

Description of Rebus3 export format

Background

Rebus has over 25 years in the past been able to produce text-based export files used for reading traffic data in ticket machines and real-time systems. The export format has also been used by operators when tendering and when block planning.

We would appreciate that there are a hundred different applications using our export format in one way or another.

The disadvantages of the text-based file format, which is based on fixed positions, is that it is almost impossible to extend the fields as this affects the following fields starting position. A common solution to this problem has been to add the same field once more at the end of the file and then with a greater length. For the same reason we've always had to add new fields at the end of the files.

The benefits have been that the format is very compact and easy to read for bug fixing etc.

When the Rebus3 development started, it was a requirement to have an XML-based export format. However, we were forced to be backwards compatible with the old format as far as possible. You cannot ask that all suppliers will rewrite their import procedures over night to keep their systems running. We hope and believe that one can imagine replacing the old import format with the new format in the longer run. This means that you can optionally create the old export format from the new, directly in the Rebus3 export module.

The advantages of the new XML-based format is that you can easily add and extend attributes. It is also very easy to load since you can use deserialising of the files directly to classes in the .NET applications. These classes can be automatically generated based on the Rebus export formats schema file (XSD).

This saves a lot of monotonous work for the user who does the data input and also minimizes the risk of errors that could easily happen if you should manually decode text files.

With the creation of the new export format, we have tried to keep to the old vocabulary as much as possible. This means that the concepts are sometimes in Swedish and sometimes in English and don't follow Transmodel to the letter. We still think that this will be the best for those who will rewrite their applications to comply with the new format.

The Rebus export schema file

This file is the base for both documentation and input to the class generator. The schedule is generated by Altova XML Spy, but it is of course possible to use any program you wish to look at the files. Below is a description of the top level of the schema. Each subcomponent can be found in an XML file with the same name (Alma.XML, Bytesinfo.XML etc ...). You could in principle create everything in a single XML file, but it usually is so big that you cannot open and read it manually using e.g. Notepad + +.

The images in this document are for support, so that the rest of the text will be easier to understand. For exact description of the export format see the schema file, as it may updated later than this document.

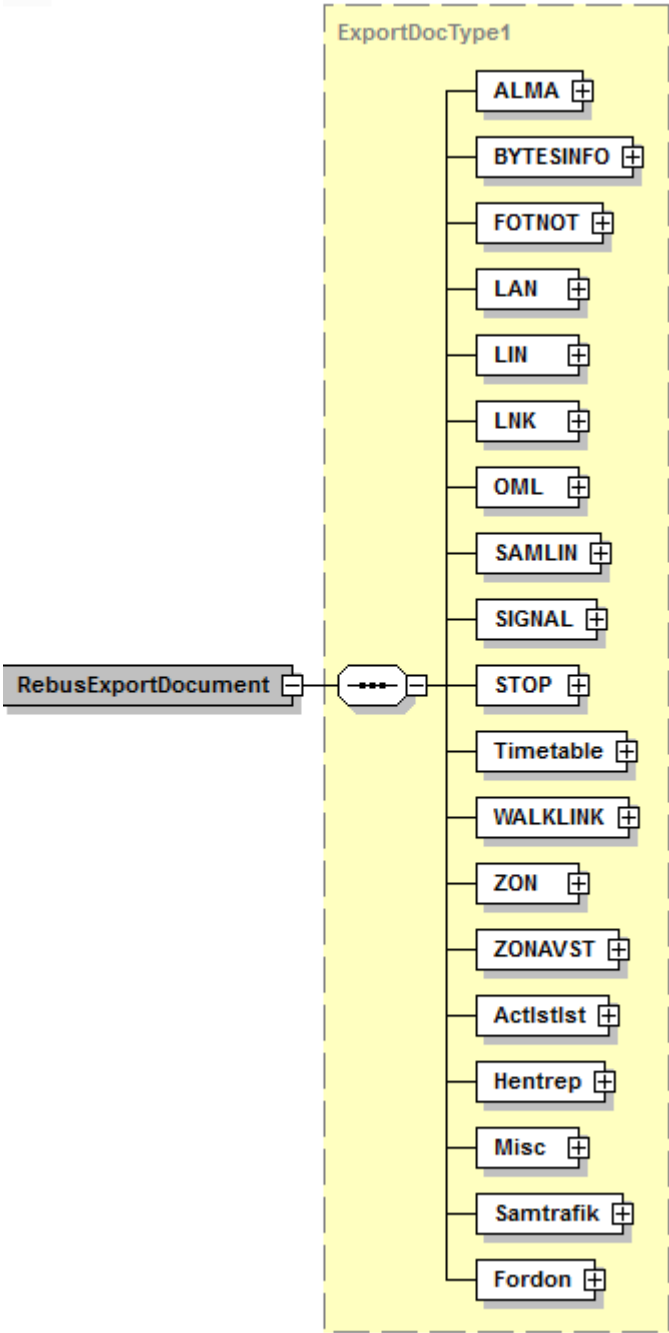
What is covered in the documentation

In addition to this manual this is included:

- Schema file (XSD).
- Pre-generated class (iexport1.vb) in vb.net.
- Sample application in vb.net for loading the export to the class iexport1.

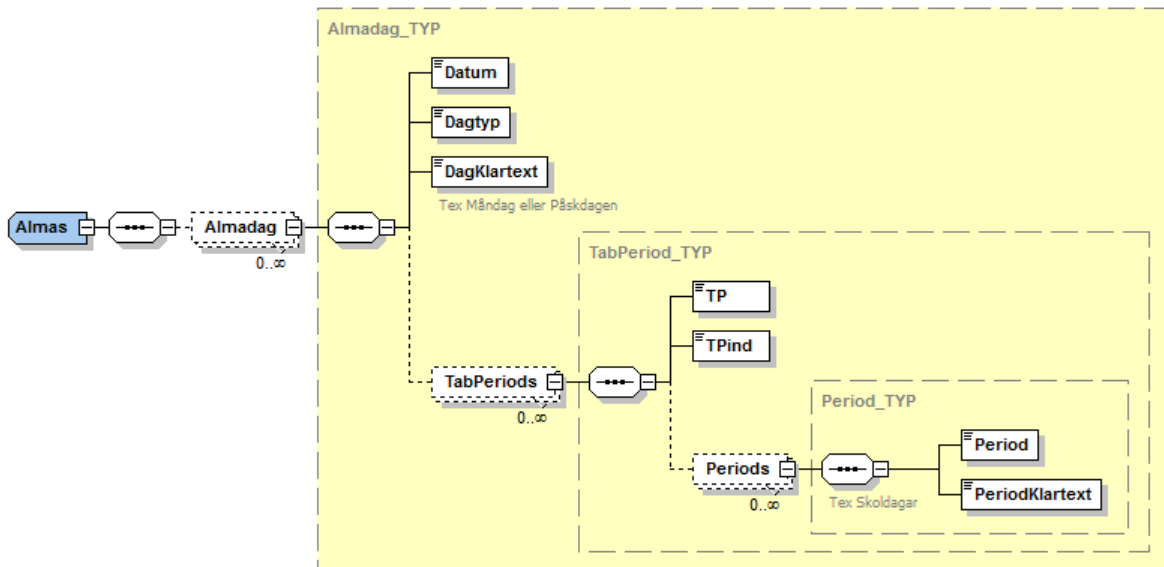
You are of course free to choose any method for loading the export files, but by starting from the sample application you will most likely save a lot of development time.

Rebus3 export break down



Alma.xml

This file contains data on operational days and periods.



For each day (date), the day type is specified.

Day types:

- 1 Monday
- 2 Tuesday
- 3 Wednesday
- 4 Thursday
- 5 Friday
- 6 Saturday
- 7 Sunday

These day types do not need to conform to the calendric day types e.g. Midsummer Eve may very well be operated as a Saturday even though it always falls on a Friday.

It is possible to add a plain text description of the day if you desire.

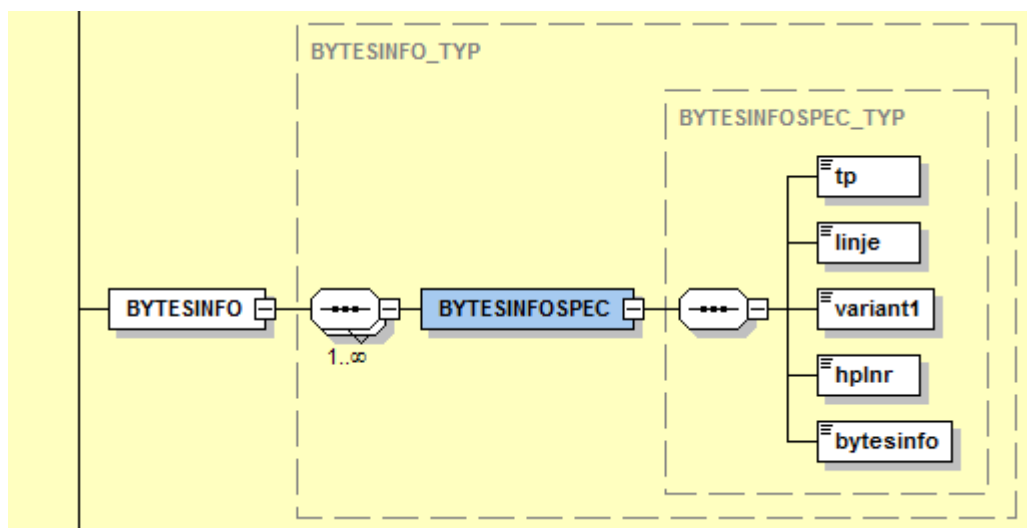
For each day, there can be 0 or more timetable periods (Tabperiods). These are defined by the fields Timetable period (TP) and the Timetable period index (TPind).

Each timetable period may contain 0 or more periods. Periods tend to be school days, winter and so on. Also these periods have a description field in plain text.

Note that there is a simpler way to get the duration of a trip than to calculate it by day type and periods in the calendar! The duration is calculated in every trip in TimeTable.XML!

Bytesinfo.xml

This file is specifically designed for a real system in the Mälardalen region where the internal stop sign would show the possibility of switching to intersecting routes without regard to the departure time.



Fotnot.xml

There are three types of footnotes in Rebus3 (Notetype):

- 0 Global footnote.
- 1 Fixed footnote.
- 2 Loose footnote.

If it is global note, there is no information in the fields TP, TPind, line, direction or trip number. A global footnote have the same meaning throughout the Rebus system regardless of timetable period.

The fixed footnotes may also be divided into three groups (control):

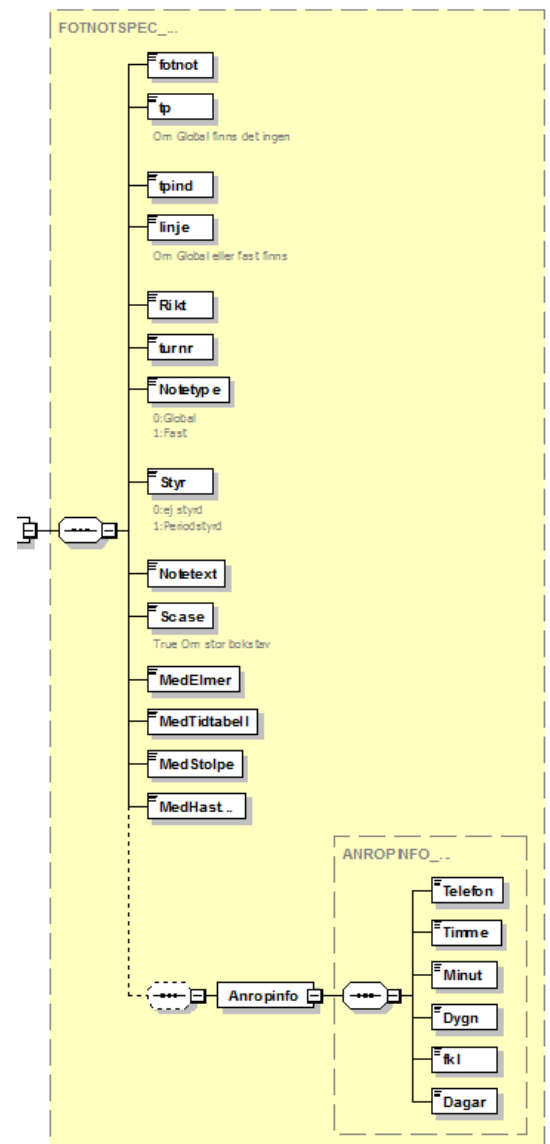
- 0 not controlled.
- 1 timetable period controlled.
- 2 traffic type controlled.

