

# 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	<a href="#">CC BY 4.0</a>

## 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 <a href="https://opentransportdata.swiss">opentransportdata.swiss</a> .
Repository	<a href="https://www.tp-info.ch/de/datenmanagement/ski/standards-der-ski">https://www.tp-info.ch/de/datenmanagement/ski/standards-der-ski</a>

## History

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

<b>Version</b>	<b>Status</b>	<b>Remarks</b>	<b>Author</b>	<b>Valid from</b>
			M. Günter	
0.3	Draft	Version for discussion including GTFS Flex	M. Griesser	2023-08-07
0.1	Draft	First version	M. Griesser	2023-04-11

# Content

<b>1</b>	<b>What is it all about?</b>	<b>5</b>
<b>2</b>	<b>Description and Context</b>	<b>5</b>
<b>3</b>	<b>Who is responsible?</b>	<b>5</b>
<b>4</b>	<b>Important Links</b>	<b>6</b>
<b>5</b>	<b>Technology stack and standards</b>	<b>6</b>
5.1	GTFS-Static	6
5.2	GTFS-Realtime	7
<b>6</b>	<b>Usage</b>	<b>7</b>
<b>7</b>	<b>Datasets / Services Switzerland</b>	<b>8</b>
<b>8</b>	<b>Assessment</b>	<b>8</b>
<b>9</b>	<b>Conclusions</b>	<b>9</b>
9.1	Comparison to other Standards (for Example SIRI):	9
<b>10</b>	<b>Specification and recommendation</b>	<b>10</b>
<b>11</b>	<b>GTFS - Swiss Profil</b>	<b>11</b>
11.1	GTFS Static (Swiss Profil)	11
11.1.1	Usefull Links:	11
11.1.2	Short Introduction	11
11.1.3	Dataset Files	12
11.2	GTFS-realtime (Swiss Profil)	31
11.2.1	Introduction	31
11.2.2	Swiss Specific Information	32
11.2.3	Full Element Index	33
11.2.4	General Elements	34
11.2.5	Service Alerts (Provided by SBB)	37
11.2.6	Vehicle Position	48
11.2.7	Trip Updates (Provided by SBB)	49
<b>12</b>	<b>Extension under development: GTFS-Flex</b>	<b>60</b>
12.1	GTFS Flex	60
12.1.1	Links	60
12.1.2	Description	60

12.2	Extension under development: GTFS GTFS-flex (Swiss Profil).....	64
12.2.1	area.txt .....	64
12.2.2	stop_areas.txt.....	64
12.2.3	booking_rules.txt .....	65
12.2.4	stop_times.txt (File extensions).....	67
12.2.5	locations.geojson.....	70
<b>13</b>	<b>Possible other extensions in the near future.....</b>	<b>71</b>

# 1 What is it all about?

This document is intended to lay the foundation for an efficient, standardized exchange of static and real-time information's in terms of transport timetables and related geographic information based on GTFS.

The profile should serve for the following purposes:

- provide sufficient guidance for a coherent, interoperable adoption of GTFS in Switzerland,
- allow for a quick and easy GTFS-Connection
- lay the foundation for an effective and efficient data exchange infrastructure.

The profile is based on the standard GTFS-Standard.

## 2 Description and Context

General Transit Feed Specification (GTFS) is a digital exchange format developed by Google for public transport timetables and related geographic information, such as stop locations. The data is provided by transport companies and published as a collected database on the Open-Data platform öV-Schweiz in GTFS format. The data is used for the development of applications related to public transport, such as timetable queries.

GTFS data (static) describes public transportation in a particular region at a specific point in time. It contains information such as schedules, routes, stops, and fare information. This information typically changes infrequently and is usually maintained and updated by transport agencies. The aggregated GTFS data of the whole Switzerland are available on the Open Data Platform.

Real-time GTFS data, on the other hand, 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.

In Switzerland, the GTFS specification is used by many transportation agencies and public transportation authorities to provide data about public transportation.

Currently, GTFS version 1.0 is made available in Switzerland. In the future, developments and adaptations to Google's range of functions are planned. All further implementations will be followed up in this document.

## 3 Who is responsible?

The GTFS specification was originally developed by Google and released as an open-source project to facilitate the integration of public transportation into applications like Google Maps. While Google still plays an important role in the continued development of GTFS, the project is now supported by a broader community of developers and organizations.

Responsibility for the continued development of GTFS lies with the community that hosts the project on GitHub and works on its development. Proposed changes and discussions about the specification are led by the GTFS developer community, which is composed of a variety of organizations and individuals, including transportation agencies, developers, researchers, and advocates.

Additionally, there are also organizations like the Open Transit Standards Working Group that focus on the development and promotion of open standards in public transportation, including GTFS.

[GitHub - google/transit \(https://github.com/google/transit\)](https://github.com/google/transit)

In Switzerland, GTFS is being further developed and adapted to Swiss needs by the SKI+ team as part of the Open Journey Planner project. However, HRDF and NeTEx are the main timetable format and for real-time VDV 454/453 and SIRI are used. SKI+ moves in the direction of NeTEx and SIRI.

## 4 Important Links

No	Description	Link
1	Best Practices Guideline	<a href="https://gtfs.org/schedule/best-practices/">https://gtfs.org/schedule/best-practices/</a>
2	Google Description of the Static-Service	<a href="https://developers.google.com/transit/gtfs?hl=de">https://developers.google.com/transit/gtfs?hl=de</a>
3	Google Description of the Realtime-Service	<a href="https://developers.google.com/transit/gtfs-realtime?hl=de">https://developers.google.com/transit/gtfs-realtime?hl=de</a>
4	GitHub Community Link	<a href="https://github.com/google/transit">https://github.com/google/transit</a>
5	GTFS Realtime Description on the Open Transport Data platform	<a href="https://opentransportdata.swiss/de/cookbook/gtfs-rt/">https://opentransportdata.swiss/de/cookbook/gtfs-rt/</a>
6	GTFS Static Description on the Open Transport Data platform	<a href="https://opentransportdata.swiss/de/cookbook/gtfs/">https://opentransportdata.swiss/de/cookbook/gtfs/</a>
7	GTFS Static Data for Switzerland	<a href="https://opentransportdata.swiss/de/dataset/timetable-2023-gtfs2020">https://opentransportdata.swiss/de/dataset/timetable-2023-gtfs2020</a>
8	GTFS FAQ	<a href="https://opentransportdata.swiss/de/faq/fahrplaene-gtfs/">https://opentransportdata.swiss/de/faq/fahrplaene-gtfs/</a>
9	GTFS Mapping with HRDF	<a href="https://opentransportdata.swiss/de/cookbook/verwendung-von-hrdf-fahrplaenen-zusammen-mit-gtfs-rt/">https://opentransportdata.swiss/de/cookbook/verwendung-von-hrdf-fahrplaenen-zusammen-mit-gtfs-rt/</a>

## 5 Technology stack and standards

The two services GTFS Static and GTFS-Realtime are based on different technologies and stacks:

### 5.1 GTFS-Static

Some of the common technologies used to implement GTFS include:

- CSV files: GTFS uses CSV files to represent data in tabular form.
- Databases: GTFS data can be stored in relational databases or NoSQL databases such as MongoDB.
- RESTful APIs: Some transportation agencies and public transit authorities provide GTFS data via RESTful APIs, which enable developers to access the data and integrate it into applications.
- JSON: Although GTFS is based on CSV files by default, there are also ways to convert the data into JSON format.

- Mapping tools: There are also a variety of mapping tools that enable developers to integrate GTFS data into mapping applications such as Google Maps.

## 5.2 GTFS-Realtime

- ProtoBuf: GTFS Realtime is typically exchanged in the ProtoBuf format, as it provides an efficient and compact way to transmit and store real-time data. ProtoBuf also supports multilingual libraries that make it easier to read and write ProtoBuf data in a variety of programming languages.
- RESTful APIs: Some transportation agencies and public transit authorities provide GTFS Realtime data via RESTful APIs, which enable developers to access the data and integrate it into applications.
- WebSocket: WebSocket is a communication protocol used for transmitting real-time information. It provides a bidirectional connection between a client and a server, enabling data to be transmitted in real-time.
- Mapping tools: There are also mapping tools that enable developers to integrate GTFS Realtime data into mapping applications such as Google Map

## 6 Usage

### General Usage

- The GTFS standard is widely used worldwide and is adopted by many public transit agencies to provide information about public transportation. In Switzerland, GTFS is supported by most public transit agencies, including Swiss Federal Railways (SBB), Zürcher Verkehrsbetriebe (VBZ), and Basler Verkehrsbetriebe (BVB). GTFS is also commonly used in the German-speaking region (DACH), such as by the Wiener Linien and Munich transport companies.
- The GTFS standard is widely used in the United States by many public transportation operators, including the New York Metropolitan Transportation Authority (MTA), the Chicago Transit Authority (CTA), and the San Francisco Municipal Transportation Agency (SFMTA). In the US, GTFS is often used as a basis for mobile applications and online tools that provide public transportation information.
- In China, GTFS is also increasingly being used, especially in larger cities such as Beijing and Shanghai. The Chinese government has also been investing more in the modernization of public transportation in recent years, and has been relying on technologies such as GTFS

Overall, the GTFS standard has become an important tool for public transit and has contributed to making public transit data more accessible and promoting the integration of public transit into applications and services.

GTFS has a focus on pure customer information. All other formats are used for the exchange of planning data and real-time information between transport companies to ensure an end-to-end travel chain independent of the executing transport company. Consequently, standards like VDV, SIRI, NeTEx contain significantly more information.

GTFS is a suitable standard for fundamental use cases in public transportation to inform passengers basically. For more complex requirements (which needs more detailed Data) that involve for example disruptions, detours, substitute vehicles, specific parameters like capacity, accessibility or operational data, advanced standards like VDV-454, NeTEx, and SIRI are more appropriate. The choice of standard strongly depends on the specific requirements and goals of the project and interface.

More Details can be found in Chapter 9.

## 7 Datasets / Services Switzerland

<p><b>GTFS Export for whole Switzerland can be found here:</b>  <a href="https://opentransportdata.swiss/de/group/timetables-gtfs">https://opentransportdata.swiss/de/group/timetables-gtfs</a></p> <p>A new upload is available weekly:  <a href="https://opentransportdata.swiss/de/dataset/timetable-2023-gtfs2020">https://opentransportdata.swiss/de/dataset/timetable-2023-gtfs2020</a></p>
<p><b>A detailed Sample with all Elements could be found in the Google Documentation:</b>  <a href="https://developers.google.com/transit/gtfs-realtime/examples/trip-updates-full?hl=de">https://developers.google.com/transit/gtfs-realtime/examples/trip-updates-full?hl=de</a></p>

## 8 Assessment

Rough, qualitative evaluation or assessment of the CIP+ team <sup>1</sup>

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

---

<sup>1</sup> The principles are defined in the standardisation document for NADIM. Meaning: 0 = not existing, += low, ++ = medium, +++ = high.



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

## 9 Conclusions

In conclusion, the GTFS standard is a widely used and important tool for public transportation providers worldwide, including in Switzerland and the DACH region. It enables the easy sharing and integration of public transportation data in various applications and services, and is established, of high quality, and compliant. The availability of GTFS data has greatly improved the accessibility and usability of public transportation information for travellers and developers alike. The focus when using GTFS data should be on the customer and their passenger information. GTFS is less suitable as an exchange format for real-time information between transport companies.

### 9.1 Comparison to other Standards (for Example SIRI):

- SIRI ET/PT 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. This includes information such as vehicle positions, arrival and departure times, and service disruptions, as well as more detailed information about vehicle routes, stops, and schedules.
- 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 can include information about detours, delays, and additional journeys, as well as real-time updates about the status of individual vehicles and services. 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. This can help passengers better plan their journeys and avoid disruptions, which can improve the overall passenger experience
- GTFS Realtime, 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 Realtime 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. This can be very valuable for passengers, as it allows them to stay informed about the status of their services and make informed decisions about how to plan their journeys.

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. These provide a greater level of detail in the information made available. This is important for further processing.

## **10 Specification and recommendation**

Basically, we orientate ourselves on the specifications of Google and Community and take over the functions that are needed for a consistent passenger information for passengers in Switzerland. In addition to the Google definition, the focus is on the unification and harmonization of data and thus the implementation of the SID4PT (Swiss Identification for Public Transportation), which will be also part of the GTFS Implementations.

SBB (SKI) pursues the strategy of collecting all real-time information of the whole of Switzerland and making it available to all consumers in different and target-oriented formats.

This also includes the conversion of VDV and SIRI as well as NeTEX data into the GTFS formats.

Consequently, SBB will make the following GTFS data freely available to all submitting companies

- GTFS Static (planning data)
- GTFS-Realtime (Service Alerts, Trip Updates)
- GTFS-Flex

# 11 GTFS - Swiss Profile

The reference and starting point of this document is the GTFS specification (version 2.0). This document is to be read together with the specification (Google / Best Practices / GitHub). It clarifies and details parts and offers restrictions to the original specification to improve interoperability.

**The document lists the GTFS elements used in Switzerland. It also contains links to generally applicable implementation guidelines. This should give a good overview of the form in which data is made available in Switzerland. Important notice.**

Used Technologies for the **Swiss Implementation**:

- SBB provides the trip updates via a HTTPS-GET request
- SBB provides the service alerts via a HTTPS-GET request
- Data can be provided in the Protocol Buffer format or as Jason (only for testing purposes)

**For all elements, services or files the following information is available.**



Used in Swiss Implementation



Not used in Swiss Implementation

## 11.1 GTFS Static (Swiss Profile)

### 11.1.1 Useful Links:

- Best Practices for the Implementation of GTFS Static: [Best Practices - General Transit Feed Specification \(gtfs.org\) Best Practices](https://gtfs.org/schedule/best-practices/) (https://gtfs.org/schedule/best-practices/)
- Detailed Description of the Google Implementation: [GTFS Static - Überblick | Static Transit | Google Developers](https://developers.google.com/transit/gtfs?hl=de) (https://developers.google.com/transit/gtfs?hl=de)
- Short Overview / Description of the GTFS Static Service: [GTFS Static Overview | Static Transit | Google Developers](https://developers.google.com/transit/gtfs?hl=de) (https://developers.google.com/transit/gtfs?hl=de)
- Short Overview (Description of the GTFS Realtime Services: [GTFS Realtime Overview | Realtime Transit | Google Developers](https://developers.google.com/transit/gtfs-realtime?hl=de) (https://developers.google.com/transit/gtfs-realtime?hl=de)
- GitHub Project for GTFS: [GitHub - google/transit](https://github.com/google/transit) (https://github.com/google/transit)
- [FAQ to the Swiss Implementation](https://opentransportdata.swiss/de/faq/fahrplaene-gtfs/) (https://opentransportdata.swiss/de/faq/fahrplaene-gtfs/)
- [Using HRDF timetable together with GTFS](https://opentransportdata.swiss/de/cook-book/verwendung-von-hrdf-fahrplaenen-zusammen-mit-gtfs-rt/) (https://opentransportdata.swiss/de/cook-book/verwendung-von-hrdf-fahrplaenen-zusammen-mit-gtfs-rt/)

### 11.1.2 Short Introduction

GTFS Static is provided as a set of text files in ZIP format. Each file contains information about a particular aspect of the traffic information such as stops (stops.txt), routes (routes.txt), trips (trips.txt), agencies (agency.txt), and other schedule-related data. Some information is necessary to provide valid GTFS data, others are optional and provide useful additional information (e.g. schedule changes on specific holidays = calendar\_dates.txt)

### 11.1.3 Dataset Files

Alle available files for the Swiss Profile (GTFS Static) could be found here: [Fahrpläne GTFS - Gruppen | Open-Data-Plattform Mobilität Schweiz \(opentransportdata.swiss\)](#)

