SIRI VM PROFILE SWITZERLAND

Systemaufgaben Kundeninformation (SKI) – Team SKI+
https://transportdatamanagement.ch

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Document information

Description	This document contains the description of the SIRI VM (Vehicle Monitoring) profile for Switzerland and the basics of the intended service for collecting and redistributing SIRI VM information in Switzerland. The profile is based on the current draft of the European SIRI profile.
Target audience	People who use or want to use vehicle positions in Switzerland.
Electronic documentation	https://www.xn--v-info-vxa.ch/de/datenmanagement/ski/standards-der-ski

Change History

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1 What is it all about?

This document is intended to lay the foundations for an efficient and standardized exchange of real-time vehicle positions and status information of public transport vehicles (trains, buses, etc.) and possibly also private mobility operators (such as taxis, car sharing) in Switzerland.

The profile should serve the following purposes:

- provide guidance for a coherent, interoperable adoption of vehicle monitoring,
- facilitate the implementation of vehicle monitoring services and applications,
- provide a basis for a solid data exchange infrastructure in Switzerland.

The profile is based on the standard SIRI VM (V2.0, released 2015), plus the European profile SIRI-EPIP-RT and some SIRI VM V2.1 extensions (both currently work in progress).

2 Description and Context

The terms *vehicle positions*, or more broadly, *vehicle monitoring (VM)*, refer to the observation of positions (geographical coordinates) and other vehicle-related information (e.g., occupancy, status, availability, speed, heading) in real time, I.e., with a delay of a few seconds only.

In our context, vehicles of interest are:

- vehicles of public-transport operators, such as trains, buses, trams, ferries, etc.,
- vehicles of private operators, such as taxis, rental and mobility-sharing services, etc.

Furthermore, it must be emphasised that VM is both for vehicles in motion and at rest, not only for vehicles at rest. Vehicles at rest are of interest in the mobility-sharing domain, where available shared scooters, bikes etc. waiting for customers need to be advertised for. For this purpose, the GBFS standard (General Bikeshare Feed Specification) has been introduced and widely adopted. GBFS, however, is not designed and not well fit for vehicles in motion, it lacks attributes such as speed, heading, as well as any public-transport related information (stops, lines, etc.).

Beyond mobility sharing, real-time VM is used by many transport operators for the surveillance and control of their vehicles. For these purposes, the VM data is currently not openly shared.

This profile is intended to foster a broader publication of VM data as open data, thus facilitating a range of new mobility-services use cases:

- enhance apps for mobility, maps or routing, showing which services (vehicles) are nearby, including their availability and booking links,
- enable roaming use cases, allowing to attract customers of other companies,
- derive aggregated data such as effective bus routes, statistics of road use, or usage data (e.g., distances covered, etc.)
- monitoring and supervision of vehicles for regulatory purposes, e.g., respecting geo-fences, curfews or other restrictions.

Following our general principles and governance on standardisation of mobility, this profile is based on the European CEN Transmodel standardisation, namely:

- the SIRI standard,
- the SIRI VM (Vehicle Monitoring) part of SIRI,
- the European Real-Time Passenger SIRI Information Profile – SIRI-EPIP-RT.

In addition, the Norwegian Entur VM service has served as a model.

3 Who is responsible?

The SIRI standard and the SIRI European profile are owned by the CEN (European Committee for Standardization). They are part of the CEN Transmodel (Public Transport Reference Data Model) family of standards. The Transmodel standards are propagated by EU legislation but adopted as well by other countries outside the EU, including Switzerland.

The standardisation of mobility data formats in Switzerland is owned by the Swiss Federal office of Transport (FOT) and has been delegated partly to the SKI agency (Systemaufgaben Kundeninformation).