A fixed footnote has the same meaning throughout the timetable period.

Loose footnotes has its meaning only within the line and direction as it is defined in.

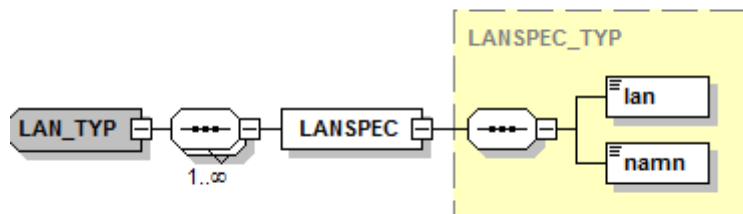
There is some logical variables to take into consideration and these are MedElmer, Medtidtabell, MedStolpe and Medhastus.

These must the user handle and enter the footnote where appropriate.



Lan.xml

This file contains information about the counties. This is also to be found in the file Misc.



Lin.xml

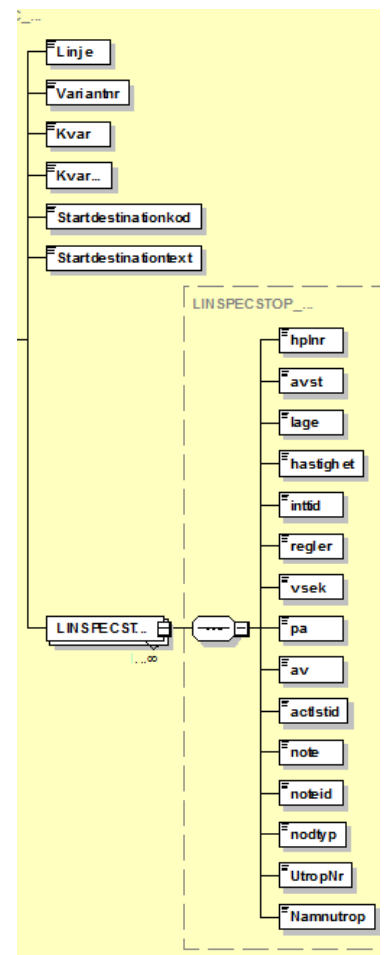
The Lin table is important because it contains all the variants route descriptions. For each route the variants are calculated. Every time variant becomes a variant. It is enough that a time footnote differs for it to be a new variant.

The following fields are contained in LIN.

- Linje: Route number.
- Variantnr: a calculated number that connects the LIN and TUR object in TIMETABLE.
- Kvar: Route variant denotation.
- Kvartxt: Text for the route variant denotation.
- Startdestinationkod: The destination to which the variant is destined at trip start.
- Startdestinationstext: The text of the destination.

For each stop point in the variant the following are stated:

- Hplnr: Stop area number.
- Avst: Distance in meters to the next stop point.
- Lage: Stop point.
- Hast: Speed. This speed can have been entered in the timetable. Affects the interpolation.
- Inttid: Time from start of the variant in seconds.
- Regler: 1 if control time otherwise 0.
- Vsek: Sequence number within the variant.
- Pa: 1 if embarking otherwise 0.
- Av: 1 if disembarking otherwise 0.
- Actlstid: If this value is greater than zero, then there's a task after the stop point. What activity and how long after the stop point it occurs, measured in meters, is shown in ACTLST.
- Note: Time footnote.
- Noteid: Used to relate to footnote.
- Nodtyp: Not used.
- Utroplnr: Announcement number for the stop.
- Namnutrop: Name announcement number related to the name directory.



Lnk.xml

The link table contains data that applies between the stop points.

The from and to points are described by :

- JourneypatternpointGID.
- Hplnr: Stop point number.
- Designation: Stop point.

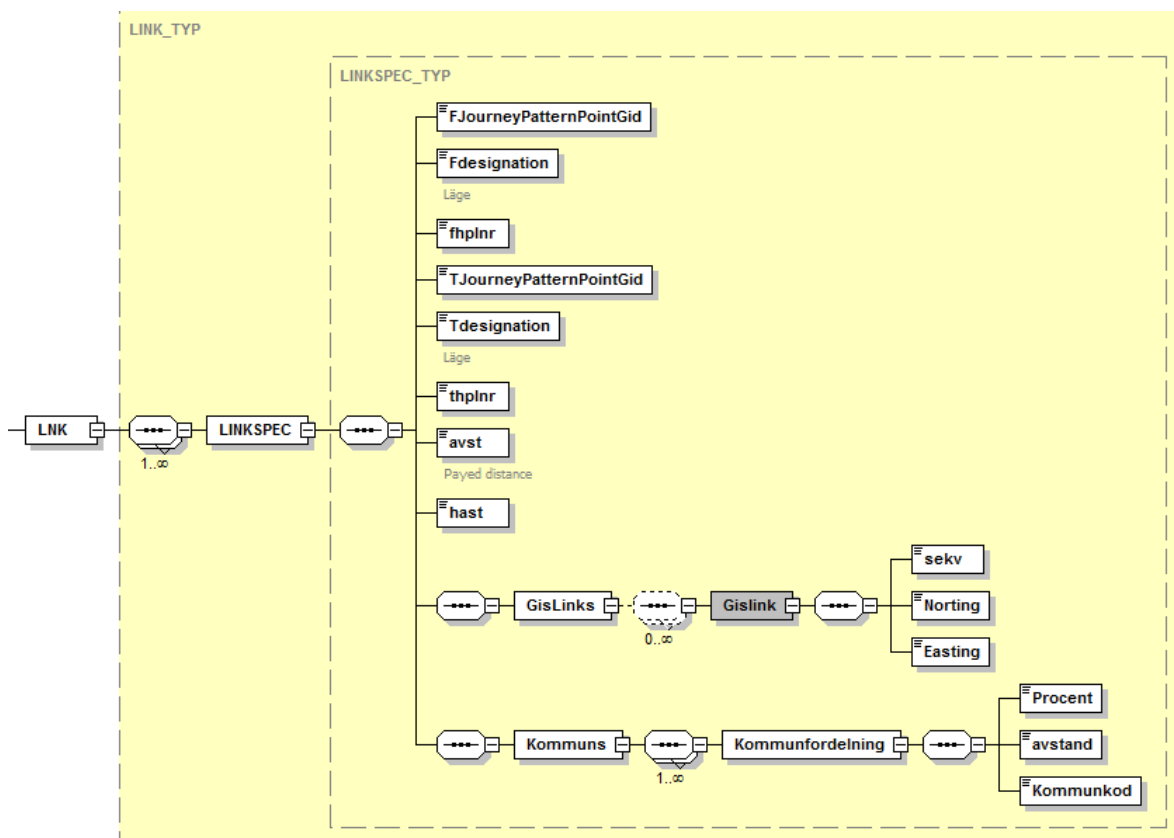
Avst is the distance between the stop points used for production calculation.

Hast: Optionally entered speed.

The geometrical description of the link is in Gislinks which consists of:

- Sekv: sequence number.
- Northing: Coordinate north (X in RT90).
- Easting: Coordinate east (Y in RT90).

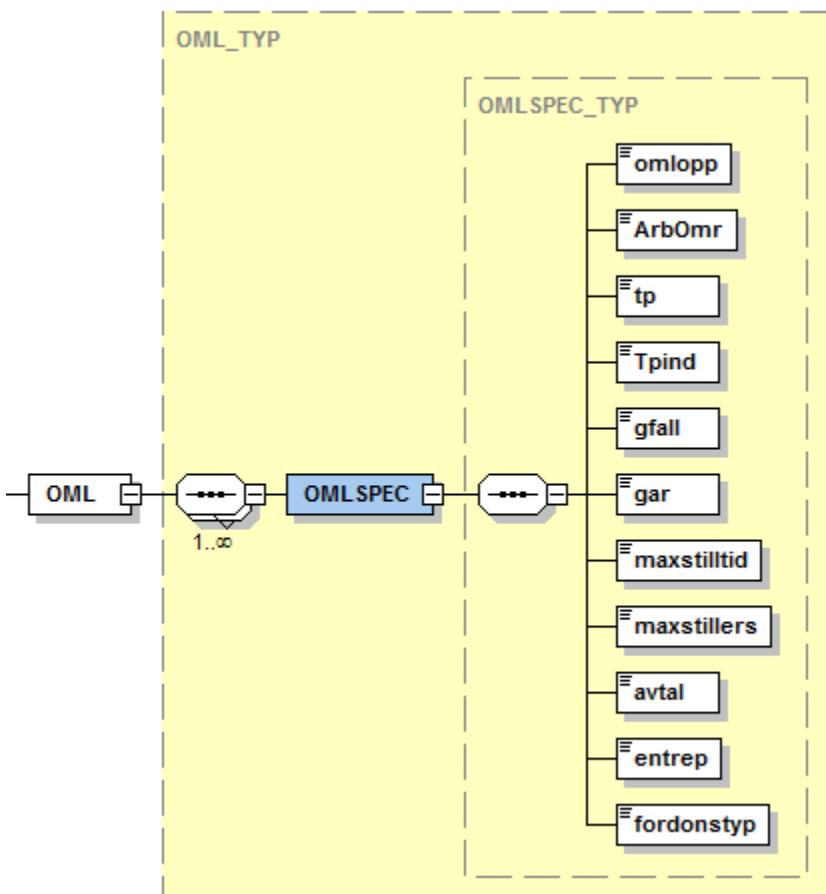
Municipal distribution of the link is displayed in percent in Kommuns. This includes all operated municipalities with their percentage distribution.



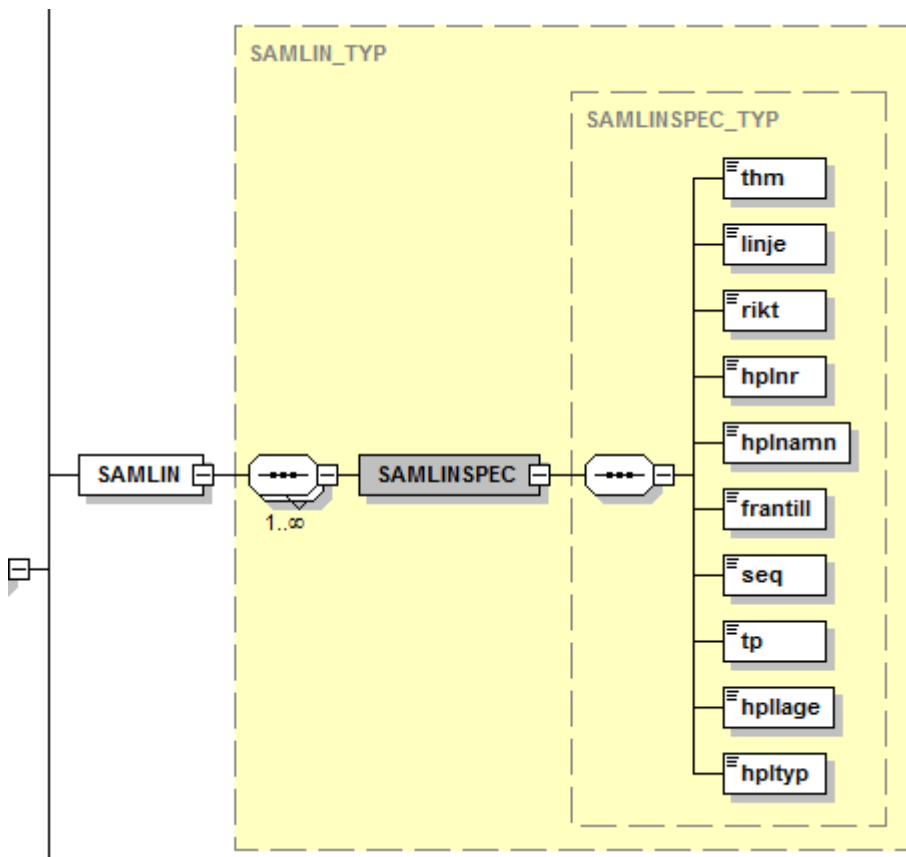
Oml.xml

Oml contains information about the blocks i.e. a logical bus's driving assignments during an operational instance.

- Omlopp: Block number.
- ArbOmr: View point name.
- TP: Timetable period.
- TPInd: Timetable period index.
- Gfall: Block case.
- Maxstilltid: Maximum downtime before the block returns to depot if possible.
- Maxstillers: Max downtime which is the basis for reimbursement.
- Avtal: Contract number that is linked to block.
- Entrep: Which operator performing the block. This may therefore be other than what is specified in the trip.
- Fordonstyp: Vehicle type operating the block. This may also deviate from the trips vehicle type requirements.