No	Filename	Required <a href="#">Based on Google</a>	Definition <input checked="" type="checkbox"/> <b>Used in Swiss Implementation</b> <input type="checkbox"/> <b>Not used in Swiss Implementation</b>
1	<a href="#">agency.txt</a>	Required	<input checked="" type="checkbox"/> <b>Used in Swiss Implementation</b> Transit agencies with service represented in this dataset
2	<a href="#">stops.txt</a>	Required	<input checked="" type="checkbox"/> <b>Used in Swiss Implementation</b> Stops where vehicles pick up or drop off riders. Also defines stations and station entrances.
3	<a href="#">routes.txt</a>	Required	<input checked="" type="checkbox"/> <b>Used in Swiss Implementation</b> Transit routes. A route is a group of trips that are displayed to riders as a single service
4	<a href="#">trips.txt</a>	Required	<input checked="" type="checkbox"/> <b>Used in Swiss Implementation</b> Trips for each route. A trip is a sequence of two or more stops that occur during a specific time period.
5	<a href="#">stop_times.txt</a>	Required	<input checked="" type="checkbox"/> <b>Used in Swiss Implementation</b> Times that a vehicle arrives at and departs from stops for each trip.
6	<a href="#">calendar.txt</a>	Conditionally Required	<input checked="" type="checkbox"/> <b>Used in Swiss Implementation</b> Service dates specified using a weekly schedule with start and end dates. This file is required unless all dates of service are defined in <a href="#">calendar_dates.txt</a> .
7	<a href="#">calendar_dates.txt</a>	Conditionally required	<input checked="" type="checkbox"/> <b>Used in Swiss Implementation</b> Exceptions for the services defined in the <a href="#">calendar.txt</a> . If <a href="#">calendar.txt</a> is omitted, then <a href="#">calendar_dates.txt</a> is required and must contain all dates of service.
8	<a href="#">fare_attributes.txt</a>	Optional	<input type="checkbox"/> <b>Not used in Swiss Implementation</b>
9	<a href="#">fare_rules.txt</a>	Optional	<input type="checkbox"/> <b>Not used in Swiss Implementation</b>
10	<a href="#">shapes.txt</a>	Optional	<input type="checkbox"/> <b>Not used in Swiss Implementation</b>  We are considering the use. As our implementation is based on OSM, the shapes.txt will have to adhere to the OSM license.
11	<a href="#">frequencies.txt</a>	Optional	<input type="checkbox"/> <b>Not used in Swiss Implementation</b>
12	<a href="#">transfers.txt</a>	Optional	<input checked="" type="checkbox"/> <b>Used in Swiss Implementation</b> When calculating an itinerary, GTFS-consuming applications interpolate transfers based on allowable time and stop proximity

13	<a href="#">pathways.txt</a>	Optional	<b>✗ Not used in Swiss Implementation</b> 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	<a href="#">levels.txt</a>	Optional	<b>✗ Not used in Swiss Implementation</b>
15	<a href="#">feed_info.txt</a>	Conditionally required	<b>✓ Used in Swiss Implementation</b> This file contains information about the dataset itself, rather than the services the dataset describes
16	<a href="#">translations.txt</a>	Optional	<b>✗ Not used in Swiss Implementation</b>
17	<a href="#">attributions.txt</a>	Optional	<b>✗ Not used in Swiss Implementation</b>

Figure 1: Overview GTFS-Static File set

Please refer to [Referenzdokument | Static Transit | Google Developers](#) for further information.

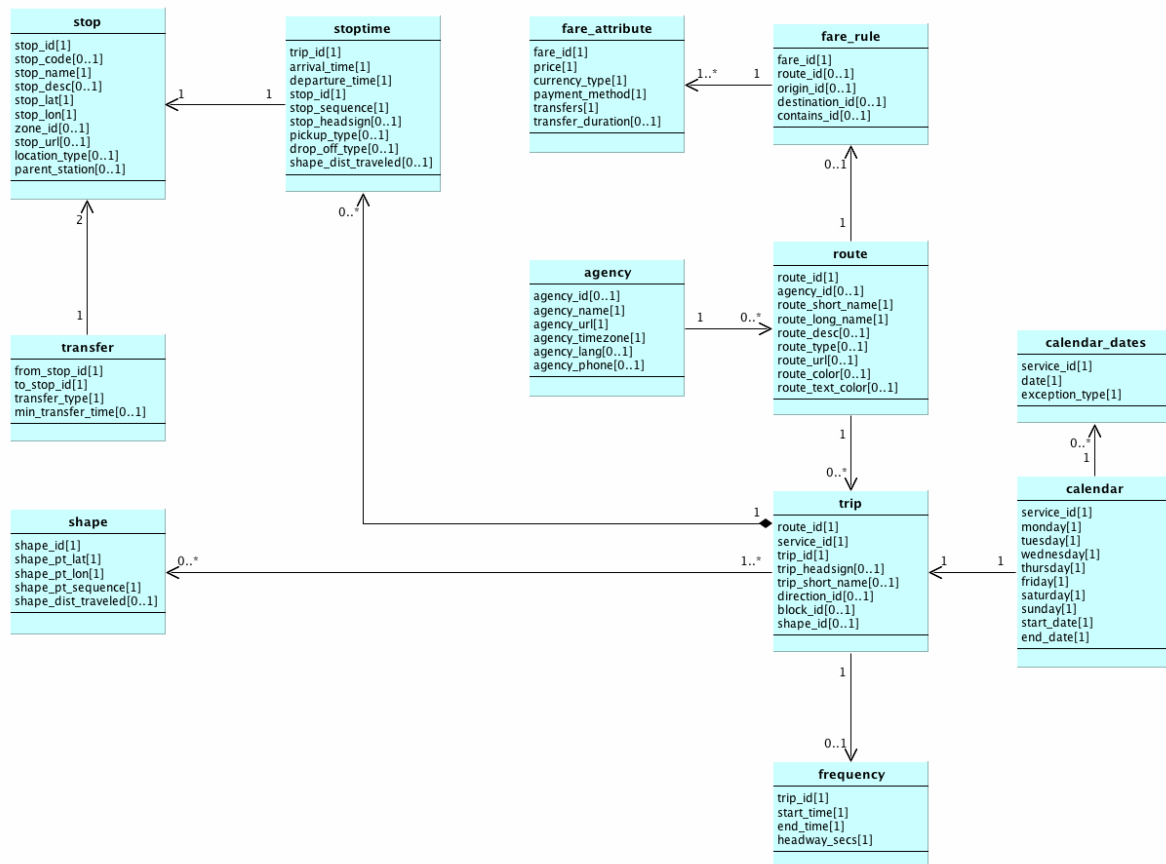



Figure 2: Connection between Files according to Google

### 11.1.3.1 Agency.txt

An agency is the operator of public transport services. It is often a public agency. The operators are defined in the **agency.txt** file.

	<p><b>Specific Information to this section could be found here:</b></p> <p><a href="https://developers.google.com/transit/gtfs/reference#agencytxt">https://developers.google.com/transit/gtfs/reference#agencytxt</a></p> <p><a href="#">Reference   Static Transit   Google Developers Best Practices - General Transit Feed Specification (gtfs.org)</a></p>
---	---

#### 11.1.3.1.1 File definitions: Required

Field Name	Required	Description <input checked="" type="checkbox"/> Used in Swiss Implementation <input type="checkbox"/> Not used in Swiss Implementation
<b>agency_id</b>	Conditionally Required	<input checked="" type="checkbox"/> 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.
<b>agency_name</b>	Required	<input checked="" type="checkbox"/> Full name of the transit agency.
<b>agency_url</b>	Required	<input checked="" type="checkbox"/> URL of the transit agency.
<b>agency_time-zone</b>	Required	<input checked="" type="checkbox"/> Time zone where the transit agency is located.
<b>agency_lang</b>	Optional	<input checked="" type="checkbox"/> Primary language used by this transit agency.
<b>agency_phone</b>	Optional	<input checked="" type="checkbox"/> A voice telephone number for the specified agency.
<b>agency_fare_url</b>	Optional	<input type="checkbox"/> URL of a web page that allows a rider to purchase tickets or other fare instruments for that agency online.
<b>agency_email</b>	Optional	<input type="checkbox"/> Email address actively monitored by the agency's customer service department.

Figure 3: Field definitions agency.txt


#### 11.1.3.1.2 Example from OpenTransportData

```
agency_id,agency_name,agency_url,agency_timezone,agency_lang,agency_phone
"87_LEX","LEX","http://www.sbb.ch/","Europe/Berlin","DE","0848 44 66 88"
"11","Schweizerische Bundesbahnen SBB","http://www.sbb.ch/","Europe/Berlin","DE","0848 44 66 88"
"823","Basler Verkehrsbetriebe","http://www.sbb.ch/","Europe/Berlin","DE","0848 44 66 88"
"827","Städtische Verkehrsbetriebe Bern","http://www.sbb.ch/","Europe/Berlin","DE","0848 44 66 88"
"37","Baselland Transport","http://www.sbb.ch/","Europe/Berlin","DE","0848 44 66 88"
"96","Aargau Verkehr AG","http://www.sbb.ch/","Europe/Berlin","DE","0848 44 66 88"
"88","Regionalverkehr Bern-Solothurn","http://www.sbb.ch/","Europe/Berlin","DE","0848 44 66 88"
"78","Sihltal-Zürich-Uetliberg-Bahn","http://www.sbb.ch/","Europe/Berlin","DE","0848 44 66 88"
"44","Transports Publics Neuchâtelois SA (cmn)","http://www.sbb.ch/","Europe/Berlin","DE","0848 44 66 88"
"53","Transports publics fribourgeois","http://www.sbb.ch/","Europe/Berlin","DE","0848 44 66 88"
```

Figure 4: agency.txt Example OpenTransportData

### 11.1.3.2 Stops.txt

A stop is a place where a vehicle stops to allow passengers to get on and off. Stops are defined in the **stops.txt** file. Stops can be grouped together, for example, if there are multiple stops in a station. In this case, a parent stop is defined for all stops in this station.

	<p>Specific Information to this section could be found here:</p> <p><a href="https://developers.google.com/transit/gtfs/reference#stopstxt">https://developers.google.com/transit/gtfs/reference#stopstxt</a></p> <p><a href="https://www.gtfs.org/docs/Best-Practices-General-Transit-Feed-Specification">Best Practices - General Transit Feed Specification (gtfs.org)</a></p>
---	---

The stop point must be modelled in GTFS as individual stops. A change of the stop point is then a change of the stop from the point of view of GTFS.

#### An Example "8500010" (Basel SBB)

```
"8500010","Basel SBB","47.5474065481454","7.58955142623287",,,,,,"8500010P"
"8500010:0:1","Basel SBB","47.5474671825912","7.58955142623287",,,,,,"8500010P"
"8500010:0:10","Basel SBB","47.5483160574667","7.58955142623287",,,,,,"8500010P"
"8500010:0:11","Basel SBB","47.548255424003","7.58955142623287",,,,,,"8500010P"
"8500010:0:11AB","Basel SBB","47.5478916217475","7.58955142623287",,,,,,"8500010P"
"8500010:0:12","Basel SBB","47.5481947904691","7.58955142623287",,,,,,"8500010P"
"8500010:0:14","Basel SBB","47.548134156865","7.58955142623287",,,,,,"8500010P"
"8500010:0:15","Basel SBB","47.5484979574371","7.58955142623287",,,,,,"8500010P"
"8500010:0:16","Basel SBB","47.5480128894465","7.58955142623287",,,,,,"8500010P"
"8500010:0:16C","Basel SBB","47.5489830209385","7.58955142623287",,,,,,"8500010P"
"8500010:0:17","Basel SBB","47.5480735231908","7.58955142623287",,,,,,"8500010P"
"8500010:0:2","Basel SBB","47.5478309877927","7.58955142623287",,,,,,"8500010P"
"8500010:0:3","Basel SBB","47.547649085076","7.58955142623287",,,,,,"8500010P"
"8500010:0:30","Basel SBB","47.5489223882463","7.58955142623287",,,,,,"8500010P"
"8500010:0:31","Basel SBB","47.5486192237333","7.58955142623287",,,,,,"8500010P"
"8500010:0:33","Basel SBB","47.5486798567762","7.58955142623287",,,,,,"8500010P"
"8500010:0:35","Basel SBB","47.548740489749","7.58955142623287",,,,,,"8500010P"
"8500010:0:4","Basel SBB","47.5475884512723","7.58955142623287",,,,,,"8500010P"
"8500010:0:5","Basel SBB","47.5477097196728","7.58955142623287",,,,,,"8500010P"
"8500010:0:5AB","Basel SBB","47.5484373241838","7.58955142623287",,,,,,"8500010P"
"8500010:0:6","Basel SBB","47.5477703537678","7.58955142623287",,,,,,"8500010P"
"8500010:0:7","Basel SBB","47.5479522556321","7.58955142623287",,,,,,"8500010P"
"8500010:0:7AB","Basel SBB","47.5488011226516","7.58955142623287",,,,,,"8500010P"
"8500010:0:7CD","Basel SBB","47.5485585906203","7.58955142623287",,,,,,"8500010P"
"8500010:0:8","Basel SBB","47.5483766908603","7.58955142623287",,,,,,"8500010P"
"8500010:0:9","Basel SBB","47.5475278169668","7.58955142623287",,,,,,"8500010P"
"8500010:0:9AB","Basel SBB","47.548861755484","7.58955142623287",,,,,,"8500010P"
"8500010P","Basel SBB","47.5474065481454","7.58955142623287",,,,,,"1"
```

Figure 5: Stop Point Example with Parent

All stops of Basel have a common "Parent" "8500010P". The individual tracks are separated with ":". A "track" can also be a track+sectors (ex: "8500010:0:7CD"). There are also very extraordinary additions, like "Bern Bfpl" so "8507000:0:Bfpl", when RBS uses it for rail replacement buses.

#### 11.1.3.2.1 File definition: Required

Field Name	Required	Description
		<input checked="" type="checkbox"/> Used in Swiss Implementation <input type="checkbox"/> Not used in Swiss Implementation
stop_id	Required	<input checked="" type="checkbox"/> 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.
stop_code	Optional	<input type="checkbox"/> Short text or a number that identifies the location for riders.
stop_name	Conditionally Required	<input checked="" type="checkbox"/> Name of the location. Use a name that people will understand in the local and tourist vernacular.
stop_desc	Optional	<input type="checkbox"/>

		Description of the location that provides useful, quality information. Do not simply duplicate the name of the location.
<b>stop_lat</b>	<b>Conditionally Required</b>	✓ Latitude of the location, based on DIDOK
<b>stop_lon</b>	<b>Conditionally Required</b>	✓ Longitude of the location, based on DIDOK
<b>zone_id</b>	<b>Conditionally Required</b>	✗ Identifies the fare zone for a stop. This field is required if providing fare information using <b>fare_rules.txt</b> , otherwise it is optional.
<b>stop_url</b>	<b>Optional</b>	✗ URL of a web page about the location. This should be different from the agency.agency_url and the routes.route_url field values.
<b>location_type</b>	<b>Optional</b>	✓ (not filled) Type of the location:
<b>parent_station</b>	<b>Conditionally Required</b>	✓ Defines hierarchy between the different locations defined in stops.txt. It contains the ID of the parent location, as followed: a station.
<b>stop_timezone</b>	<b>Optional</b>	✗ Time zone of the location. If the location has a parent station, it inherits the parent station's time zone instead of applying its own.
<b>wheelchair_boarding</b>	<b>Optional</b>	✗ Indicates whether wheelchair boardings are possible from the location. Valid options are:
<b>level_id</b>	<b>Optional</b>	✗ Level of the location. The same level can be used by multiple unlinked stations.
<b>platform_code</b>	<b>Optional</b>	✗ Platform identifier for a platform stop (a stop belonging to a station).

