511 Transit Data Guidelines

Version 2.0

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METROPOLITAN TRANSPORTATION COMMISSION

DOCUMENT VERSION CONTROL

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1 PURPOSE

This document is intended to provide a set of guidelines so that MTC's partner transit agencies can prepare and deliver data as per 511 SF Bay requirements. This document covers both technical data requirements and quality aspects of transit data provided through the General Transit Feed Specification (GTFS), GTFS+ (an extended set of files), and real-time data feeds in GTFS-Realtime format. Data prepared as per these guidelines will allow the 511 SF Bay transit system to deliver enhanced data to third party consumers that will facilitate better transit travel experience for riders. There are two sections within this document, covering:

- GTFS and GTFS+ static data
- Real-time transit data

2 DOCUMENT OVERVIEW

Each section below describes various data elements and their recommended characteristics for data feeds known as GTFS, GTFS+, and real-time.

Transit agencies are requested to use this document as a reference to understand 511 SF Bay transit data requirements. Additional reference documents that may be consulted, include:

- GTFS reference – specification for GTFS files, available online at https://developers.google.com/transit/gtfs/reference/
- GTFS-Realtime reference – specification for GTFS-Realtime feeds, available online at https://developers.google.com/transit/gtfs-realtime/reference
- '511 RTT JMS DTD v9.7' – 511 Real-Time Transit (RTT) XML DTDs for JMS implementation (deprecated)

3 STATIC DATA: GTFS & GTFS+

The General Transit Feed Specification (GTFS) defines a set of transit data files in comma separated value (CSV) format that together describe a transit service. Data described in these files are considered relatively static in nature. GTFS documentation is available online at the URL mentioned above. While GTFS allows for quite a bit of flexibility, 511 SF Bay Transit implements the GTFS specification with a few additional rules necessary for proper utilization of transit data in a regional setting. These rules doesn't break the core GTFS specification; they rather help improve the quality of the data.

In addition to the GTFS files, MTC defines a set of additional CSV files – called the 'GTFS+' files – that allow 511 SF Bay Transit to acquire necessary data not covered in the GTFS specification. For example, GTFS allows for trip direction information in a binary manner (0 for one direction and 1 for the opposite direction). These binary values can only be translated into two default direction names such as 'Inbound' and 'Outbound.' In a regional system, these default values may not describe directions of all transit services adequately. So, 511 Transit uses the GTFS+ directions.txt file to allow for wide ranging direction names such as 'North', 'Clockwise', etc. Some of these additional GTFS+ files may be applicable only for transit agencies providing real-time data to 511 SF Bay, as noted in each file description. GTFS+ files must be included in the same zip package with the standard GTFS files.

Below are 511 SF Bay Transit specific guidelines for various required and optional GTFS files, and specifications for 511 recommended and optional GTFS+ files.

3.1 GTFS (REQUIRED)

agency.txt

This is a required file for 511 SF Bay that describes the attributes of a transit service provider. Table below includes required fields for 511 SF Bay.

Field Name	Property	Required/Recommended
agency_id (required)	Value should not exceed 50 characters.	Required
agency_name (required)	Value should not exceed 50 characters.	Required
agency_url (required)	Value should not exceed 500 characters.	Required
	Include a complete and active URL for the transit service website. If the webpage for the service is part of the city's website, include the full link to the service webpage.	Recommended

routes.txt

In addition to GTFS specifications for the routes.txt file, 511 SF Bay Transit provides the following additional guidelines for route_short_name and route_long_name fields.

Field Name	Property	Required/Recommended
route_short_name (required)	Must provide the publicly known route identifier.	Required
	It is necessary that values in this field be unique. If values are duplicated, 511 SF Bay Transit will reject the feed.	Required
	Values should not contain any description or direction information such as Inbound, Outbound, E, W, etc.	Recommended
route_long_name (optional)	This field provides the publicly known additional (to route_short_name) concise textual name for a route. The	Required

Field Name	Property	Required/Recommended
	following contents should be avoided in the value of route_long_name. • route_short_name • Direction name/code such as 'inbound', 'east', 'E' etc. • Adverb such as 'to', 'from', 'towards', etc. The word 'route'	

In order to provide more context on the above guidelines for route_short_name and route_long_name, let's consider an arbitrary example of a route name "Inbound to 10 NB Fremont Hub." Such a complex name that includes line number (10), direction name (Inbound), directional abbreviation (NB), and a destination name (Fremont Hub), can be confusing and should not be used as route_short_name or route_long_name. Instead, only the line number "10" should be used as the route_short_name value. A route_long_name can be the major corridor the route serves ('Mission' for route 14 and 'Geary' for route 38 of Muni), or be a combination of two endpoints/destinations of the route ('Downtown Oakland – Downtown Berkeley' for AC Transit route 6). Direction information should be provided in the GTFS trips.txt file using the direction_id field, and be further qualified in the GTFS+ directions.txt file. If "Fremont Hub" is meant to be the destination name, it should be used as the trip_headsign value in the trips.txt file. The GTFS trips.txt file is described in more detail below.

calendar.txt

511 SF Bay requires that all regular services be defined in the calendar.txt file. 511 Transit also requires that at least one of the days of the week fields (monday, tuesday, wednesday, thursday, friday, saturday, sunday) must have its value set to '1' for each service defined in this file. Service holidays (no service or reduced service) should only be defined in the calendar_dates.txt file as explained below through use cases. Each unique service defined in calendar.txt and calendar_dates.txt file should be named in the GTFS+ calendar_attributes.txt file.

stops.txt

A set of 511 SF Bay specific guidelines for this required GTFS file are provided below.