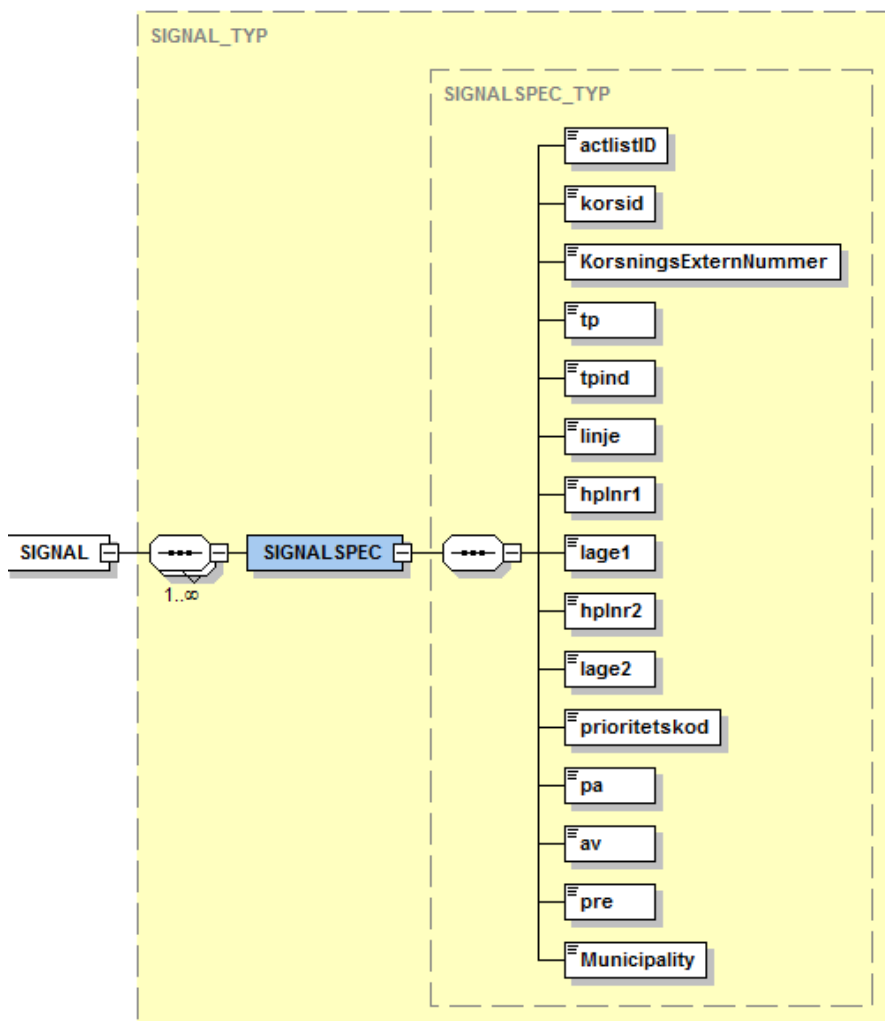
Samlin.xml



Signal.xml

This file contains information about signal priority occurring on a link.

- ActlstID: Connection to the Actlst table.
- Korsid: The intersection's unique Rebus number.
- Korsningsexternnummer: The number used in the system.
- TP: Timetable period.
- TPind: Timetable period index.
- Linje: Route number.
- Hplnr1: Departing stop point number.
- Lage1: Departing stop point.
- Hplnr2: Arriving stop point number.
- Lage2: Arriving stop point.
- Prioritetskod: The code that tells the signal on how to operate the intersection.
- Pa: Number of meters after hplnr1 for request in.
- Av: Number of meters after hplnr1 for request out.
- Pre: Number of meters after hplnr1 for pre-request. This value may be negative.



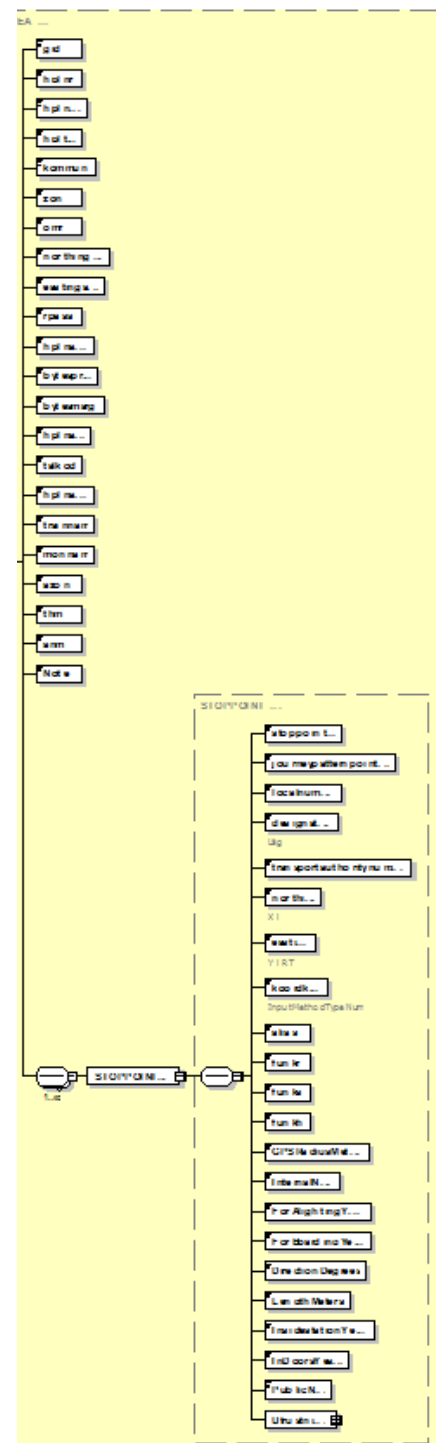
Stop.xml

The stop file contains all the data regarding stop area and stop point.
For each stop area this information is given:

- Gid: Stop area gid.
- Hplnam: Stop area name.
- Hpltyp: Not used.
- Kommun: Municipality affiliation.
- Zon: Rate zone affiliation.
- Omr: Not used.
- NorthingAvg: Center coordinate of the stop area.
- EastingAvg: se above
- Rpass: Count node to Fskab's manual passenger counting system Pasta.
- Hplnamk: Short stop area name
- Bytesprio: Transfer priority. Used in the journey planner. If 0, no transfer.
The higher the value the better the transfer point.
- Bytesmarginal: Minimum transfer margin in seconds in order for the journey planner to perform a transfer.
- Hplnamt: Stop area name in urban traffic.
- Talkod: Announcement code for stop area names.
- HplnamU: Stop area name information service.
- Trainnam: Stop area name for trains.
- Monnam: Stop area name for monitors.
- Azon: Adjacent zone.
- THM: Traffic administrator.
- Anm: Notes for the stop area, such as a description of the stop point etc.
- Note: Not used.

There may be one or more stop points associated with each stop point area.
These are described here:

- StopPointGid:
- JourneyPatternPointGid:
- Localnumber: Number linked with the stop point letter (designation).
- Designation: Stop point (e.g. A).
- Transportauthoritynumber: same as THM above.
- Northing.Easting: coordinate for the stop point.
- Koordkval: Specifies the quality of the coordinate; undefined, estimated, measured.
- Alias: The stop points alias (can be track 1A or equivalent).
- Funkr, FunkS, FunkH: Disability classification for the stop point.
- GPSRadiusmeters: A radius within a vehicle is considered be at the stop point. Internal note: Comment field for the stop point.
- ForAlightingYesNo/ForBoardingYesNo: Indicates whether it is possible to get on and off.
- DirectionDegrees: The angle in which the stop point is considered to be operated.
- Lengtmeters: Length of the stop point slot.



- InsideStationYesNo: Specifies whether the stop point is inside a station or not.
- IndoorsYesNo: Specifies whether to the stop point is indoors or not.

Additionally, there may be information on the stop points features:

Is there a slot (ficka), bicycle protection (cykeskydd), commuting parking (pendlarpark), clock (klocka), lighting (belysning), concrete heat (betongvarme), advertising pillars (reklamskap), timetable boards (anslag) or bus shelters (hallplatskur).

Uentre: Describes the operator in charge of maintenance at the stop point area.

Tsthpl: ????

Tsphpl: ????

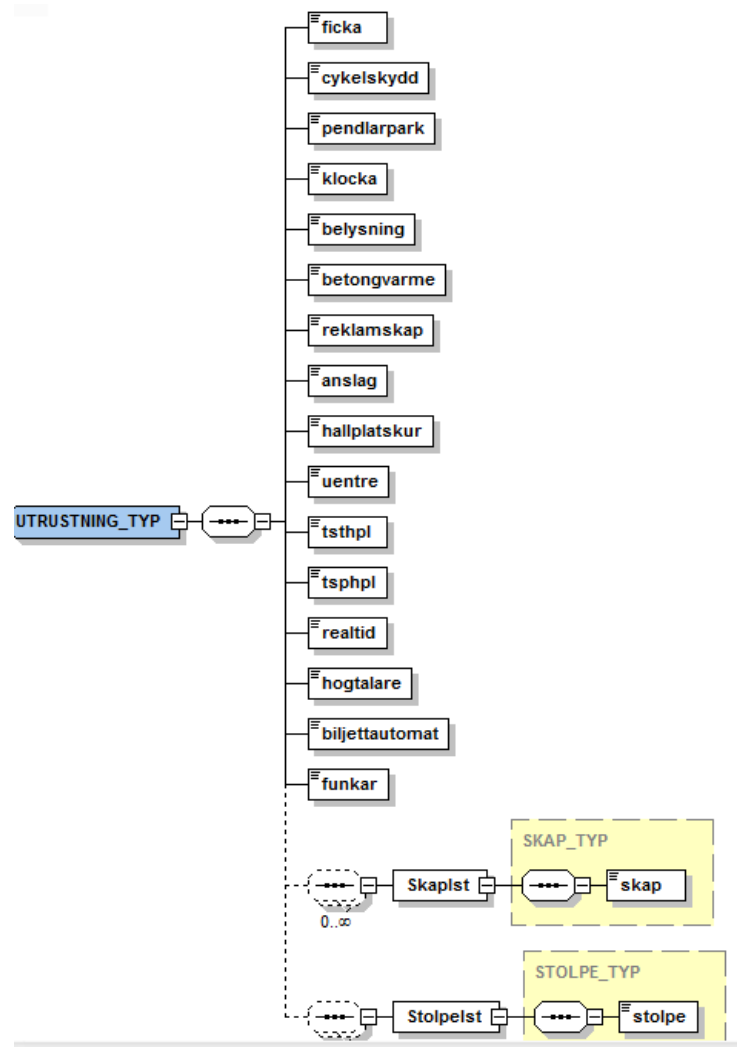
Realtid: Indicates whether there are real time signs.

Högtalare: Indicates whether there are speakers.

Biljettautomat: Indicates whether there is a ticket machine.

Funkar: ???

There may also be a number of timetable posts and a number of timetable cabinets at the stop point.

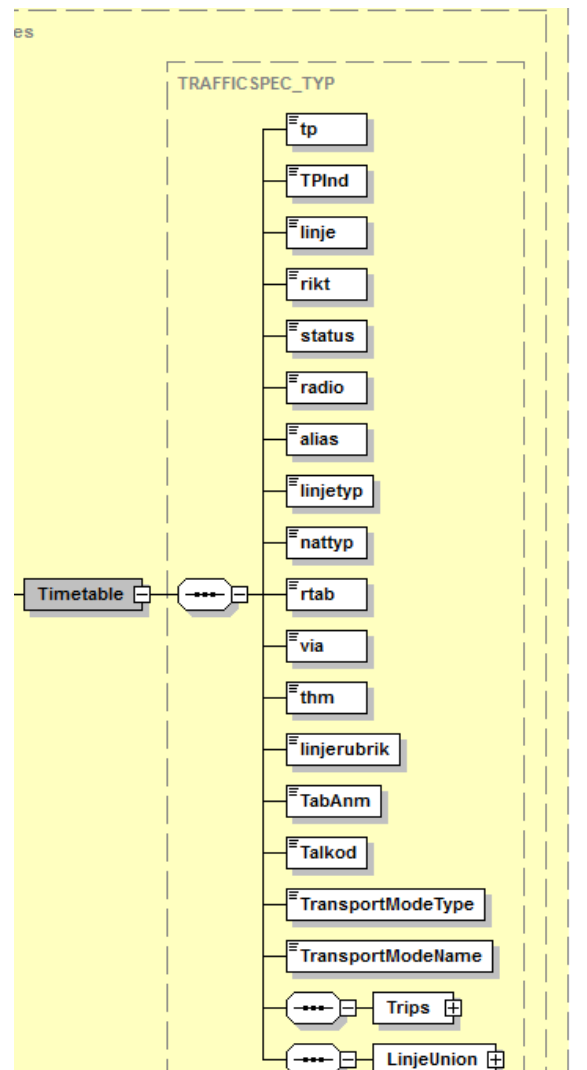


Timetable.xml

This file contains all trip information such as departure times and durations etc.
Contains the same information as the old tur.dat and turg.dat.