Figure 6: Field definitions stops.txt

### 11.1.3.2.2 Example from OpenTransportData

```


stop_id,stop_name,stop_lat,stop_lon,location_type,parent_station
"1100008","Zell (Wiesental), Wilder Mann","47.7100842702352","7.85964788274668","",""
"1100009","Zell (Wiesental), Grönland","47.7131911044794","7.86290876722849","",""
"1100010","Atzenbach","47.7146175266411","7.8723500608659","",""
"1100011","Mambach, Brücke","47.7282088873189","7.8774704579861","",""
"1100012","Mambach, Mühlschau","47.7340818684375","7.8813871126254","",""
"1100013","Mambach, Silbersau","47.7395192233867","7.88223152899259","",""
"1100014","Fröhd (Schwarzw), Wühre","47.7543663509316","7.88913059037559","",""
"1100015","Fröhd (Schwarzw), Unterkastel","47.7605926689054","7.88553732923861","",""
"1100016","Wembach (Baden)","47.7728317637339","7.88772023537933","",""
"1100017","Schönau (Schw), Brand","47.7774561479519","7.89219384549486","",""
"1100018","Schönau (Schw), Zentrum","47.786208751796","7.89383776246503","",""
"1100019","Schönau (Schw), Friedhof","47.7896429916744","7.89809577691235","",""
"1100020","Schönau (Schw), Schönenbuchen","47.7936261842555","7.90221904406703","",""

```

Figure 7: stops.txt Example OpenTransportData



### 11.1.3.3 Routes.txt

	<p>Specific Information to this section could be found here:</p> <p><a href="https://developers.google.com/transit/gtfs/reference#routestxt">https://developers.google.com/transit/gtfs/reference#routestxt</a></p> <p><a href="#">Best Practices - General Transit Feed Specification (gtfs.org)</a></p>
---	---

#### Attention:

Some routes in GTFS have an extension "-Y". The reason is that they have an artificially created route number. Only this way "route\_short\_name" can be valid. These artificial routes should not be displayed to users like this. For trains, "trip\_short\_name" will contain the train number.

This leads to the problem that unfortunately we do not have a match between the FAHRTID, the HRDF data or the Route\_id. But the problem should be solved with the future implementation of SID4PT. Further information could be found here:

- <https://opentransportdata.swiss/de/cookbook/verwendung-von-hrdf-fahrplaenen-zusammen-mit-gtfs-rt/>

The transport texts (Verkehrsmitteltext) that will be applied (the variable route\_desc contains information of the column "Abbreviation"):

Please refer to the table on OpenTransportData for the detailed list with all available transport texts (Verkehrsmitteltexte) [GTFS | Open-Data-Plattform Mobilität Schweiz \(opentransportdata.swiss\)](#)

#### 11.1.3.3.1 File definition: Required

Field Name	Required	Description <input checked="" type="checkbox"/> Used in Swiss Implementation <input type="checkbox"/> Not used in Swiss Implementation
route_id	Required	<input checked="" type="checkbox"/> Identifies a route (based on the DIVA Identifier). In Future <b>SLNID</b> is planned. Current Implementation: route_id = <DIVA Betriebszweig>-<DIVA Liniennummer>-<DIVA Projektkurzbezeichnung>-<DIVA Linienversionsnummer>
agency_id	Conditionally required	<input checked="" type="checkbox"/> Agency for the specified route.
route_short_name	Conditionally required	<input checked="" type="checkbox"/> Short name of a route.
route_long_name	Conditionally required	<input checked="" type="checkbox"/> Full name of a route. This name is generally more descriptive
route_desc	Optional	<input checked="" type="checkbox"/> Description of a route that provides useful, quality information. Do not simply duplicate the name of the route.
route_type	Required	<input checked="" type="checkbox"/> Indicates the type of transportation used on a route. Valid options are:  A list of all used <b>route_type</b> for the Swiss Implementation can

		be found on <a href="https://opentransportdata.swiss/">GTFS   Open-Data-Plattform Mobilität Schweiz (opentransportdata.swiss)</a>
<b>route_url</b>	<b>Optional</b>	✘ URL of a web page about the particular route.
<b>route_color</b>	<b>Optional</b>	✘ Route color designation that matches public facing material.
<b>route_text_color</b>	<b>Optional</b>	✘ Legible colour to use for text drawn against a background of route_color.
<b>route_sort_order</b>	<b>Optional</b>	✘ Orders the routes in a way which is ideal for presentation to customers. Routes with smaller route_sort_order values should be displayed first.
<b>continuous_pickup</b>	<b>Optional</b>	✘ Indicates whether a rider can board the transit vehicle anywhere along the vehicle's travel path.
<b>continu-ous_drop_off</b>	<b>Optional</b>	✘ Indicates whether a rider can alight from the transit vehicle at any point along the vehicle's travel path.


Figure 8: Field definitions routes.txt

### 11.1.3.3.2 Example from OpenTransportData

```
route_id,agency_id,route_short_name,route_long_name,route_desc,route_type
"91-10-A-j23-1","78","S10","","S","109"
"91-10-B-j23-1","11","S10","","S","109"
"91-10-C-j23-1","65","S10","","S","109"
"91-10-E-j23-1","3849","10","","T","900"
"91-10-G-j23-1","65","SN10","","SN","109"
"91-10-j23-1","37","10","","T","900"
"91-10-Y-j23-1","11","RE","","RE","106"
"91-11-A-j23-1","11","S11","","S","109"
"91-11-B-j23-1","327000","S11","","S","109"
"91-11-C-j23-1","3849","11","","T","900"
"91-11-j23-1","37","11","","T","900"
```

Figure 9: routes.txt Example OpenTransportData

### 11.1.3.4 trips.txt

	<p>Specific Information to this section could be found here:</p> <p><a href="https://developers.google.com/transit/gtfs/reference#tripstxt">https://developers.google.com/transit/gtfs/reference#tripstxt</a></p> <p><a href="https://www.gtfs.org/docs/Best-Practices-General-Transit-Feed-Specification">Best Practices - General Transit Feed Specification (gtfs.org)</a></p>
---	---

**Attention:**

For trains, "**trip\_short\_name**" contains the train number.

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 and in NeTeX to the ServiceJourney.**

More information about the Trip and its structure or composition can be obtained here:

- <https://opentransportdata.swiss/de/cookbook/verwendung-von-hrdf-fahrplaenen-zusammen-mit-gtfs-rt/>
- <https://opentransportdata.swiss/de/faq/fahrplaene-gtfs/>

#### 11.1.3.4.1 File definition: Required

Field Name	Required	Description
		<input checked="" type="checkbox"/> Used in Swiss Implementation <input type="checkbox"/> Not used in Swiss Implementation
<b>route_id</b>	Required	<input checked="" type="checkbox"/> Identifies a route. Currently DIVA-Format, in Future SJYID is planned.
<b>service_id</b>	Required	<input checked="" type="checkbox"/> Identifies a set of dates when service is available for one or more routes.
<b>trip_id</b>	Required	<input checked="" type="checkbox"/> Identifies a trip. Currently DIVA-Format, in 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 : <a href="https://opentransportdata.swiss/de/faq/fahrplaene-gtfs/">https://opentransportdata.swiss/de/faq/fahrplaene-gtfs/</a>
<b>trip_headsign</b>	Optional	<input checked="" type="checkbox"/> Text that appears on signage identifying the trip's destination to riders.
<b>trip_short_name</b>	Optional	<input checked="" type="checkbox"/>

		Public facing text used to identify the trip to riders, for instance, to identify train numbers for commuter rail trips.
<b>direction_id</b>	<b>Optional</b>	<input checked="" type="checkbox"/> Indicates the direction of travel for a trip. This field is not used in routing; it provides a way to separate trips by direction when publishing time tables.
<b>block_id</b>	<b>Optional</b>	<input checked="" type="checkbox"/> Identifies the block to which the trip belongs.
<b>shape_id</b>	<b>Conditionally required</b>	<input type="checkbox"/> Identifies a geospatial shape that describes the vehicle travel path for a trip.
<b>wheelchair_accessible</b>	<b>Optional</b>	<input type="checkbox"/> Indicates wheelchair accessibility. Valid options are:
<b>bikes_allowed</b>	<b>Optional</b>	<input type="checkbox"/> Indicates whether bikes are allowed. Valid options are:


Figure 10: Field definitions trips.txt

#### 11.1.3.4.2 Example from OpenTransportData

<pre> route_id,service_id,trip_id,trip_headsign,trip_short_name,direction_id,block_id "91-10-A-j23-1","TA+gz","1.TA.91-10-A-j23-1.1.H","Zürich HB SZU","12908","0","" "91-10-A-j23-1","TA+gz","10.TA.91-10-A-j23-1.1.H","Zürich HB SZU","12872","0","" "91-10-A-j23-1","TA+em","100.TA.91-10-A-j23-1.7.H","Zürich HB SZU","12876","0","" "91-10-A-j23-1","TA","101.TA.91-10-A-j23-1.7.H","Zürich HB SZU","12844","0","" "91-10-A-j23-1","TA+em","102.TA.91-10-A-j23-1.7.H","Zürich HB SZU","12968","0","" "91-10-A-j23-1","TA+gz","103.TA.91-10-A-j23-1.7.H","Zürich HB SZU","12826","0","" "91-10-A-j23-1","TA","104.TA.91-10-A-j23-1.7.H","Zürich HB SZU","12788","0","" "91-10-A-j23-1","TA","105.TA.91-10-A-j23-1.7.H","Zürich HB SZU","12856","0","" "91-10-A-j23-1","TA+em","106.TA.91-10-A-j23-1.7.H","Zürich HB SZU","12924","0","" "91-10-A-j23-1","TA","107.TA.91-10-A-j23-1.7.H","Zürich HB SZU","12832","0","" "91-10-A-j23-1","TA","108.TA.91-10-A-j23-1.7.H","Zürich HB SZU","12952","0","" </pre>
--

Figure 11: trips.txt Example OpenTransportData

### 11.1.3.5 Stop\_times

	<p>Specific Information to this section could be found here:</p> <p><a href="https://developers.google.com/transit/gtfs/reference#stop_timestxt">https://developers.google.com/transit/gtfs/reference#stop_timestxt</a>  <a href="https://developers.google.com/transit/gtfs/reference#stop_timestxt">Best Practices - General Transit Feed Specification (gtfs.org)</a></p>
---	--

#### 11.1.3.5.1 File definition: Required

Field Name	Required	Description
		<input checked="" type="checkbox"/> Used in Swiss Implementation <input type="checkbox"/> Not used in Swiss Implementation
<b>trip_id</b>	Required	<input checked="" type="checkbox"/> Identifies a trip.
<b>arrival_time</b>	Conditionally required	<input checked="" type="checkbox"/> Arrival time at a specific stop for a specific trip on a route. If there are not separate times for arrival and departure at a stop, enter the same value for arrival_time and departure_time.
<b>departure_time</b>	Conditionally required	<input checked="" type="checkbox"/> Departure time from a specific stop for a specific trip on a route.
<b>stop_id</b>	Required	<input checked="" type="checkbox"/> Identifies the serviced stop. All stops serviced during a trip must have a record in <b>stop_times.txt</b> .
<b>stop_sequence</b>	Required	<input checked="" type="checkbox"/> Order of stops for a particular trip. The values must increase along the trip but do not need to be consecutive.
<b>stop_headsign</b>	Optional	<input type="checkbox"/> Text that appears on signage identifying the trip's destination to riders.
<b>pickup_type</b>	Optional	<input checked="" type="checkbox"/> Indicates pickup method. Valid options are: In Swiss currently only pickup method "0" is delivered  0 - or empty - Regularly scheduled pickup. 1 - No pickup available. 2 - Must phone agency to arrange pickup. 3 - Must coordinate with driver to arrange pickup.
<b>drop_off_type</b>	Optional	<input checked="" type="checkbox"/> Indicates drop off method. Valid options are: In Swiss currently only drop_off method "0" is delivered  0 or empty - Regularly scheduled drop off. 1 - No drop off available. 2 - Must phone agency to arrange drop off. 3 - Must coordinate with driver to arrange drop off.
<b>continuous_pickup</b>	Optional	<input type="checkbox"/> Indicates whether a rider can board the transit vehicle at any point along the vehicle's travel path.
<b>continuous_drop_off</b>	Optional	<input type="checkbox"/> Indicates whether a rider can alight from the transit vehicle at any point along the vehicle's travel path as described by shapes.txt, from this stop_time to the next stop_time in the trip's stop_sequence.
<b>shape_dist_traveled</b>	Optional	<input type="checkbox"/> Actual distance travelled along the associated shape, from the first stop to the stop specified in this record.


<b>timepoint</b>	Optional	 <p>Indicates if arrival and departure times for a stop are strictly adhered to by the vehicle or if they are instead approximate and/or interpolated times.</p>
------------------	----------	---

Figure 12: Field definitions stop\_times.txt

### 11.1.3.5.2 Example from OpenTransportData


trip_id	arrival_time	departure_time	stop_id	stop_sequence	pickup_type	drop_off_type
"1.TA.91-C24-j23-1.1.H"	"07:50:00"	"07:50:00"	"8772202"	"1"	"0"	"0"
"1.TA.91-C24-j23-1.1.H"	"07:52:00"	"07:54:00"	"8728262"	"2"	"0"	"0"
"1.TA.91-C24-j23-1.1.H"	"07:58:00"	"07:59:00"	"8772850"	"3"	"0"	"0"
"1.TA.91-C24-j23-1.1.H"	"08:03:00"	"08:04:00"	"8772253"	"4"	"0"	"0"
"1.TA.91-C24-j23-1.1.H"	"08:08:00"	"08:09:00"	"8772254"	"5"	"0"	"0"
"1.TA.91-C24-j23-1.1.H"	"08:13:00"	"08:14:00"	"8772256"	"6"	"0"	"0"
"1.TA.91-C24-j23-1.1.H"	"08:19:00"	"08:20:00"	"8772257"	"7"	"0"	"0"
"1.TA.91-C24-j23-1.1.H"	"08:24:00"	"08:24:00"	"8772258"	"8"	"0"	"0"
"2.TA.91-C24-j23-1.1.H"	"07:50:00"	"07:50:00"	"8772202"	"1"	"0"	"0"
"2.TA.91-C24-j23-1.1.H"	"07:52:00"	"07:54:00"	"8728262"	"2"	"0"	"0"
"2.TA.91-C24-j23-1.1.H"	"07:58:00"	"07:59:00"	"8772850"	"3"	"0"	"0"
"2.TA.91-C24-j23-1.1.H"	"08:03:00"	"08:04:00"	"8772253"	"4"	"0"	"0"
"2.TA.91-C24-j23-1.1.H"	"08:08:00"	"08:09:00"	"8772254"	"5"	"0"	"0"

Figure 13: stop\_times.txt Example OpenTransportData

### 11.1.3.6 Calendar.txt

Services define the date range and days of the week (e.g. Monday to Friday) when a trip is available. They are defined in the **calendar.txt** file. A single service can be applied to multiple trips.

If multiple schedules apply to a particular vehicle, e.g. one on weekdays and another on weekends, it is recommended to define two trips with the same stops but different services and StopTimes.

	<p>Specific Information to this section could be found here:</p> <p><a href="https://developers.google.com/transit/gtfs/reference#calendar.txt">https://developers.google.com/transit/gtfs/reference#calendar.txt</a></p> <p><a href="#">Best Practices - General Transit Feed Specification (gtfs.org)</a></p>
---	---

#### 11.1.3.6.1 File definition: Conditionally Required

Field Name	Required	Description <input checked="" type="checkbox"/> Used in Swiss Implementation <input type="checkbox"/> Not used in Swiss Implementation
<b>service_id</b>	Required	<input checked="" type="checkbox"/> Uniquely identifies a set of dates when service is available for one or more routes. Each service_id value can appear at most once in a <b>calendar.txt</b> file.
<b>monday</b>	Required	<input checked="" type="checkbox"/> Indicates whether the service operates on all Mondays in the date range specified by the start_date and end_date fields. Note that exceptions for particular dates may be listed in <b>calendar_dates.txt</b> . Valid options are:  1 - Service is available for all Mondays in the date range. 0 - Service is not available for Mondays in the date range.
<b>tuesday</b>	Required	<input checked="" type="checkbox"/> Functions in the same way as monday except applies to Tuesdays
<b>wednesday</b>	Required	<input checked="" type="checkbox"/> Functions in the same way as monday except applies to Wednesdays
<b>thursday</b>	Required	<input checked="" type="checkbox"/> Functions in the same way as monday except applies to Thursdays
<b>friday</b>	Required	<input checked="" type="checkbox"/> Functions in the same way as monday except applies to Fridays
<b>saturday</b>	Required	<input checked="" type="checkbox"/> Functions in the same way as monday except applies to Saturdays.
<b>sunday</b>	Required	<input checked="" type="checkbox"/> Functions in the same way as monday except applies to Sundays.
<b>start_date</b>	Required	<input checked="" type="checkbox"/> Start service day for the service interval.
<b>end_date</b>	Required	<input checked="" type="checkbox"/> End service day for the service interval. This service day is included in the interval.

