

Wie GTFS-Datenfeeds zur Verbesserung des öffentlichen Verkehrs nachhaltig beitragen

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Webinar, 13. November 2023

Basierend auf Inhalten von Martin Griesser,
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Agenda

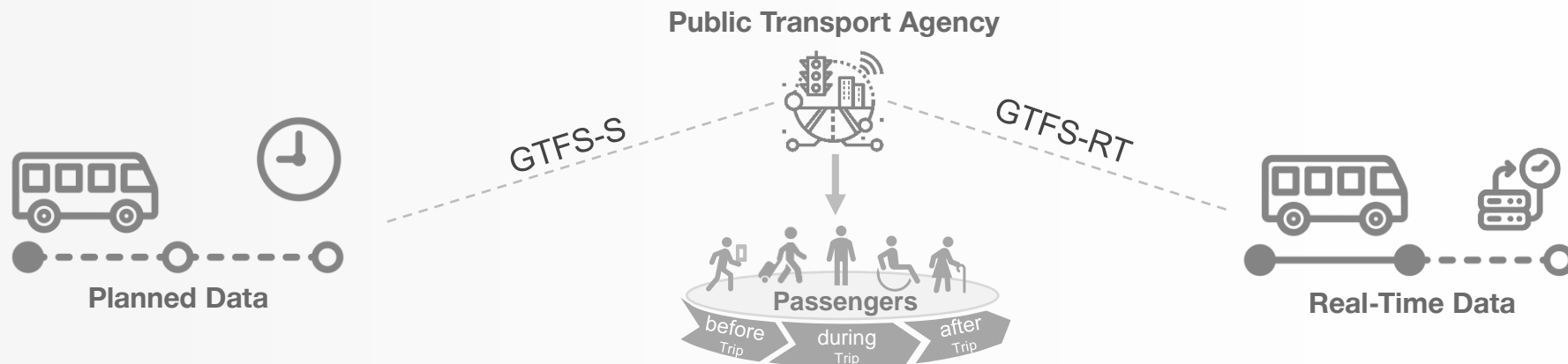
- GTFS-S und GTFS RT
- Was bietet die Systemführerschaft Kundeninformation (SKI) an?
- Das GTFS-Profil und sein aktueller Stand
- Erste Elemente Roadmap GTFS Ökosystem
- Community GTFS
- Diskussionspunkte von Eurer Seite? Fragen/Antworten

GTFS-S und GTFS-RT

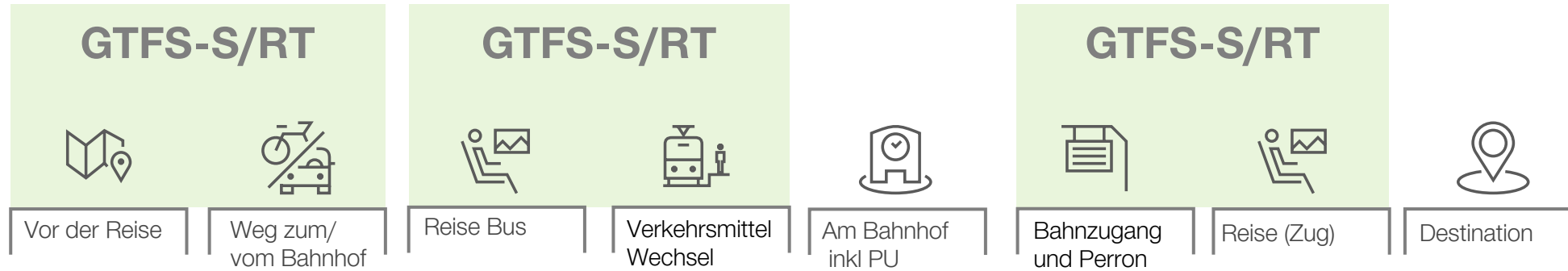
GTFS Basics

General Transit Feed Specification

- **Open Standard** used to distribute relevant **information about transit systems** to travellers
- Transit data can be consumed by a wide variety of software applications
- Used by thousands of public transport providers
- GTFS consists of **two main parts**:
 - **GTFS Static**: information about routes, schedules, fares, and geographic transit details
→ *simple text files*
 - **GTFS Real-Time**: real-time data about three services: trip updates, vehicle positions, service alerts
→ *protocol buffers*



GTFS Basics – Customer Journey



Beste 47 min 57 min 10 h 2 h 39

Braatstrasse, 8234 Stetten

Oerlikon, Zürich

Jetzt starten [Optionen](#)

[Wegbeschreibung an mein Smartphone senden](#)

16:54 bis 17:51 57 min

16:58 ab Stetten SH, Braati · **Pünktlich**

9 min alle 30 min

[Details](#)

16:58 ● Stetten SH, Braati

24 Schaffhausen, Bahnhof
13 min (6 Zwischenstopps) · **Pünktlich**

- 17:00 Schaffhausen, Otteregass
- 17:02 Schaffhausen, Post Herblingen
- 17:04 Schaffhausen, Falkeneck
- 17:05 Schaffhausen, Sandlöchli
- 17:06 Schaffhausen, Gernsbühl

17:11 ● Schaffhausen

Betreiber: Verkehrsbetriebe Schaffhausen

17:11 ● Schaffhausen

Zu Fuß
ca. 1 min

Vorsicht: Diese Ansicht kann Fehler enthalten oder Straßenabschnitte, die nicht für Fußgänger geeignet sind.