All exported timetables are found in this file. For each timetable the following data are included:

- TP Timetable period.
- TPInd Timetable period index.
- Linje Route number.
- Rikt Direction.
- Status Flag if the timetable is finished or not.
- Radio Radio code.
- Alias An external name on the line for example the "Soft Line".
- Linjetyt The route can be grouped into Line types.
- Nättyt The route can also be grouped into Route network types.
- Rtab Heading for the current direction.
- Via Via text for the current direction.
- Thm Traffic administrator.
- Linjerubrik Heading for the entire route regardless of direction.
- Tabanm A comment for the timetable for internal use.
- Talkod Announcement code for the line number.
- Transportmodetype Type of service, such as bus or train.
- Transportmodename Name in plain text on the Transportmodetype



After this there will be a list of all trips in the timetable.

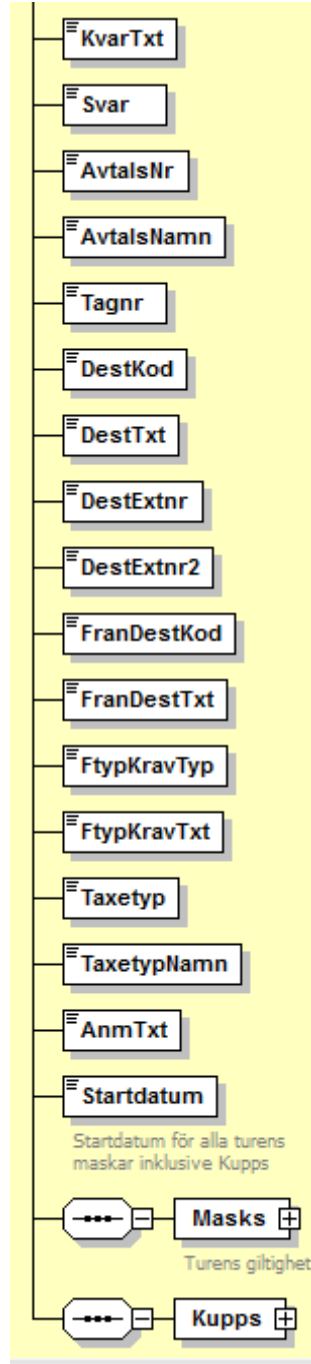
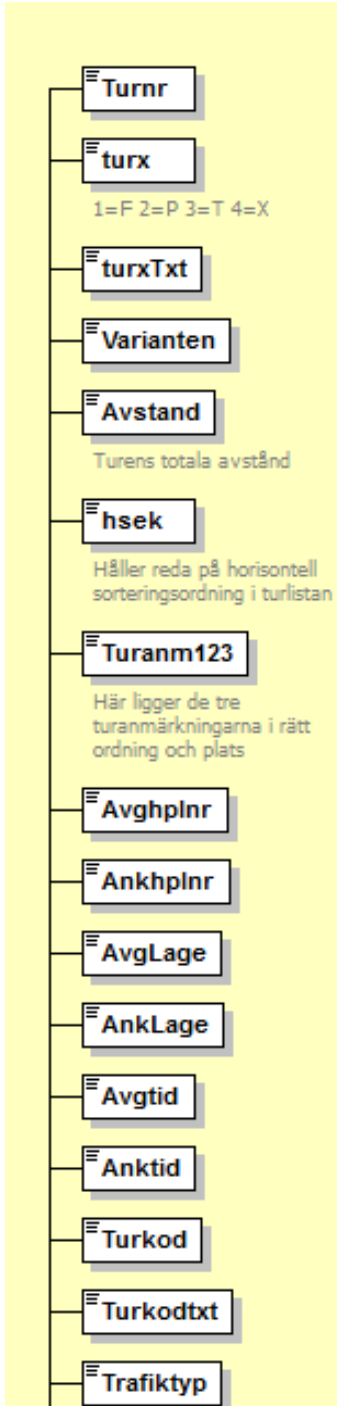
Trips

The trip information is so extensive that we in this documentation have been forced to split up the diagram a little bit to make it readable.

Attributes for the trip are:

- Turnr Trip number, always unique for a route.
- Turx Stating if it is a reinforcement or other type of trip.
- TurxTxt Turx in plain text.
- Varianten Variant of the route link which is described in LIN.
- Avstånd The trips total distance in meters.
- Hsek Horizontal sorting order, ie. the order in which the tours will be given.
- Turanm123 Text field with room for a maximum of 3 footnotes for the trip.
- Avghplnr Departure stop area for the trip.
- Ankhplnr Arrival stop area for the trip.
- Avglage Departure stop point for the trip.
- Anklage Arrival stop point for the trip.
- Avgtid Departure time for the trip.
- Anktid Arrival time for the trip.
- Turkod Self-distribution key for production calculation.
- Turkodtxt Plain text for the trip node.
- Trafiktyp For example, on call traffic.
- Trafiktyptxt Plain text for the traffic type.
- Period Period that specifies, via the calendar, when the trip operates.
- Periodnamn Name of the period e.g. school days.
- Insper Inhibition period. Period that indicates when the trip is not operating.
- Inspernamn Plain text for the inhibition period.
- Periodgrupp Period group, i.e. combination of periods specifies the duration.
- PeriodgruppNamn Name of the period group.
- EntrepDefaultKod The operator code designated by the planner.
- EntrepDefaultNamn EntrepDefaultKod in plain text.
- Dagar Day indication 1-5.
- Dagtyp Binary e.g. 31.
- Kvar Entered route variant on the trip.
- Kvartxt Route variant in plain text.
- Svar Destination variation for example A when branching routes e.g. 12A.
- Avtalsnr Contract number entered on the trip.
- Avtalsnamn Name of the contract in plain text.
- Tagnr Train number on the trip (occurs naturally only of rail traffic).
- Destkod Destination code. The trips destination at trip start.
- Desttxt The destination in plain text.
- DestExtnr External destination number.
- DestExtnr2 External destination number2.
- FranDestkod The trips departure destination. Good to have for monitors displaying arrival information
- FranDesttxt Departure destination in plain text.
- FtypKravTyp The trips vehicle type requirements.
- FtypKravtxt Vehicle type requirement in plain text.

- Taxetyyp The trips rate type.
- Taxetyppnamn Rate type in plain text.
- Anmtxt The trips comment text.
- Startdatum First date in the duration mesh.
- Masks The trips duration described as 14 groups with 30 days in each group.

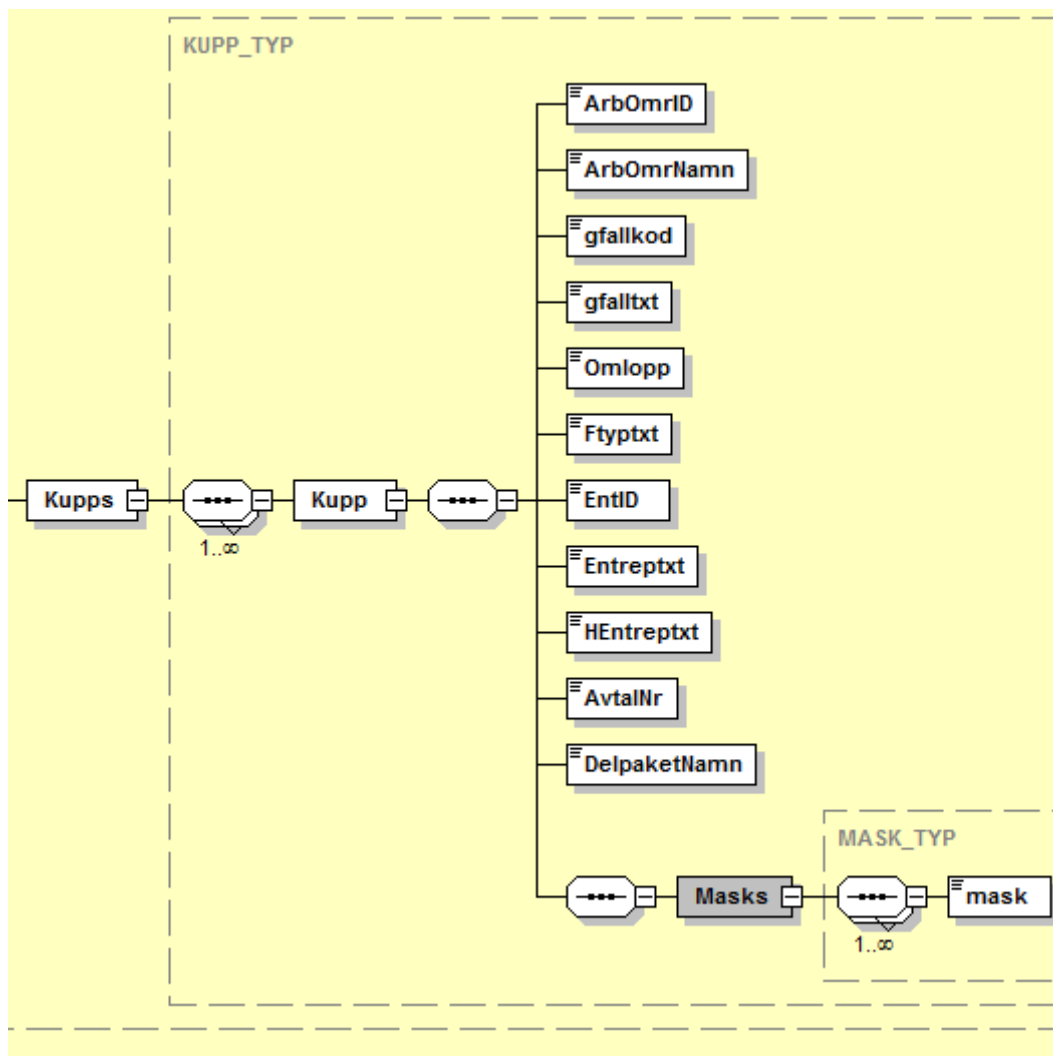


Driving assignments (Kupps)

Driving assignments or blocks are described in the trips block cases. The same trip can thus be operated by several blocks depending on the traffic operation case. Furthermore, the trip can theoretically be block planned from several view points.

A block consists of the following attributes:

- ArbOmrID ID for the view point.
- ArbOmrNamn Name of the view point.
- Gfallkod Block case code.
- Gfalltxt Block case text.
- Omlopp Block number.
- Ftyptxt The blocks vehicle type. May differ from the trips requirements.
- EntID The blocks operators ID.
- Entrep txt The blocks operator in plain text e.g. Nobina Malmö.
- HEntrep txt The blocks prime operator e.g. Nobina.
- Avtalnr The blocks contract number, may differ from the trips contract.
- DelpaketNamn Name of the block package.
- Mask The blocks duration.

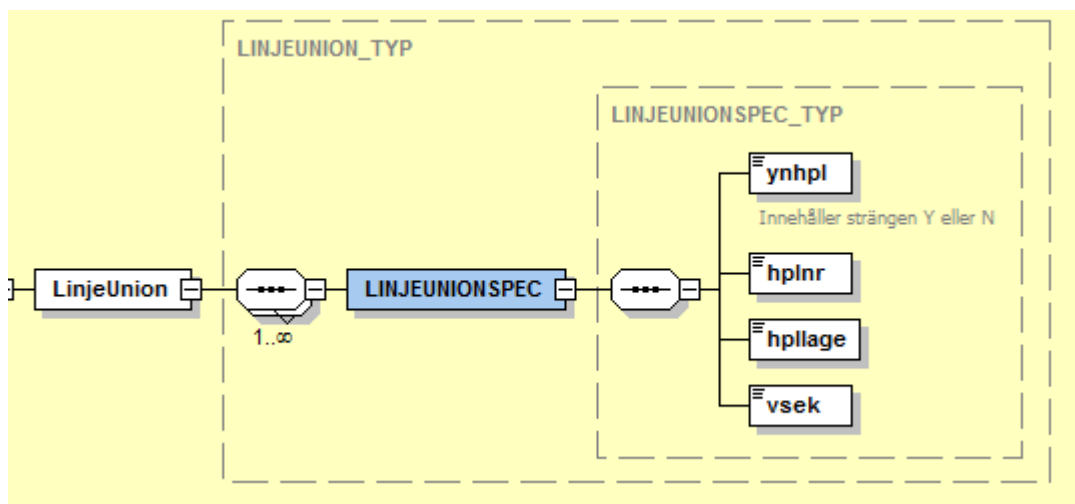


Linjeunion.xml

Lineunionen describes the stop order that is common (unionen) for all its variants.