Figure 14: Field definitions caldener.txt

#### 11.1.3.6.2 Example form OpenTransportData

```

service_id,monday,tuesday,wednesday,thursday,friday,saturday,sunday,start_date,end_date
"TA","1","1","1","1","1","1","1","20221211","20231209"
"TA+00000","0","0","1","0","0","0","0","20221211","20231209"
"TA+00200","1","1","1","1","1","0","0","20221211","20231209"
"TA+00330","1","1","1","1","1","1","1","20221211","20231209"
"TA+00520","0","0","0","0","0","0","1","20221211","20231209"
"TA+00630","0","0","0","0","0","0","1","20221211","20231209"
"TA+00930","1","1","1","1","0","0","0","20221211","20231209"

```

```
"TA+00c20", "1", "1", "1", "1", "1", "0", "0", "20221211", "20231209"  
"TA+00c30", "0", "0", "0", "0", "0", "1", "1", "20221211", "20231209"  
"TA+00d10", "0", "0", "0", "0", "0", "0", "1", "20221211", "20231209"  
"TA+00d30", "0", "0", "0", "0", "0", "0", "1", "20221211", "20231209"
```


*Figure 15: calender.txt Example OpenTransportData*



### 11.1.3.7 Calendar\_dates.txt

If a trip is not available on certain days, e.g. holidays, these days should be defined in the [calendar\\_dates.txt](#) file. This file can be used to define days when a trip is performed or not performed against the rule.

Perhaps you offer special services only on a public holiday. These would then need to be set as unavailable for that day in the [calendar.txt](#) file and as available in the [calendar\\_dates.txt](#) file

	<p>Specific Information to this section could be found here:</p> <p><a href="https://developers.google.com/transit/gtfs/reference#calendartxt">https://developers.google.com/transit/gtfs/reference#calendartxt</a>  <a href="#">Best Practices - General Transit Feed Specification (gtfs.org)</a></p>
---	---

#### 11.1.3.7.1 File definition: Conditionally Required

Field Name	Required	Description <input checked="" type="checkbox"/> Used in Swiss Implementation <input type="checkbox"/> Not used in Swiss Implementation
<b>service_id</b>	Required	<input checked="" type="checkbox"/> Identifies a set of dates when a service exception occurs for one or more routes.
<b>date</b>	Required	<input checked="" type="checkbox"/> Date when service exception occurs.
<b>exception_type</b>	Required	<input checked="" type="checkbox"/> Indicates whether service is available on the date specified in the date field. Valid options are:  1 - Service has been added for the specified date. 2 - Service has been removed for the specified date.

Figure 16 Field definitions caldener.txt

#### 11.1.3.7.2 Example from OpenTransportData

```


service_id,date,exception_type
"TA+00000","20221214","2"
"TA+00000","20221221","2"
"TA+00000","20230111","2"
"TA+00000","20230118","2"
"TA+00000","20230125","2"
"TA+00000","20230201","2"
"TA+00000","20230208","2"
"TA+00000","20230215","2"
"TA+00000","20230301","2"
"TA+00000","20230308","2"
"TA+00000","20230315","2"

```

Figure 17: calendar\_dates.txt Example OpenTransportData


### 11.1.3.8 Fare\_attributes.txt

✘ Not used in Swiss Implementation

	Specific Information to this section could be found here: <a href="https://developers.google.com/transit/gtfs/reference#fare_attributes.txt">https://developers.google.com/transit/gtfs/reference#fare_attributes.txt</a> <a href="#">Best Practices - General Transit Feed Specification (gtfs.org)</a>
---	--


### 11.1.3.9 Fare\_rules.txt

✘ Not used in Swiss Implementation

	Specific Information to this section could be found here: <a href="https://developers.google.com/transit/gtfs/reference#fare_rules.txt">https://developers.google.com/transit/gtfs/reference#fare_rules.txt</a> <a href="#">Best Practices - General Transit Feed Specification (gtfs.org)</a>
---	--


### 11.1.3.10 Shapes.txt

✘ Not used in Swiss Implementation


	Specific Information to this section could be found here: <a href="https://developers.google.com/transit/gtfs/reference#shapes.txt">https://developers.google.com/transit/gtfs/reference#shapes.txt</a> <a href="#">Best Practices - General Transit Feed Specification (gtfs.org)</a>
---	--

### 11.1.3.11 Frequencies.txt

✘ Not used in Swiss Implementation

	Specific Information to this section could be found here: <a href="https://developers.google.com/transit/gtfs/reference#frequencies.txt">https://developers.google.com/transit/gtfs/reference#frequencies.txt</a> <a href="#">Best Practices - General Transit Feed Specification (gtfs.org)</a>
---	--

### 11.1.3.12 Transfers.txt

	<p>Specific Information to this section could be found here:</p> <p><a href="https://developers.google.com/transit/gtfs/reference#transferstxt">https://developers.google.com/transit/gtfs/reference#transferstxt</a>  <a href="https://developers.google.com/transit/gtfs/reference#transferstxt">Best Practices - General Transit Feed Specification (gtfs.org)</a></p>
---	---

#### 11.1.3.12.1 File definition: Optional

Field Name	Re-quired	Description
		<p>✓ Used in Swiss Implementation</p> <p>✗ Not used in Swiss Implementation</p>
<b>from_stop_id</b>	Re-quired	<p>✓</p> <p>Identifies a stop or station where a connection between routes begins.</p>
<b>to_stop_id</b>	Re-quired	<p>✓</p> <p>Identifies a stop or station where a connection between routes ends.</p>
<b>transfer_type</b>	Re-quired	<p>✓</p> <p>Indicates the type of connection for the specified (from_stop_id, to_stop_id) pair. Valid options are:</p>
<b>min_trans-fer_time</b>	Op-tional	<p>✓</p> <p>Amount of time, in seconds, that must be available to permit a transfer between routes at the specified stops. The min_transfer_time should be sufficient to permit a typical rider to move between the two stops, including buffer time to allow for schedule variance on each route.</p>

Figure 18: Field definitions transfers.txt

#### 11.1.3.12.2 Example from OpenTransportData


```

from stop id,to stop id,transfer type,min transfer time
"1100079","8014441","2","240"
"1100079","8014441:0:2","2","240"
"1100079","8014441:0:3","2","240"
"1100079","8014441:0:1","2","240"
"1100084","8014440","2","180"
"1100084","8014440:0:1","2","180"
"1100097","8014447","2","240"
"1100097","8014447:0:2","2","240"
"1100097","8014447:0:1","2","240"
"1100097","8014447:0:3","2","240"
"1100102","8014446","2","240"
"1100102","8014446:0:1","2","240"


```

### 11.1.3.13 Levels.txt






 **Not used in Swiss Implementation**

	<p>Specific Information to this section could be found here:</p> <p><a href="https://developers.google.com/transit/gtfs/reference#levelstxt">https://developers.google.com/transit/gtfs/reference#levelstxt</a></p>
---	---

### 11.1.3.14 Feed\_info.txt

	<p>Specific Information to this section could be found here:</p> <p><a href="https://developers.google.com/transit/gtfs/reference#feed_infotxt">https://developers.google.com/transit/gtfs/reference#feed_infotxt</a>  <a href="https://developers.google.com/transit/gtfs/reference#best-practices">Best Practices - General Transit Feed Specification (gtfs.org)</a></p>
---	---

#### 11.1.3.14.1 File definition: Conditionally required

Field Name	Required	Description
		<p> <b>Used in Swiss Implementation</b></p> <p> <b>Not used in Swiss Implementation</b></p>
<b>feed_publisher_name</b>	Required	<p></p> <p>Full name of the organization that publishes the dataset. This might be the same as one of the agency.agency_name values.</p>
<b>feed_publisher_url</b>	Required	<p></p> <p>URL of the dataset publishing organization's website. This may be the same as one of the agency.agency_url values.</p>
<b>feed_lang</b>	Required	<p></p> <p>Default language for the text in this dataset. This setting helps GTFS consumers choose capitalization rules and other language-specific settings for the dataset.</p> <p>To define another language, use the language field in <a href="#">translations.txt</a>.</p> <p>For example, a dataset in Switzerland might set the original stops.stop_name field populated with stop names in different languages. Each stop name is written in accordance with the dominant language in that stop's geographic location. Stop names include Genève for the French-speaking city of Geneva, Zürich for the German-speaking city of Zurich, and Biel/Bienne for the bilingual city of Biel/Bienne. Set feed_lang=mul and provide the following translations in <a href="#">translations.txt</a>:</p> <ul style="list-style-type: none"> <li>• <b>German:</b> "Genf," "Zürich," and "Biel"</li> <li>• <b>French:</b> "Genève," "Zurich," and "Bienne"</li> <li>• <b>Italian:</b> "Ginevra," "Zurigo," and "Bienna"</li> <li>• <b>English:</b> "Geneva," "Zurich," and "Biel/Bienne"</li> </ul>

<b>default_lang</b>	<b>Optional</b>	✗ Defines the language used when the data consumer doesn't know the language of the rider. It's often defined as en, English.
<b>feed_start_date</b>	<b>Optional</b>	✓ The dataset provides complete and reliable schedule information for service in the period from the beginning of the feed_start_date day to the end of the feed_end_date day.
<b>feed_end_date</b>	<b>Optional</b>	✓ Refer to the feed_start_date row in this table.
<b>feed_version</b>	<b>Optional</b>	✓ String that indicates the current version of their GTFS dataset.
<b>feed_contact_email</b>	<b>Optional</b>	✗ Email address for communication regarding the GTFS dataset and data publishing practices.
<b>feed_contact_url</b>	<b>Optional</b>	✗ URL for contact information, a web-form, support desk, or other tools for communication regarding the GTFS dataset and data publishing practices


### 11.1.3.14.2 Example from OpenTransportData

```
feed_publisher_name,feed_publisher_url,feed_lang,feed_start_date,feed_end_date,feed_version
"SBB","http://www.sbb.ch/","DE","20221211","20231209","20230327"
```

Figure 19: feed\_info.txt Example OpenTransportData


### 11.1.3.15 Translations.txt

 **Not used in Swiss Implementation**

	Specific Information to this section could be found here: <a href="https://developers.google.com/transit/gtfs/reference#translationstxt">https://developers.google.com/transit/gtfs/reference#translationstxt</a>
---	--

### 11.1.3.16 Attributions.txt

 **Not used in Swiss Implementation**

	Specific Information to this section could be found here: <a href="https://developers.google.com/transit/gtfs/reference#attributionstxt">https://developers.google.com/transit/gtfs/reference#attributionstxt</a>
---	--

## 11.2 GTFS-Realtime (Swiss Profile)

Best Practices: [Best Practices - General Transit Feed Specification \(gtfs.org\)](https://gtfs.org/realtime/best-practices/)

### 11.2.1 Introduction

GTFS-realtime is a standard developed by Google in order to allow transit agencies to provide real-time information about their service.

There are three types of data a GTFS-realtime feed provides:

1. Vehicle positions
2. Trip updates (Provided from SBB)
3. Service alerts (Provided from SBB)

**Vehicle positions** contain data about events that have already occurred (e.g. “the vehicle was at this location one minute ago”), whereas **trip updates** contain data about events that are yet occur (e.g. “the bus will arrive in three minutes”). **Service alerts** contains information about delays, changed routes, replacement vehicles or cancellations for individual lines to enable passengers to plan as accurately as possible.

Typically, a single GTFS-realtime feed contains only one of these three types of data. Many agencies therefore have multiple GTFS-realtime feeds (that is, one for vehicle positions, one for trip updates and one for service alerts)

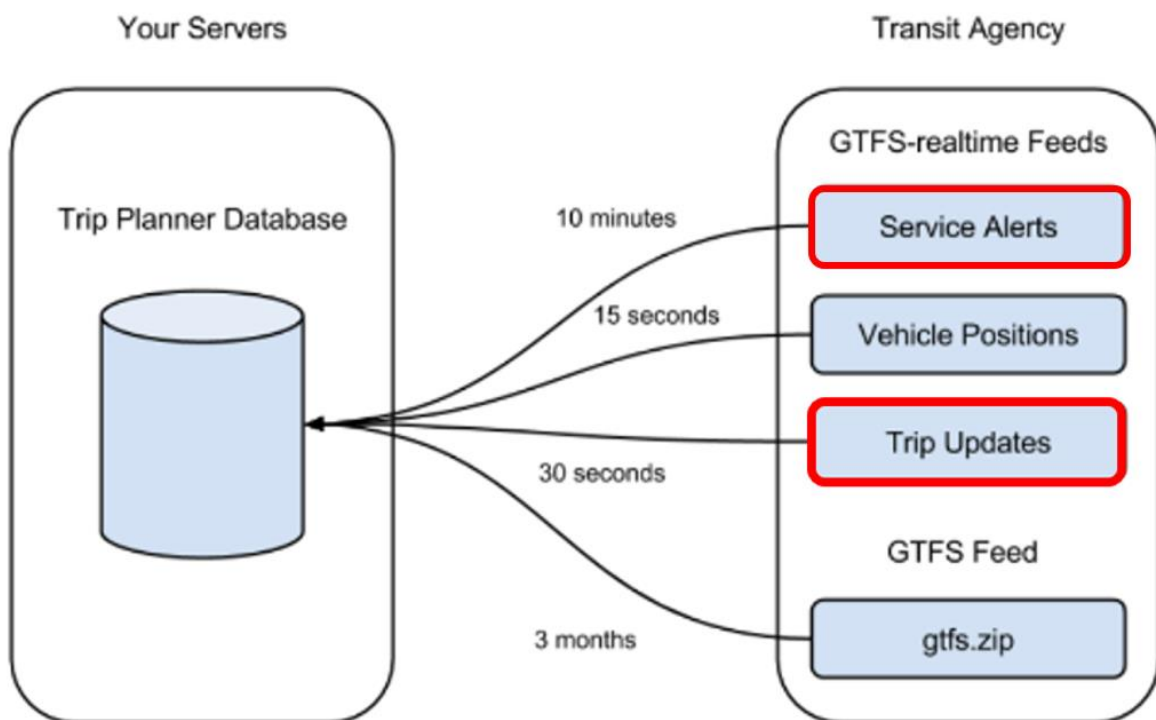


Figure 20:GTFS-realtime feeds

In Switzerland, two of the three services are currently implemented, namely "Trip Update" and "Service Alerts".

### 11.2.2 Swiss Specific Information

- The OpenDataPlattform is currently only Supporting GTFS-RT "Trip Update" – Version 1.0. Please be aware that 2.0 Elements are currently ignored.
- The OpenDataPlattform 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.
- The real-time feed includes all known changes in public transport Switzerland in the entire preview window (three hours) for all transport companies that provide real-time data.
- 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.