4 Important links

Abrev.	Description	Link
CEN-SIRI	CEN SIRI Website	https://www.transmodel-cen.eu/siri-standard
DDS SKI data hub	Incident Management Public Transport Switzerland (SIRI-SX / VDV736)	https://opentransportdata.swiss/en/siri-sx
Entur VM	VM service provided by Entur in Norway	https://api.entur.io/realtime/v1/rest/vm?datasetId=VYX&maxSize=10
FOT	Swiss Federal office of Transport	https://www.bav.admin.ch/bav/en/home.html
GBFS	General Bikeshare Feed Specification	https://gbfs.mobilitydata.org
GBFS/CH	GBFS feeds in Switzerland	https://www.sharedmobility.ch, https://github.com/SFOE/sharedmobility
SIRI-EPIP-RT	Public transport — Service interface for real-time information relating to public transport operations — Part 7: European Real-Time Passenger SIRI – Information Profile	ongoing work, not yet published (as of April 2023).
SIRI github	Open parts of the SIRI specification, including XML examples and XML Schema definitions.	https://github.com/SIRI-CEN/SIRI
SIRI Part 3	SIRI Part 3": European Standard EN 15531-3 Public transport — Service interface for real-time information relating to public transport operations — Part 3: Functional service interfaces, August 2015	not openly available, under copyright.
SKI	SKI agency / Transport Data Management Standards	https://transportdatamanagement.ch/de/standards
SKI+	SKI sub-team, supporting FOT in the setup of a Swiss National Access Point.	https://opentransportdata.swiss/en/

5 Basic technologies and standards

This profile is based on SIRI VM, which has comprehensive coverage for vehicles in motion, above all in public transport, but adaptable to private transport systems.

The SIRI data formats build upon XML (eXtensible Markup Language) and XML Schema by the W3C (World Wide Web Consortium).

For data exchange, SIRI uses standard web technologies. In our profile, the HTTPS protocol is used.

6 Usage

SIRI VM is used in Nordic countries for the dissemination of vehicle positions.

It will be used the same way in the European SIRI profile and will be used the same way here.

7 Datasets/Services Switzerland

We intend to provide a SIRI VM request/response service on opentransportdata.swiss. Operators can deliver and receive data through DDIP services of SKI (see DDS SKI data hub).

The real-time data set on opentransportdata.swiss will also contain the operators that we have vehicle positions for.

8 Assessment

The following assessment resulted from the analyses of SKI-VM by the SKI+ team:

P1 international	+++	As a standard of the CEN Transmodel family, SIRI has an international, European focus.
P2 open	+	Usage and parts of the specification (XML schema) are open and free; the official specification documents unfortunately are under copyright and not openly available.
P3 simple	++	SIRI is a wide, comprehensive standard. SIRI VM, though, is not overly complex, its specification covers a mere 15 pages.
P4 established	+++	The base standard (SIRI, SIRI VM) has seen decades of evolution and adoption.
P5 evolutionary	+++	The Transmodel family and the responsible work groups have a history of a thorough, yet slow evolution of its standards.
P6 of high quality	++	SIRI overall and the SIRI VM part are at a high quality level; however they leave (too) much room for interpretation, hindering interoperability, requiring the definition of complementary profiles.
P7 compliant	+++	Conformance with Transmodel and its other major standards is a strong point of SIRI.
P8 interpretation-free	+	Cf. P6; in effect, this is one of the main reasons for profiles such as this document.

9 Conclusions

A VM data service based on a SIRI VM profile is useful for the following use cases:

- Visualisation of vehicles on maps,
- Measuring capacity by linking cell-phone locations and vehicle locations,
- derive routes of a vehicle from location sequences,
- Monitoring the activity in demand-responsive services for areas (e.g. how many vehicles are in the area,
- Operational purposes for interchanges.

The following profile should define a foundation for its adoption in Switzerland.

10 Specification and Recommendation

A data exchange for SIRI VM should be provided.

For the exchange of vehicle position within and from the public transport in Switzerland, SIRI VM should be used.

11 SIRI VM – Swiss Profile

11.1 Scope of Validity

This chapter defines a profile for the adoption of SIRI VM in Switzerland. Starting with version 1.0, this profile will be “binding”, in the sense that any user claiming to provide an implementation that is compliant with this profile must adhere to the given rules.

The rules are marked with a “class” as follows:

- “may”: an optional rule that users may or may not adopt at their own discretion.
- “should”: a rule that is highly recommended and that users should observe if possible, and only for good reasons deviate from.
- “must”: a mandatory rule that must be adhered to.