Lineunionen has the following attributes:

- ynhopl If the stop is a control node or not.
- hplnr Stop area number
- hpllage Stop point
- vsek Sequence number

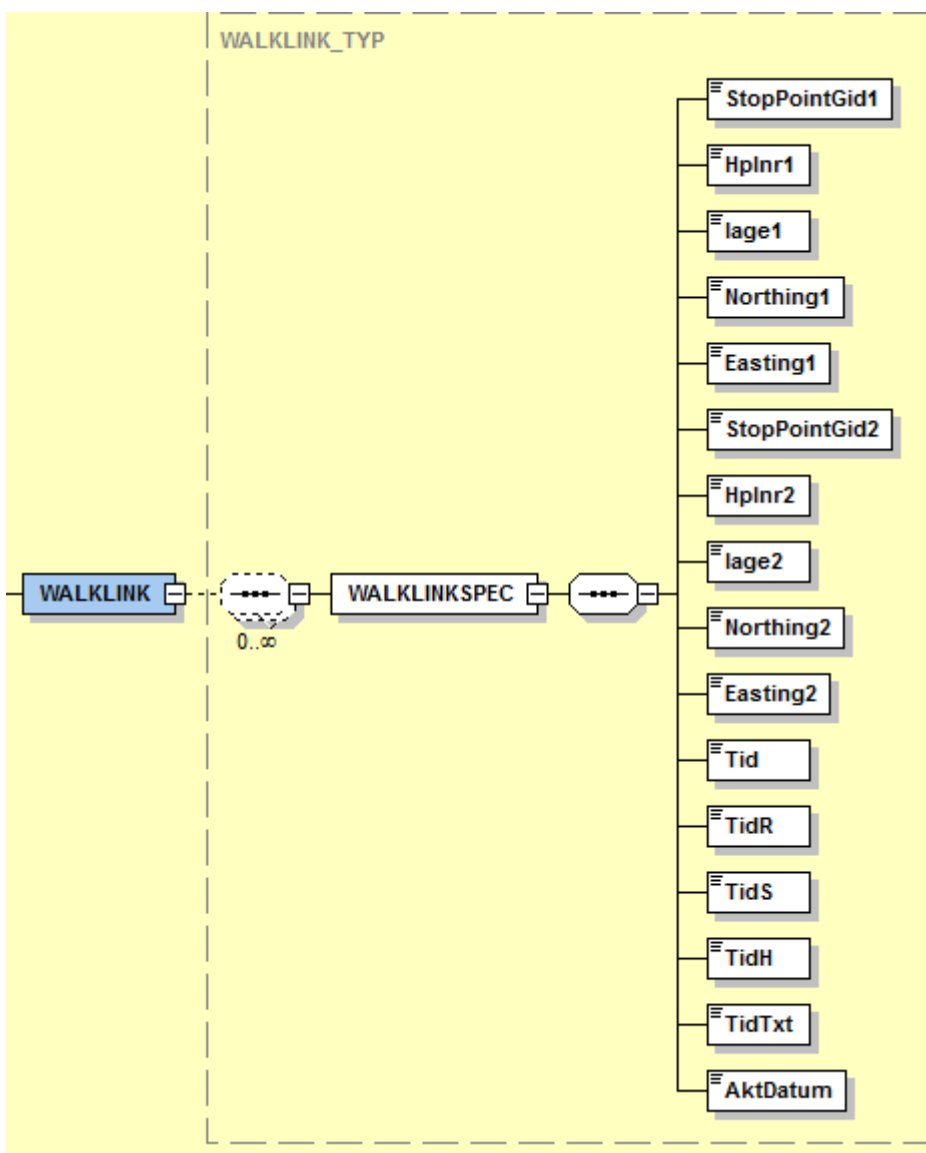


Walklink.xml

Here are all walking links (Connectionlinks) between the stop points. This information is used primarily by the journey planner which must be able to find transfers between stop areas. One common case is that there is a train station with its own stop area number and a central point in almost the same place where bus services operates, which can also have their own numbers.

The journey planner must then know this in order to allow a transfer. In addition to describing the stop points with their coordinates, there is also walking time in seconds given for the following categories:

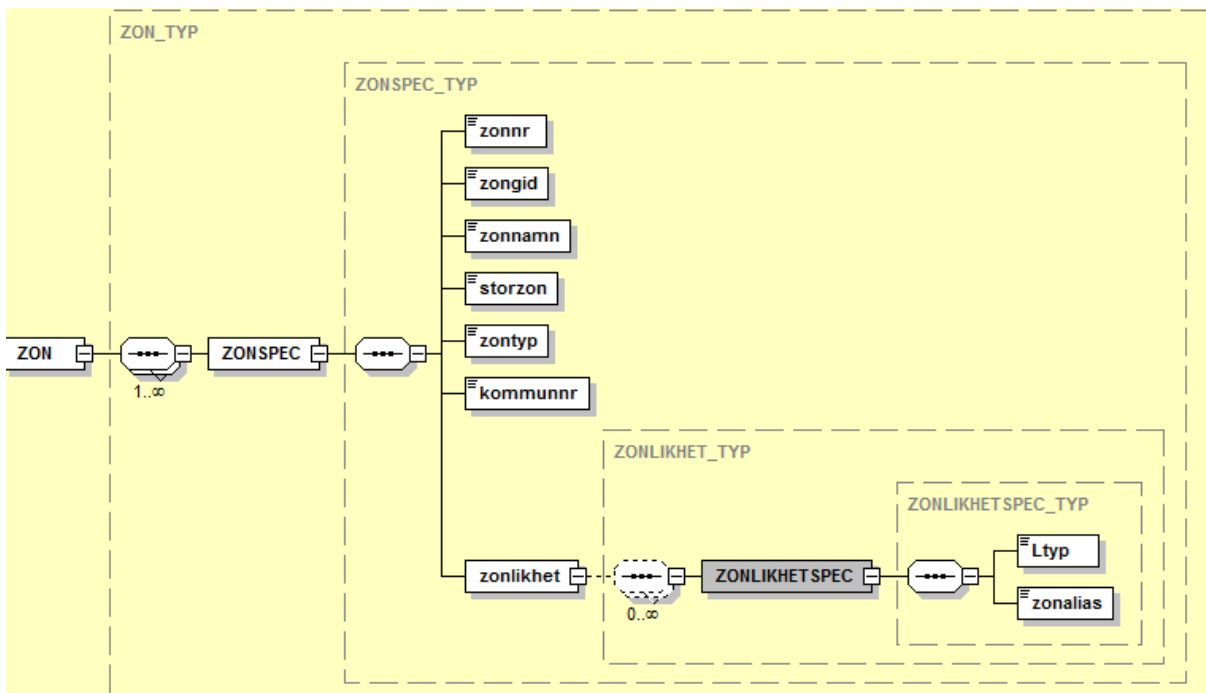
- Normal walking speed.
- Disabled.
- Visually impaired.
- Hearing Impaired.



Zones

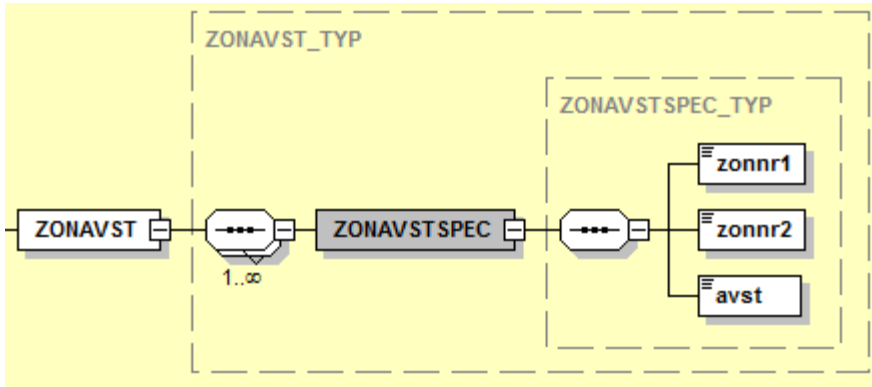
Rate zones are described with the following attributes:

- Zone number.
- ZonGid.
- Name of the rate zone.
- Name of any large zon (storzon) that the rate zone may be part of.
- Zone type????
- Municipality affiliation.
- Zone similarity.
 - For each line type, there may be a so-called zone alias.



Zonavstånd.xml

Zone distance is used exclusively by those counties that have a zonal kilometer rate. The zones are then usually termed rate points. The construction is to calculate which zones have adjacent traffic and for these relations a distance is given. This distance does not in any manner need to be accurate geographically. The different legs of a trip are summed and the price is calculated on the total distance. Examples of a provider that uses this model can be FARA (former CPT Nordic).

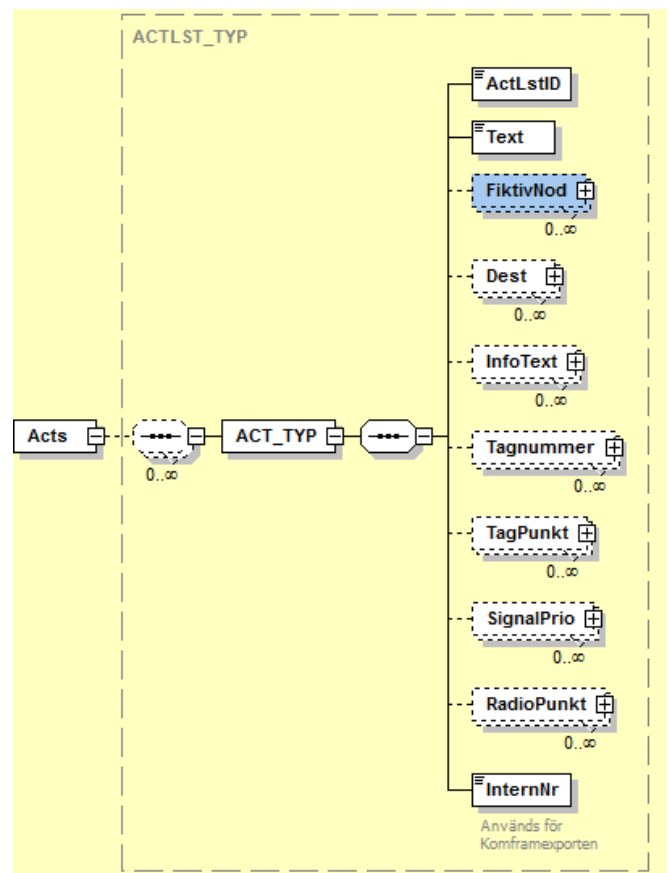


Aktiviteter.xml

Activities are events that occur sometime during a trips traffic operation. An activity may consist of several types of events, and also more than one of each.

Examples of activities are:

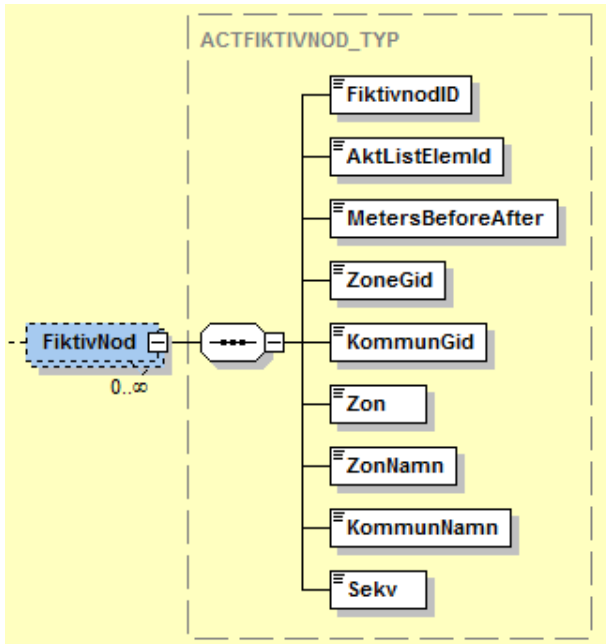
- Passerad zone (Passed zone, here called FiktivNod). These are needed in order to correctly calculate the price for trains and express lines running straight through one or more rate zones without stopping.
- Omskyltning under färd (Change of destination signs while driving, here called Dest). At the trips start there is a destination that can be specified for the trip itself. If it's necessary to change the exterior destination signs when driving this activity are then used.
- Infotext (Info text) is an event that describes interior signage. It can be an invitation to passengers to go to an event or sometimes manual transfer information.
- Tågnummer (Train number) is a method to change the train number in the trips routing. Often there is a "main" trip number that is specified at the trips start but sometimes you want to be able to change train numbers during the trip.
- Tågpunkt (Train point) is a way to tell where there are sensors for real-time information.
- Signalprioritet (Signal Priority) is used to lower the total trip time and thereby make public transport more attractive to the traveler. Moreover, one can with traffic light priority increase the throughput of travelers and thereby increase revenue. One way to use traffic light priority is to let the vehicle computer send a request to the intersection equipment with a request for priority. This should be done at such a distance from the intersection that the traffic light has time to turn green before the bus arrives.
- Radio Point is for certain real-time system to be able to tell the vehicle computer that it is time to change the radio frequency.