### 11.2.3 Full Element Index

[GTFS Realtime Reference](#) | [Realtime Transit](#) | [Google Developers](#)

Element Index with Link to Google Documentation:


- [FeedMessage](#)
  - [FeedHeader](#)
    - [Incrementality](#)
  - [FeedEntity](#)
    - [TripUpdate](#)
      - [TripDescriptor](#)
        - [ScheduleRelationship](#)
      - [VehicleDescriptor](#)
      - [StopTimeUpdate](#)
        - [StopTimeEvent](#)
        - [ScheduleRelationship](#)
    - [VehiclePosition](#)
      - [TripDescriptor](#)
        - [ScheduleRelationship](#)
      - [VehicleDescriptor](#)
      - [Position](#)
      - [VehicleStopStatus](#)
      - [CongestionLevel](#)
      - [OccupancyStatus](#)
    - [Alert](#)
      - [TimeRange](#)
      - [EntitySelector](#)
        - [TripDescriptor](#)
          - [ScheduleRelationship](#)
      - [Cause](#)
      - [Effect](#)
      - [TranslatedString](#)
        - [Translation](#)

Figure 21: Element Index GTFS-RT

## 11.2.4 General Elements

- [FeedMessage](#)
  - [FeedHeader](#)
    - [Incrementality](#)
  - [FeedEntity](#)

### 11.2.4.1 FeedMessage

	<p>Specific Information to Section could be found here:</p> <p><a href="https://developers.google.com/transit/gtfs-realtime/reference#message-feedmessage">https://developers.google.com/transit/gtfs-realtime/reference#message-feedmessage</a>  <a href="#">Best Practices - General Transit Feed Specification (gtfs.org)</a></p>
---	--

<i>Field Name</i>	<i>Required</i>	<i>Car-dinal-ity</i>	<i>Description</i> <input checked="" type="checkbox"/> Used in Swiss Implementation <input type="checkbox"/> Not used in Swiss Implementation
<b>header</b>	Required	One	<input checked="" type="checkbox"/> Metadata about this feed and feed message.
<b>entity</b>	Condition-ally required	Many	<input checked="" type="checkbox"/> Contents of the feed. If there is real-time information available for the transit system, this field must be provided. If this field is empty, consumers should assume there is no real-time information available for the system.

Figure 22: Field definitions FeedMessage


```

{
  "Header": {
    "GtfsRealtimeVersion": "1.0",
    "Incrementality": "FullDataset",
    "Timestamp": 1680178351
  },
  "Entity": [
    {
      "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": "20230330",
          "ScheduleRelationship": "Scheduled"
        }
      }
    }
  ]
}

```

Figure 23: FeedMessage - Example OpenTransportData

### 11.2.4.2 Message FeedHeader:

	<p>Specific Information to Section could be found here:</p> <p><a href="https://developers.google.com/transit/gtfs-realtime/reference#message-feedheader">https://developers.google.com/transit/gtfs-realtime/reference#message-feedheader</a>  <a href="https://gtfs.org/">Best Practices - General Transit Feed Specification (gtfs.org)</a></p>
---	--

<i>Field Name</i>	<i>Required</i>	<i>Cardinality</i>	<i>Description</i> <input checked="" type="checkbox"/> Used in Swiss Implementation <input type="checkbox"/> Not used in Swiss Implementation
<b>gtfs_realtime_version</b>	Required	One	<input checked="" type="checkbox"/> See Google-Description. Only Version 1.0 is implemented.
<b>incrementality</b>	Required	One	<input checked="" type="checkbox"/> In the Swiss Implementation only "Full_Dataset" is used
<b>timestamp</b>	Required	One	<input checked="" type="checkbox"/> This timestamp identifies the moment when the content of this feed has been created (in server time). In POSIX time (i.e., number of seconds since January 1st 1970 00:00:00 UTC).

Figure 24 Field definitions - FeedHeader

```

{
  "Header": {
    "GtfsRealtimeVersion": "1.0",
    "Incrementality": "FullDataset",
    "Timestamp": 1680178351
  },
  "Entity": [
    {
      "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": "20230330",
          "ScheduleRelationship": "Scheduled"
        }
      }
    }
  ]
}


```

Figure 25: FeedHeader - Example OpenTransportData

<i>Value</i>	<i>Description</i> <input checked="" type="checkbox"/> Used in Swiss Implementation <input type="checkbox"/> Not used in Swiss Implementation
<b>FULL_DATASET</b>	<input checked="" type="checkbox"/> This feed update will overwrite all preceding realtime information for the feed. Thus this update is expected to provide a full snapshot of all known realtime information.
<b>DIFFERENTIAL</b>	<input type="checkbox"/> Currently, this mode is unsupported and behaviour is unspecified for feeds that use this mode.

Figure 26: Value definition: Enum Incrementality

### 11.2.4.3 Message FeedEntity

	<p>Specific Information to Section could be found here:</p> <p><a href="https://developers.google.com/transit/gtfs-realtime/reference#message-feedentity">https://developers.google.com/transit/gtfs-realtime/reference#message-feedentity</a>  <a href="https://developers.google.com/transit/gtfs-realtime/reference#message-feedentity">Best Practices - General Transit Feed Specification (gtfs.org)</a></p>
---	---

Field Name	Required	Cardinality	Description
			<input checked="" type="checkbox"/> Used in Swiss Implementation <input checked="" type="checkbox"/> Not used in Swiss Implementation
<b>id</b>	Required	One	<input checked="" type="checkbox"/> Feed-unique identifier for this entity. The IDs are used only to provide incrementality support. DIVA Internal Number
<b>is_deleted</b>	Optional	One	<input checked="" type="checkbox"/> Whether this entity is to be deleted. Should be provided only for feeds with Incrementality of DIFFERENTIAL - this field should NOT be provided for feeds with Incrementality of FULL_DATASET. The Swiss Implementation always provides "IsDeleted": false
<b>trip_update</b>	Conditionally required	One	<input checked="" type="checkbox"/> Data about the realtime departure delays of a trip. At least one of the fields trip_update, vehicle, or alert must be provided - all these fields cannot be empty.
<b>vehicle</b>	Conditionally required	One	<input checked="" type="checkbox"/> Data about the realtime position of a vehicle. At least one of the fields trip_update, vehicle, or alert must be provided - all these fields cannot be empty.
<b>alert</b>	Conditionally required	One	<input checked="" type="checkbox"/> Data about the realtime alert. At least one of the fields trip_update, vehicle, or alert must be provided - all these fields cannot be empty.

Figure 27: Field definition - FeedEntity

```

{
  "Header": {
    "GtfsRealtimeVersion": "1.0",
    "Incrementality": "FullDataset",
    "Timestamp": 1680178351
  },
  "Entity": [
    {
      "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": "20230330",
          "ScheduleRelationship": "Scheduled"
        }
      }
    }
  ]
}

```

Figure 28: FeedEntity - Example OpenTransportData

## 11.2.5 Service Alerts (Provided by SBB)

✔ Used in Swiss Implementation

### 11.2.5.1 Introduction


More Information about the Service Alert implementation could as well be found here:

- [GTFS-RT: Service-Alerts – \(Ereignisinformationen Schweiz\) | Open-Data-Plattform Mobilität Schweiz \(opentransportdata.swiss\)](#)

### 11.2.5.2 Elements



### 11.2.5.3 message Alert

	<p>General Information in terms of Service Alerts can be found here: <a href="#">Service Alerts   Realtime Transit   Google for Developers</a></p> <p>Specific Information to Section could be found here:</p> <p><a href="https://developers.google.com/transit/gtfs-realtime/reference#message-alert">https://developers.google.com/transit/gtfs-realtime/reference#message-alert</a></p>
---	---

<i>Field Name</i>	<i>Re-quired</i>	<i>Cardinality</i>	<i>Description</i> ✔ Used in Swiss Implementation ✘ Not used in Swiss Implementation
<b>active_period</b>	Optional	Many	✔ Used in Swiss Implementation  Time when the alert should be shown to the user. If missing, the alert will be shown as long as it appears in the feed. If multiple ranges are given, the alert will be shown during all of them.
<b>informed_entity</b>	Re-quired	Many	✔ Used in Swiss Implementation  Entities whose users we should notify of this alert. At least one informed_entity must be provided.
<b>cause</b>	Optional	One	✔ Used in Swiss Implementation
<b>effect</b>	Optional	One	✔ Used in Swiss Implementation
<b>url</b>	Optional	One	✔ Used in Swiss Implementation  The URL which provides additional information about the alert. <a href="#">Using Message Translation</a>
<b>header_text</b>	Re-quired	One	✔ Used in Swiss Implementation  Header for the alert. This plain-text string will be highlighted, for example in boldface. <a href="#">Using Message Translation</a>
<b>descrip-tion_text</b>	Re-quired	One	✔ Used in Swiss Implementation

			<p>Description for the alert. This plain-text string will be formatted as the body of the alert (or shown on an explicit "expand" request by the user). The information in the description should add to the information of the header.</p> <p><a href="#">Using Message Translation</a></p>
--	--	--	--

Table 1: Field definition - Alert

```

"id": "f8890c30-clbe-5b3c-a9f1-5fb4b3e22851",
>alert": {
  "activePeriod": [
    {
      "start": "1690538400",
      "end": "1690545600"
    }
  ],
  "informedEntity": [
    {
      "agencyId": "801",
      "routeId": "96-214-j23-1",
      "directionId": 0
    },
    {
      "agencyId": "801",
      "routeId": "96-214-j23-1",
      "directionId": 1
    }
  ],
  "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 inter-
vals.",
        "language": "en"
      },
      {
        "text": "Circolazione degli autobus irregolare sulla linea 475.",
        "language": "it"
      },
      {
        "text": "Circulation irrégulière des bus sur la ligne 475.",
        "language": "fr"
      }
    ]
  },
  "descriptionText": {
    "translation": [
      {

```

```


    "text": "Der Grund dafür ist ein Unfall. Die Einschränkung dauert bis
ca. 13:30. Es sind Verspätungen zu erwarten. Wir empfehlen, kurz vor jeder Fahrt den Online-Fahr-
plan zu konsultieren.",
    "language": "de"
  },
  {
    "text": "This is due to an accident. The restriction lasts until ap-
prox. 13:30. Expect delays. Please consult online timetable before each trip.",
    "language": "en"
  },
  {
    "text": "Il motivo è un incidente. La restrizione durerà fino alle
13:30 circa. Sono da prevedere ritardi. Raccomandiamo di consultare l'orario online poco prima di
ogni viaggio.",
    "language": "it"
  },
  {
    "text": "Un accident en est la cause. La perturbation dure jusqu'à
env. 13:30. Des retards sont à prévoir. Nous vous recommandons de consulter l'horaire en ligne peu
avant le départ.",
    "language": "fr"
  }
]
}
},

```

*Table 2: Alert: Example OpenTransportData*

#### 11.2.5.4 Message TimeRange (Swiss Implementation: «activePeriod»)

A time interval. The interval is considered active at time t if t is greater than or equal to the start time and less than the end time.

	<p>General Information in terms of Service Alerts can be found here: <a href="#">Service Alerts   Realtime Transit   Google for Developers</a></p> <p>Specific Information to Section could be found here:</p> <p><a href="https://developers.google.com/transit/gtfs-realtime/reference#message-timerange">https://developers.google.com/transit/gtfs-realtime/reference#message-timerange</a></p>
---	---

<i>Field Name</i>	<i>Required</i>	<i>Cardinality</i>	<i>Description</i> <input checked="" type="checkbox"/> Used in Swiss Implementation <input type="checkbox"/> Not used in Swiss Implementation
<b>start</b>	Conditionally required	One	<input checked="" type="checkbox"/> <b>Used in Swiss Implementation</b>  Start time, in POSIX time (i.e., number of seconds since January 1st 1970 00:00:00 UTC). If missing, the interval starts at minus infinity. If a TimeRange is provided, either start or end must be provided - both fields cannot be empty.
<b>end</b>	Conditionally required	One	<input checked="" type="checkbox"/> <b>Used in Swiss Implementation</b>  End time, in POSIX time (i.e., number of seconds since January 1st 1970 00:00:00 UTC). If missing, the interval ends at plus infinity. If a TimeRange is provided, either start or end must be provided - both fields cannot be empty.

Table 3: Field definition - TimeRange

```

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

Table 4: TimeRange: Example OpenTransportData



### 11.2.5.5 Message EntitySelector (Swiss Implementation: «informedEntity»)


A selector for an entity in a GTFS feed. The values of the fields should correspond to the appropriate fields in the GTFS feed. At least one specifier must be given. If several are given, they should be interpreted as being joined by the logical AND operator. Additionally, the combination of specifiers must match the corresponding information in the GTFS feed.

In other words, for an alert to apply to an entity in GTFS it must match all of the provided EntitySelector fields.

For example, an EntitySelector that includes the fields route\_id: "5" and route\_type: "3" applies only to the route\_id: "5" bus - it does not apply to any other routes of route\_type: "3".

If a producer wants an alert to apply to route\_id: "5" as well as route\_type: "3", it should provide two separate EntitySelector fields, one referencing route\_id: "5" and another referencing route\_type: "3".

At least one specifier must be given - all fields in an EntitySelector cannot be empty.

	<p>General Information in terms of Service Alerts can be found here: <a href="#">Service Alerts   Realtime Transit   Google for Developers</a></p> <p>Specific Information to Section could be found here:</p> <p><a href="https://developers.google.com/transit/gtfs-realtime/reference#message-entityselector">https://developers.google.com/transit/gtfs-realtime/reference#message-entityselector</a></p>
---	---

<i>Field Name</i>	<i>Required</i>	<i>Cardinality</i>	<i>Description</i>
			<b>✓ Used in Swiss Implementation</b> <b>✗ Not used in Swiss Implementation</b>
<b>agency_id</b>	Conditionally required	One	<b>✓ Used in Swiss Implementation</b> The <b>agency_id</b> from the GTFS feed that this selector refers to. Go-Nummer is used in Swiss Implementation. See GTFS Static implementation
<b>route_id</b>	Conditionally required	One	<b>✓ Used in Swiss Implementation</b> The <b>route_id</b> from the GTFS that this selector refers to. If <b>direction_id</b> is provided, <b>route_id</b> must also be provided. Still DIVA Number is used for the Identification of the route. See GTFS Static implementation
<b>route_type</b>	Conditionally required	One	<b>✗ Not used in Swiss Implementation</b> The <b>route_type</b> from the GTFS that this selector refers to.
<b>direction_id</b>	Conditionally required	One	<b>✓ Used in Swiss Implementation</b> The <b>direction_id</b> from the GTFS feed trips.txt file, used to select all trips in one direction for a route, specified by <b>route_id</b> . If <b>direction_id</b> is provided, <b>route_id</b> must also be provided.
<b>trip</b>	Conditionally required	One	<b>✗ Not used in Swiss Implementation</b> Currently not implemented in EMS System The trip instance from the GTFS that this selector refers to. This <b>TripDescriptor</b> must resolve to a single trip instance in the GTFS data (e.g., a producer cannot provide only a <b>trip_id</b> for exact_times=0 trips). If the <b>ScheduleRelationship</b> field is populated within this <b>TripDescriptor</b> it will be ignored by consumers when attempting to identify the GTFS trip.
<b>stop_id</b>	Conditionally required	One	<b>✓ Used in Swiss Implementation</b> The <b>stop_id</b> from the GTFS feed that this selector refers to. SLOID is provide for StopID

*Table 5: Field definition – EntitySelector*

```

"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:sloid:6201"
  },
  {
    "agencyId": "82",
    "stopId": "ch:1:sloid:6201"
  }
],



```

Table 6: EntitySelector: Example OpenTransportData


11.2.5.6 Message TripDescription


 Not used in Swiss Implementation

	<p>General Information in terms of Service Alerts can be found here: <a href="#">Service Alerts   Realtime Transit   Google for Developers</a></p> <p>Specific Information to Section could be found here:</p> <p><a href="https://developers.google.com/transit/gtfs-realtime/reference#message-tripdescriptor">https://developers.google.com/transit/gtfs-realtime/reference#message-tripdescriptor</a></p>
---	---

	Not used for message TripDescription
	Used in Swiss Implementation for message StopTimeUpdate

11.2.5.7 Enum Cause

	<p>General Information in terms of Service Alerts can be found here: <a href="#">Service Alerts   Realtime Transit   Google for Developers</a></p> <p>Specific Information to Section could be found here:</p> <p><a href="https://developers.google.com/transit/gtfs-realtime/reference#enum-cause">https://developers.google.com/transit/gtfs-realtime/reference#enum-cause</a></p>
---	---

<i>Value GTFS</i>	<i>Value EMS</i>
<b>UNKNOWN_CAUSE</b>  Used in Swiss Implementation	AlertCause=unknown

<b>OTHER_CAUSE</b> ✔ Used in Swiss Implementation	AlertCause AlertCause = undefinedAlertCause AlertCause = serviceDisruption AlertCause = emergencyServicesCall AlertCause= routeBlockage AlertCause= specialEvent AlertCause=congestion
<b>TECHNICAL_PROBLEM</b> ✔ Used in Swiss Implementation	AlertCause=vehicleFailure AlertCause=technicalProblem
<b>STRIKE</b> ✘ Not used in Swiss Implementation	
<b>DEMONSTRATION</b> ✘ Not used in Swiss Implementation	
<b>ACCIDENT</b> ✔ Used in Swiss Implementation	AlertCause=accident
<b>HOLIDAY</b>	
<b>WEATHER</b> ✔ Used in Swiss Implementation	AlertCause=poorWeather
<b>MAINTENANCE</b> ✔ Used in Swiss Implementation	AlertCause=maintenaceWork
<b>CONSTRUCTION</b> ✔ Used in Swiss Implementation	AlertCause=constructionWork
<b>POLICE_ACTIVITY</b> ✘ Not used in Swiss Implementation	
<b>MEDICAL_EMERGENCY</b> ✘ Not used in Swiss Implementation	

Table 7: Field definition cause and comparison to EMS

**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

Table 8: Converter Rules EMS SBB to GTFS