Auf Bahnhofstrasse nach Südwesten

Rechts ablegen

17:17 ● Schaffhausen

17:17 ● Schaffhausen

RE Zürich HB
30 min (2 Zwischenstopps) · Gleis 3
Haltestellennummer: Schaffhausen - Gleis 3

17:17 ● Schaffhausen

RE Zürich HB
30 min (2 Zwischenstopps) · Gleis 3
Haltestellennummer: Schaffhausen - Gleis 3

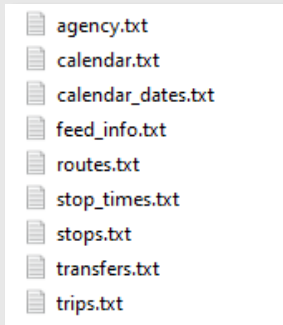
Bülach

Betreiber: Schweizerische Bundesbahnen SBB

17:47 ● Zürich Oerlikon

GTFS Basics – GTFS Static

- **GTFS Static** describes public transportation in a **particular region** at a **specific point in time**
- This information typically **changes infrequently** and is usually maintained and updated by transport agencies
- GTFS Static is provided as a **set of text files** in ZIP format
→ Published 1x/week on opentransportdata.swiss
- Each file contains information about a particular aspect of the traffic information: **stops** (stops.txt), **routes** (routes.txt), **trips** (trips.txt), **agencies** (agency.txt), other schedule-related data
- Some information is **necessary** to provide valid GTFS data, others are **optional** (e.g. schedule changes on specific holidays = calendar_dates.txt)

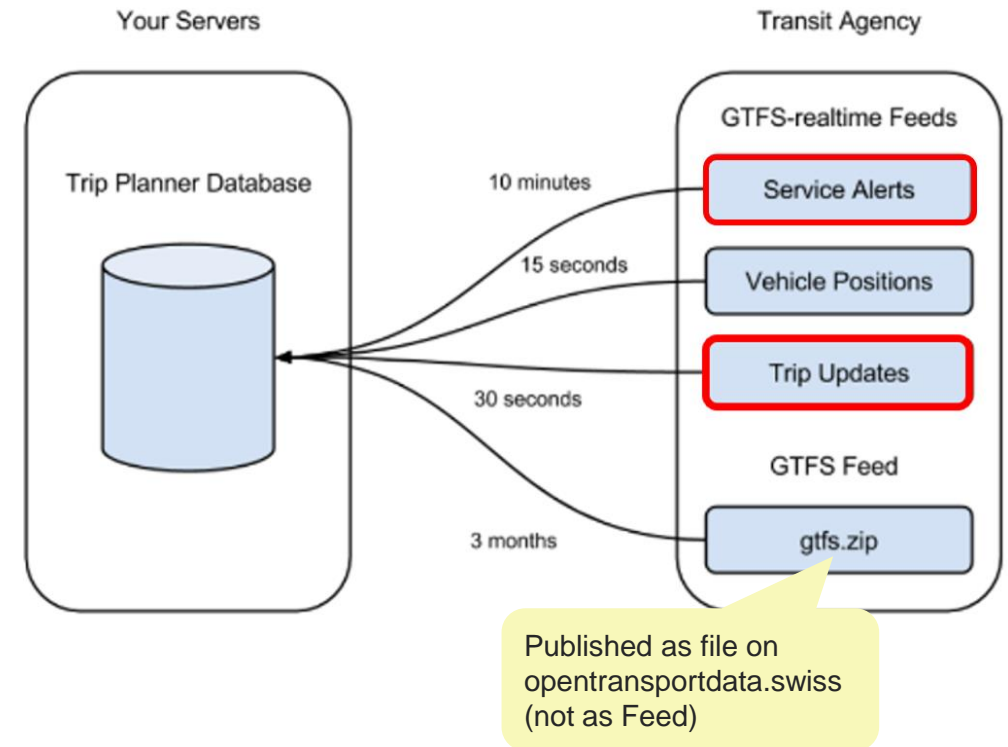


No	Filename	Definition
1	agency.txt	Transit agencies with service represented in this dataset
2	stops.txt	Stops where vehicles pick up or drop off riders. Also defines stations and station entrances.
3	routes.txt	Transit routes. A route is a group of trips that are displayed to riders as a single service
4	trips.txt	Trips for each route. A trip is a sequence of two or more stops that occur during a specific time period.
5	stop_times.txt	Times that a vehicle arrives at and departs from stops for each trip.
6	calendar.txt	Service dates specified using a weekly schedule with start and end dates. This file is required unless all dates of service are defined in calendar_dates.txt .
7	calendar_dates.txt	Exceptions for the services defined in the calendar.txt . If calendar.txt is omitted, then calendar_dates.txt is required and must contain all dates of service.
8	fare_attributes.txt	-
9	fare_rules.txt	-
10	shapes.txt	We are considering the use. As our implementation is based on OSM, the shapes.txt will have to adhere to the OSM license.
11	frequencies.txt	-
12	transfers.txt	When calculating an itinerary, GTFS-consuming applications interpolate transfers based on allowable time and stop proximity
13	pathways.txt	We will consider it, as soon as the detailed stop modelling is complete. As our implementation is based on OSM, the pathways.txt will have to adhere to the OSM license.
14	levels.txt	-
15	feed_info.txt	Information about the dataset itself, rather than the services the dataset describes
16	translations.txt	-
17	attributions.txt	-