Passerad zon (Passed zone)

To describe when this event will take place the following must be specified:

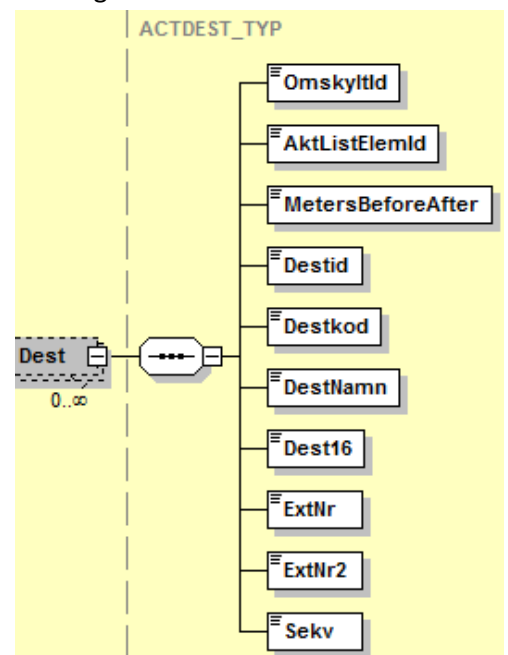
- How many meters after the current stop area that the event should occur.
- The zone which is passed is described with.
 - ZoneGid.
 - Zone number.
 - Zone name.
- Associated municipality is stated.
- The sequence number is to keep the sorting order if there are multiple passed zones.



Omskytning (Change of destination sign)

Change of exterior destination signs are done in the following manner:

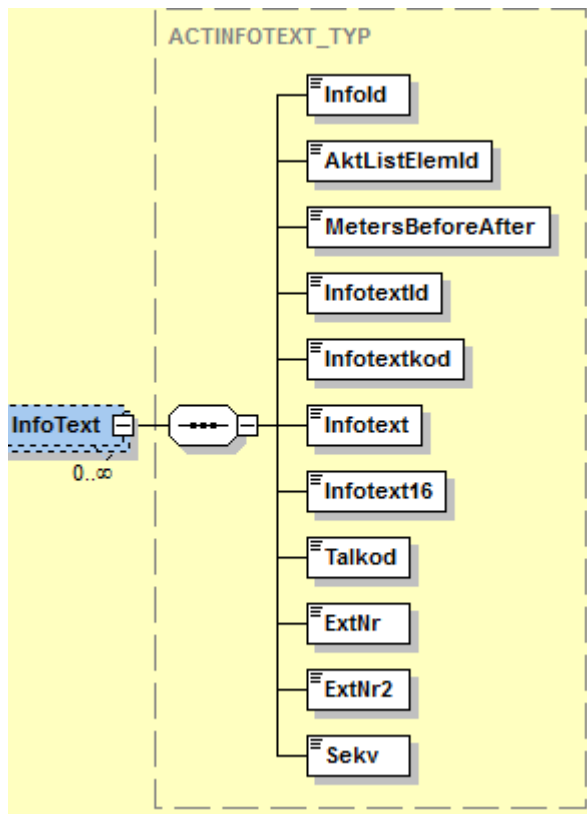
- The number of meters after the stop area the change of destination sign should occur.
- The change of destination sign is described using the following attributes.
 - Destid Internal Id.
 - Destkod The destinations Rebus code.
 - Destnamn Destination text.
 - Dest16 Short text for signs that can only handle 16 characters.
 - Extnr The destinations external code.
 - Extnr2 There may be a extnr2 for via destinations.
 - Sequence number



Infotext (Info text)

Info text that is supposed to be used on the internal sign consists of the following:

- How many meters after the current stop area the event should occur.
- Code for text.
- The text itself.
- Short name of the Info text (16 chars).
- Announcement code for eventual announcements.

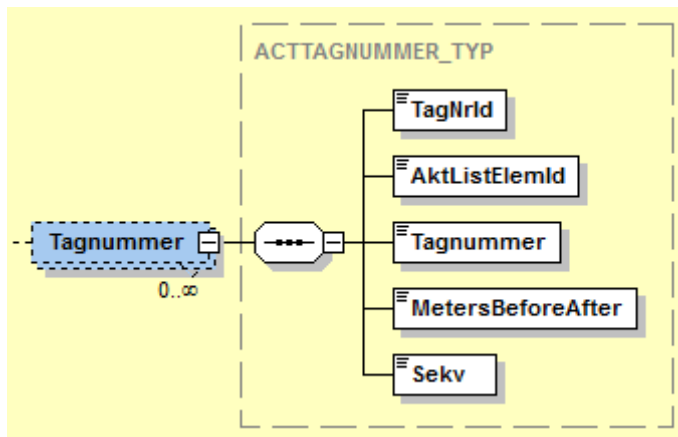


Tågnummer (Train number)

Train number is as mentioned before a way to let a trip change train numbers during the trip.

This are done using the following attributes:

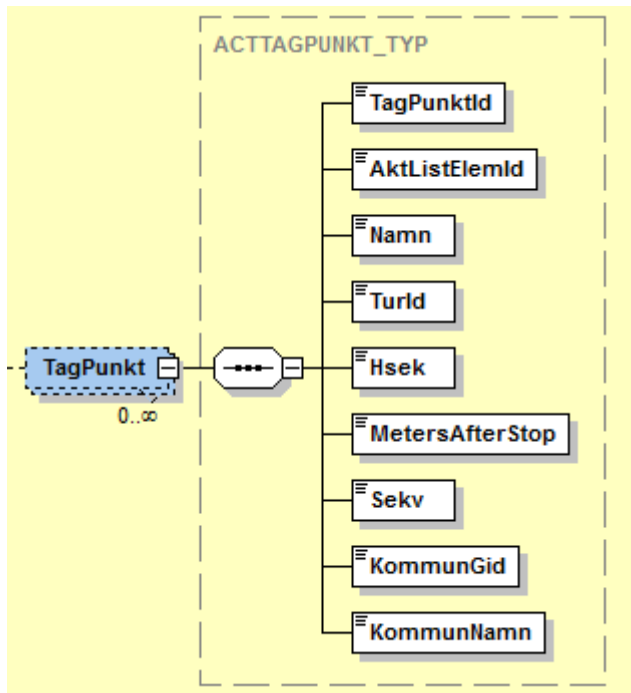
- New train number.
- Number of meters after the current stop area the event should occur.
- Sequence number if the train number is to be changed more than once.



Tågpunkt (Train points)

Train points are described with the following attributes:

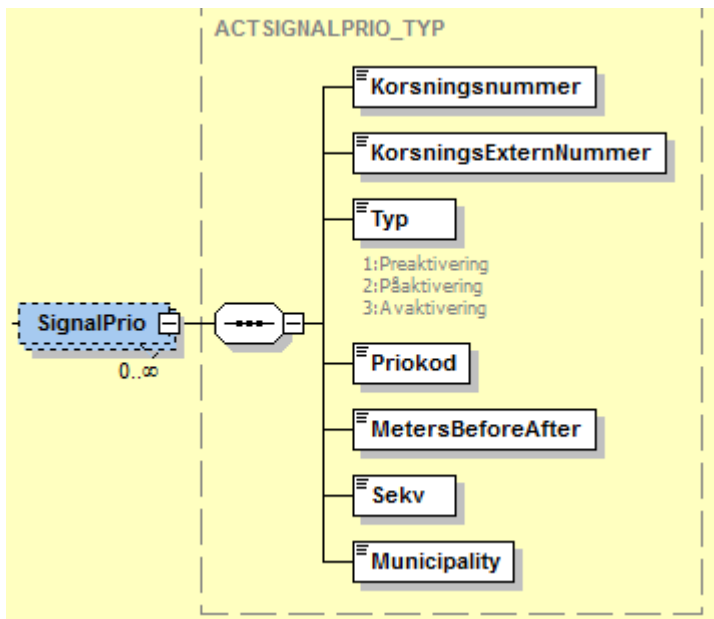
- The train point id.
- The train point name.
- Number of meters after the current stop area the event should occur.
- In which municipality the train point is.



Signalprioritering (Signal priority)

Traffic light priority is specified by the following attributes:

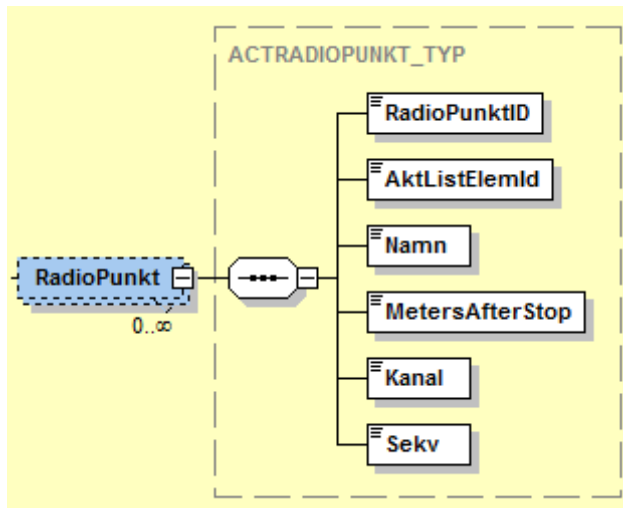
- Intersection number for Rebus.
- External intersection number.
- Type of request.
 - 1 Pre request.
 - 2 Request in.
 - 3 Request out.
- Priority Code, to tell how to drive through the intersection
- Number of meters after the current stop area the event should occur.
- Sequence number for the order
- Municipality affiliation



Radiopunkt (Radio point)

Radio point is to tell the the vehicle computer when it's time to change the radio frequency.
This is done as follows:

- Point number.
- Name of the point.
- Number of meters after the current stop area the event should occur.
- What channel it should be changed to.
- Internal order number



Entreprenör.xml

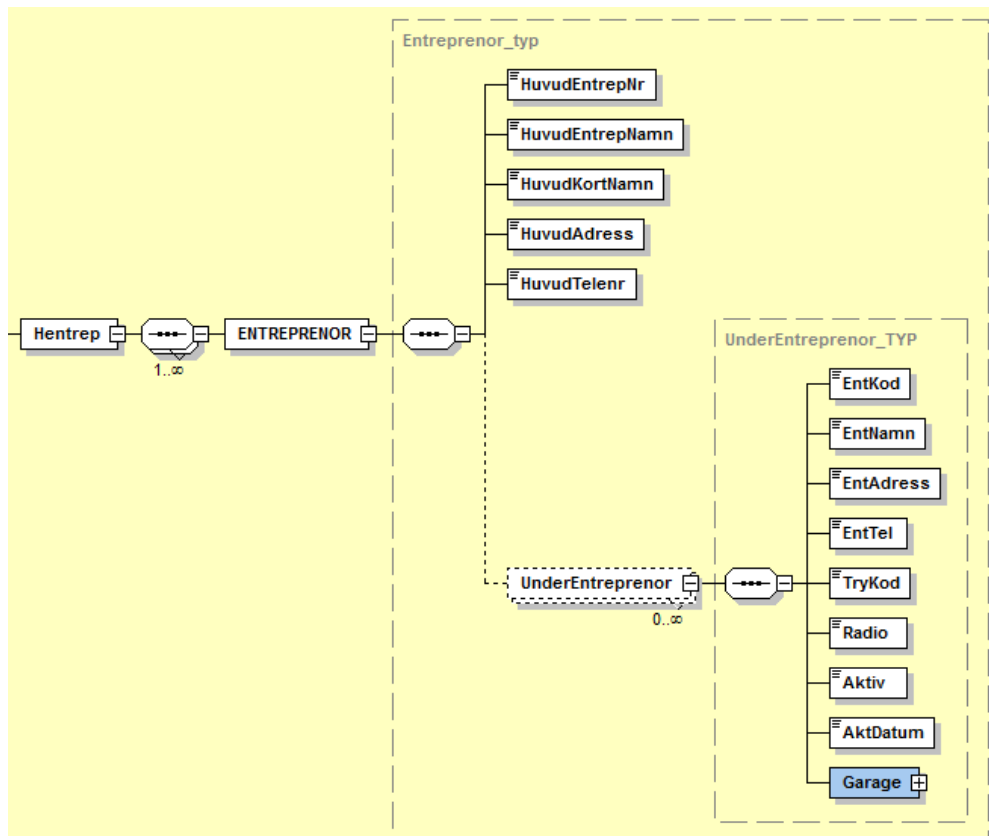
The Operator registry is hierarchically organized with the following levels:

1. Main operator
2. Operator
3. Garage
4. Vehicle

The main operator may for example be Nobina, operator can be Nobina Kristianstad and garage can be Nobinas depot in Nöbbelöv.