```
"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"
    }
  ]
},
```

*Table 9: Cause: Example OpenTransportData*

### 11.2.5.8 Enum Effect

	<p>General Information in terms of Service Alerts can be found here: <a href="#">Service Alerts   Realtime Transit   Google for Developers</a></p> <p>Specific Information to Section could be found here:</p> <p><a href="https://developers.google.com/transit/gtfs-realtime/reference#enum-effect">https://developers.google.com/transit/gtfs-realtime/reference#enum-effect</a></p>
---	---


<i>Value GTFS</i>	<i>Value EMS</i>
<b>NO_SERVICE</b> ❌ Not used in Swiss Implementation	
<b>REDUCED_SERVICE</b> ❌ Not used in Swiss Implementation	
<b>SIGNIFICANT_DELAYS</b> ❌ Not used in Swiss Implementation	
<b>DETOUR</b> ❌ Not used in Swiss Implementation	
<b>ADDITIONAL_SERVICE</b> ❌ Not used in Swiss Implementation	
<b>MODIFIED_SERVICE</b> ❌ Not used in Swiss Implementation	
<b>OTHER_EFFECT</b> ❌ Not used in Swiss Implementation	
<b>UNKNOWN_EFFECT</b> ✅ Used in Swiss Implementation	Condition: Unknown
<b>STOP_MOVED</b> ❌ Not used in Swiss Implementation	

Table 10: Field definition "Effect" and comparison to EMS

<pre> "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"     }   ] } </pre>
---

Table 11: Effect: Example OpenTransportData

### 11.2.5.9 Message TranslatedString

	<p>General Information in terms of Service Alerts can be found here: <a href="#">Service Alerts   Realtime Transit   Google for Developers</a></p> <p>Specific Information to Section could be found here:</p> <p><a href="https://developers.google.com/transit/gtfs-realtime/reference#message-translatedstring">https://developers.google.com/transit/gtfs-realtime/reference#message-translatedstring</a></p>
---	---

<i>Field Name</i>	<i>Required</i>	<i>Cardinality</i>	<i>Description</i>
			<input checked="" type="checkbox"/> Used in Swiss Implementation <input type="checkbox"/> Not used in Swiss Implementation
<b>translation</b>	Required	Many	<input checked="" type="checkbox"/> Used in Swiss Implementation At least one translation must be provided.

Table 12: Field definition - TranslatedString

Used for the Elements "url", "headerText", "descriptionText"


```

"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"
    }
  ]
}

```

Table 13: TranslatedString: Example OpenTransportData

### 11.2.5.10 Message Translation

	<p>General Information in terms of Service Alerts can be found here: <a href="#">Service Alerts   Realtime Transit   Google for Developers</a></p> <p>Specific Information to Section could be found here:</p> <p><a href="https://developers.google.com/transit/gtfs-realtime/reference#fields_15">https://developers.google.com/transit/gtfs-realtime/reference#fields_15</a></p>
---	---

<i>Field Name</i>	<i>Required</i>	<i>Cardinality</i>	<i>Description</i>
			<input checked="" type="checkbox"/> Used in Swiss Implementation <input type="checkbox"/> Not used in Swiss Implementation
<b>text</b>	Required	One	<input checked="" type="checkbox"/> Used in Swiss Implementation A UTF-8 string containing the message.
<b>language</b>	Conditionally required	One	<input checked="" type="checkbox"/> Used in Swiss Implementation BCP-47 language code. Can be omitted if the language is unknown or if no internationalization is done at all for the feed. At most one translation is allowed to have an unspecified language tag - if there is more than one translation, the language must be provided.

Table 14: Field definition – Translation

```
"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"
    }
  ]
}
```

Table 15: Translation: Example OpenTransportData

## 11.2.6 Vehicle Position

 Not used in Swiss Implementation

### 11.2.6.1 Introduction

Not used in Swiss Profile


### 11.2.6.2 Elements

- [Alert](#)
  - [TimeRange](#)
  - [EntitySelector](#)
    - [TripDescriptor](#)
      - [ScheduleRelationship](#)
  - [Cause](#)
  - [Effect](#)
  - [TranslatedString](#)
    - [Translation](#)

### 11.2.6.3 Samples



## 11.2.7 Trip Updates (Provided by SBB)

	<a href="#">Updates zu Fahrten   Realtime Transit   Google Developers (Deutsch)</a>
	<a href="#">Trip Updates   Realtime Transit   Google Developers (Englisch)</a>

The only HTTP stream currently available in Switzerland in the GTFS-RT area.

### 11.2.7.1 Introduction

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-realtime feed.

A trip update can report that a trip has been cancelled, or it can update the progress of any number of stops on the trip. For example, a trip update may contain an arrival estimate only for the vehicle's next stop, or it may contain estimates for every remaining stop on the trip.

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

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.

Useful links:


- [FAQ to the Swiss Implementation](#)
- [Using HRDF timetable together with GTFS](#)

### 11.2.7.2 Elements

Full Element Index could be found here (Official Google Documentation):

<a href="#">GTFS Realtime Reference   Realtime Transit   Google Developers</a>	
•	<a href="#">TripUpdate</a>
•	<a href="#">TripDescriptor</a>
•	<a href="#">ScheduleRelationship</a>
•	<a href="#">VehicleDescriptor</a>
•	<a href="#">StopTimeUpdate</a>
•	<a href="#">StopTimeEvent</a>
•	<a href="#">ScheduleRelationship</a>

### 11.2.7.3 *message* TripUpdate

	General Information in terms of TripUpdates can be found here: <a href="#">Trip Updates   Realtime Transit   Google Developers</a>
	Specific Information to Section could be found here: <a href="https://developers.google.com/transit/gtfs-realtime/reference#message-tripupdate">https://developers.google.com/transit/gtfs-realtime/reference#message-tripupdate</a> <a href="#">Best Practices - General Transit Feed Specification (gtfs.org)</a>

<i>Field Name</i>	<i>Required</i>	<i>Cardinality</i>	<i>Description</i> <input checked="" type="checkbox"/> Used in Swiss Implementation <input type="checkbox"/> Not used in Swiss Implementation
<u>trip</u>	Required	One	<input checked="" type="checkbox"/> This element is used to match the referenced trip to <b>trips.txt</b> file from the corresponding GTFS feed
<u>vehicle</u>	Optional	One	<input type="checkbox"/> This element provides information that can be used to identify a particular vehicle
<u>stop_time_update</u>	Conditionally required	Many	<input checked="" type="checkbox"/> This element contains one or more instances of <b>StopTimeUpdate</b> . Each occurrence represents a prediction for a single stop. They must be in order of their stop sequence
<b>timestamp</b>	Optional	One	<input type="checkbox"/> This value refers to the moment at which the real-time progress was measured, specified in number of seconds since 1-Jan-1970 00:00:00 UTC
<b>delay</b>	Optional	One	<input type="checkbox"/> This value is only experimental at time of writing. It is used to indicate the number of seconds the vehicle is either early (negative number) or late (positive number). Estimates specified within <b>StopTimeUpdate</b> elements take precedence over this value

Figure 29: Field definition - TripUpdate

```


    "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"
        }
      ],
    },
  },

```

Figure 30: TripUpdate- Example OpenTransportData

### 11.2.7.4 *message* TripDescription

This element is used to match the referenced trip to [trips.txt](#) file from the corresponding GTFS feed. Since the `schedule_relationship` value is “SCHEDULED“, this trip corresponds to a trip in the Static File ([trips.txt](#))

	<p>Specific Information to this section could be found here:</p> <p><a href="https://developers.google.com/transit/gtfs-realtime/reference#message-tripdescriptor">https://developers.google.com/transit/gtfs-realtime/reference#message-tripdescriptor</a>  <a href="#">Best Practices - General Transit Feed Specification (gtfs.org)</a></p>
---	---

<i>Field Name</i>	<i>Required</i>	<i>Cardinality</i>	<i>Description</i> <input checked="" type="checkbox"/> Used in Swiss Implementation <input type="checkbox"/> Not used in Swiss Implementation
<b>trip_id</b>	Conditionally required	One	<input checked="" type="checkbox"/> This is the ID of a trip as it appears in the <a href="#">trips.txt</a> of the corresponding GTFS feed. Alternatively, this value may refer to a trip that has been added via a <a href="#">TripUpdate</a> message and does not exist in the GTFS feed
<b>route_id</b>	Conditionally required	One	<input checked="" type="checkbox"/> If this value is specified, it should match the route ID for the trip specified in <b>trip_id</b> . If the <b>route_id</b> is specified but no <b>trip_id</b> is specified, then this trip descriptor references all trips for the given route.
<b>direction_id</b>	Conditionally required	One	<input type="checkbox"/> This value corresponds to the <b>direction_id</b> value as specified in the <a href="#">trips.txt</a> file of the corresponding GTFS feed. At time of writing this is an experimental field in the GTFS-realtime specification. GTFS-Flex already provides this element. Will be added in RT (next Version)
<b>start_time</b>	Conditionally required	One	<input checked="" type="checkbox"/> If the specified trip in <b>trip_id</b> is a frequency-expanded trip, this value must be specified to determine which instance of a trip this selector refers to. Its value is in the format HH:MM:SS, as in the <a href="#">stop_times.txt</a> and <a href="#">frequencies.txt</a> files
<b>start_date</b>	Conditionally required	One	<input checked="" type="checkbox"/> It is possible that knowing the <b>trip_id</b> may not be enough to determine a specific trip. For instance, if a train is scheduled to depart at 11:30 PM but is running 40 minutes late, then you would need to know its date to match up with the original trip (40 minutes late), and not the next day's instance of the trip (23 hours 20 minutes early). This field helps to avoid this ambiguity. The date is specified in YYYYMMDD format.

<b>schedule_relation-ship</b>	Optional	One	<input checked="" type="checkbox"/> This value indicates the relationship between the trip(s) specified in this selector and its regular schedule
-------------------------------	----------	-----	--

Figure 31: Field definition – TripDescription



Specific Information to this section could be found here:

<https://developers.google.com/transit/gtfs-realtime/reference#enum-schedulerelationship-2>


<i>Value</i>	<i>Comment</i>
<b>SCHEDULED</b>	✔ Trip that is running in accordance with its GTFS schedule, or is close enough to the scheduled trip to be associated with it.
<b>ADDED</b>	✔ An extra trip that was added in addition to a running schedule, for example, to replace a broken vehicle or to respond to sudden passenger load.
<b>UNSCHE- ULED</b>	A trip that is running with no schedule associated to it - this value is used to identify trips defined in GTFS frequencies.txt with exact_times = 0. It should not be used to describe trips not defined in GTFS frequencies.txt, or trips in GTFS frequencies.txt with exact_times = 1.
<b>CANCELED</b>	✔ A trip that existed in the schedule but was removed.

Figure 32: Value definition: Enum ScheduleRelationship

```
"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": "20230330",
    "ScheduleRelationship": "Scheduled"
  }
}
```

Figure 33: TripDescription - Example OpenTransportData

### 11.2.7.5 Message VehicleDescription

 Not used in Swiss Implementation

This element provides information that can be used to identify a particular vehicle.




Specific Information to this section could be found here:

<https://developers.google.com/transit/gtfs-realtime/reference#message-vehicledescriptor>  
[Best Practices - General Transit Feed Specification \(gtfs.org\)](#)

### 11.2.7.6 *message* StopTimeUpdate

This element contains one or more instances of StopTimeUpdate. Each occurrence represents a prediction for a single stop. They must be in order of their stop sequence.

The **stop\_time\_update** elements contain information specific to a stop on the trip. It is repeated for each stop that there is information for. If the trip has been cancelled (indicated by a schedule\_relationship value of CANCELED) then there will no stop\_time\_update elements.

	<p>Specific Information to this section could be found here:</p> <p><a href="https://developers.google.com/transit/gtfs-realtime/reference#message-stoptimeupdate">https://developers.google.com/transit/gtfs-realtime/reference#message-stoptimeupdate</a>  <a href="#">Best Practices - General Transit Feed Specification (gtfs.org)</a></p>
---	---

<i>Field Name</i>	<i>Required</i>	<i>Cardinality</i>	<i>Description</i> <input checked="" type="checkbox"/> Used in Swiss Implementation <input type="checkbox"/> Not used in Swiss Implementation
<b>stop_sequence</b>	Conditionally required	One	<input checked="" type="checkbox"/> In GTFS feeds, the order of stops in a trip is indicated by the <b>stop_sequence value</b> in <b>stop_times.txt</b> . If specified, the value specified in the <b>StopTimeUpdate</b> must match the value from the GTFS feed. It is possible for a single trip to make multiple visits to a single stop (for example, if it's a loop service), so this value is important.
<b>stop_id</b>	Conditionally required	One	<input checked="" type="checkbox"/> This value corresponds to a single stop from the associated GTFS feed. Using this value and the <b>stop_sequence</b> value, it is possible to pinpoint a specific record from <b>stop_times.txt</b> that this <b>StopTimeUpdate</b> element alters
<b>arrival</b>	Conditionally required	One	<input checked="" type="checkbox"/> Specifies the updated arrival time. If the <b>schedule_relationship</b> is <b>SCHEDULED</b> , then this field and/or departure must be specified. = StopTimeEvent
<b>departure</b>	Conditionally required	One	<input checked="" type="checkbox"/> Specifies the updated departure time. If the <b>schedule_relationship</b> is <b>SCHEDULED</b> , then this field and/or arrival must be specified. = StopTimeEvent
<b>schedule_relationship</b>	Optional	One	<input checked="" type="checkbox"/> If no value is specified, this defaults to <b>SCHEDULED</b> . Other possible values and their meanings are as described below

Figure 34: Field definition – StopTimeUpdate



Specific Information to this section could be found here:

<https://developers.google.com/transit/gtfs-realtime/reference#enum-schedulereationship>

<i>Value</i>	<i>Comment</i>
<b>SCHED- ULED</b>	The vehicle is proceeding in accordance with its static schedule of stops, although not necessarily according to the times of the schedule. This is the default behaviour. At least one of arrival and departure must be provided.
<b>SKIPPED</b>	The stop is skipped, i.e., the vehicle will not stop at this stop. The arrival and departure fields are optional.
<b>NO_DATA</b>	No data is given for this stop. It indicates that there is no realtime information available. When set NO_DATA is propagated through subsequent stops so this is the recommended way of specifying from which stop you do not have realtime information. When NO_DATA is set neither arrival nor departure should be supplied.

Figure 35: Value definition: Enum ScheduleRelationship



### 11.2.7.7 message StopTimeEvent



Specific Information to this section could be found here:

<https://developers.google.com/transit/gtfs-realtime/reference#message-stoptimeevent>  
[Best Practices - General Transit Feed Specification \(gtfs.org\)](https://gtfs.org/)

Field Name	Required	Cardinality	Description <input checked="" type="checkbox"/> Used in Swiss Implementation <input type="checkbox"/> Not used in Swiss Implementation
<b>delay</b>	Conditionally required	One	<input checked="" type="checkbox"/> The number of seconds that a vehicle is early (a negative value) or late (a positive value). A value of 0 indicates the vehicle is exactly on time
<b>time</b>	Conditionally required	One	The time of the arrival or departure, specified in number of seconds since 1-Jan-1970 00:00:00 UTC
<b>uncertainty</b>	Optional	One	Represents the level of uncertainty attached to this prediction in seconds. A value of 0 means is it completely certain, while an omitted value means an unknown level of uncertainty.

