CTTRANSIT

CTTRANSIT REAL-TIME DATA FEEDS DOCUMENTATION (V 0.9.2)

MARCH 4, 2015
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1. PURPOSE OF THIS DOCUMENT

This document provides necessary information for the development of applications for CTfastrak, the new Bus Rapid Transit system that will serve travelers in central Connecticut.

Notes:
- CTfastrak will start service on March 28, 2015.
- This document is for information purposes only and may change.

2. CTTRANSIT OPEN DATA OVERVIEW

CTtransit will publish the following data for CTfastrak:

- **Schedule data**, including full schedule and route configuration as a:
  - GTFS dataset
- **Real-time data**, including information about arrival/departure predictions, vehicle locations, and service alerts as:
  - GTFS-realtime feeds
    - Trip Updates
    - Vehicle Positions
    - Service Alerts
  - JSON feeds
    - Trip Updates
    - Vehicle Positions
    - Service Alerts

Currently, real-time feeds in GTFS-realtime and JSON formats will be available only for CTfastrak services. More information about CTfastrak services can be found at [http://www.ctfastrak.com/](http://www.ctfastrak.com/).

The release of real-time data feeds for CTfastrak is the first phase of an initiative which will make similar information available for CTtransit services state-wide in the future.

Concepts and IDs are consistent across data feeds wherever possible.

2.1 Use of CTtransit data

Access to the CTtransit data feeds is governed by the language in the CTtransit License Agreement ([http://www.cttransit.com/about/developers/gtfsdata/](http://www.cttransit.com/about/developers/gtfsdata/)) in addition to the following conditions:

- CTtransit does not guarantee any technical support of any kind to users.
- No user may execute polling commands more often than every 30 seconds. A user that polls more often than that or otherwise overtaxes CTtransit's system may be suspended or terminated from the data feed.

2.2 Getting help and updates

CTtransit is happy to answer developer questions at developer@cttransit.com.
Developers are encouraged to join the CTtransit Developers discussion forum at https://groups.google.com/d/forum/cttransit_developers to get the latest updates.

3. GTFS SCHEDULE DATASET OVERVIEW

CTtransit publishes full schedule and route configuration information for all its services in GTFS format. CTtransit’s GTFS files are available in ZIP files at http://www.cttransit.com/about/developers/gtfsdata/. More information about GTFS can be found at https://developers.google.com/transit/gtfs/.

Notes:
- Currently, schedule information in GTFS format is available for all CTtransit divisions in separate datasets.
- Until start of service for CTfastrak, a test GTFS dataset will be provided for the Hartford division which includes CTfastrak, labeled “CTfastrak”. This will be in addition to the ‘production’ GTFS dataset for the Hartford division, labeled “Hartford”.
- At the start of service on March 28, 2015, CTfastrak schedule information will be included in the dataset for the Hartford division.
- CTfastrak routes have the following route_short_names in the GTFS dataset: 101, 102, 121, 128, 140, 141, 144, 153, 161, 923, 924, 925, and 928.

4. GTFS-REALTIME FEEDS OVERVIEW

CTtransit will provide real-time data feeds for arrival/departure predictions, vehicle locations, and service alerts in GTFS-realtime format at http://www.cttransit.com/about/developers/realtimedata/. Real-time data will currently only be available for CTfastrak services.

4.1 Accessing the Feed

CTtransit will provide the following GTFS-realtime feeds in separate protocol buffer files:
- Trip Updates – this feed includes trip progress and arrival/departure predictions.
- Vehicle Positions – this feed includes vehicle positions.
- Service Alerts – this feed includes service alerts.
- Combined – this feed includes all of the above.

Notes:
- Links to access each feed will be provided before start of service for CTfastrak as part of an update to this document.
- Sample real-time data feeds in GTFS-realtime format can be found at http://www.cttransit.com/about/developers/gtfsdata/Main.asp. Please see section for ‘Real Time Test Data’ under ‘CTfastrak’.