Field Name	Property	Required/Recommended
stop_code (required for real-time agencies)	For agencies providing real-time data to 511 SF Bay, values in this field must be the same as the real-time stop IDs.	Required
	For agencies providing real-time data to 511 SF Bay, values in this field must be prepended with MTC assigned prefix digit(s). Prefixed values ensure uniqueness of stop codes across the region and facilitates departure information inquiry.	Required
	Values should be kept to a minimum number of digits (preferably no more than 6 digits) for better usability.	Recommended
stop_name (required)	Length of the stop_name values should be no more than 100 characters.	Required
	Direction and route information should not be a part of the stop name.	Required
	Stop names should be developed as per the guidelines provided in Appendix-1. This will help improve the quality of stop names and build data consistency across the region.	Strongly recommended
wheelchair_boarding (optional)	This information helps application developers provide more useful information to riders with special needs.	Recommended

trips.txt

A set of 511 SF Bay specific guidelines for this required GTFS file are provided below.

Field Name	Property	Required/Recommended
trip_headsign (optional)	Though optional, this field adds significant value for data consumers. The value should be concise and provide a meaningful destination name for the trip.	Strongly recommended
	Value should not exceed 120 characters.	Required
trip_short_name (optional)	Though optional, this field is important for those services that publish vehicle numbers such as the train number.	Recommended for appropriate service
	Value should not exceed 50 characters.	Required
direction_id (required)	This value, along with its description in the directions.txt file, is required by 511 SF Bay.	Required
wheelchair_accessible (optional)	This optional GTFS field adds valuable information for riders with special needs and should be provided.	Recommended
bikes_allowed (optional)	This optional GTFS filed adds valuable information for riders with bike and should be provided.	Recommended

stop_times.txt

A set of 511 SF Bay specific guidelines for this required GTFS file are provided below.

- Timepoint stops must be clearly identified, either by providing arrival and departure times only for timepoint stops, or by marking timepoint stops with the value '1' in the timepoint field when all stops have arrival and departure times. Without timepoint identification, information providers consider every stop with arrival and departure time a timepoint. This will result in user-unfriendly timetable output.
- First and last stops for each trip must be timepoints.
- Non-revenue stops must not be included.
- A timepoint stop must include both arrival and departure times.

fare_attributes.txt

511 SF Bay requires the fare_attributes.txt file. Without this file, an important piece of information about a transit trip will be missing. This file should include all current and future general fares for single ride, route based, or zone based. For example, if the current single adult fare is $2.00 and increases to $2.50 from a particular date, both fares should be included in this file, as shown with fare IDs 1 and 4, respectively, in Figure 1 below.

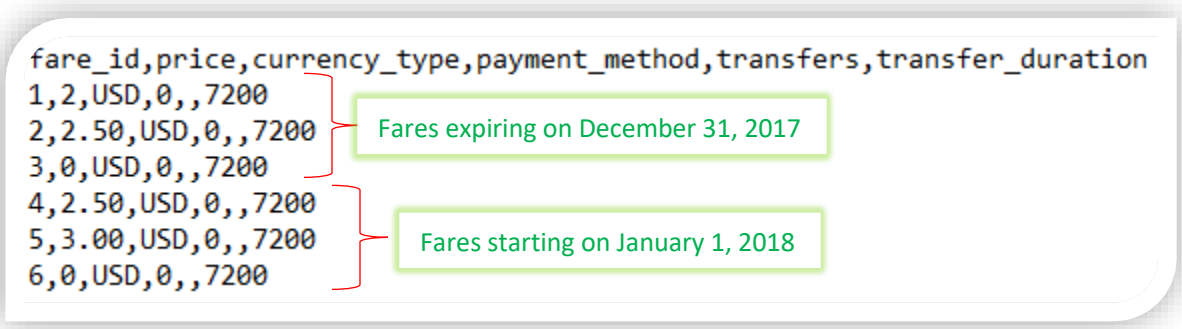

Figure 1: fare_attributes file with current and new fares

In the GTFS+ fare_rider_categories.txt file, the $2.00 fare should be identified with an expiration date of December 31, 2017, and the $2.50 fare should be identified with a commencement date of January 1, 2018, as

demonstrated in the example GTFS+ fare_rider_categories.txt file below. This approach with expiration and commencement dates allows for codifying fare change without recreating the GTFS feed or duplicating routes only to accommodate a fare change. This approach for fare change allows to maintain the GTFS specification for the fare_attributes.txt file.