11.2 Basics

The profile is based on (see chapter “Important Links”):

- SIRI Standard 2.0, including its specifications and XSDs,
- SIRI Part 3, p. 81-96,
- SIRI-EPIP-RT, p. 121-130.

While SIRI overall and SIRI Part 3 define SIRI VM entirely as a standard with a wide range of options, SIRI-EPIP-RT makes some narrowing decisions about which options to use/not to use, however, still leaving a range of options open.

This profile intends to define a precise, minimum standard of options (XML elements, attributes) that must be provided, plus some restrictions and clarifications about their exact content (e.g., what coordinates, what date-time format).

To facilitate a quick and easy adoption, the profile starts with a prototypic example and limits the explanations to the necessary minimum, leaving away obvious and formalistic definitions. For full details and exact definitions of other available options, the specifications and SIRI XSDs (on SIRI github) may be consulted.

11.3 General Rules

Rules that hold generally within this profile.

No.	Topic	Description	Class	Example
1	Full SIRI VM compliance	The formats in use must be fully compliant with the full SIRI VM specification, thus “valid SIRI VM".	**must**	SIRI VM response SIRI VM request (if used)
2	Optional elements and attributes	Any optional elements or attributes of the full SIRI VM specification, which are not prescribed by this profile, may be added at the discretion of the user. However, they must expect that some recipients of the data will ignore those optional elements.	may	ProgressBetweenStops Bearing InCongestion MonitoredCall
3	Timestamp timezone, precision and format	Timestamps (date and time) should: - be in UTC time zone, - be marked with a “Z” (Zulu time) at the end, - be formatted as an ISO-8601 string (yyyy-MM-ddTHH:mm:ss.SSS) - have a precision of 1 second.	should	2023-03-29T15:16:46Z
4	Update interval	The position should be resent every 10 to 60 seconds. The norm should be 10 seconds.	should	
5	Expected volume	We have about 5’000-10’000 parallel active vehicles in Switzerland. Within the next 5 years we assume to have 20 % online. Therefore, we assume that a response will be about 600 KB uncompressed data per 30 seconds.	should	
6	Compression	The response should be compressed in a ZIP-archive. This results in a response being about 60 KB in size.	should	

11.4 SIRI VM Requests

The current version of this profile only supports the request-response model (“direct request”, no subscriptions).

SIRI VM specifies an XML-based request (see some examples on SIRI github). In our context, this is a “luxury” variant that is allowed but not necessary.

As a more simplistic base variant, however, we require that a simple HTTPS GET request be provided. This is based on the example of Norway (see Entur VM).

No.	Topic	Description	Class	Example
1	HTTPS GET service	To adhere to this profile, a SIRI VM data feed must be provided as HTTP GET service under a permanent URL.	**must**	Norway’s Entur VM: https://api.entur.io/realtime/v1/rest/vm?datasetId=VYX&maxSize=10
2	Access control	Access to the service may be restricted by appropriate means such as a bearer token (with a prior user registration) and/or rate limits. For feeds that need to bet obtained by SKI, only open streams, white listed IP or a fixed Authorization header (bearer or basic) are allowed to be used. The reason is, that no additional communication about the setup up of the stream should be necessary.	may	Authorization: Bearer xyz
3	Query parameters	The service may provide support for the following query parameters in order to filter the results: - maxSize (max. Number of results returned) - datasetId (an Id string to identify a subset of results) - VehicleMonitoringRef - VehicleRef - LineRef - DirectionRef Query parameters are not really native to SIRI VM. They are used in the Nordic profile. To comply with the Swiss profile a request without parameters (and an empty body) must be supported that provides the whole stream.	may	… &LineRef=S7&datasetId=SBB --> only vehicles of line S7 by SBB will be returned.
4	Standard SIRI VM request	SIRI VM requests bodies based on the standards specification may be supported in addition.	may	

11.5 SIRI VM Response

No.	Topic	Description	Class	Example
1	Full Compliance with SIRI	The response is to be provided in full compliance with the SIRI specification. This includes the usual XML header with namespaces and the usual structure with a root element <Siri>.	**must**	See “prototypical example” below.