4.2 Relationship with Other CTtransit Data Feeds

GTFS-realtime feeds have to be linked to GTFS schedule data for most applications.
4.3 Format Documentation


The GTFS-realtime feeds have the following format:

header
- **gtfs_realtime_version**. Set to “1.0”.
- **timestamp**

entity
- **id**
- **trip_update**. Included if trip_update entity is provided. See trip_update below.
- **vehicle**. Included if vehicle entity is provided. See vehicle below.
- **alert**. Included if alert entity is provided. See alert below.

trip_update
- **trip**
  - **trip_id**. See additional information in Section 4.4.
  - **route_id**
  - **start_date**
  - **schedule_relationship**. Not included if trip is working as scheduled; otherwise, set to ADDED if trip is an added trip, or CANCELED if trip has been canceled.
- **vehicle**
  - **id**
  - **label**

stop_time_update
- **stop_sequence**
- **stop_id**
- **arrival**. See additional information in Section 4.4.
  - **delay**. Not included if delay is zero.
  - **time**
- **departure**. See additional information in Section 4.4.
  - **delay**. Not included if delay is zero.
  - **time**
  - **schedule_relationship**. Not included if stop is a scheduled stop; otherwise set to SKIPPED if stop is skipped.

timestamp

vehicle
- **trip**
- trip_id. See additional information in Section 4.4.
- route_id
- start_date
- schedule_relationship. Not included if trip is working as scheduled; otherwise, set to ADDED if trip is an added trip, or CANCELED if trip has been canceled.

- vehicle
  - id
  - label

- position
  - latitude
  - longitude

- timestamp

- alert
  - active_period. An alert can only have one active_period.
    - start
    - end

- informed_entity. Only agencies, routes, and stops are supported.
  - agency_id. Included if applicable
  - route_id. Included if applicable
  - stop_id. Included if applicable

- header_text
  - translation
    - text
    - language. Set to “en”.

- description_text
  - translation
    - text
    - language. Set to “en”.

4.4 Additional Information

- Incrementality:
  - This field is not provided, but should be considered to be set to “FULL DATASET”. “DIFFERENTIAL” is not supported in the GTFS-realtime feeds.

- Trips:
  - For each active vehicle in the trip_update feed, information about two trips will be provided where applicable i.e. the vehicle’s current trip and the next trip in the block.
  - Arrival/departure prediction information will be provided for all remaining stops on the current trip and stops of the next trip.
CTtransit

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- Arrival and departure prediction information:
  - Both arrival and departure prediction information will be provided for all stops in `stop_time_update`, except for the origin stop (only departure prediction information will be provided) and the destination stop (only arrival prediction information will be provided).

- Detours:
  - Stops that are not served will have schedule_relationship set to SKIPPED.
  - `stop_time_update`, including arrival/departure predictions, will not be provided for any replacement stops.
  - Information about replacement stops will be provided via service alerts.

- Added trips:
  - Added trips are always based on a scheduled trip.
  - `trip_id` for added trips is set to the concatenated value of the `trip_id` of the scheduled trip on which it is based, an underscore, and an integer value for the number of the added trip (for example, the `trip_id` for the first added trip based on a scheduled trip with `trip_id` "750442" will be "750442_1").

4.5 Samples

4.5.1 SAMPLE OF THE TRIP UPDATES FEED

```
header {
  gtfs_realtime_version: "1.0"
  timestamp: 1425069685
}
entity {
  id: "701354"
  trip_update {
    trip {
      trip_id: "701354"
      start_date: "20150227"
      route_id: "50-54"
    }
    stop_time_update {
      stop_sequence: 50
      arrival {
        delay: 180
        time: 1425069588
      }
      departure {
        delay: 180
        time: 1425069588
      }
      stop_id: "BLUDEEN"
    }
    stop_time_update {
      stop_sequence: 51
      arrival {
        delay: 180
        time: 1425069645
      }
      departure {
        delay: 180
        time: 1425069645
      }
      stop_id: "BLUWESN"
    }
  }
```

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stop_time_update {
    stop_sequence: 52
    arrival {
        delay: 180
        time: 1425069660
    }
    stop_id: "BLU1292N"
}
vehicle {
    id: "2439"
    label: "1439"
}
timestamp: 1425069669
}

4.5.2 SAMPLE OF THE VEHICLE POSITIONS FEED

header {
    gtfs_realtime_version: "1.0"
    timestamp: 1425069685
}
entity {
    id: "1431"
    vehicle {
        trip {
            trip_id: "705356"
            start_date: "20150227"
            route_id: "101"
        }
        position {
            latitude: 41.6869125
            longitude: -72.75929
        }
        timestamp: 1425069663
        vehicle {
            id: "2431"
            label: "1431"
        }
    }
}