3.2 GTFS (OPTIONAL)

calendar_dates.txt

511 SF Bay uses the calendar_dates.txt file only for special service and service exceptions such as Holiday service. Regular service should only be defined in the calendar.txt file. If calendar_dates.txt file is missing in the feed, 511 SF Bay assumes there are no service exceptions to the regular service. No more than 150 (one hundred and fifty) unique dates should be included in this file. When more than 150 unique dates are necessary, it is recommended that those dates be split over multiple feeds. Calendar_dates.txt can be used for various service exception use cases. The three most common ones are explained with examples below.

Use Case 1: No Service Holiday

Let's consider the Christmas and New Year's holidays, both falling on Mondays. The agency doesn't run any service on those days. In the calendar.txt file, the agency defined three different regular services – for weekdays, Saturday, and Sunday. Because, Christmas and New Year's fall on weekdays, the agency will define one service exception for each in the calendar_dates.txt file to remove the weekday service for December 25, 2017 and January 1, 2018 by using the exception_type '2,' as demonstrated in the calendar.txt and calendar_dates.txt files below.

```
service_id,monday,tuesday,wednesday,thursday,friday,saturday,sunday,start_date,end_date
Weekday-01,1,1,1,1,1,0,0,20170821,20180330
Saturday-01,0,0,0,0,0,1,0,20170826,20180331
Sunday-01,0,0,0,0,0,0,1,20170820,20180325
```

Figure 2: calendar file with regular service

```
service_id,date,exception_type
Weekday-01,20171225,2
Weekday-01,20180101,2
```

Figure 3: calendar_dates file for no service

Use Case 2: Service Swap for a Holiday

Let's consider the same Christmas and New Year's holidays, but this time the agency runs Sunday service instead of the weekday service for both holidays. The calendar.txt file will remain the same, but the calendar_dates.txt file will have one additional definition for each holiday to specify the addition of the Sunday service, in addition to the removal of the weekday service. See the example calendar_dates.txt file below in combination with the calendar file in figure 4.

```
service_id,date,exception_type
Weekday-01,20171225,2
Sunday-01,20171225,1
Weekday-01,20180101,2
Sunday-01,20180101,1
```

Figure 4: calendar_dates file for service swap

Use Case 3: Special Service

Now let's consider a scenario when additional trips are added to the service for November 15, 2017 – a Wednesday – to a few routes to accommodate the extra passenger load expected for the baseball game. The service that captures only the extra trips will be defined in the calendar_dates.txt file with exception_type '1', as demonstrated in figure 5 below.

```
service_id,date,exception_type
Weekday-01,20171225,2
Sunday-01,20171225,1
Weekday-01,20180101,2
Sunday-01,20180101,1
Giants-01,20171115,1
```

Figure 5: calendar_dates file with extra service for baseball game

Alternatively, if the baseball game day service includes all trips of that day, it can be added in the calendar_dates.txt file replacing the regular weekday service, as shown in the figure 6 below.

```
service_id,date,exception_type
Weekday-01,20171225,2
Sunday-01,20171225,1
Weekday-01,20180101,2
Sunday-01,20180101,1
Weekday-01,20171115,2
Giants-01,20171115,1
```

Figure 6: calendar_dates file with special service replacing regular service

fare_rules.txt

The fare_rules.txt file is optional and can only be included with an accompanying fare_attributes.txt file. Figure 7 below is an example fare_rules file that should accompany the fare_attributes file in Figure 1. This file says that fare_id 1 (referred from fare_attributes file) applies to route_ids 2, 4, 6, 8, 1, 3, 5, 7, and 9

(referred from routes.txt file). Similarly, fare_id 2 applies to route_ids 41 and 42, and fare_id 3 applies to route_ids 33, 31, and 30.

```
fare_id,route_id,origin_id,destination_id,contains_id
1,2,,,
1,4,,,
1,6,,,
1,8,,,
1,1,,,
1,3,,,
1,5,,,
1,7,,,
1,9,,,
2,41,,,
2,40,,,
3,33,,,
3,31,,,
3,30,,,
```

Figure 7: fare_rules file for current fares

shapes.txt

The shapes.txt file should be provided in accordance with GTFS Specification. When provided, 511 SF Bay processes the file and provides to data consumers.

frequencies.txt (not supported by 511 SF Bay)

511 SF Bay currently doesn't support this file. Instead, arrival/departure schedules should be provided in stop_times.txt file (described above) for all trips in the service.

transfers.txt (not supported by 511 SF Bay)

511 SF Bay currently doesn't support this file. If provided, this file will be discarded by the system.

pathways.txt (supported only in the Regional GTFS feed)

511 SF Bay currently doesn't process this file if included in the transit agency GTFS feed. Instead, 511 SF Bay creates and includes pathways.txt file for the entire region in a single Regional GTFS feed.

levels.txt (supported only in the Regional GTFS feed)

511 SF Bay currently doesn't process this file if included in the transit agency GTFS feed. Instead, 511 SF Bay creates and includes levels.txt file for the entire region in a single Regional GTFS feed.