Used in Swiss implementation
 Not used in Swiss implementation

GTFS Basics – GTFS Real-Time

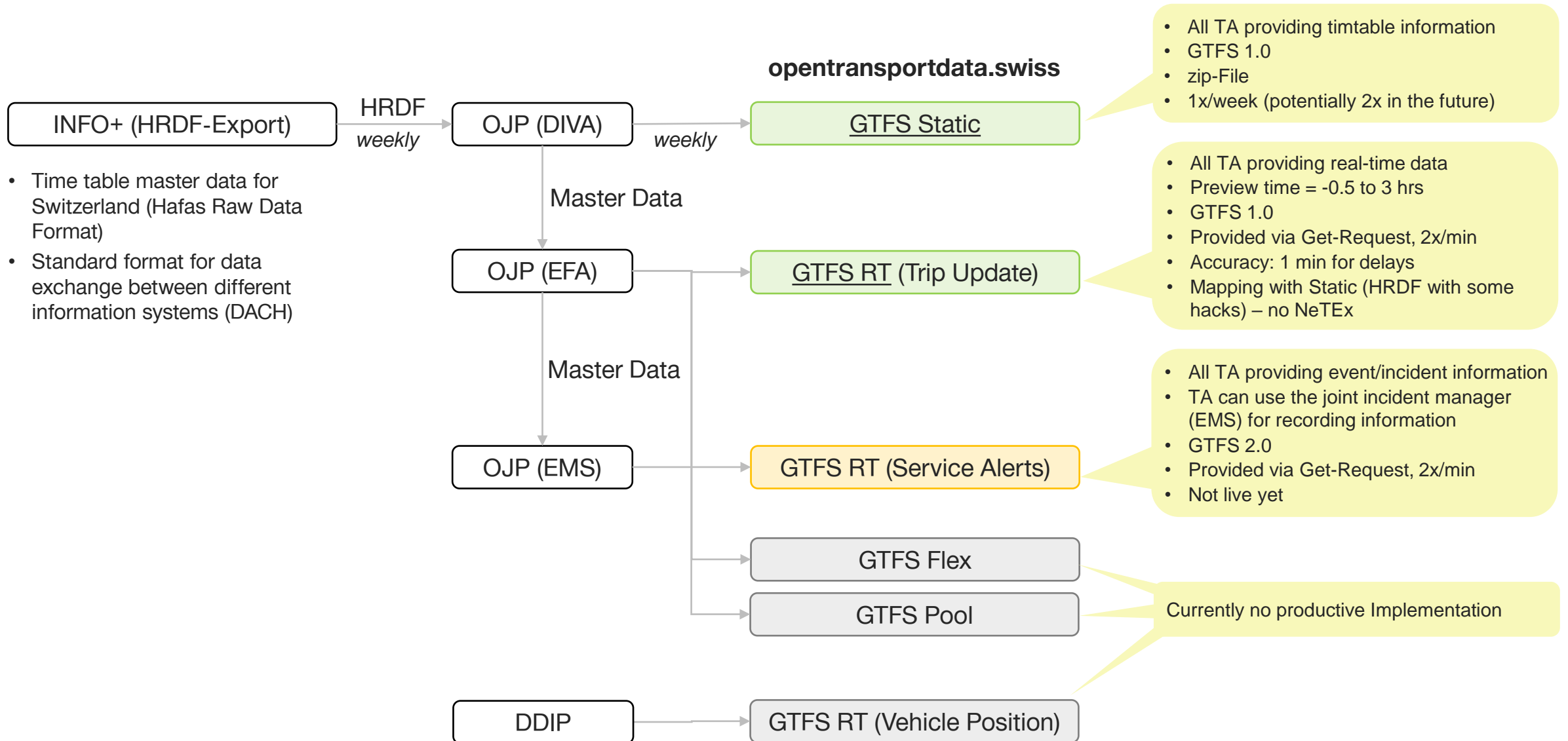
- **GTFS Real-Time** data is provided in real-time and includes information such as **delays, disruptions, vehicle positions, and estimated arrival times**
- It is generated and **updated in real-time** by transportation agencies or their partners.
- A GTFS Real-Time feed provides **three types of data**:
 - **Vehicle positions:** data about events that have already occurred (e.g. “the vehicle was at this location one minute ago”)
 - **Trip updates:** data about events that are yet occur (e.g. “the bus will arrive in three minutes”)
 - **Service alerts:** information about delays, changed routes, replacement vehicles or cancellations for individual lines



Was bietet SKI an?

GTFS-Implementation SKI

Swiss GTFS Implementation – Provided GTFS Data



Das GTFS Profil

Work in progress

Kopie erhältlich (gegen Feedback)

GENERAL TRANSIT FEED SPECIFICATION (GTFS) PROFILE SCHWEIZ

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

Status	Draft
Version	0.14
Date of publication	2023-09-29
Authors	Martin Griesser (SBB NDx), David Rudi (SBB SKI+), Matthias Günter (SBB SKI+)
Copyright	CC BY 4.0

Document information

Description	This document contains information, assessments, and explanations on the GTFS_standard used in Switzerland in the Swiss profile.
Target Group	People and organizations who want to obtain or provide GTFS data for the whole of Switzerland via the opentransportdata.swiss
Repository	https://www.tp-info.ch/de/datenmanagement/ski/standards-der-ski

History

Version	Status	Remarks	Author	Valid from
0.14	Draft	Draft for publication	M. Griesser D. Rudi	2023-09-21



General Part

Chapter 1-9

- What is it all about / Description
Responsibility / Links (More Information)
- Used Technology Stack and standards
- Usage / Datasets Switzerland
- Assessment / Conclusion
- Specification / Recommendation



Swiss Profile – GTFS Static

- Links
- Introduction
- Dataset-Files (Detailed Explanation of each File)
- Dataset Examples



Swiss Profile – GTFS-RT (General)

- Links
- Introduction
- Element-Index (Overview)
- General Element (Detailed Description)
- Explanation included Services



Swiss Profile – GTFS-RT (Service Alerts)

- Links
- Elements / Messages (Detailed Description)
- Examples
- Mapping Rules (SIRI -> GTFS)



Swiss Profile – GTFS-RT (Trip Update)

- Links
- Elements / Messages (Detailed Description)
- Examples



Swiss Profile – GTFS (Flex)

- Links
- Elements / Messages (Detailed Description)
- Examples



General Part - Chapter 1-9

Übersetzung: Wir sehen GTFS als zentral für das Ökosystem öV Schweiz an.

Assessment

P1 international	+++	GTFS is widely used and recognized as an international standard for public transit data exchange
P2 open	+++	GTFS is an open and free format, allowing for easy access and use by developers and public transit agencies
P3 simple	+++	GTFS is designed with simplicity in mind, making it easy for transit agencies to implement and maintain
P4 established	+++	GTFS has been in use for over a decade and is widely adopted by public transit agencies around the world
P5 evolutionary	++	GTFS continues to evolve with the changing needs of public transit, with regular updates and new features being added
P6 of high quality	+++	GTFS is a well-designed and well-documented format, with a high level of quality and reliability
P7 compliant	+++	GTFS is compliant with relevant international standards for public transit data exchange.
P8 interpretation-free	++	GTFS is designed to be unambiguous and interpretation-free, reducing the potential for errors or misinterpretation

Comparison to other Standards

SIRI ET/PT noch nicht verfügbar. In Arbeit.

- SIRI ET/PT (Estimated Timetable / Planned Timetable) is a highly flexible standard that allows for a wide range of real-time information to be exchanged between various systems and devices involved in public transport operations.
- One key advantage of SIRI ET/PT is its ability to provide a **detailed and up-to-date view of the entire journey of a vehicle**, down to the smallest detail. This level of detail can be very **valuable for transport authorities**, as it allows them to closely monitor the performance of their services and make informed decisions about how to optimize them.
- At the same time, SIRI ET/PT can also provide **valuable information to passengers**, such as real-time updates about the status of their services, including delays and cancellations.
- GTFS-RT, on the other hand, is **more limited in scope than SIRI ET/PT**, as it is primarily designed to provide real-time updates to the static schedule information provided by GTFS. However, it does offer a number of **advantages** over SIRI ET/PT in **terms of simplicity and ease of use**. The format is relatively simple and easy to understand, which can make it easier for transport authorities and developers to work with.
- One of the key advantages of GTFS-RT is that it is **designed specifically for providing real-time information to passengers**. It allows for real-time updates about the status of services to be displayed on digital signage, mobile apps, and other passenger information systems.
- In general, GTFS is from SKI+ (SBB) point of view a format to deliver data (**target group: passengers, apps, tools**). For the delivery of data (**data collection with the central data hubs**), proven **interfaces** such as SIRI, VDV or NeTEX should be used.



