General Transit Feed Specification Reference

Revised October 28, 2025. See <u>Revision History</u> for more details.

This document defines the format and structure of the files that comprise a GTFS dataset.

Document Conventions

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC 2119.

Term Definitions

This section defines terms that are used throughout this document.

Dataset A complete set of files defined by this specification reference. Altering the dataset creates a new version of the dataset. Datasets should be published at a public, permanent URL, including the zip file name. (e.g., https://www.agency.org/gtfs/gtfs.zip).

Record A basic data structure comprised of a number of different field values describing a single entity (e.g. transit agency, stop, route, etc.). Represented, in a table, as a row.

Field A property of an object or entity. Represented, in a table, as a column. The field exists if added in a file as a header. It may or may not have field values defined.

Field value An individual entry in a field. Represented, in a table, as a single cell.

Service day A service day is a time period used to indicate route scheduling. The exact definition of service day varies from agency to agency but service days often do not correspond with calendar days. A service day may exceed 24:00:00 if service begins on one day and ends on a following day. For example, service that runs from 08:00:00 on Friday to 02:00:00 on Saturday, could be denoted as running from 08:00:00 to 26:00:00 on a single service day.

Text-to-speech field The field should contain the same information than its parent field (on which it falls back if it is empty). It is aimed to be read as text-to-speech, therefore, abbreviation should be either removed ("St" should be either read as "Street" or "Saint"; "Elizabeth I" should be "Elizabeth the first") or kept to be read as it ("JFK Airport" is said abbreviated).

Leg Travel in which a rider boards and alights between a pair of subsequent locations along a trip.

Journey Overall travel from origin to destination, including all legs and transfers in-between.

Sub-journey Two or more legs that comprise a subset of a journey.

Fare product Purchassable fare products that can be used to pay for or validate travel.

Effective Fare Leg A sub-journey of two or more legs that should be treated as a single leg for matching rules in fare_leg_rules.txt for the purposes of fare calculation.

Presence

Presence conditions applicable to fields and files.

Required The field or file must be included in the dataset and contain a valid value for each record.

Optional The field or file may be omitted from the dataset.

Conditionally Required The field or file must be included under conditions outlined in the field or file description.

Conditionally Forbidden The field or file must not be included under conditions outlined in the field or file description.

Recommended The field or file may be omitted from the dataset, but it is a best practice to include it. Before omitting this field or file, the best practice should be carefully evaluated and the full implications of omission should be understood.

Field Types

Field types applicable to fields.

Color A color encoded as a six-digit hexadecimal number. Refer to https://htmlcolorcodes.com to generate a valid value (the leading "#" must not be included).

Currency code An ISO 4217 alphabetical currency code. For the list of current currency, refer to https://en.wikipedia.org/wiki/ISO_4217#Active_codes.

Currency amount A decimal value indicating a currency amount. The number of decimal places is specified by ISO 4217 for the accompanying Currency code. All financial calculations should be processed as decimal, currency, or another equivalent type suitable for financial calculations depending on the programming language used to consume data. Processing currency amounts as float is discouraged due to gains or losses of money during calculations.

Date Service day in the YYYYMMDD format. Since time within a service day may be above 24:00:00, a service day may contain information for the subsequent day(s).

Email An email address.

Enum An option from a set of predefined constants defined in the Description column.

ID An ID field value is an internal ID, not intended to be shown to riders, and is a sequence of any UTF-8 characters. Using only printable ASCII characters is recommended. An ID is labeled "unique ID" when it must be unique within a file. IDs defined in one .txt file are often referenced in another .txt file. IDs that reference an ID in another table are labeled "foreign ID".

Language code An IETF BCP 47 language code. For an introduction to IETF BCP 47, refer to http://www.rfc-editor.org/rfc/bcp/bcp47.txt and http://www.w3.org/International/articles/language-tags/.

Latitude WGS84 latitude in decimal degrees. The value must be greater than or equal to -90.0 and less than or equal to 90.0.

Longitude WGS84 longitude in decimal degrees. The value must be greater than or equal to -180.0 and less than or equal to 180.0.

Float A floating point number.

Integer An integer.

Phone number A phone number.