Feed_info.txt

511 SF Bay includes its own feed_info.txt file in the output GTFS feed. If provided in the transit agency GTFS feed, this file will be discarded by the system.

3.3 GTFS+ (REQUIRED)

directions.txt

The binary (0 or 1) values allowed for the direction_id field in the GTFS trips.txt file don't allow for custom, more informative, direction names such as North, South, etc. This additional file captures the direction text for each of the directions in a route and assigns them to timetable outputs. 511 SF Bay strongly recommends that this file be provided. Without the direction names, timetable outputs will include default 'inbound' and 'outbound' direction names. When this file is provided, the optional direction_id field in GTFS trips.txt must be filled in, and the following guidelines should be adhered to for this file.

Field Name	Property			Required/Recommended
route_id (required)	This value is referenced from the GTFS routes.txt file.			Required
direction_id (required)	This value is referenced from the GTFS trips.txt file. Each (route_id, direction_id) pair should only appear once.			Required
direction (required)	Values allowed include:			Required
	North South East West Northeast	Northwest Southeast Southwest Clockwise Counterclockwise	Inbound Outbound Loop A Loop B Loop	

realtime_routes.txt

This additional file contains information about routes that are real-time enabled. It is a **required** file for agencies providing a real-time feed to 511 SF Bay. This file allows 511 SF Bay to identify routes that are and aren't enabled for real-time predictions. Identification of real-time enabled routes allows 511 SF Bay to use GTFS/GTFS+ data as the service configuration data for the real-time data. When included, this file should comply with the following guidelines.

Field Name	511 Transit Requirement/Recommendations	Required/Recommended
route_id (required)	This value in referenced from the routes.txt file.	Required
realtime_enabled (required)	Allowable numeric values: 0 – route is not real-time enabled 1 – route is real-time enabled	Required

calendar_attributes.txt

Though not part of the GTFS specification, this additional file provides descriptive names for all unique services defined in the GTFS calendar.txt and calendar_dates.txt files. Names for services provided through the service_description field are important for applications as they are used for naming service types in the display of timetables and user interfaces. Names help users look up the desired timetable. Inclusion of this file is **strongly recommended**. All unique service_ids defined in the GTFS calendar.txt and calendar_dates.txt files must be described in this file.

Field Name	Property	Required/Recommended
service_id (required)	Values must match with all unique service_ids from calendar.txt and calendar_dates.txt.	Required
service_description (required)	Length should not exceed 250 characters.	Required
	Should convey the correct description of the service, e.g., *Weekdays*, *Sunday/Holiday, Weekday except Wednesday, Wednesday Only,* etc. For service running on specific days	Recommended

Field Name	Property	Required/Recommended
	of the week, e.g., Monday, Wednesday, and Friday, use description like 'Mon, Wed, Fri' instead of MoWeFr.	

3.4 GTFS+ (511 SF BAY RECOMMENDED)

stop_attributes.txt

This additional file helps to capture important stop attributes that are not included in GTFS stops.txt file. This additional data enriches stop information and is useful for better journey planning. When this recommended file is included, the following guidelines should be adhered to. When provided, 511 SF Bay will include this file for the data consumers.

Field Name	Property	Required/Recommended
stop_id (required)	This value is referenced from the GTFS stops.txt file.	Required
accessibility_id (optional)	Allowable numeric values and their meaning: 0 - Unknown 1 - No ADA 2 - Full ADA 3 - Wheel Chair 4 - Blind 5 - Deaf 6 - Blind/Wheel Chair 7 - Deaf/Blind 8 - Deaf/Wheel Chair	Recommended
cardinal_direction (optional)	Allowable two-character values and their full names: NO - North, SO - South, EA - East, WE - West NE - Northeast, NW - Northwest, SE - Southeast, SW - Southwest	Recommended
relative_position (optional)	Allowable two-character values and their meaning: • NS = nearside of intersection • FS = far side of intersection • AT = stop is at a landmark used in the stop name • OP = stop is across street from the landmark used in the stop name • MB = stop somewhere near the middle of the street segment	Recommended
stop_city (required)	Helps to look up stops in a city when spatial query is not possible. Length should not exceed 60 characters.	Required

rider_categories.txt

GTFS fare_attributes.txt file can only provide regular adult fare. Fares applicable for other rider categories such as students, children, seniors, etc. can be provided through this additional GTFS+ rider_categories.txt file in combination with the GTFS+ fare_rider_categories.txt file. 511 SF Bay strongly recommends that transit agencies include both rider_categories.txt and fare_rider_categories.txt files when there are discounted fares for special rider categories. The rider_categories.txt file defines various rider categories a transit agency may have. When provided, the file should comply with the following guidelines.