```

"StopTimeUpdate": [
  {
    "StopSequence": 1,
    "StopId": "8775605",
    "Departure": {
      "Delay": 0
    },
    "ScheduleRelationship": "Scheduled"
  },
  {
    "StopSequence": 7,
    "StopId": "8775100",
    "Arrival": {
      "Delay": 4200
    },
    "Departure": {
      "Delay": 4200
    },
    "ScheduleRelationship": "Scheduled"
  },
  {
    "StopSequence": 8,
    "StopId": "8731901",
    "Arrival": {
      "Delay": 4800
    },
    "Departure": {
      "Delay": 4800
    },
    "ScheduleRelationship": "Scheduled"
  },
  {
    "StopSequence": 10,
    "StopId": "8772568",
    "Arrival": {
      "Delay": 4200
    },
    "Departure": {
      "Delay": 4200
    },
    "ScheduleRelationship": "Scheduled"
  },
  {
    "StopSequence": 11,
    "StopId": "8772500",
    "Arrival": {
      "Delay": 4800
    }
  }
]

```

```
    },  
    "Departure": {  
      "Delay": 4800  
    },  
    "ScheduleRelationship": "Scheduled"  
  }  
]
```

*Figure 36: StopTimeUpdate - Example OpenTransportData*

### 11.2.7.8 Samples from OpenTransportData

#### Complete Sample form OpenTransportData Platform:

```
"Entité": [
  {
    "Id": "350.TA.91-K4-j23-1.25.R",
    "Is Deleted": false,
    "Trip Update": {
      "Trip": {
        "Thripid": "350.TA.91-K4-j23-1.25.R",
        "RouteId": "91-K4-j23-1",
        "StartTime": "06:42:00",
        "StartDate": "20230329",
        "ScheduleRelationship": "Scheduled"
      },
      "StopTimeUpdate": [
        {
          "StopSequence": 1,
          "StopId": "8711300",
          "Departure": {
            "Delay": 0
          },
          "ScheduleRelationship": "Scheduled"
        },
        {
          "StopSequence": 2,
          "StopId": "8711819",
          "Arrival": {
            "Delay": 600
          },
          "Departure": {
            "Delay": 600
          },
          "ScheduleRelationship": "Scheduled"
        },
        {
          "StopSequence": 5,
          "StopId": "8711825",
          "Arrival": {
            "Delay": 300
          },
          "Departure": {
            "Delay": 300
          },
          "ScheduleRelationship": "Scheduled"
        },
        {
          "StopSequence": 7,
          "StopId": "8714200",
          "Arrival": {
            "Delay": 0
          },
          "Departure": {
            "Delay": 0
          },
          "ScheduleRelationship": "Scheduled"
        },
        {
          "StopSequence": 9,
          "StopId": "8714212",
          "Arrival": {
            "Delay": 0
          },
          "Departure": {
            "Delay": -120
          },
          "ScheduleRelationship": "Scheduled"
        },
        {
          "StopSequence": 10,
          "StopId": "8718500",
          "Arrival": {
            "Delay": 0
          },
          "Departure": {
```