The main operator is described as follows:

- Number (There is an established number for all entrepreneurs in Sweden).
- Name
- Short name
- Address
- Telephone



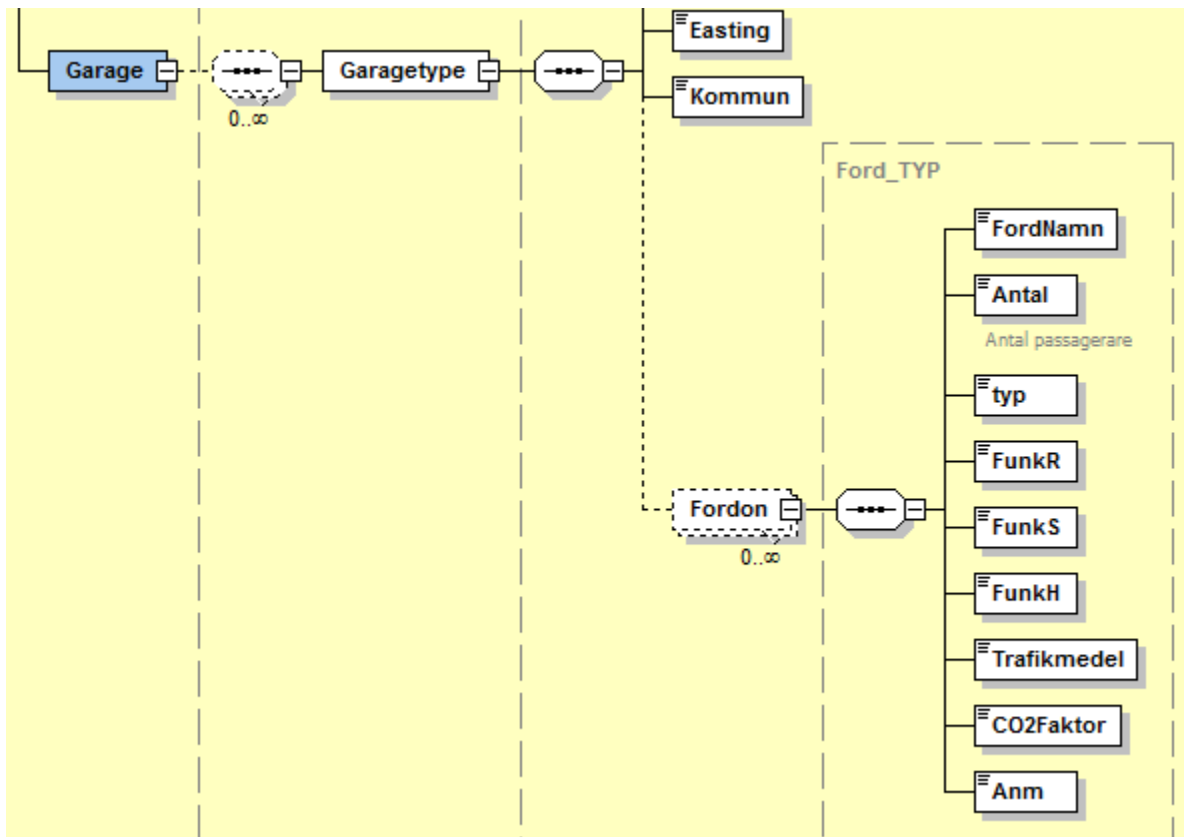
Sub operators are described in the same way

- Code
- Name
- Address
- Telephone
- Print code
- Radio

Garage

Every operator's garage is described as follows:

- Garage name.
- Coordinates.
- Municipal affiliation.
- What kind of vehicles there is.



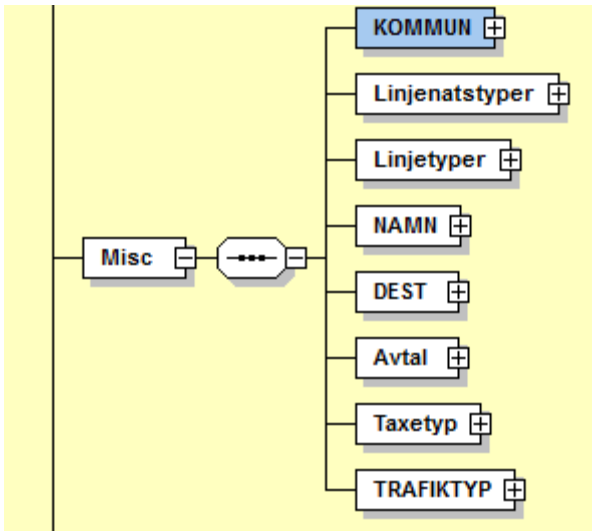
The vehicles are described with the following attributes:

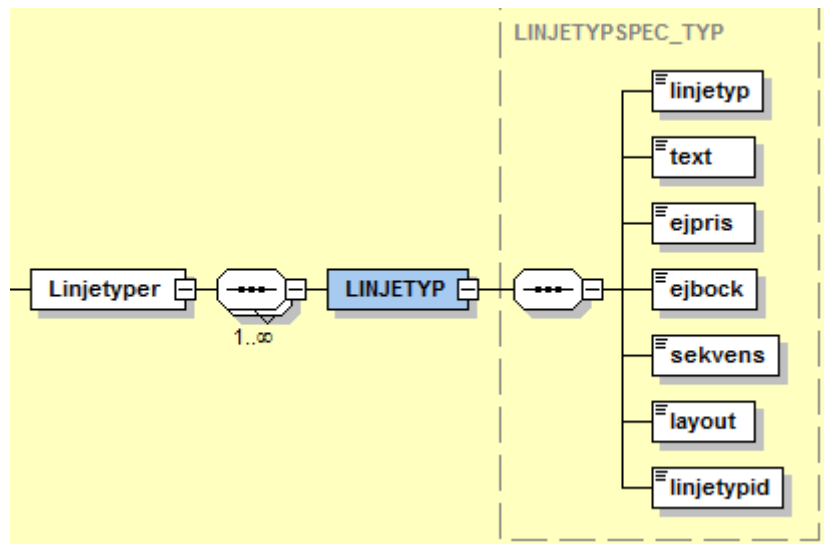
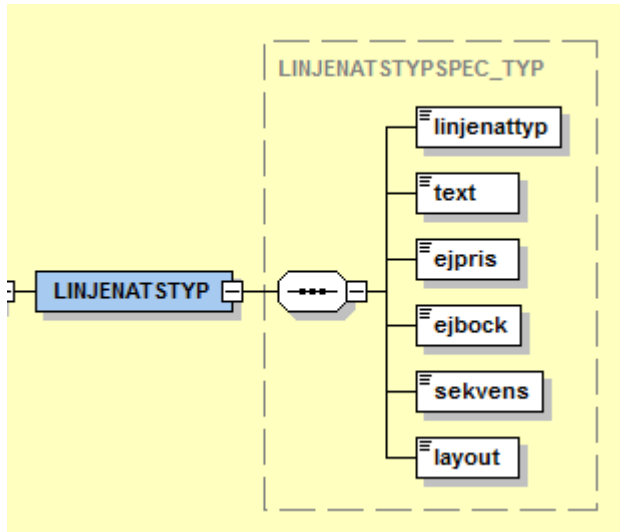
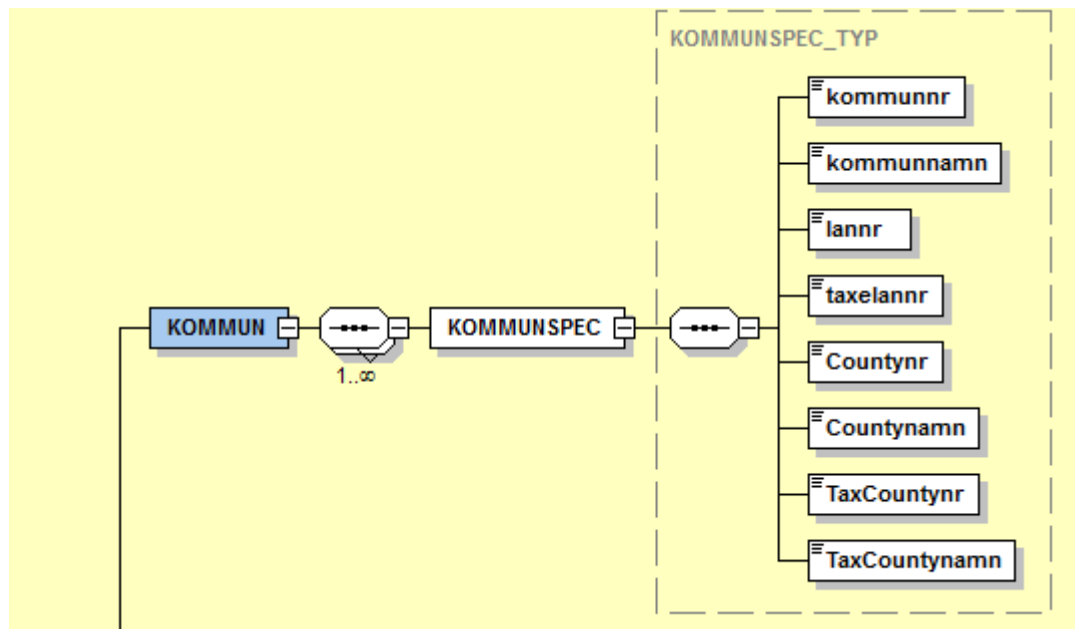
- Vehicle name.
- Quantity .
- Vehicle type.
- Disability classification.
- Transport medium (bus, train or ferry).
- CO2-factor (Environmental measurement).
- Comment text.