11.5.1 Prototypical Example

The following prototypical example shows a valid response that contains all relevant content prescribed by this profile.

Reminder: As stated by “General Rules” No. 2, all the many optional elements of the SIRI VM standard *may* be added but *need not*.

```
<?xml version="1.0" encoding="UTF-8"?>
<Siri xmlns="http://www.siri.org.uk/siri"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" version="siri:2.1">
 <ServiceDelivery>
  <ResponseTimestamp>2023-03-29T15:16:46Z</ResponseTimestamp>
  <ProducerRef>SBB</ProducerRef>
  <VehicleMonitoringDelivery version="ch.SIRI VM:0.2">
   <ResponseTimestamp>2023-03-29T15:16:46Z</ResponseTimestamp>
   <VehicleActivity>
    <RecordedAtTime>2023-03-29T15:16:46Z</RecordedAtTime>
    <ValidUntilTime>2023-03-29T15:26:46Z</ValidUntilTime>
    <MonitoredVehicleJourney>
     <LineRef>ch:1:slnid:123456789</LineRef>
     <FramedVehicleJourneyRef>
      <DataFrameRef>2023-03-29</DataFrameRef>
      <DatedVehicleJourneyRef>sbb:ServiceJourney:325a606ee9</DatedVehicleJourneyRef>
     </FramedVehicleJourneyRef>
     <VehicleMode>rail</VehicleMode>
     <PublishedLineName>S3</PublishedLineName>
     <OperatorRef>ch:1:sboid:11</OperatorRef>
     <ProductCategoryRef>ch:1:TypeOfProductCategoryRef:IR</ProductCategoryRef >
     <OriginName>Basel</OriginName>
     <DestinationName>Olten</DestinationName>
     <Monitored>true</Monitored>
     <DataSource>CEN</DataSource>
     <VehicleLocation>
      <Longitude>7.720711</Longitude>
      <Latitude>47.494772</Latitude>
     </VehicleLocation>
      <Bearing>90</Bearing>
      <Velocity>80</Velocity>
      <Latitude>47.494772</Latitude>
     <Occupancy>manySeatsAvailable</Occupancy>
     <Delay>PT33S</Delay>
    </MonitoredVehicleJourney>
   </VehicleActivity>
  </VehicleMonitoringDelivery>
 </ServiceDelivery>
</Siri>
```

11.5.2 Root Element Siri

The XML root element of the response is Siri (“<Siri...>”). It contains static attributes, plus one child element ServiceDelivery.

No.	Topic	Description	Class	Example
1	Basics	The root element Siri contains: - xmlns attribute, referring to the siri namespace, - xmlns:xsi attribute, referring to XML schema, - version attribute, referring to the correct Siri standard supported; currently, 2.0 or 2.1 (as a preview) make sense, - Exactly one child element ServiceDelivery (see following section).	**must**	xmlns="http://www.siri.org.uk/siri" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" version="siri:2.1"

11.5.3 ServiceDelivery Element

The ServiceDelivery element is the main payload container for the response.

No.	Topic	Description	Class	Example
1	Basics	The ServiceDelivery element contains: - no attributes, - ResponseTimestamp element (see “General Rules” above) - 0..1 ProducerRef element. - Exactly one element VehicleMonitoringDelivery (see following section).	**must**	<ResponseTimestamp> 2023-0329T15:16:46Z </ResponseTimestamp>
2	ProducerRef	A name/id that identifies the producer.	should	<ProducerRef>SBB</ProducerRef>

11.5.4 VehicleMonitoringDelivery Element

The VehicleMonitoringDelivery element is yet another nested payload container for a SIRI VM response.

No.	Topic	Description	Class	Example
1	Basics	The VehicleMonitoringDelivery contains: - a version attribute, - a ResponseTimestamp element (see “General Rules” above),	**must**	

		- 0..* (zero, one or several) VehicleActivity elements (see following section).		
2	version attribute	The version attribute should contain a hint about the profile version it is based on.	should	Version="ch.SIRI VM:0.2"
3	Response Timestamp element	Should be identical to its namesake under ServiceDelivery (see above).	should	

11.5.5 VehicleActivity Element

The VehicleActivity element contains all VM information of one vehicle.