Swiss Profile – GTFS Static

[How to get / FAQ: GTFS | Open-Data-Plattform Mobilität Schweiz \(opentransportdata.swiss\)](#)

No	Filename	Definition
1	agency.txt	Transit agencies with service represented in this dataset
2	stops.txt	Stops where vehicles pick up or drop off riders. Also defines stations and station entrances.
3	routes.txt	Transit routes. A route is a group of trips that are displayed to riders as a single service
4	trips.txt	Trips for each route. A trip is a sequence of two or more stops that occur during a specific time period.
5	stop_times.txt	Times that a vehicle arrives at and departs from stops for each trip.
6	calendar.txt	Service dates specified using a weekly schedule with start and end dates. This file is required unless all dates of service are defined in calendar_dates.txt .
7	calendar_dates.txt	Exceptions for the services defined in the calendar.txt . If calendar.txt is omitted, then calendar_dates.txt is required and must contain all dates of service.
8	fare_attributes.txt	-
9	fare_rules.txt	-
10	shapes.txt	We are considering the use. As our implementation is based on OSM, the shapes.txt will have to adhere to the OSM license.
11	frequencies.txt	-
12	transfers.txt	When calculating an itinerary, GTFS-consuming applications interpolate transfers based on allowable time and stop proximity
13	pathways.txt	We will consider it, as soon as the detailed stop modelling is complete. As our implementation is based on OSM, the pathways.txt will have to adhere to the OSM license.
14	levels.txt	-
15	feed_info.txt	Information about the dataset itself, rather than the services the dataset describes
16	translations.txt	-
17	attributions.txt	-

Used in Swiss implementation Not used in Swiss implementation

Features

- Files can be downloaded on [Fahrpläne GTFS - Gruppen | Open-Data-Plattform Mobilität Schweiz \(opentransportdata.swiss\)](#) (Weekly Update)
- Agency_ID = Identifies a transit brand which is often synonymous with a transit agency. Currently we use the GO-Number out of DiDoK. In Future SBOID should be used.
- Stop_ID = Identifies a stop, station, or station entrance. Currently we use BP-UIC (DIDOK-Code). In future SLOID is planned. Stop_Id is directly taken from the HRDF-Import.
- Route_ID = Identifies a route (based on the DIVA Identifier). In Future SLNID is planned.
 - Current Implementation: route_id = <DIVA Betriebszweig>-<DIVA Liniennummer>-<DIVA Projektkurzbezeichnung>-<DIVA Linienversionsnummer>
 - Some routes in GTFS have an extension "-Y". The reason is that they have an artificially created route number
 - No match between the FAHRTID, the HRDF data or the Route_id. But the problem should be solved with the future implementation of SID4PT.

Trip_ID = Currently DIVA-Format, in the future SJYID is planned.

- The Trip ID is made up of different DIVA numbers/fields and has nothing to do with the HRDF data. The assignment is not quite 1:1, as the trip ID (= trip number) does not have to be unique within an HRDF data set, but using stops and stopping times, as the data user did, the appropriate trip can be determined as described here : <https://opentransportdata.swiss/de/faq/fahrplaene-gtfs/>
- A "trip" according to GTFS represents in Transmodel the notion of a "DatedVehicleJourney" (in OJP a "DatedJourney"). In Transmodel and OJP a TRIP is a trip of the customer as returned by the Trip Planner. It consists of different partial journeys, transfers, and other paths to be taken using different modes. **In HRDF the GTFS "trip" corresponds to the journey (Fahrt) and in NeTeX to the ServiceJourney.**

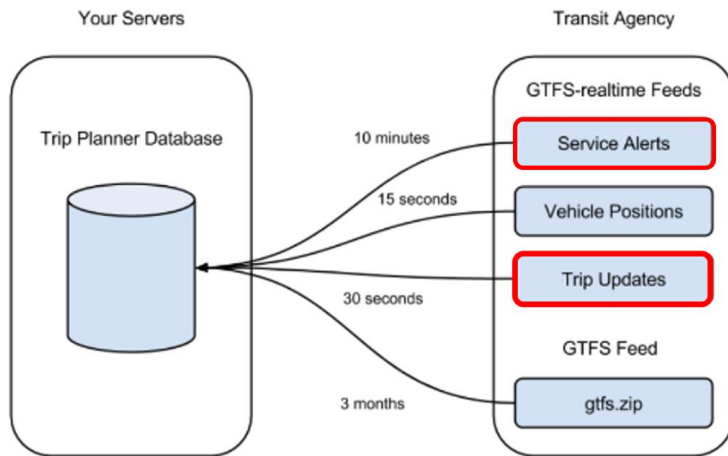
- Immerhin jetzt stabile ID (im Fahrplanjahr und meist auch zwischen Fahrplanjahren)
- Mapping zu HRDF schwierig (übliche Matchingtechniken notwendig)

GTFS RT 1.0 vs GTFS RT 2.0: <https://barbeau.medium.com/whats-new-in-gtfs-realtime-v2-0-cd45e6a861e9>



Swiss Profile – GTFS-RT (General)

How to get / FAQ: [GTFS Real-Time \(GTFS-RT\) | Open-Data-Plattform Mobilität Schweiz \(opentransportdata.swiss\)](#)



[GTFS Data / GTFS TripUpdate Static Protobuffer](#)

```
GET https://api.opentransportdata.swiss/gtfsrt2020?format=JSON

2  "Header": {
3    "GtfsRealtimeVersion": "1.0",
4    "Incrementality": "FullDataset",
5    "Timestamp": "1696866409"
6  },
7  "Entity": [
8    {
9      "Id": "2015.TA.91-1-D-j23-1.388.R",
10     "IsDeleted": false,
11     "TripUpdate": {
12       "Trip": {
13         "TripId": "2015.TA.91-1-D-j23-1.388.R",
14         "RouteId": "91-1-D-j23-1",
15         "StartTime": "13:07:00",
16         "StartDate": "20231009",
17         "ScheduleRelationship": "Scheduled"
18       }
19     }
20   }
21 ]
```