Field Name	Property	Required/Recommended
rider_category_id (required)	Must use following numeric IDs: 1 – Regular (adult) 2 – Senior 3 – Child 4 – Student 5 – Youth 6 – Disabled 7 – Promotional 11 – Military 15 to 25 – Custom categories (agency can assign categories that do not fall under standard categories mentioned above)	Required
rider_category_description (required)	Length should not exceed 256 characters.	Required
	Should be easily understandable, e.g., '*Child (ages 5-11)*', '*Seniors (Ages 62 & Up)*', etc.	Recommended

Figure 8 below provides a sample rider_categories.txt file.

```
rider_category_id,rider_category_description
1,Regular (Adult)
2,Senior (65+)/ Disabled/ Medicare (SDM)
3,Youth (Ages 6-18)
5,Child (Ages 5 & Under)
```

Figure 8: rider_categories file with three non-regular rider categories

fare_rider_categories.txt

The purpose of this file is two-fold. It specifies fare attributes for various rider categories defined in the rider_categories.txt file. It also facilitates fare change information – with or without rider categories. GTFS file fare_attributes.txt can contain current and future fare prices for the 'Regular (adult)' rider category but it cannot specify when a fare ends, and a new fare begins. Expiration dates of the current regular fare and commencement of the future regular fare are defined in this additional GTFS+ fare_rider_categories.txt file. In addition, current and future fares for other non-regular rider categories can be provided in this file.

Field Name	Property	Required/Recommended
fare_id (required)	For regular adult fares, this value is referenced from the fare_attributes.txt file. If fare change is not included, regular adult fare_id should not be included.	Required
	For non-regular fares, new and unique values are introduced.	Required
rider_category_id (required)	This value is referenced from the rider_categories.txt file.	Required
	Each (fare_id, rider_category_id) pair can only appear once in this file.	Required
Price (required)	Values must be provided for all non-regular rider categories.	Required
	Format of price values should be 5,2 (numbers up to and including 999.99) decimal number.	Required
	Currency type is assumed to be the same as the fare_attributes.txt file.	Required
expiration_date (optional)	Must be defined for all expiring fares (fares expire at the end of the service day); Empty for all upcoming fares.	Required
	Values must be provided in the YYYYMMDD format.	Required
commencement_date (optional)	Must be defined for all upcoming fares (fares begin at the start of the service day); Empty for all expiring fares.	Required
	Values must be provided in the YYYYMMDD format.	Required

Figure 9 below provides a sample fare_rider_categories.txt file that captures regular fares defined in the fare_attributes.txt file and fares for non-regular rider categories defined in the rider_categories.txt file with appropriate expiration and commencement dates.

```
fare_id,rider_category_id,price,expiration_date,commencement_date
1,2,1.75,20171231,
1,5,1.75,20171231,
1,6,1.75,20171231,
1,15,1.75,20171231,
2,2,2.75,20171231,
2,5,2.75,20171231,
2,6,2.75,20171231,
2,15,2.75,20171231,
3,2,3.75,20171231,
3,5,3.75,20171231,
3,6,3.75,20171231,
3,15,3.75,20171231,
4,2,4.75,,20180101
4,5,4.75,,20180101
4,6,4.75,,20180101
4,15,4.75,,20180101
5,2,5.75,,20180101
5,5,5.75,,20180101
5,6,5.75,,20180101
5,15,5.75,,20180101
6,2,6.75,,20180101
6,5,6.75,,20180101
6,6,6.75,,20180101
6,15,6.75,,20180101
```

Figure 9: fare_rider_categories file with expiration and commencement dates for fares

3.5 GTFS+ (OPTIONAL)

realtime_trips.txt (deprecated)

This file is relevant for agencies providing real-time data to 511 SF Bay. It helps map trip IDs between GTFS and real-time feeds. If trip IDs in the GTFS trips.txt file and in the real-time feed are the same, this file should not be included. 511 SF Bay prefers that the trip IDs in the real-time data feed are the same in the GTFS trips.txt file. If that is not possible for any reason, this realtime_trips.txt file must be provided, complying with the following guidelines.

Field Name	Property	Required/Recommended
trip_id (required)	This value is referenced from the GTFS trips.txt file.	Required
realtime_trip_id (required)	This value is referenced from the real-time configuration TripMapping.	Required

farezone_attributes.txt

This additional GTFS+ file is optional and applicable only for those transit services that use zone based fares. This file facilitates naming fare zones to help riders find fares for their journey from a fare lookup tool. For example, AC Transit may name its fare zones as Local and Transbay, or East Bay and Transbay.

Field Name	511 Transit Requirements/Recommendations	Required/Recommended
zone_id (required)	This value is referenced from the stops.txt file.	Required
zone_name (required)	Length of the value should not exceed 250 characters.	Required

4 REAL TIME DATA: GTFS-RT

Google Transit Feed Specification for Real Time is an extension to the GTFS static. It provides up to date information for the current arrival and departure times. 511 is introducing GTFS-RT as the preferred format for real time data and deprecating its JMS based real time and configuration data feeds. GTFS-RT feed uses protocol buffers for the data exchange that keeps the data in a simple and light weight format for faster transmission.

All three GTFS-RT feeds are supported by 511 SF Bay. Following is the list of feeds with 511 SF Bay requirements.