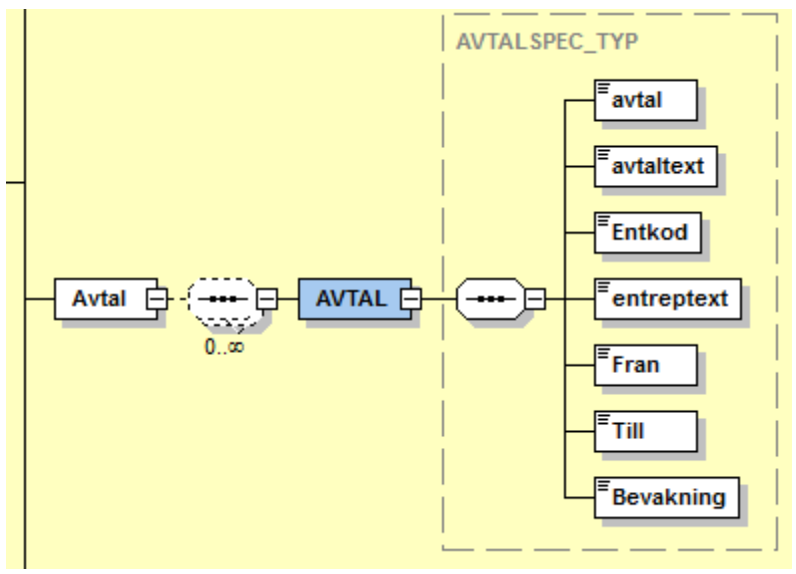
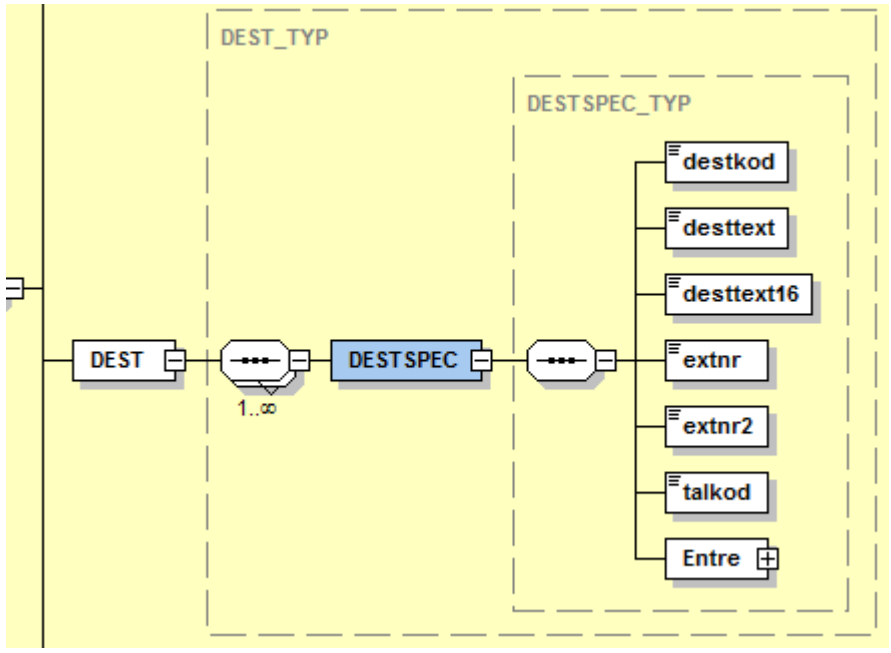
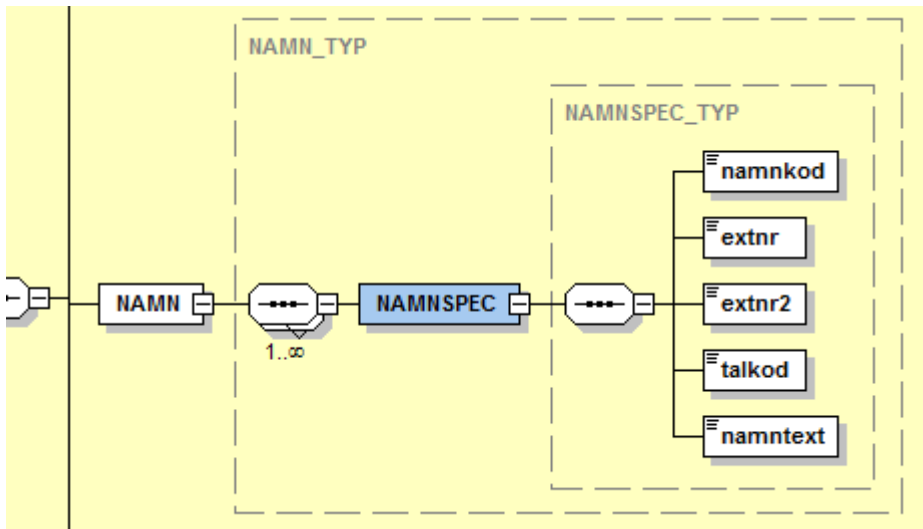
Miscellaneous

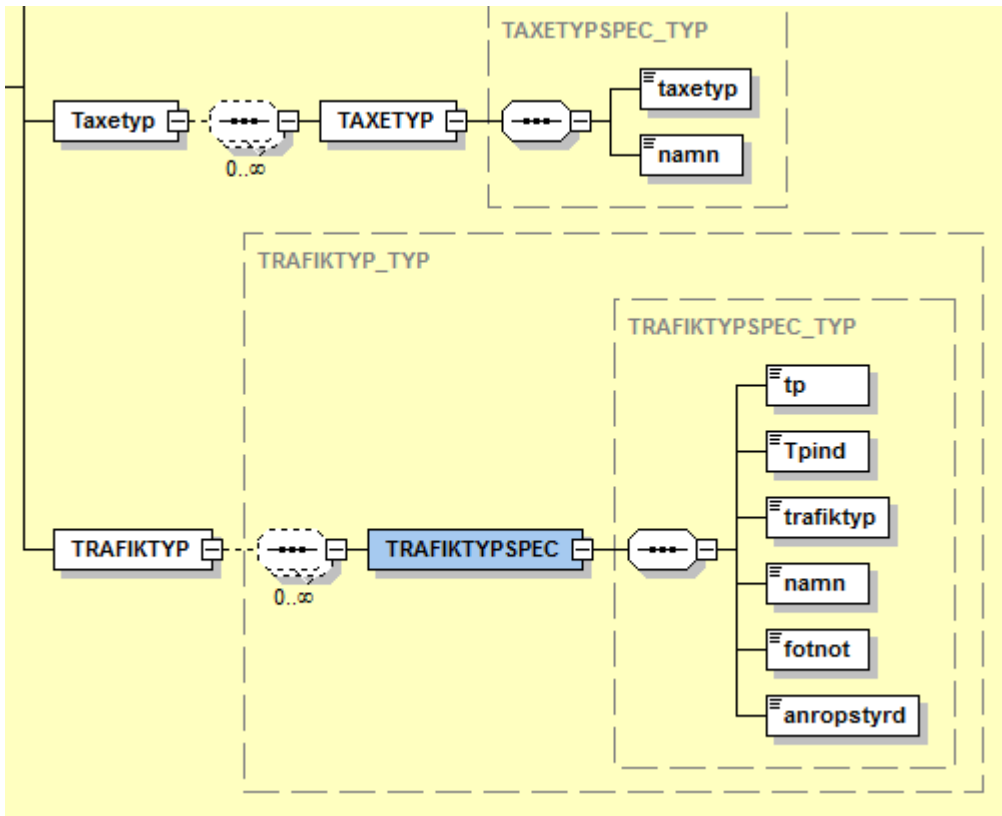
The misc file consists of the following:

- Municipals
- Route network types
- Route types
- Name
- Destinations
- Contracts
- Rate type
- Traffic type

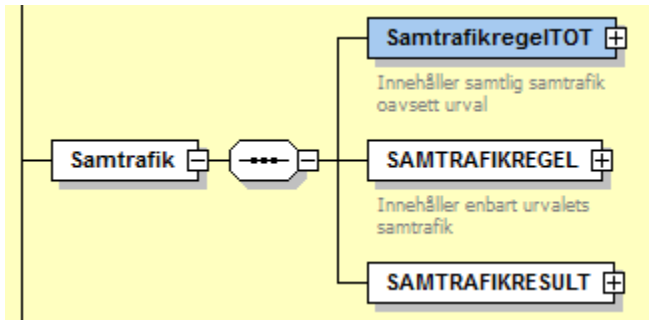




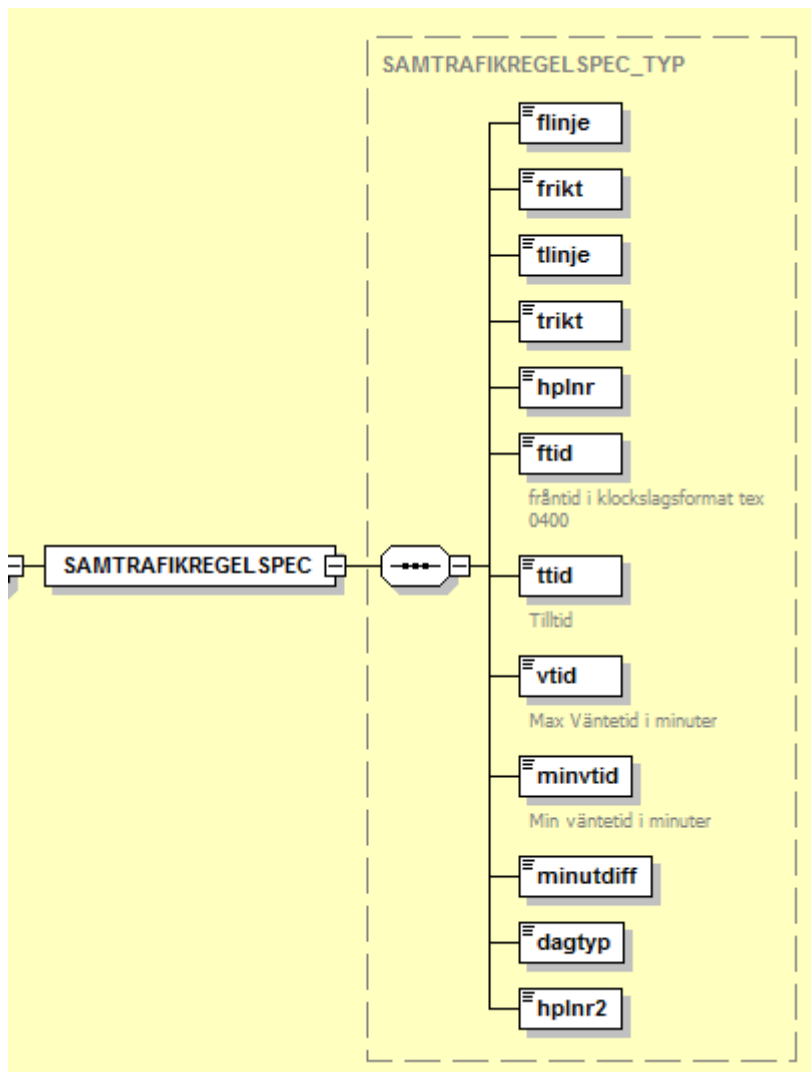


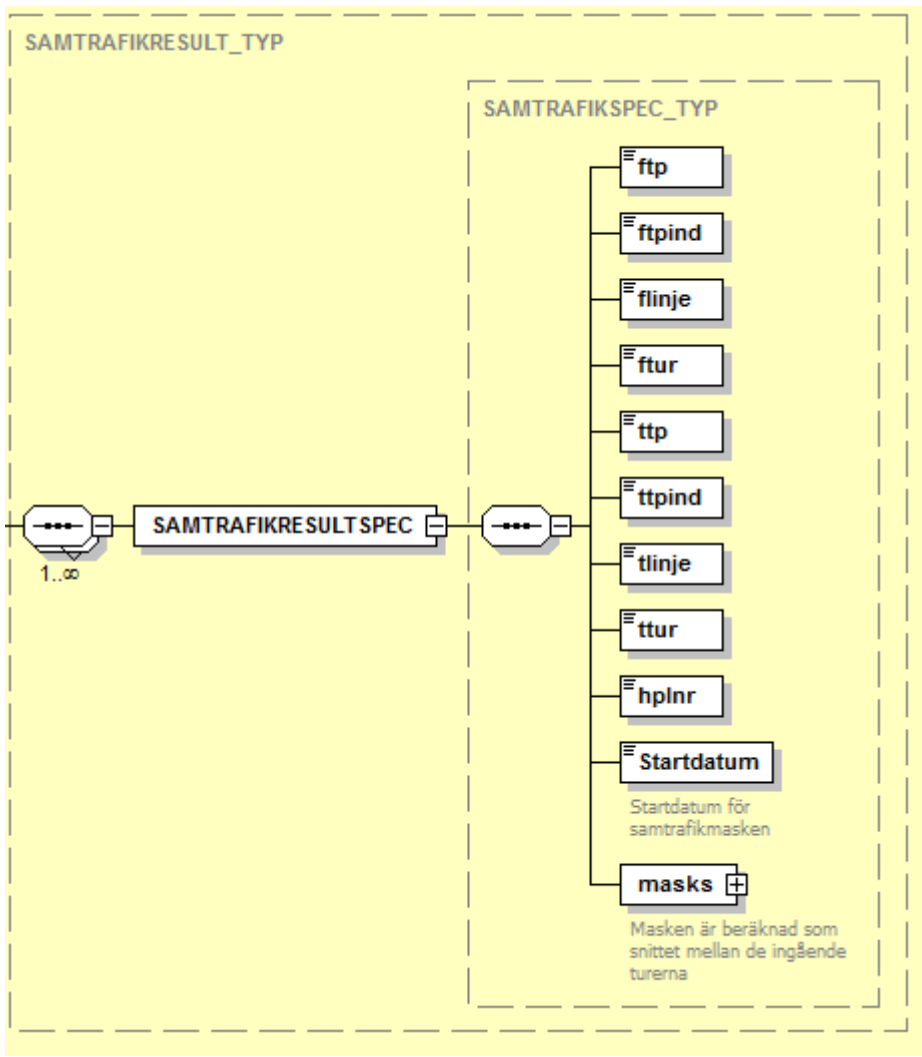


Samtrafik



Både SamtrafikregelTOT och Samtrafikregel består av samma data





Fordon