Features

- opentransportdata.swiss is currently only Supporting GTFS-RT "Trip Update" – Version 1.0. Please be aware that 2.0 Elements are currently ignored
- opentransportdata.swiss is currently Supporting GTFS-RT "Service Alerts"- Version 2.0. Please note these differences in the Service Versions.
- You can make a maximum of two queries per minute on the interface with your key. This is a sliding window.
- You can make a maximum of two queries per minute on the interface with your key. This is a sliding window.
- For GTFS-RT there is an update rule for delays. If, for example, a whole trip is delayed by 5 minutes, this is only shown on the first stop. For all further stops the delay must be updated during import. The update must be done for arrival and departure times.
- GTFS-RT only provides new data if something has changed. Only the departure forecast is considered by our system. If the departure forecast remains and only the arrival forecast changes, no GTFS-RT message is generated for this trip.



Swiss Profile – GTFS-RT (Service Alerts)

How to get / FAQ: GTFS-RT: Service-Alerts – (Ereignisinformationen Schweiz) | Open-Data-Plattform Mobilität Schweiz (opentransportdata.swiss)

<p>GTFS ServiceAlerts</p> <p>Zu jeder Haltestelle / Halepunkt wird ebenfalls die Agency geliefert.</p> <pre> "informedEntity" : [{ "agencyId" : "820", "stopId" : "ch:1:sloid:89712" }, { "agencyId" : "801", "stopId" : "ch:1:sloid:89712" }], </pre> <p>Zu jeder Linie wird ebenfalls die Linienrichtung geliefert</p> <pre> "informedEntity" : [{ "agencyId" : "801", "routeId" : "96-186-7-323-1", "directionId" : 0 }, { "agencyId" : "801", "routeId" : "96-186-7-323-1", "directionId" : 1 }, { "agencyId" : "801", "routeId" : "96-186-2-323-1", "directionId" : 0 }], </pre>	<p>SIRI-SX</p> <pre> < StopPlaces > < AffectedStopPlace > < StopPlaceRef >ch:1:sloid:89712</ StopPlaceRef > < PlaceName >Kriens, Grosshofstrasse</ PlaceName > </ AffectedStopPlace > </ StopPlaces > < AffectedNetwork > < AffectedLine > < AffectedOperator > < OperatorRef >ch:1:sloid:100602</ OperatorRef > </ AffectedOperator > < AffectedOperator > < OperatorRef >85:801:1867</ OperatorRef > </ AffectedOperator > < LineRef >85:801:1867</ LineRef > < PublishedLineName >677</ PublishedLineName > </ AffectedLine > < AffectedLine > < AffectedOperator > < OperatorRef >ch:1:sloid:100602</ OperatorRef > </ AffectedOperator > < AffectedOperator > < OperatorRef >85:801:1862</ OperatorRef > </ AffectedOperator > < LineRef >85:801:1862</ LineRef > < PublishedLineName >675</ PublishedLineName > </ AffectedLine > </ AffectedNetwork > </pre>
--	---

[HTTP](#) GTFS Data / GTFS Alerts Data Jason Tyk

```

GET https://stm-test.odpch.ch/gtfs/alerts-json/consolidated/?format=JSON

Pretty Raw Preview Visualize JSON
1 1
2 2 "header": {
3 3   "gtfsRealtimeVersion": "2.0",
4 4   "incrementality": "FULL_DATASET",
5 5   "timestamp": "169686677"
6 6 },
7 7 "entity": [
8 8   {
9 9     "id": "98a2669f-bf52-57fb-8bb5-a0b569e88e2d",
10 10     "alert": {
11 11       "activePeriod": [
12 12         {
13 13           "start": "1696859940",
14 14           "end": "1696868400"
15 15         }

```

Features

- opentransportdata.swiss is currently Supporting GTFS-RT "Service Alerts"- Version 2.0. Please note these differences in the Service Versions
- Source for this implementation is the EMS-System
- Mapping table is available between SIRI and GTFS

Ursachen

Ursache System	Ursache Interface
AlertCause	OTHER_CAUSE
AlertCause > undefinedAlertCause	OTHER_CAUSE
AlertCause > constructionWork	CONSTRUCTION
AlertCause > serviceDisruption	OTHER_CAUSE
AlertCause > emergencyServicesCall	OTHER_CAUSE
AlertCause > vehicleFailure	TECHNICAL_PROBLEM
AlertCause > poorWeather	WEATHER
AlertCause > routeBlockage	OTHER_CAUSE
AlertCause > technicalProblem	TECHNICAL_PROBLEM
AlertCause > unknown	UNKNOWN_CAUSE
AlertCause > accident	ACCIDENT
AlertCause > specialEvent	OTHER_CAUSE
AlertCause > congestion	OTHER_CAUSE
AlertCause > maintenanceWork	MAINTENANCE



Swiss Profile – GTFS-RT (Service Alerts) - Example

Achtung: JSON ist NICHT die standardisierte Version. Produktive Systeme sollten immer auf Protobuffer aufsetzen.

```
"id": "0b781290-4776-5628-8aa4-fccc8dec62bd",
"alert": {
  "activePeriod": [
    {
      "start": "1690541760",
      "end": "1690545600"
    }
  ],

```

```
"informedEntity": [
  {
    "agencyId": "801",
    "routeId": "96-214-j23-1",
    "directionId": 0
  },
  {
    "agencyId": "801",
    "routeId": "96-214-j23-1",
    "directionId": 1
  }
],
```

Second Example:

```
"informedEntity": [
  {
    "agencyId": "65",
    "stopId": "ch:1:slويد:6201"
  },
  {
    "agencyId": "82",
    "stopId": "ch:1:slويد:6201"
  }
],
```