No.	Topic	Description	Class	Example
1	Basics	The VehicleActivity contains: - no attributes, - a RecordedAtTime and a ValidUntilTime element - Exactly one MonitoredVehicleJourney element (see following secition).	**must**	
2	RecordedAtTime	"*Time at which VEHICLE data was recorded*" (SIRI VM spec., mandatory). In addition, see "General Rules" for timestamps above.	**must**	2023-03-29T15:16:46Z
3	ValidUntilTime	"*Time until which data is valid.*" (SIRI VM spec., mandatory). This is a somewhat bizarre information for a vehicle in motion. We propose that this field is equal to RecordedAtTime + update interval.	**must**	update interval = 1 minute, RecordedAtTime = 2023-03-29T15:16:46Z --> ValidUntilTime = 2023-03-29T15:17:46Z

11.5.6 MonitoredVehicleJourney Element

The MonitoredVehicleJourney element of SIRI VM is a complex structure to provide all details of the given vehicle on its journey, including its previous or onward calls (stops). In this profile, we limit this to a few mandatory elements about the position, plus some recommended context information, based on the SIRI VM "minimum" detail level.

Topic	Description	Class	Example
Basics	The MonitoredVehicleJourney contains no attributes, plus a selection out of a large range of	**must**	

	child elements (the following rules), each with cardinality 0..1.		
LineRef	*"Reference to the Line in question (ID to the corresponding object in the timetable data)"* (SIRI-EPIP-RT).	**must**	ch:1:slnid:123456789
FramedVehicle JourneyRef	An element with two sub-elements DataFrameRef and DatedVehicleJourneyRef. In practice, DataFrameRef should indicate the operation day (date as yyyy-mm-dd), and DatedVehicleJourneyRef should be an identifier for the given journey (service) used in related systems (e.g. a timetable service or a service disposition system).	**must**	<FramedVehicleJourneyRef> <DataFrameRef>2023-03-29</DataFrameRef> <DatedVehicleJourneyRef>sbb:ServiceJourney:325a606ee9</DatedVehicleJourneyRef> </FramedVehicleJourneyRef>
VehicleMode	The mode of transport/mobility, one out of a list	may	air, bus, coach, metro, rail, tram, trolleyBus, water, taxi, selfDrive, underground, suburbanRail, urbanRail, telecabin, funicular (plus some more, see SIRI-EPIP-RT)
PublishedLine Name	The line name as published/visible to customers	may	S3
OperatorRef	Reference to the operator; if available, the SBOID should be used.	may/ should	ch:1:sboid:11
OriginName	The starting point of the journey, as visible to customers.	may	Basel
ProductCategory Ref	"Verkehrsmittelkategorie"	may	ch:1:TypeOfProdductCategoryRef:IR
DestinationName	The destination of the journey, as visible to customers.	may	Olten
DataSource	*"Codespace of the data source"*, will be added as mandatory in SIRI 2.1 / SIRI-EPIP-RT. The data source describes the sender of the data (and the environment). It is suggested that the short name + "-" + <environment> is used.	**must**	BLS-prod BernMobil-int SBB-Rosy-prod
VehicleLocation	An element with two sub-elements Longitude and Latitude, which define the location of the vehicle.	**must**	<VehicleLocation> <Longitude>7.720711</Longitude>

	Longitude and latitude must be WGS 84 coordinates in decimal notation with a precision of 6 decimal places (and should not be more than 6).		<Latitude>47.494772 </Latitude> </VehicleLocation>
LocationRecorde dAtTime	Time at which location was recorded. If not present assume that the recorded at time on the containing delivery.	may	<LocationRecordedAtTim e></ LocationRecordedAtTime >
Bearing	Bearing in compass degrees in which VEHICLE is heading.	may	<Bearing>240</Bearing>
Velocity	Velocity of VEHICLE. EIther actual speed or average speed may be used. (since SIRI 2.0)	may	<Velocity>0</Velocity>
Occupancy	Will be added as optional in SIRI 2.1 / SIRI-EPIP-RT.	may	manySeatsAvailable, fewSeatsAvailable, standingRoomOnly
Delay	Indicating the current delay respective to a plan or timetable. Must be provided as an integer or floating-point number with a prefix “PT” and the time unit as suffix.	**must**	PT33S, PT3.123M Suffix: - S for seconds, - M for minutes.

