name": {
                        "@value": "Magdalena",
                        "@language": "nl"
                }
           ]
       }
  ]
}
```

Data example 8: describing the schedule of a vehicle

woensdag 1 maart 2023 15:53

In this data example we describe a Block from de Lijn, being a collection of consecutive ServiceJourneys executed by the same vehicle on a certain daytype. Blocks are a way to efficiently deploy vehicles and drivers by sequencing Journeys of different Lines.

This diagram depicts the sequence of ServiceJourneys covered by the Block:



We describe:

- Block 36449481 from De Lijn, where a vehicle executes a sequence of ServiceJourneys starting in Maastricht and ending in Waterschei.
- We will only describe the first two ServiceJourneys and the last.
- First ServiceJourney 3644941 executes a journey of Line 45 from Maastricht/Maaseik to Hasselt starting at 9:07 in Maastricht Station perron D (ScheduledStopPoint _:SSP001) and ending in Hasselt Station perron 13 (ScheduledStopPoint _:SSP002).
- It is followed by ServiceJourney 36446858 that executes a journey of Line 1 from Hasselt to Genk starting at 10:00 in Hasselt Station perron 11 (ScheduledStopPoint_:SSP003) and ending in Genk Station perron 12 (ScheduledStopPoint_:SSP004) at 10:31.
- Then there are a number of journeys which we will not document in this data example.
- Last ServiceJourney 36457225 executes a journey of Line G1 from Sledderlo to Waterschei starting at 19:04 in Genk steenbergstraat (ScheduledStopPoint_:SSP005) and ending in Waterschei Kerkhof (ScheduledStopPoint :SSP006) at 19:56.
- The ServiceJourneys follow sequences of ScheduledStopPoints described in JourneyPatterns
 (_:sjp001, _:sjp002 and _:sjp003 respectively) which we only describe minimally here (see Dataexample 2: describing patterns to operate the line For more detailed examples).
- Blocks annd ServiceJourneys are tied to certain Daytypes (weekdays, weekend, holidays, schooldays etc...). For example in the weekend a Line could follow another patterns (eg sexecuting only part of the Route), resulting in different PassingTimes and requiring another sequence of VehicleJourneys, the alternative sequence then forms another Block.
- In the data received by De Lijn the DayType was not detailed, we only know that it has the (somewhat misleading) name "Calendar51152".
- We further know that this DayType is defined by a ServiceCalendar which runs from 20210402 to 20210630. As we do not know what the properties are of DayType Calndar51152, we cannot derive the operatingDays of the Block and its ServiceJourneys.
- (If for example Calendar51152 would correspond with weekdays, knowing that the serviceCalendar runs from 20210402 to 20210630 we could calculate the exact dates on which Block 36449481 would be executed.

```
The data example:
      "@context": [
"https://raw.githubusercontent.com/GeertThijs/MyFiles/master/ContextfileVehicleScheduling.jsonld",
"https://raw.githubusercontent.com/GeertThijs/MyFiles/master/ContextfileTimetables.jsonld",
                   "TimeTabledPassingTime.pointInJourneyPattern": {
                          "@reverse": "https://purl.eu/ns/mobility/timetables-and-
planning#at"
       .,
'@graph": [
                   "@id": "_:264-6407/51152",
"@type": "Block",
                   "Block.including":
"_:36449481",
":36446858"
                         __:36449481",
"__:36446858",
                          ":36457225"
                   ]
                   "@id": "_:36449481",
"@type": "ServiceJourney",
"VehicleJourney.departureTime": "09:07:00.000",
"VehicleJourney.madeUsing": "_:sjp001",
"VehicleJourney.dayType": "_:Calendar51152",
"VehicleJourney.passedAt": [
                                 "@type": "TimeTabledPassingTime",
                                "TimeTabledPassingTime.departureTime": "09:07:00.000",
"TimeTabledPassingTime.pointInJourneyPattern": {
    "@type": "StopPointInJourneyPattern",
                                       "StopPointInJourneyPattern.order":
                                       "StopPointInJourneyPattern.aViewOf": "_:ssp001"
                          {},
```

```
"@type": "TimeTabledPassingTime",
                        "TimeTabledPassingTime.arrivalTime": "09:55:00.000",
"TimeTabledPassingTime.pointInJourneyPattern": {
                                "@type": "StopPointInJourneyPattern",
                               "StopPointInJourneyPattern.order": 34,
"StopPointInJourneyPattern.aViewOff": "_:ssp002"
                       }
              }
       ]
},
       "@id": "_:36446858",