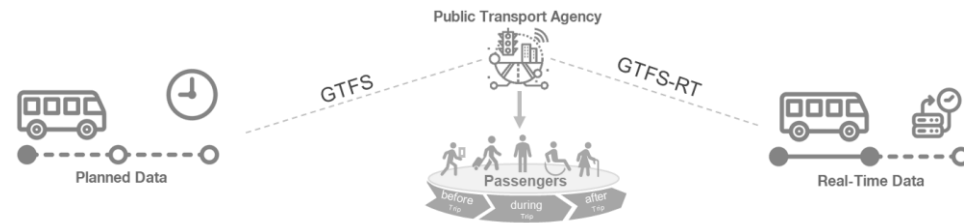
```
"cause": "UNKNOWN_CAUSE",
"effect": "UNKNOWN_EFFECT",
"url": {
  "translation": [
    {
      "text": "https://www.PostAuto.ch",
      "language": "de"
    },
    {
      "text": "https://www.PostAuto.ch",
      "language": "fr"
    },
    {
      "text": "https://www.PostAuto.ch",
      "language": "it"
    },
    {
      "text": "https://www.PostAuto.ch",
      "language": "en"
    }
  ]
},
```

```
"headerText": {
  "translation": [
    {
      "text": "Unregelmässiger Busverkehr der Linie 475.",
      "language": "de"
    },
    {
      "text": "Bus services of line 475 are running at irregular intervals.",
      "language": "en"
    },
    {
      "text": "Circolazione degli autobus irregolare sulla linea 475.",
      "language": "it"
    },
    {
      "text": "Circulation irrégulière des bus sur la ligne 475.",
      "language": "fr"
    }
  ]
}
```



Swiss Profile – GTFS-RT (Trip Update)

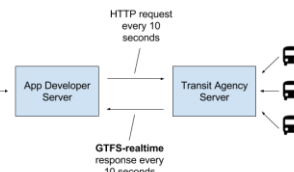
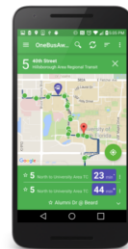
How to get / FAQ: [GTFS Real-Time \(GTFS-RT\) | Open-Data-Plattform Mobilität Schweiz \(opentransportdata.swiss\)](https://opentransportdata.swiss/)



[HTTP](#) GTFS Data / GTFS TripUpdate Static Protobuffer

GET <https://api.opentransportdata.swiss/gtfsrt2020?format=JSON>

```
2  "Header": {
3    "GtfsRealtimeVersion": "1.0",
4    "Incrementality": "FullDataset",
5    "Timestamp": "1696866409"
6  },
7  "Entity": [
8    {
9      "Id": "2015.TA.91-1-D-j23-1.388.R",
10     "IsDeleted": false,
11     "TripUpdate": {
12       "Trip": {
13         "TripId": "2015.TA.91-1-D-j23-1.388.R",
14         "RouteId": "91-1-D-j23-1",
15         "StartTime": "13:07:00",
16         "StartDate": "20231009",
17         "ScheduleRelationship": "Scheduled"
18       }
19     }
20   ]
21 }
```



Features

- opentransportdata.swiss is currently only supporting GTFS-RT "Trip Update" – Version 1.0. Please be aware that 2.0 elements are currently ignored
- A trip update message is used to report the progress of a vehicle along its trip. Each trip may only have one trip update message in a GTFS-real-time feed
- Update rule for delays. If, for example, a whole trip is delayed by 5 minutes, this is only shown on the first stop. For all further stops the delay must be updated during import. The update must be done for arrival and departure times.
- If a trip does not have a trip update message, this should be interpreted as there being no real-time information available; not that it is necessarily progressing as scheduled
- GTFS-RT only provides new data if something has changed. Only the departure forecast is considered by our system. If the departure forecast remains and only the arrival forecast changes, no GTFS-RT message is generated for this trip.