```

    "Delay": 0
  },
  "ScheduleRelationship": "Scheduled"
}
]
},

```

Full Trip Update example from Google: [Full Trip Update example | Realtime Transit | Google Developers](#)

## 12 Extension under development: GTFS-Flex

	The real content may change as development progresses.
---	--

### 12.1 GTFS Flex

#### 12.1.1 Links

No	Description	Link
1	General Description	<a href="#">GitHub - MobilityData/gtfs-flex: A data format that models flexible public transportation services as an extension to GTFS</a>
2	General File-Set	<a href="#">gtfs-flex/RTDgtfsflexdraft_2017-05-31.zip at master · MobilityData/gtfs-flex · GitHub</a>
3	Actual Documentation	<a href="#">gtfs-flex/reference.md at master · MobilityData/gtfs-flex · GitHub</a>
4	GTFS Flex File-Set (On Demand)	<a href="#">gtfs-flex/FlexExample--on-demand-service.zip at master · MobilityData/gtfs-flex · GitHub</a>
5	GTFS Flex File Set (Same Day)	<a href="#">gtfs-flex/FlexExample--same-day-service.zip at master · MobilityData/gtfs-flex · GitHub</a>

#### 12.1.2 Description


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 in real-time by providing information about alternative routes, stops, and departure times.

An example of this is a bus that normally has a fixed schedule but can also deviate from certain stops at certain times upon request to pick up or drop off passengers. With GTFS-Flex, these flexible route information can be integrated into the GTFS format to make public transportation even more user-friendly and efficient.

### 12.1.2.1 Overview

	<p>Specific Information to this section could be found here:</p> <p><a href="https://github.com/MobilityData/gtfs-flex">GitHub - MobilityData/gtfs-flex: A data format that models flexible public transportation services as an extension to GTFS</a></p> <p><a href="https://github.com/MobilityData/gtfs-flex/blob/master/reference.md">gtfs-flex/reference.md at master · MobilityData/gtfs-flex · GitHub</a></p>
---	---

### 12.1.2.2 Schematic Extensions

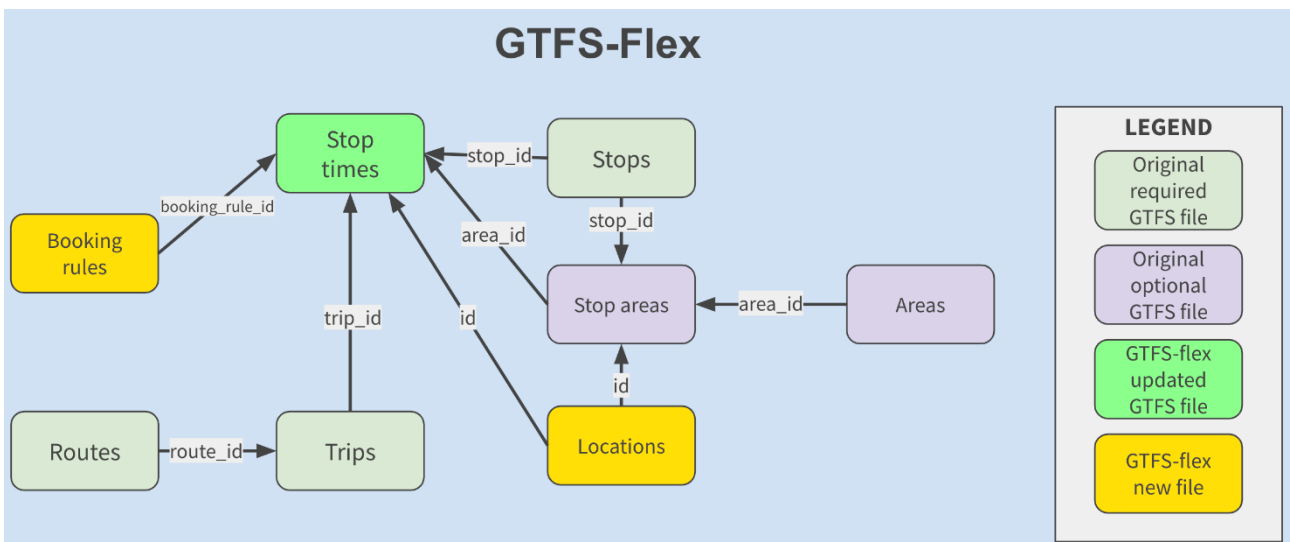


Figure 37: GTFS-Flex Extensions

### 12.1.2.3 General Extensions

Extension Name	Short Description
<a href="#">GTFS- Flexible Trips</a>	Flexible services that operate according to some schedule but are responsive to on-demand requests of individual riders.
<a href="#">GTFS Booking Rules</a>	Booking information for rider-requested services using <b>GTFS-FlexibleTrips</b> , such as how

	far in advance booking should occur or a phone number that should be called.
--	--



To integrate GTFS-Flex into a GTFS implementation, several files in the GTFS feed usually need to be modified. Here are the files and fields that typically need to be adjusted:

1. calendar.txt: The calendar.txt file contains information about the schedule that applies to each route. To support GTFS-Flex, the file needs to be extended with the "service\_flex" field. This field indicates whether the route is flexible or not. When the "service\_flex" field is set to "1", the route is flexible.
2. trips.txt: The trips.txt file contains information about each trip on each route. To support GTFS-Flex, the fields "trip\_flex", "start\_flex", "end\_flex", "pickup\_flex", and "drop\_off\_flex" need to be added. These fields indicate whether the trip is flexible and which stops and time windows are flexible.
3. stops.txt: The stops.txt file contains information about each stop in the system. To support GTFS-Flex, the fields "stop\_flex" and "stop\_lonlat\_flex" need to be added. The "stop\_flex" field indicates whether the stop is flexible, while the "stop\_lonlat\_flex" field indicates the geographic coordinates of the stop when it is flexible.
4. [stop\\_times.txt](#): The stop\_times.txt file contains information about each stop arrival and departure for each trip. To support GTFS-Flex, based on the use case / application area of GTFS-Flex different fields have to be added to the file. For details please refer to: [gtfs-flex/reference.md at master · MobilityData/gtfs-flex · GitHub](#)
5. agency.txt: The agency.txt file contains information about the transit agency operating the service. To support GTFS-Flex, the "agency\_phone" field needs to be added. This field provides a phone number that passengers can call to request flexible service.
6. areas.txt: Adding area\_id and area\_name. Area.txt file would become necessary in the future. For more details please refer to : [gtfs-flex/reference.md at master · MobilityData/gtfs-flex · GitHub](#)
7. stop\_areas.txt: file would become necessary in the future. As well some Extensions to the Standard-Implementation
8. locations.geojson: File will be necessary.

12.1.2.4 Data-Set Files - New files for GTFS-Flex


areas.txt: Adding area\_id and area\_name. Area.txt file would become necessary in the future. For more details please refer to : [gtfs-flex/reference.md at master · MobilityData/gtfs-flex · GitHub](#)

- Blue = Files are already implemented (GTFS Static)
- Green = New Files for (GTFS Flex) Implementation
- Red = Extensions of already existing Files in terms of the GTFS Flex implementation

No	Filename	Re-quired	Definition
			 <b>Used in Swiss Implementation</b>  <b>Not used in Swiss Implementation</b>

1	<a href="#">agency.txt</a>	Required	Transit agencies with service represented in this dataset
2	<a href="#">areas.txt</a>	Required	Defines area Identifiers
6	<a href="#">routes.txt</a>	Required	Transit routes. A route is a group of trips that are displayed to riders as a single service
3	<a href="#">Booking_rules.txt</a>	Required	Defines the rules / requirements that must be met for a successful booking
4	<a href="#">stops.txt</a>	Required	Stops where vehicles pick up or drop off riders. Also defines stations and station entrances.
5	<a href="#">Stop_areas.txt</a>	Required	
7	<a href="#">trips.txt</a>	Required	Trips for each route. A trip is a sequence of two or more stops that occur during a specific time period.
8	<a href="#">stop_times.txt</a>	Required	<b>Extensions in Terms of GTFS-Flex:</b> Times that a vehicle arrives at and departs from stops for each trip.
9	<a href="#">calendar.txt</a>	Required	Service dates specified using a weekly schedule with start and end dates. This file is required unless all dates of service are defined in <a href="#">calendar.txt</a>
10	<a href="#">calendar_dates.txt</a>	Required	Exceptions for the services defined in the <a href="#">calendar.txt</a> . If <a href="#">calendar.txt</a> is omitted, then <a href="#">calendar_dates.txt</a> is required and must contain all dates of service.
11	<a href="#">fare_attributes.txt</a>	Optional	Not used: Current prices and fares are not yet provided
12	<a href="#">fare_rules.txt</a>	Optional	Not used: Current prices and fares are not yet provided
13	<a href="#">shapes.txt</a>	Optional	Not used because the locations.geojson is used.
14	<a href="#">frequencies.txt</a>	Optional	not used
15	<a href="#">transfers.txt</a>	Required	When Calculating an itinerary, GTFS-consuming applications interpolate transfers based on allowable time and top proximity
16	<a href="#">pathways.txt</a>	Optional	we do not yet map multi-level stops
17	<a href="#">levels.txt</a>	Optional	we do not yet map multi-level stops
18	<a href="#">feed_info.txt</a>	Required	This file contains information about the dataset itself, rather than the service the dataset describes
19	<a href="#">translations.txt</a>	Optional	Not used
20	<a href="#">attributions.txt</a>	Optional	Not used

## Message StopTimeEvent


	<p>Specific Information to this section could be found here:</p> <ul style="list-style-type: none"> <li>• <a href="https://developers.google.com/transit/gtfs-realtime/reference#message-stoptimeevent">https://developers.google.com/transit/gtfs-realtime/reference#message-stoptimeevent</a></li> <li>• <a href="#">Best Practices - General Transit Feed Specification (gtfs.org)</a></li> </ul>
---	--

<i>Field Name</i>	<i>Required</i>	<i>Cardinality</i>	<i>Description</i> <input checked="" type="checkbox"/> <b>Used in Swiss Implementation</b> <input type="checkbox"/> <b>Not used in Swiss Implementation</b>
<b>delay</b>	Conditionally required	One	<input checked="" type="checkbox"/> The number of seconds that a vehicle is early (a negative value) or late (a positive value). A value of 0 indicates the vehicle is exactly on time
<b>time</b>	Conditionally required	One	The time of the arrival or departure, specified in number of seconds since 1-Jan-1970 00:00:00 UTC
<b>uncertainty</b>	Optional	One	Represents the level of uncertainty attached to this prediction in seconds. A value of 0 means is it completely certain, while an omitted value means an unknown level of uncertainty.

Current On-Demand Requirements and Data

## 12.2 Extension under development: GTFS GTFS-flex (Swiss Profile)


### 12.2.1 area.txt

	<p>Specific Information to Section could be found here:</p> <p><a href="#">Reference - General Transit Feed Specification (gtfs.org) gtfs-flex/spec/reference.md at master · MobilityData/gtfs-flex (github.com)</a></p>
---	--

Analog Area-Datei für NeTEX (2.2.2.2)

<b>Field Name</b>	<b>Presence</b>	<b>Description</b> <input checked="" type="checkbox"/> <b>Used in Swiss Implementation</b> <input type="checkbox"/> <b>Not used in Swiss Implementation</b>
area_id	<b>Required</b>	<input checked="" type="checkbox"/> <b>Used in Swiss Implementation</b> Identifies an area. Must be unique in areas.txt.
area_name	<b>Optional</b>	<input checked="" type="checkbox"/> <b>Used in Swiss Implementation</b> The name of the area as displayed to the rider.

### 12.2.2 stop\_areas.txt


	<p>Specific Information to Section could be found here:</p> <p><a href="#">gtfs-flex/spec/reference.md at master · MobilityData/gtfs-flex · GitHub Reference - General Transit Feed Specification (gtfs.org)</a></p> <p>Adjustments on this file currently made in <a href="#">GTFS-Flex by tzujenchanmbd · Pull Request #388 · google/transit · GitHub</a> (02.08.23)</p>
---	--



Field Name	Required	Description
		<p>✔ Used in Swiss Implementation</p> <p>✘ Not used in Swiss Implementation</p>
area_id	Required	<p>✔ Used in Swiss Implementation</p> <p>Identifies an area to which one or multiple stop_ids belong. The same stop_id may be defined in many area_ids.</p> <p>May also identify a group of stops and/or GeoJSON locations that together indicate locations where a rider may request pickup or drop off.</p> <p>It is forbidden to define an area_id with the same value as a stop_id or id from locations.geojson.</p>
stop_id	Required	<p>✔ Used in Swiss Implementation</p> <p>Identifies a stop or GeoJSON location. If a station (i.e. a stop with stops.location_type=1) is defined in this field, it is assumed that all of its platforms (i.e. all stops with stops.location_type=0 that have this station defined as stops.parent_station) are part of the same area. This behaviour can be overridden by assigning platforms to other areas.</p>

Table 1:Field definitions stop\_areas.txt

### 12.2.3 booking\_rules.txt

	<p>Specific Information to Section could be found here:</p> <p><a href="https://github.com/MobilityData/gtfs-flex/blob/master/spec/reference.md">gtfs-flex/spec/reference.md at master · MobilityData/gtfs-flex (github.com)</a></p>
---	--


Field Name	Required	Description
		<p>✔ Used in Swiss Implementation</p> <p>✘ Not used in Swiss Implementation</p>
booking_rule_id	Required	<p>✔ Used in Swiss Implementation</p> <p>Identifies the rule.</p>
booking_type	Required	<p>✔ Used in Swiss Implementation</p> <p>Indicates how far in advance booking can be made. Valid options are:</p> <p>0 - Real time booking.  1 - Up to same-day booking with advance notice.  2 - Up to prior day(s) booking.</p>
prior_notice_duration_min	Conditionally Required	<p>✔ Used in Swiss Implementation</p> <p>Minimum number of minutes before travel to make the request.</p> <p><b>Conditionally Required:</b></p> <ul style="list-style-type: none"> <li>- <b>Required</b> for booking_type=1.</li> <li>- <b>Forbidden</b> otherwise.</li> </ul>

prior_notice_duration_max	<b>Conditionally Forbidden</b>	<p>✔ Used in Swiss Implementation Maximum number of minutes before travel to make the booking request.</p> <p><b>Conditionally Forbidden:</b></p> <ul style="list-style-type: none"> <li>- <b>Forbidden</b> for booking_type=0 and booking_type=2.</li> <li>- Optional for booking_type=1.</li> </ul>
prior_notice_last_day	<b>Conditionally Required</b>	<p>✘ Not used in Swiss Implementation Last day before travel to make the booking request.</p> <p>Example: "Ride must be booked 1 day in advance before 5PM" will be encoded as prior_notice_last_day=1.</p> <p><b>Conditionally Required:</b></p> <ul style="list-style-type: none"> <li>- <b>Required</b> for booking_type=2.</li> <li>- <b>Forbidden</b> otherwise.</li> </ul>
prior_notice_last_time	<b>Conditionally Required</b>	<p>✘ Not used in Swiss Implementation Last time on the last day before travel to make the booking request.</p> <p>Example: "Ride must be booked 1 day in advance before 5PM" will be encoded as prior_notice_last_time=17:00:00.</p> <p><b>Conditionally Required:</b></p> <ul style="list-style-type: none"> <li>- <b>Required</b> if prior_notice_last_day is defined.</li> <li>- <b>Forbidden</b> otherwise.</li> </ul>
prior_notice_start_day	<b>Conditionally Forbidden</b>	<p>✘ Not used in Swiss Implementation Earliest day before travel to make the booking request.</p> <p>Example: "Ride can be booked at the earliest one week in advance at midnight" will be encoded as prior_notice_start_day=7.</p> <p><b>Conditionally Forbidden:</b></p> <ul style="list-style-type: none"> <li>- <b>Forbidden</b> for booking_type=0.</li> <li>- <b>Forbidden</b> for booking_type=1 if prior_notice_duration_max is defined.</li> <li>- Optional otherwise.</li> </ul>
prior_notice_start_time	<b>Conditionally Required</b>	<p>✘ Not used in Swiss Implementation Earliest time on the earliest day before travel to make the booking request.</p> <p>Example: "Ride can be booked at the earliest one week in advance at midnight" will be encoded as prior_notice_start_time=00:00:00.</p> <p><b>Conditionally Required:</b></p> <ul style="list-style-type: none"> <li>- <b>Required</b> if prior_notice_start_day is defined.</li> <li>- <b>Forbidden</b> otherwise.</li> </ul>
prior_notice_service_id	<b>Conditionally Forbidden</b>	<p>✘ Not used in Swiss Implementation Indicates the service days on which prior_notice_last_day or prior_notice_start_day are counted.</p>

		<p>Example: If empty, prior_notice_start_day=2 will be two calendar days in advance. If defined as a service_id containing only business days (weekdays without holidays), prior_notice_start_day=2 will be two business days in advance.</p> <p><b>Conditionally Forbidden:</b></p> <ul style="list-style-type: none"> <li>- Optional if booking_type=2.</li> <li>- <b>Forbidden</b> otherwise.</li> </ul>
message	Optional	<p>✔ Used in Swiss Implementation</p> <p>Message to riders utilizing service at a stop_time when booking on-demand pickup and drop off. Meant to provide minimal information to be transmitted within a user interface about the action a rider must take in order to utilize the service.</p>
pickup_message	Optional	<p>✘ Not used in Swiss Implementation</p> <p>Functions in the same way as message but used when riders have on-demand pickup only.</p>
drop_off_message	Optional	<p>✘ Not used in Swiss Implementation</p> <p>Functions in the same way as message but used when riders have on-demand drop off only.</p>
phone_number	Optional	<p>✔ Used in Swiss Implementation</p> <p>Phone number to call to make the booking request.</p>
info_url	Optional	<p>✔ Used in Swiss Implementation</p> <p>URL providing information about the booking rule.</p>
booking_url	Optional	<p>✘ Not used in Swiss Implementation</p> <p>URL to an online interface or app where the booking request can be made.</p>

Table 2: Field definitions booking\_rules.txt

#### 12.2.4 stop\_times.txt (File extensions)

	<p>Specific Information to Section could be found here:</p> <p><a href="#">gtfs-flex/spec/reference.md at master · MobilityData/gtfs-flex (github.com)</a>  <a href="#">Reference - General Transit Feed Specification (gtfs.org)</a></p>
---	---

Field Name	Presence	Description
		<p>✔ Used in Swiss Implementation</p> <p>✘ Not used in Swiss Implementation</p>
stop_id	Required	✔ Used in Swiss Implementation


		<p>Identifies the serviced stop. All stops serviced during a trip must have a record in stop_times.txt. Referenced locations must be stops, not stations or station entrances. A stop may be serviced multiple times in the same trip, and multiple trips and routes may service the same stop.</p> <p>If service is on demand, a GeoJSON location or stop area can be referenced:  <b>id from locations.geojson</b>  <b>- stop_areas.area_id</b></p>
stop_sequence	<b>Required</b>	<p>✔ <b>Used in Swiss Implementation</b></p> <p>Order of stops for a particular trip. The values must increase along the trip but do not need to be consecutive.</p> <p><i>Example: The first location on the trip could have a stop_sequence=1, the second location on the trip could have a stop_sequence=23, the third location could have a stop_sequence=40, and so on.</i></p> <p>Travel within the same <b>stop area</b> or <b>GeoJSON location</b> requires <b>two records in stop_times.txt</b> with the <b>same stop_id</b> and consecutive values of stop_sequence.</p>
arrival_time	<b>Conditionally Required</b>	<p>✔ <b>Used in Swiss Implementation</b></p> <p>Arrival time at a specific stop for a specific trip on a route. If there are not separate times for arrival and departure at a stop, enter the same value for arrival_time and departure_time.</p> <p>Scheduled stops where the vehicle strictly adheres to the specified arrival and departure times are timepoints. If this stop is not a timepoint, it is recommended to provide an estimated or interpolated time. If this is not available, arrival_time can be left empty. Further, indicate that interpolated times are provided with timepoint=0. If interpolated times are indicated with timepoint=0, then time points must be indicated with timepoint=1. Provide arrival times for all stops that are timepoints.</p> <p><b>Conditionally Required:</b></p> <ul style="list-style-type: none"> <li>- <b>Required</b> for the first and the last stop in a trip.</li> <li>- <b>Forbidden</b> when stop_times.start_pickup_drop_off_window or stop_times.end_pickup_drop_off_window are defined.</li> </ul>
departure_time	<b>Conditionally Required</b>	<p>✔ <b>Used in Swiss Implementation</b></p> <p>Departure time from a specific stop for a specific trip on a route. If there are not separate times for arrival and departure at a stop, enter the same value for arrival_time and departure_time. See</p>

		<p>the arrival_time description for more details about using timepoints correctly.</p> <p>The departure_time field should specify time values whenever possible, including non-binding estimated or interpolated times between timepoints.</p> <p><b>Conditionally Required:</b></p> <ul style="list-style-type: none"> <li>- <b>Required</b> for the first and the last stop in a trip.</li> <li>- <b>Forbidden</b> when stop_times.start_pickup_drop_off_window or stop_times.end_pickup_drop_off_window are defined.</li> </ul>
start_pickup_drop_off_window	<b>Conditionally Required</b>	<p>✔ <b>Used in Swiss Implementation</b></p> <p>Time that on-demand service becomes available in a GeoJSON location, stop area or stop.</p> <p><b>Conditionally Required:</b></p> <ul style="list-style-type: none"> <li>- <b>Required</b> if stop_times.stop_id refers to stop_areas.area_id or id from locations.geojson.</li> <li>- <b>Forbidden</b> if stop_times.arrival_time or stop_times.departure_time are defined.</li> </ul>
end_pickup_drop_off_window	<b>Conditionally Required</b>	<p>✔ <b>Used in Swiss Implementation</b></p> <p>Time that on-demand service ends in a GeoJSON location, stop area or stop.</p> <p><b>Conditionally Required:</b></p> <ul style="list-style-type: none"> <li>- <b>Required</b> if stop_times.stop_id refers to stop_areas.area_id or id from locations.geojson.</li> <li>- <b>Forbidden</b> if stop_times.arrival_time or stop_times.departure_time are defined.</li> </ul>
pickup_type	<b>Conditionally Forbidden</b>	<p>✔ <b>Used in Swiss Implementation</b></p> <p>Indicates pickup method. Valid options are:</p> <p>0 or empty - Regularly scheduled pickup.  1 - No pickup available.  2 - Must phone agency to arrange pickup.  3 - Must coordinate with driver to arrange pickup.</p> <p><b>Conditionally Forbidden:</b></p> <ul style="list-style-type: none"> <li>- pickup_type=0 <b>forbidden</b> for stop_times.stop_id referring to stop_areas.area_id or id from locations.geojson.</li> <li>- pickup_type=3 <b>forbidden</b> for stop_areas.area_id or locations.geojson.</li> <li>- Optional otherwise.</li> </ul>
drop_off_type	<b>Conditionally Forbidden</b>	<p>✔ <b>Used in Swiss Implementation</b></p> <p>Indicates drop off method. Valid options are:</p> <p>0 or empty - Regularly scheduled drop off.  1 - No drop off available.  2 - Must phone agency to arrange drop off.  3 - Must coordinate with driver to arrange drop off.</p> <p><b>Conditionally Forbidden:</b></p>

		<p>- drop_off_type=0 <b>forbidden</b> for stop_times.stop_id referring to stop_areas.area_id or id from locations.geojson.</p> <p>- Optional otherwise.</p>
mean_duration_factor and mean_duration_offset	<b>Conditionally Forbidden</b>	<p><b>✗ Not used in Swiss Implementation</b></p> <p>Together, mean_duration_factor and mean_duration_offset allow an estimation of the duration a rider's trip will take, in minutes, using the on-demand service in a GeoJSON location or stop area.</p> <p>Data consumers are expected to use mean_duration_factor and mean_duration_offset to make the following calculation:</p> <p><b>Conditionally Forbidden:</b></p> <ul style="list-style-type: none"> <li>- <b>Forbidden</b> if stop_times.stop_id does not refer to a stop_areas.area_id or an id from locations.geojson.</li> <li>- Optional otherwise.</li> </ul>
safe_duration_factor and safe_duration_offset	<b>Conditionally Forbidden</b>	<p><b>✗ Not used in Swiss Implementation</b></p> <p>Together, safe_duration_factor and safe_duration_offset allow an estimation of the longest amount of time a rider can expect the on-demand service in a GeoJSON location or stop areas may require, in minutes, for 95% of trips.</p> <p>Data consumers are expected to use safe_duration_factor and safe_duration_offset to make the following calculation:</p> <p><b>Conditionally Forbidden:</b></p> <ul style="list-style-type: none"> <li>- <b>Forbidden</b> if stop_times.stop_id does not refer to a stop_areas.area_id or an id from locations.geojson.</li> <li>- Optional otherwise</li> </ul>
pickup_booking_rule_id	<b>Optional</b>	<p><b>✗ Not used in Swiss Implementation</b></p> <p>Identifies the boarding booking rule at this stop time.</p> <p>Recommended when pickup_type=2.</p>
drop_off_booking_rule_id	<b>Optional</b>	<p><b>✗ Not used in Swiss Implementation</b></p> <p>Identifies the boarding booking rule at this stop time.</p> <p>Recommended when pickup_type=2.</p>

Tabelle 3: Field definitions stop\_times.txt

### 12.2.5 locations.geojson

	<p>Specific Information to Section could be found here:</p> <p><a href="https://github.com/MobilityData/gtfs-flex/blob/master/spec/reference.md">gtfs-flex/spec/reference.md at master · MobilityData/gtfs-flex (github.com)</a></p>
---	--

#### General Information:

- This file uses a subset of the GeoJSON format, described in [RFC 7946](https://tools.ietf.org/html/rfc7946).
- The locations.geojson file must contain a FeatureCollection.

- A FeatureCollection defines various stop locations where riders may request pickup or drop off.
- Every GeoJSON Feature must have an id. The id belongs to the same namespace as stop\_id in stops.txt and area\_id in stop\_areas.txt, called “stop locations”.
- Every GeoJSON Feature should have objects and associated keys according to the table below:

Field Name	Presence	Description <input checked="" type="checkbox"/> <b>Used in Swiss Implementation</b> <input type="checkbox"/> <b>Not used in Swiss Implementation</b>
- type	<b>Required</b>	<input checked="" type="checkbox"/> <b>Used in Swiss Implementation</b> "FeatureCollection" of locations.
- features	<b>Required</b>	<input checked="" type="checkbox"/> <b>Used in Swiss Implementation</b> Collection of "Feature" objects describing the locations.
- type	<b>Required</b>	<input checked="" type="checkbox"/> <b>Used in Swiss Implementation</b> "Feature"
- id	<b>Required</b>	<input checked="" type="checkbox"/> <b>Used in Swiss Implementation</b> Location ID belonging to the same namespace as stops.stop_id. It is forbidden to define an id from locations.geojson with the same value as a stops.stop_id.
- properties	<b>Required</b>	<input checked="" type="checkbox"/> <b>Used in Swiss Implementation</b> Location property keys.
- stop_name	Optional	<input checked="" type="checkbox"/> <b>Used in Swiss Implementation</b> Indicates the name of the location as displayed to riders.
- stop_desc	Optional	<input type="checkbox"/> <b>Not used in Swiss Implementation</b> Meaningful description of the location to help orient riders.
- zone_id	<b>Conditionally Required</b>	<input type="checkbox"/> <b>Not used in Swiss Implementation</b> Identifies the fare zone for a stop.  Conditionally required: - <b>Required</b> if fare_rules.txt is defined. - Optional otherwise.
- stop_url	Optional	URL of a web page about the location.  If provided, the URL should be different from the agency.agency_url and the routes.route_url field values.
- geometry	<b>Required</b>	<input checked="" type="checkbox"/> <b>Used in Swiss Implementation</b> Geometry of the location.
- type	<b>Required</b>	<input checked="" type="checkbox"/> <b>Used in Swiss Implementation</b> Must be of type: - "Polygon" - "MultiPolygon"
- coordinates	<b>Required</b>	<input checked="" type="checkbox"/> <b>Used in Swiss Implementation</b> Geographic coordinates (latitude and longitude) defining the geometry of the location.

Tabelle 4: Field definitions geojson

## 13 Possible other extensions in the near future

<a href="#">GTFS Occupancies in RT</a>	Realtime information about occupancy	Will be studied
--	--------------------------------------	-----------------

<a href="#">GTFS Pathways</a>	Transfer paths	Will be studied
GTFS Shapes	The path public transport takes	Will be studied