Time Time in the HH:MM:SS format (H:MM:SS is also accepted). The time is measured from "noon minus 12h" of the service day (effectively midnight except for days on which daylight savings time changes occur). For times occurring after midnight on the service day, enter the time as a value greater than 24:00:00 in HH:MM:SS.

Local time Time in the HH:MM:SS format (H:MM:SS is also accepted). Represents a wall-clock time shown in the local time of the specified location.

Text A string of UTF-8 characters, which is aimed to be displayed and which must therefore be human readable.

Timezone TZ timezone from the https://www.iana.org/time-zones. Timezone names never contain the space character but may contain an underscore. Refer to http://en.wikipedia.org/wiki/List_of_tz_zones for a list of valid values.

URL A fully qualified URL that includes http:// or https://, and any special characters in the URL must be correctly escaped. See the following http://www.w3.org/Addressing/URL/4_URI_Recommentations.html for a description of how to create fully qualified URL values.

Field Signs

Signs applicable to Float or Integer field types.

Non-negative Greater than or equal to 0.
Non-zero Not equal to 0.
Positive Greater than 0.

Dataset Attributes

Attributes that apply to the entire dataset.

Primary key The primary key of a dataset is the field or combination of fields that uniquely identify a row. Primary key (*) is used when all provided fields for a file are used to uniquely identify a row. Primary key (none) means that the file allows only one row.
Example: The trip_id and stop_sequence fields make the primary key of stop_times.txt.

Dataset Files

This specification defines the following files.

File Name	Presence	Description
agency.txt	Required	Transit agencies with service represented in this dataset.
stops.txt	Conditionally Required	Stops where vehicles pick up or drop off riders. Also defines stations and station entrances.
routes.txt	Required	Transit routes. A route is a group of trips that are displayed to riders as a single service.
trips.txt	Required	Trips for each route. A trip is a sequence of two or more stops that occur during a specific time period.
stop_times.txt	Required	Times that a vehicle arrives at and departs from stops for each trip.
calendar.txt	Conditionally Required	Service dates specified using a weekly schedule with start and end dates.
calendar_dates.txt	Conditionally Required	Exceptions for the services defined in the calendar.txt.
fare_attributes.txt	Optional	Fare information for a transit agency's routes.
fare_rules.txt	Optional	Rules to apply fares for itineraries.

File Name	Presence	Description
timeframes.txt	Optional	Date and time periods to use in fare rules for fares that depend on date and time factors.
rider_categories.txt	Optional	Defines categories of riders (e.g. elderly, student).
fare_media.txt	Optional	To describe the fare media that can be employed to use fare products.
fare_products.txt	Optional	To describe the different types of tickets or fares that can be purchased by riders.
fare_leg_rules.txt	Optional	Fare rules for individual legs of travel.
fare_leg_join_rules.txt	Optional	Rules for defining two or more legs should be considered as a single effective fare leg for the purposes of matching against rules in fare_leg_rules.txt
fare_transfer_rules.txt	Optional	Fare rules for transfers between legs of travel.
areas.txt	Optional	Area grouping of locations.
stop_areas.txt	Optional	Rules to assign stops to areas.
networks.txt	Conditionally Forbidden	Network grouping of routes.
route_networks.txt	Conditionally Forbidden	Rules to assign routes to networks.
shapes.txt	Optional	Rules for mapping vehicle travel paths, sometimes referred to as route alignments.
frequencies.txt	Optional	Headway (time between trips) for headway-based service or a compressed representation of fixed-schedule service.
transfers.txt	Optional	Rules for making connections at transfer points between routes.
pathways.txt	Optional	Pathways linking together locations within stations.
levels.txt	Conditionally Required	Levels within stations.
location_groups.txt	Optional	A group of stops that together indicate locations where a rider may request pickup or drop off.
location_group_stops.txt	Optional	Rules to assign stops to location groups.
locations.geojson	Optional	Zones for rider pickup or drop-off requests by on-demand services, represented as GeoJSON polygons.
booking_rules.txt	Optional	Booking information for rider-requested services.

File Name	Presence	Description
translations.txt	Optional	Translations of customer-facing dataset values.
feed_info.txt	Conditionally Required	Dataset metadata, including publisher, version, and expiration information.
attributions.txt	Optional	Dataset attributions.