Swiss Profile – GTFS-RT (Trip Update) - Example

Achtung: JSON ist NICHT die standardisierte Version. Produktive Systeme sollten immer auf Protobuffer aufsetzen.

```
"Id": "42.TA.91-71A-j23-1.16.H",
"IsDeleted": false,
"TripUpdate": {
  "Trip": {
    "TripId": "42.TA.91-71A-j23-1.16.H",
    "RouteId": "91-71A-j23-1",
    "StartTime": "07:00:00",
    "StartDate": "20230403",
    "ScheduleRelationship": "Scheduled"
  },
  "StopTimeUpdate": [
    {
      "StopSequence": 1,
      "StopId": "8775605",
      "Departure": {
        "Delay": 0
      },
      "ScheduleRelationship": "Scheduled"
    },
  ]
}
```

```
"Id": "42.TA.91-71A-j23-1.16.H",
"IsDeleted": false,
"TripUpdate": {
  "Trip": {
    "TripId": "42.TA.91-71A-j23-1.16.H",
    "RouteId": "91-71A-j23-1",
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    "ScheduleRelationship": "Scheduled"
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  }
}
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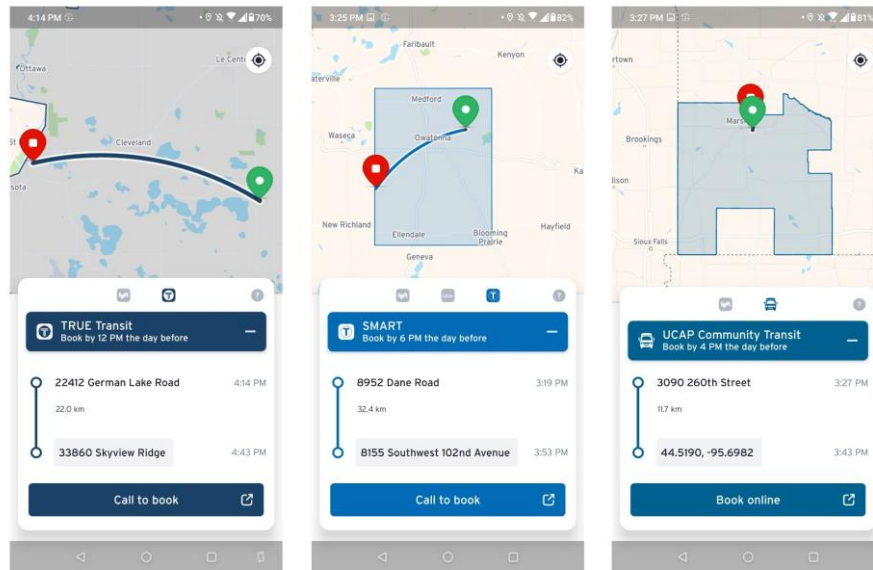
Currently no productive Implementation
Data is provided via the Journey Planer

Swiss Profile – GTFS (Flex)

Kurze Einführung ODV notwendig?

Features

- opentransportdata.swiss is currently not supporting GTFS "Flex" – Version 1.0. Please be aware of this
- GTFS-Flex stands for "General Transit Feed Specification - Flexible". It is an extension of the GTFS format developed by Google to standardize and simplify information about public transportation
- In contrast to the original GTFS format, which contains static information about public transportation such as schedules and routes, GTFS-Flex provides additional flexibility by adding dynamic or flexible route information.
- With GTFS-Flex, transit operators can respond to ride requests from passengers by providing information about alternative routes, stops, and departure times.
- Provided via File-Download (Extension of Data-Set for GTFS-Static). The following files are extended or adapted
- area.txt = New File for Flex (Defines area identifiers)
- booking_rules.txt = New Fille for Flex (Defines the rules / requirements that must be met for a successful booking)
- stop_areas.txt = New File (definition of the non-conventional stop ranges)
- stop_times.txt = Extension of already existing file
- locations.geojson = Describes geographical areas



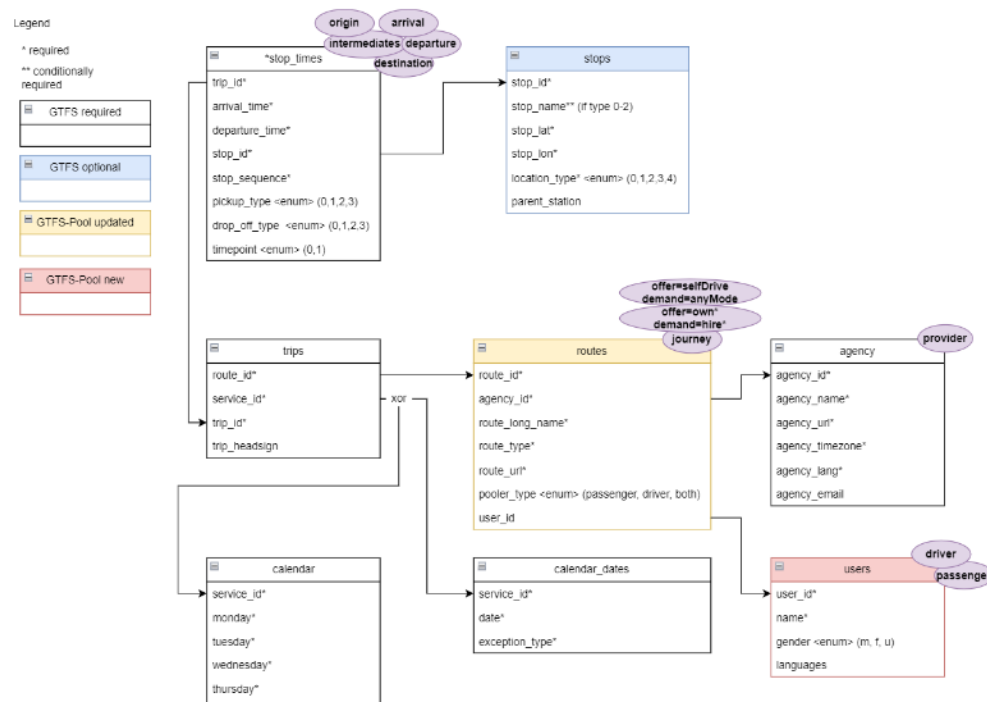
Swiss Profile – GTFS (Pool)

Sehr früher Entwurf.

Kurze Einführung Pooling?

Features

- opentransportdata.swiss is currently not Supporting GTFS "Pool" – Version 1.0. Please be aware of this.
- GTFS-Pool stands for "General Transit Feed Specification - Pooling". It is an extension of the GTFS format developed by Google to standardize and simplify information about public transportation
- In contrast to the original GTFS format, which contains static information about public transportation such as schedules and routes, GTFS-Pool provides the offered trips of pooling services..
- With GTFS-Pool, transit operators can provide offered SINGLE JOURNEYS by VEHICLE POOLING SERVICES.
- Provision through Amarillo (as an idea): <https://amarillo.bbnavi.de/>



Roadmap (Entwurf)

Roadmap

	PI 16 (Q4/2023)	PI 17 (Q1/2024)	PI 18 (Q2/2024)	PI 19 (Q3/2024)
CH GTFS Profil	Entwurf	Finalisierung		
GTFS-RT Service Alerts produktiv	Umsetzung	Umsetzung		
GTFS Flex verfügbar				
GTFS Pool Konzept	Konzept	Konzept		
GTFS Static SJYID		Umsetzung, je nach Verfügbarkeit	Umsetzung, je nach Verfügbarkeit	
GTFS Static / RT: Verbesserte Haltestellen	Umsetzung, je nach Verfügbarkeit			
GTFS Shapes			Produktiv (*)	
GTFS stabile Liniennummern ✓				
Bessere Darstellung Flügelzüge		Konzept		

(*) Lizenz- und Qualitätsfragen

Punkte von Euch?

Gibt es Punkte, die Ihr in unserem GTFS im Moment vermisst? Und Priorität?

Spezialitäten

Umsetzung Halteketten

- Im Moment aus GLEIS-Datei HRDF.
- D.h. keine wirklichen geographischen Objekte bis jetzt.
- DIDOK/ATLAS sind ausgerüstet. INFO+ beginnt auch damit.
- Sobald Daten verfügbar, können wir sie auch über GTFS korrekt ausliefern.
- Achtung: Die Umsetzung der Bahnhöfe/Metabahnhöfe ist bereits eine Erweiterung von GTFS (allerdings haben wir sie einfach kopiert)

```

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```


Swiss Journey ID und GTFS trip_id

- SJYID ist immer nur zusammen mit einem Betriebstag eindeutig.
 - trip_id muss in der Datei eindeutig sein
- ➔ SJYID als zusätzliches Feld in trips.txt (trip_global_id)

Die Problematik der Flügelzüge

- GTFS und Repräsentation:
<https://support.google.com/transitpartners/answer/7084064?hl=en>
- Das passt nicht dazu, wie wir es in HRDF modellieren.
- GTFS (und NeTEx machen es eigentlich besser)
- Wir könnten *R aus HRDF verwenden. Das ist aber in NeTS nicht immer ausgefüllt (und die Regel von INFO+ wird von unserer aktuellen Lösung nicht umgesetzt).
- D.h. wir haben im Moment weder zwei Fahrten (Bern-Murten, Bern-Neuenburg) noch eine Fahrt Bern – Murten | Neuenburg.
- Ziel ist, dass wir im Q1/2024 uns mal wieder mit dem Thema befassen.