12 Possible data sources for vehicle position and what they could cover

Currently only an internal list exists will be added later. If you want to deliver position information, please contact opendata@sbb.ch.

13 Comparison SIRI-VM vs. VDV 453 VIS

In Switzerland many operators use software that works with VDV standards and not CEN standards. Therefore, a comparison and possible mapping is important.

13.1 General assessment

The two services SIRI-VM and VDV 453 VIS are quite similar in their structure and the core elements:

- VDV: <VISTimetableLocation> / <TripInfo>
- SIRI: <VehicleMonitoringDelivery> /<MonitoredVehicleJourney>

Regarding the transmission of the timetable position or the exact position of the vehicle, there is no advantage in either VDV or SIRI in terms of the services and their respective functionality (elements). In addition to the GPRS position, VDV also enables the transmission of logical position data and stop sequences.

However, the basic differences between the two services should be mentioned here.

- The SIRI specification is considerably more comprehensive and less stringent than the German VDV specifications. Therefore, the VDV453 and VDV454 specifications are to be regarded as national concretizations of the CEN standard 'SIRI'. For the use of SIRI in Germany, the mandatory elements of VDV453 and VDV454 are considered to be agreed as mandatory elements of SIRI[1].
- SIRI is easier and faster to implement due to the possibility of using a simple publish / subscribe procedure, especially when it comes to the simple publication and consumption of vehicle positions. VDV data is only available in the traditional subscription procedure, which is more complex to implement.

Speciality:

When mapping the individual elements (SIRI → VDV), it is noticeable that in the VDV area, elements from the <FahrtInfo> and <VISFahrplanlage> elements partially overlap. The reason for this is the (optional) implementation of the complete <FahrtInfo> element.

For Example:

VISFahrplanlage -> < LinienText > = 609	< FahrtInfo > <LinienNr> = 609
VISFahrplanlage -> < StartHst > = HARH	< FahrtInfo > <StartHst> = HARH
VISFahrplanlage -> <EndHst> = GIEE	< FahrtInfo > < ZielHst > = GIEE

13.2 VDV 453 VIS Example

Im Moment haben wir kein VIS-Beispiel aus der Schweiz. Das untenstehende Beispiel aus Deutschland dient nur der Illustration für das Mapping und kann nicht als Basis für eine VIS-Implementation in der Schweiz genutzt werden. So sind die Haltestellen bei uns SLOID oder DiDok-Codes und die Koordinaten auf jeden Fall WGS84.

```
<VISFahrplanlage Zst="2023-07-06T08:34:37.603+02:00" VerfallZst="2023-07-06T08:44:37+02:00">
  <VISID>VIS001</VISID>
  <FahrtID>
      <FahrtBezeichner>2738-00687-1</FahrtBezeichner>
      <Betriebstag>2023-07-06</Betriebstag>
  </FahrtID>
  <LinienID>SWB609</LinienID>
  <LinienText>609</LinienText>
  <RichtungsID>A</RichtungsID>
  <RichtungsText>Gielgen</RichtungsText>
  <VonRichtungsText>Hardthöhe Südwache</VonRichtungsText>
  <FahrtStatus>Ist</FahrtStatus>
  <Verspaetung>220</Verspaetung>
  <StartHst>HARH</StartHst>
  <EndHst>GIEE</EndHst>
  <AktHst>ADHG</AktHst>
  <HstSeqZaehler>17</HstSeqZaehler>
  <AufHst>false</AufHst>
  <NachHst>VERD</NachHst>
  <Distanz>3</Distanz>
```