1. **Trip Updates:** Transit agencies shall provide the data as per the GTFS-Realtime specification with the following additional requirements:
    - stop_id values must be included in the stop_time_update field (StopTimeUpdate message) even if the stop_sequence is included.
    - For arrival or departure field values in the StopTimeEvent message agencies must provide absolute 'time' value even if 'delay' value is provided.
2. **Vehicle Positions:** Standard GTFS-Realtime specification requirements only
3. **Service Alerts:** Standard GTFS-Realtime specification requirements only

Although 511 has deprecated and gradually phasing out its JMS based data feeds, the specification of the JMS configuration data is still available in Appendix 2 for agencies that have not migrated to GTFS-Realtime.

APPENDIX-1: 511 TRANSIT STOP NAMING GUIDELINES

General Rules

1. Stop names distributed for public consumption should reflect the names that people will understand in the local and tourist vernacular. If a non-public name is necessary for operational purpose, such non-public name may be maintained in the inventory in a separate field. For example, the operational name 'Green Division Yard' for SFMTA's 'Balboa Park Station' stop should be maintained in a non-public field and not be disseminated in the public GTFS feed.
2. All stop names should be maintained in one standardized case, preferably the Title Case, where only the initial letter of principal words are capitalized, e.g. Market Street. Exception may be provided to names with vernacular usage such as 'MacArthur Blvd' or 'da Vince'. The exceptions take precedence over the general rule.
3. Period (.) should be avoided in stop names unless necessary for situation such as a landmark name that includes the period. For example 'O.com Coliseum'.
4. When stop names are constructed with two distinct non-addressed elements such as two intersecting streets ('Main St' and 'A St') or a street and a landmark ('Main St' and 'Park N Ride'), only 'and', '@', '&', or '+' with spaces before and after can be used to associate those elements together in a stop name. More than two elements in a stop name should be avoided.
5. None of the associative terms/symbols can be used for any other purposes in stop names than for the purpose of separating street names in an intersection stop name.
6. Word 'at' and symbol '/' should not be used as associative term/symbol between two distinct elements of a stop name.
7. Where a hyphen is suggested in this document for stop names it should be used without a space before and after the hyphen.
8. Route direction information should not be included in stop names. For example, parenthetical 'Westbound' in 'Alida Way & Rotary Plaza (Westbound)' should not be used.
9. Pick-up/drop-off information should not be included in stop names. It is generally maintained and provided as separate attributes in the GTFS stop_times.txt file.
10. 'Nearside' and 'farside' should not be included in stop names. This information should be provided through the GTFS+ stop_attributes.txt file.

Roadway Naming in Stop Names

11. The name portion of a full street name should not be abbreviated. However, if the street is popularly known by its abbreviated version, e.g., 'MLK' for 'Martin Luther King', then abbreviated version may be used as the primary stop name.
12. Street suffix/type (Ave, St, Pkwy, etc.), and pre- and post-directional (N, E, NW, etc.) elements of street name should either be fully spelled out or be abbreviated as per the standards set in Appendices B and C of the USPS publication http://pe.usps.gov/cpim/ftp/pubs/Pub28/pub28.pdf . Complying with USPS standard allows for consistent use these elements across the region. When abbreviated, period (.) should be avoided.
13. Freeways and highways used in stop names should be named with their abbreviated (USPS standardized abbreviation) designation followed by the highway number. For example, 'I 280' or 'Hwy 280.' The hyphen, e.g., in 'I-280', must be avoided and highway names should NEVER start with the highway number (e.g., '280 Hwy' is not allowed.)
14. Hyphenated street name must be avoided in stop names, even if that is how the street is named. For example, 'Alvarado-Niles Rd' should be 'Alvarado Niles Rd' in stop names.

Intersection Stop Names

15. In case of stops at intersection locations, the on-street should always be the first street name in the stop name, then an associative term (see rule #4 above), followed by the at-street name.
16. A single associative term should be used consistently throughout the entire stop inventory of the same transit agency.
17. Associative terms/symbols should ONLY be used for the purpose of separating street names in an intersection stop name. All associative terms/symbols should be avoided for purposes other than associating two non-addressed elements of a stop name. Alternative style should be used for non-associative purposes. For example, stop names such as 'Main Street & Park & Ride' or 'Hilltop Park & Ride' can be 'Main Street & Park N Ride' or 'Hilltop Park N Ride'.
18. For stop names at intersections where streets have different names on either side of the road on which the bus is traveling, the name of the additional ON/AT street should be included using a forward slash (/). Consider example 'Decoto Rd & Royal Ann Dr/Clover St' or 'Decoto Rd & Clover St/ Royal Ann Dr'. Notice that in the first example name, the 'Royal Ann Dr' appears before the (/) because the stop is on the 'Royal Ann' side of Decoto Rd at the intersection. Similarly, in the second example, 'Clover St' appears before the (/) because the stop is on the Clover St side of Decoto Rd at the intersection.