Verfügbarkeit der GTFS-Daten im Ausland

- Wir überlegen uns, ob wir dazu eine Seite anlegen sollen.
- Verfügbar ist Frankreich, Deutschland, Österreich und Südtirol. Die restlichen italienischen Teile fehlen (namentlich auch Trenitalia).
- Wir würden auch Fernbusse zeigen (blablaCar und flixbus).
- Eure Überlegungen?

Extended route_type

- Beachtet, dass wir die erweiterten route_type verwenden.
- Beachtet, dass das Mapping von Verkehrsmitteln zu route_type etwas Informationsverlust bedeutet.

Die Verkehrsmittelkategorie, die zur Anwendung kommen (die Variable route_type enthält Informationen der Spalte „Beschreibung“).

Abbeviatio n	DE	FR	IT	EN	Ref_TransportMod e	route_typ e
ASC	Aufzug	Ascenseur	Ascensore	Lift	A	1700
B	Bus	Bus	Bus	Bus	B	700
BN	Nachtbus	Bus ligne de nuit	Bus notturno	Nightbus	B	705
BP	PanoramaBus	PanoramaBus	Bus panoramico	Panorama bus	B	710
BUS	Bus	Bus	Bus	Bus	B	700
CAR	Fernbus national	Bus longues distances national	Bus nazionale a lunga percorrenza	National long-distance bus	B	202
CAX	Fernbus international	Bus longues distances international	Bus internazionale a lunga percorrenza	International long-distance bus	B	201
EB	Eilbus	Bus acc,l,r,	Bus accelerato	Semi fast bus	B	702
EXB	Expressbus	Bus express	Bus espresso	Express bus	B	702
ICB	InterCity-Bus	InterCity-Bus	InterCity-Bus	Intercity-Bus	B	202
KB	Kleinbus	Minibus	Minibus	Minibus	B	700
NB	Nacht-Bus	Bus nocturne	Bus notturno	Night-Bus	B	705
NFB	Niederflur-Bus	Bus ... plancher surbaiss,	Bus a pianale ribassato	Low-floor bus	B	700
NFO	Niederflur-Trolleybus	Trolleybus ... plancher surbaiss,	Filobus a pianale ribassato	Low-floor trolley bus	B	700
RUB	Rufbus	Bus sur appel	bus a chiamata	On-call bus	B	715
TX	Taxi	Taxi	Taxi	Taxi	B	1500
SL	Sesselbahn	T,l,siŠge	Seggiovia	Chairlift	E	1300
CC	Zahnradbahn	Chemin de fer ... cr,maillŠre	Cremagliera	Rack-railroad	H	1400
GB	Gondelbahn	T,l,cabine	Cabinovia	Gondola lift	L	1300
LB	Luftseilbahn	T,l,ph,rique	Funivia	Cableway	L	1300
PB	Pendelbahn	T,l,ph,rique ... va-et-vient	funivia a va e viene	aerial tramway	L	1300

Toolings

- Sollen wir vermehrt auf mögliche Tools hinweisen?
- Gibt es Tools, die Euch fehlen? Die Ihr von uns erwartet?

Echtzeit Anwendungsfälle

Wäre es für Euch hilfreich, wenn wir für einzelne Anwendungsfälle (namentlich für die Echtzeit) Beispiele erstellen?

Relevante Links

- Spezifikation: <https://gtfs.org/de/resources/gtfs/>
- Ressourcen: <https://gtfs.org/de/resources/gtfs/>
- MobilityData: <https://mobilitydata.org/>
- Auch andere (z.B. Geops): <https://gtfs.geops.ch/doc/>
- **Datasets**
 - <https://opentransportdata.swiss/de/dataset/gtfsrt>
 - <https://opentransportdata.swiss/de/dataset/timetable-2024-gtfs2020>
- **Cookbook**
 - <https://opentransportdata.swiss/de/cookbook/gtfs/>
 - <https://opentransportdata.swiss/de/cookbook/gtfs-rt/>

Community Building

Christine Matt– Verantwortliche für das Community
Building

Next Steps

- Wer von Euch möchte über die **Weiterentwicklung GTFS** mit uns diskutieren?
- **Wer verwendet GTFS** von uns in einem kommerziellen Umfeld?
- Wer von Euch möchte das **Profil reviewen** und uns Feedback geben, was haben wir vergessen?
- **Habt Ihr Input**, wie der Standard selbst weiterentwickelt werden soll? (Wir können das über openmobility eingeben)
- Wer will dabei sein?

Community Building



Unser Ziel: Eine aktive Community

- **Austausch und Networking:** Regelmässige Meet-Ups und Updates zum Schweizer GTFS-Profil
- **Feedback** in puncto Qualität und Anwendbarkeit



Die Benefits im Überblick:

- Passgenaue Services und Datensätze
- **Exklusive Info-Updates** zu anwenderspezifischen Neuerungen und Weiterentwicklungen



Registrieren und Teil der Community werden:

Unter opendata@sbb.ch melden, Motivation & aktuelle Entwicklungen kurz vorstellen und dabei sein!



Wie immer freuen wir uns über euer Feedback zur Plattform sowie zu den Daten und Services via: opendata@sbb.ch



Christine Matt | Community Managerin | opentransportdata.swiss

Mobil +41 79 56 72 944 | christine.matt@sbb.ch



DINAcon

digitale Nachhaltigkeit in der Mobilität

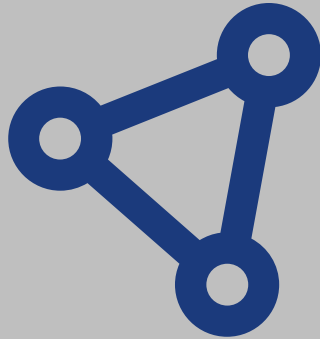
23. November 2023 / im PROGR Bern

dinacon.ch



Mit dem Ticketcode **DINAcon-BAV-2023** seid ihr dank des Sponsorings des **Bundesamtes für Verkehr** gratis dabei!

Save-the-Date



Nächstes Meet-Up:
Montag, 29. Januar 2024

zum Thema **Störungsinformationen**