"@type": "ServiceJourney",

"VehicleJourney.departureTime": "10:00:00.000",

"VehicleJourney.madeUsing": "_:sjp002",

"VehicleJourney.dayType": "_:Calendar51152",

"VehicleJourney.passedAt": [
                        "@type": "TimeTabledPassingTime",
                       "TimeTabledPassingTime.departureTime": "10:00:00.000",
"TimeTabledPassingTime.pointInJourneyPattern": {
    "@type": "StopPointInJourneyPattern",
                               "StopPointInJourneyPattern.order":
                               "StopPointInJourneyPattern.aViewOf": " :ssp003"
                       "@type": "TimeTabledPassingTime",
                       "TimeTabledPassingTime.pointInJourneyPattern": {
                               "@type": "StopPointInJourneyPattern",
"StopPointInJourneyPattern.order": 19,
"StopPointInJourneyPattern.aViewOf": "_:ssp004"
               }
      ]
       "@id": "_:36457225",

"@type": "ServiceJourney",

"VehicleJourney.departureTime": "19:04:00.000",

"VehicleJourney.madeUsing": "_:sjp003",

"VehicleJourney.dayType": "_:Calendar51152",

"VehicleJourney.passedAt": [
                       "@type": "TimeTabledPassingTime",
                       "TimeTabledPassingTime.departureTime": "19:04:00.000", "TimeTabledPassingTime.pointInJourneyPattern": {
                                "@type": "StopPointInJourneyPattern",
                               "StopPointInJourneyPattern.order": 1,
"StopPointInJourneyPattern.aViewOf": "_:ssp005"
                       }
               },
{},
                        "@type": "TimeTabledPassingTime",
                       "TimeTabledPassingTime.arrivalTime": "19:56:00.000",
"TimeTabledPassingTime.pointInJourneyPattern": {
                               "@type": "StopPointInJourneyPattern",
                               "StopPointInJourneyPattern.order": 44,
"StopPointInJourneyPattern.aViewOf": "_:ssp006"
                       }
              }
       ]
},
       "@id": "_:sjp001",
"@type": "ServiceJourneyPattern",
"JourneyPattern.destinationDisplay": {
               "@type": "DestinationDisplay",
"DestinationDisplay.frontText": {
    "@value": "lijn 45 Maastricht/Maaseik-Hasselt",
                       "@language": "nl"
        }
       "@id": "_:sjp002",
"@type": "ServiceJourneyPattern",
"JourneyPattern.destinationDisplay": {
               "metypettern.destinationDisplay": {
  "@type": "DestinationDisplay",
  "DestinationDisplay.frontText": {
     "@value": "lijn 1 Hasselt-Genk",
     "@language": "nl"
               }
       }
       "@id": "_:sjp003",
"@type": "ServiceJourneyPattern",
       "JourneyPattern.destinationDisplay": {
    "@type": "DestinationDisplay",
    "DestinationDisplay.frontText": {
        "@value": "lijn G1 Sledderlo-Waterschei",
        "@language": "nl"
              }
       }
},
       "@id": "_:ssp001",
"@type": "ScheduledStopPoint",
```

```
"ScheduledStopPoint.name": {
    "@value": "Maastricht Station perron D",
    "@language": "nl"
                     },
"ScheduledStopPoint.stopType":
"https://example.com/concept/stopplacetype/busstation"
                     "@id": "_:ssp002",
"@type": "ScheduledStopPoint",
"ScheduledStopPoint.name": {
    "@value": "Hasselt Station perron 13",
    "@language": "nl"
},
    "ScheduledStopPoint.stopType":
"https://example.com/concept/stopplacetype/busstation"
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"@type": "ScheduledStopPoint",
"ScheduledStopPoint.name": {
    "@value": "Hasselt Station perron 11",
    "@language": "nl"
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"@type": "ScheduledStopPoint",
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    "@value": "Genk Station perron 12",
    "@language": "n1"
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"@type": "ScheduledStopPoint",
                     "ScheduledStopPoint.name": {
    "@value": "Genk Steenbergstraat",
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"@id": "_:ssp006",
"@type": "ScheduledStopPoint",
"ScheduledStopPoint.name": {
    "@value": "Waterschei Kerkhof",
    "@language": "nl"
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                     "@id": "_:Calendar51152",
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