Addressed Stop Name

19. Stop names with a numbered address should always begin with the address number. A stop at 123 Main St should be named as '123 Main St', not as 'Main St at 123.' Stop names other than the numbered address should NEVER start with a number.
20. The stops that are not at an intersection but identified using a well-known landmark should ideally be named using the numbered address of the stop location. For example, 'Fitzgerald Ave at Sizzler' should be renamed to '3483 Fitzgerald Ave'. If the landmark must be included, the stop can be named as either '3483 Fitzgerald Ave at Sizzler' or 'Fitzgerald Ave @ Sizzler'.
21. Stop names like 'Gurdwara Cul-de-sac' should be avoided. A better option would be the address on Gurdwara Rd '251 Gurdwara Rd' or 'Gurdwara Sahib Fremont'.

Stops at Landmarks

22. Stop names at landmarks/known places should be fully qualified. For example, 'San Carlos Caltrain Station' is preferred over 'San Carlos Caltrain' or 'San Carlos Station' unless the shorter version is more popular in the local vernacular.
23. When a stop is located within a larger known place/area the stop name should start with the larger place/area name followed by more specific location name appended with either a hyphen or 'at.' For example, 'University of California Berkeley-Business School', 'College of San Mateo at CSM Dr', 'Southland Mall at Macy's, 'Millbrae Bart-Bay 5', or 'South San Francisco Bart-Bay 7 Eastside.'
24. A period may be used if it is part of the landmark name. For example, 'O.com Coliseum'.

Extra Qualifiers in Stop Names

25. Extra qualifying information in a stop name such as 'overpass' in 'Ralston Ave & Hwy 101 overpass' should be hyphenated as 'Ralston Ave & Hwy 101-Overpass.' Another example is 'El Camino Real & Alta Loma-Stairway' or 'Hwy 1 & Hwy 35-Bus Pad'.

Shared and Non-Revenue Stops

26. If transit agencies share a physical stop location, it is preferred that the stop name be the same in the stop inventories of all agencies sharing that stop. This helps with regional information dissemination.
27. Non-revenue/non-public stops should not be included in the GTFS stops.txt file.

Special Symbol/Character Quick Reference

The table below provides a quick reference chart for various symbols and terms mentioned in this stop naming guidelines, and their usage.

Symbol/Term	Usage Rules	Examples
and	• Only to be used as the associative term in a stop name with two distinct non-addressed elements. • Spaces should be included before and after.	• Allowed: A St and Main St • Allowed: Ardenwood Ter and Ardenwood Park N Ride
@	• Only to be used as the associative term in a stop name with two distinct non-addressed elements. • Spaces should be included before and after.	• Allowed: A St @ Main St • Allowed: Ardenwood Ter @ Sizzler
&	• Only to be used as the associative term in a stop name with two distinct non-addressed elements. • Spaces should be included before and after.	• Allowed: Fremont Blvd & Decoto Rd
+	• Only to be used as the associative term in a stop name with two distinct non-addressed elements. • Spaces should be included before and after.	• Allowed: Geary Blvd + 33rd Ave
/	• To be used without spaces for joining names of a street with two different names at an intersection. • Not to be used as the associative term for two distinct elements of a stop name.	• Allowed: Decoto Rd and Royal Ann Dr/Clover St • Not allowed: Geary Blvd/33rd Ave
at	• Not to be used as the associative term for two distinct non-addressed elements of a stop name.	• Allowed: 456 Myra St at City Hall, College of San Mateo at CSM Dr • Not allowed: Myra St at Capital Ave
. **(period)**	• Should be avoided with abbreviation or to end a stop name. • Can be used if it is part of the name (rule #25).	• Allowed: O.co Coliseum • Not allowed: Wabash Rive Pl. and Santee Rd., Wabash Rive Pl and Santee Rd.
- **(hyphen)**	• To be used with additional qualifying information in a stop name (rule #11). When used, space before or after should be avoided. • To be avoided in highway names. • To be avoided in street names.	• Allowed: El Camino Real & Oak Grove Ave-Menlo Park, University of California Berkeley-Business School • Not allowed: I-280, Alvarado-Niles Blvd

APPENDIX-2: REAL-TIME TRANSIT (RTT) CONFIGURATION DATA

This section of the document provides further explanation for data elements and their attributes defined for Real–Time Transit Configuration dataset in the "Extensible Markup Language (XML) Document Type Definitions (DTDs) for Java Message Service (JMS) Implementation", version 9.7. Transit service configuration data can be described based on route directions or trips. 511 Transit requires that the configuration data be provided with trip definition provided through the TripMapping elements in the TripMappingData collection. The following table provides requirement details for all data elements and their attributes included in the configuration dataset.

When an agency provides a GTFS-Realtime feed (see https://developers.google.com/transit/gtfs-realtime/reference/ for technical references on feed entities, TripUpdate, VehiclePosition, and Alert), this section is no longer relevant for that agency because real-time data will not be collected in the JMS XML protocol.