[1] See https://www.vdv.de/europaeische-norm-siri.aspx

```
            <Longitude>25463600</Longitude>
            <Latitude>182621385</Latitude>
            <Stauindikator>false</Stauindikator>
            <FahrtInfo>
                <FahrzeugID>2216B</FahrzeugID>
                <LinienNr>609</LinienNr>
                <UmlaufNr>2608001</UmlaufNr>
                <KursNr>1</KursNr>
                <StartHstLang>Hardthöhe Südwache</StartHstLang>
                <StartHst>HARH</StartHst>
                <ZielHstLang>Gielgen</ZielHstLang>
                <ZielHst>GIEE</ZielHst>
                <LinienfahrwegID>1</LinienfahrwegID>
                <AbfahrtszeitStartHst>2023-07-06T08:11:00+02:00</AbfahrtszeitStartHst>
                <AnkunftszeitZielHst>2023-07-06T09:17:00+02:00</AnkunftszeitZielHst>
                <ProduktID>Bus</ProduktID>
                <BetreiberID>XYZ</BetreiberID>
                <Betreiber>XYZ</Betreiber>
            </FahrtInfo>
        </VISFahrplanlage>
```

13.3 Possible Element Mapping / Comparison

Elemente SIRI	Elemente VDV	Bemerkungen
<MonitoredVehicleJourney> <LineRef>ch:1:slnid:123456789</LineRef>	<VISFahrplanlage> <LinienID>SWB609</LinienID> <FahrtInfo> <LinienNr>609</LinienNr>	LinienNr would probably not be used in a Swiss VIS profile
<MonitoredVehicleJourney> <FramedVehicleJourneyRef> <DataFrameRef>2023-03-29</DataFrameRef> <DatedVehicleJourneyRef>sbb:ServiceJourney:32e9</DatedVehicleJourneyRef> </FramedVehicleJourneyRef>	<FahrtID> <FahrtBezeichner>2738-006871</FahrtBezeichner> <Betriebstag>2023-07-06</Betriebstag> </FahrtID>	The operating day is in the DataFrameRef in SIRI.
<MonitoredVehicleJourney> <VehicleMode>rail</VehicleMode>		
<MonitoredVehicleJourney> <PublishedLineName>S3</PublishedLineName>	<VISFahrplanlage> <LinienText>609</LinienText> <FahrtInfo> <LinienNr>609</LinienNr>	
<MonitoredVehicleJourney> <OperatorRef>ch:1:sboid:11</OperatorRef>	<FahrtInfo> <BetreiberID>SWB</BetreiberID> <Betreiber>SWB</Betreiber>	
<MonitoredVehicleJourney> <ProductCategoryRef>ch:1:TypeOfProductCategoryRef:IR</ProductCategoryRef >	<FahrtInfo> <ProduktID>Bus</ProduktID>	
<MonitoredVehicleJourney> <OriginName>Basel</OriginName> <DestinationName>Olten</DestinationName> <Monitored>true</Monitored>	<FahrtInfo> <StartHstLang>Hardthöhe Südwache</StartHstLang> <StartHst>HARH</StartHst> <ZielHstLang>Gielgen</ZielHstLang> <ZielHst>GIEE</ZielHst> <VISFahrplanlage> <StartHst>HARH</StartHst> <EndHst>GIEE</EndHst> <AktHst>ADHG</AktHst>	
<MonitoredVehicleJourney> <Monitored>true</Monitored>	<VISFahrplanlage> <FahrtStatus>Ist</FahrtStatus>	
<MonitoredVehicleJourney> <DataSource>SBB_prod/DataSource>		

<MonitoredVehicleJourney> <VehicleLocation> <Longitude>7.720711</Longitude> <Latitude>47.494772</Latitude> </VehicleLocation>	<VISFahrplanlage> <AktHst>ADHG</AktHst> <HstSeqZaehler>17</HstSeqZaehler> <AufHst>false</AufHst> <NachHst>VERD</NachHst> <Distanz>3</Distanz> <Longitude>25463600</Longitude> <Latitude>182621385</Latitude>	The AufHst is currently not part in SIRI. It can be modelled by adding MonitoredCall/VehicleAt Stop. We might discuss this in a future version. These kind of things are currently transmitted through SIRI ET.
<MonitoredVehicleJourney> </Occupancy>→<Occupancy>manySeatsAvailable</Occupancy>		
<MonitoredVehicleJourney> <Delay>PT33S</Delay>	< VISFahrplanlage> <Verspaetung>220</Verspaetung>	