Data Element	Attribute	Description and Guidelines
TripMappingData (required)		• This XML collection holds all trip mapping elements of the configuration dataset. 511 Transit requires that transit agencies provide configuration data using this data collection.
	agency (required)	• Length of the agency value should be no more than 50 characters. • The value for this attribute is set and provided by 511 Transit when the JMS communication parameters are established.
	version (required)	• Value must be numeric such as 1.0. It can be fixed, or it may change as a new feed version is produced, but the version in the configuration dataset must match with the corresponding prediction and arrival status datasets.
	TimeStamp (required)	• The date/time of the current snapshot of the configuration dataset. • The format of the timestamp should be • YYYY-MM-DDTHH:MM:SSZ where Z = (+/-)HH:MM • The year, month, and day are specified, followed by a "T" (for Time) and then the hours, minutes, and seconds, followed by a time zone indicator. Note that the time in hours is specified on a 24 hour clock; i.e., am and pm cannot be used. For the timezone "Z", indicate the difference from UTC in the format: (+/-)HH:MM. • Ex: 2017-07-05T14:15:47-07:00
TripMapping (required)		• Each of these elements defines a single trip in the service. At a minimum, values for tripID, routeKey, dirKey, and dirTitle attributes should be provided.
	tripID (required)	• Identifies a vehicle trip in the transit service and must match with the trip_id in GTFS file trips.txt or realtime_trip_id in GTFS+ realtime_trips.txt file for the same vehicle trip. • Values of tripIDs must be unique within a TripMappingData collection.
	routeKey (required)	• Identifies a route by its publicly known identifier. • Values of routeKey must match with values of route_short_name in GTFS routes.txt file for the same transit route.
	dirKey (required)	• Ideally, dirKey should provide a generic direction code for all trips heading in the same direction of travel irrespective of their pattern designation. Values should match with values provided in the direction field of the GTFS+ directions.txt file. • Alternatively, if patterns are to be separately identified in each direction, dirKey values should uniquely identify them with values such as 'west1' 'inbound2', etc. • Values of dirKey should not include route number or name or single letter

Data Element	Attribute	Description and Guidelines
		direction code (E). For example, "30E Vacaville/Davis" should be avoided as dirKey value. Instead, Simply 'East' should be used.

	dirTitle (required)	• This attribute provides a textual name for the route direction and is very helpful for transit riders.
		• If single dirKey is defined for all trips irrespective of the pattern designation, a single dirTitle value should also be used for all trips in the same direction.
		• Length of the dirTitle values should be no more than 120 characters.
		• These attribute values can be the trip_headsign values provided in the GTFS trips.txt file.
		• dirTitle value should not be duplicated as dirKey value.
		• The following rules should be adhered to for dirTitle value:
		  • Values of dirTitle should not contain route number or name. For example, it should be "Inverness", not "30 Inverness."
		  • No directional information should be included. For example, instead of "Outbound to Downtown Berkeley" or "North (or N) to Downtown Berkeley" it should be "Downtown Berkeley."
		  • If a single dirKey is used for trips in the same direction, the destination name for the pattern with the most trips can be used for dirTitle.
		  • Values of dirTitle should not include special character such as '|' (pipe).
		  • Values should not include words such as 'to', 'toward', etc. '

	defaultTripForRouteDir (optional)	• Identifies a trip as the most prevalent trip in a direction.
ConfigurationData		• A collection of route elements.
	numStops (required)	• Identifies the total number of unique stops.
	msg (optional)	• Provides special message that may be applicable for the configuration data. For example, "This version contains special services for the Bay to Breakers."
	agency (required)	• Same value as provided in the TripMappingData.
	version (required)	• Same value as provided in the TripMappingData.
	TimeStamp (required)	• Same value as provided in the TripMappingData.
Route		• An element that defines attributes of a route and collection of stops for trips defined as TripMapping element. • Each Route element must contain route Key and title attributes, and a collection of Direction elements.
	key (required)	• Value must match with the route_short_name value in the GTFS routes.txt file.
	title (required)	• Name of the route should be a short name that might be in use as public information along with route number/code provided in the key field. If such a name is not applicable, the same value used in the key field may be duplicated in this field. • If route_long_name value is provided in the GTFS routes.txt file, the same value should be used here. • Route direction information must be avoided as a part of this attribute.
Direction		• Though named 'Direction,' it actually identifies a collection of stop elements for a trip defined as a TripMapping element under the TripMappingData.
	key (required)	• Value referenced from tripID in TripMapping.
	title (required)	• Value referenced from dirTitle in TripMapping.
	dirType	• When dataset is provided with the XML collection TripMappingData ,

Data Element	Attribute	Description and Guidelines
	(required)	dirType value is "TRIP_ID."
Stop		• An element that defines a stop within a trip. • Every stop element must include stop key, title, and stopOrder.
	key (required)	• Values of stop key must match with the stop_code value in GTFS stops.txt file for the same stop. • As required for the GTFS stop_code, this value must include the MTC assigned prefix digits assigned for the transit agency. • Length should be kept to six or fewer digits.
	title (required)	• Same set of rules defined for the stop_name field in the GTFS stops.txt file applies to this attribute. • Direction and/or route information should not be a part of the stop title. • Detailed guidelines for stop title are provided in Appendix-1.
	stopOrder (required)	• Sequence of the stop within the trip. • Value can start from '0' or '1.'