4.5.3 SAMPLE OF THE SERVICE ALERTS FEED

header {
    gtfs_realtime_version: "1.0"
    timestamp: 1425069685
}
entity {
    id: "68"
    alert {
        active_period {
            start: 1424991373
            end: 1425167581
        }
        informed_entity {
            route_id: "101"
            stop_id: "CTFEMAIS"
        }
        header_text {
            translation {
                text: "Test Service Notice Route and Stop"
                language: "en"
            }
        }
    }
}
Test Service Notice Route and Stop Detailed Text
5. JSON REAL-TIME FEED OVERVIEW

CTtransit will provide real-time data feeds for arrival/departure predictions, vehicle locations, and service alerts in JSON format at http://www.cttransit.com/about/developers/realtimedata/. Real-time data will currently only be available for CT fastrak services.

5.1 Accessing the Feed

CTtransit will provide the following JSON feeds in separate files:

- Trip Updates – this feed includes trip progress and arrival/departure predictions.
- Vehicle Positions – this feed includes vehicle positions.
- Service Alerts – this feed includes service alerts.
- Combined – this feed includes all of the above.

Notes:
- Links to access each feed will be provided before start of service for CT fastrak as part of an update to this document.
- Sample real-time data feeds in GTFS-realtime format can be found at http://www.cttransit.com/about/developers/gtfsdata/Main.asp. Please see section for ‘Real Time Test Data’ under ‘CTfastrak’.

5.2 Relationship with Other CTtransit Data Feeds

The JSON feed has to be linked to CTtransit’s GTFS schedule data for most applications.

5.3 Format Documentation

The JSON feed is designed to have a similar structure and behavior as the GTFS-realtime feeds. The JSON feeds have the following format:

**header**

- **incrementality.** Set to 0.
- **timestamp**

**entity.** Array of entities. For each entity in array:

- **id**
- **trip_update.** Included if trip_update entity is provided; otherwise, set to null. See **trip_update** below.
- **vehicle.** Included if vehicle entity is provided; otherwise, set to null. See **vehicle** below.
- **alert.** Included if alert entity is provided; otherwise, set to null. See **alert** below.

**trip_update**

- **trip**
  - **trip_id.** See additional information in Section 5.4.
  - **route_id**
  - **start_date**
- **schedule_relationship**. Set to 0 if trip is working as scheduled, 1 if trip is an added trip, or 2 if trip has been canceled.

- **vehicle**
  - id
  - label

- **stop_time_update**
  - stop_sequence
  - stop_id
  - arrival. See additional information in Section 5.4.
    - delay
    - time
  - departure. See additional information in Section 5.4
    - delay
    - time
  - **schedule_relationship**. Set to 0 if stop is scheduled, 1 if stop is skipped, or 2 if there is no real-time data available for this stop.

- **timestamp**

- **trip**
  - trip_id. See additional information in Section 5.4.
  - route_id
  - start_date
  - **schedule_relationship**. Set to 0 if trip is working as scheduled, 1 if trip is an added trip, or 2 if trip has been canceled.

- **vehicle**
  - id
  - label

- **position**
  - latitude
  - longitude

- **timestamp**

- **alert**
  - active_period
    - start
    - end
  - informed_entity. Only agencies, routes, and stops are supported.
    - agency_id (if applicable)
    - route_id (if applicable)
5.4 Additional Information

- **Trips:**
  - For each active vehicle in the trip_update feed, information about two trips will be provided where applicable i.e. the vehicle’s current trip and the next trip in the block.
  - Arrival/departure prediction information will be provided for all remaining stops on the current trip and stops of the next trip.

- **Arrival and departure prediction information:**
  - Both arrival and departure prediction information will be provided for all stops in stop_time_update, except for the origin stop (only departure prediction information will be provided) and the destination stop (only arrival prediction information will be provided).

- **Detours:**
  - Stops that are not served will have schedule_relationship set to 1.
  - stop_time_update, including arrival/departure predictions, will not be provided for any replacement stops.
  - Information about replacement stops will be provided via service alerts.

- **Added trips:**
  - Added trips are always based on a scheduled trip.
  - trip_id for added trips is set to the concatenated value of the trip_id of the scheduled trip on which it is based, an underscore, and an integer value for the number of the added trip (for example, the trip_id for the first added trip based on a scheduled trip with trip_id “750442” will be “750442_1”).

5.5 Samples

### 5.5.1 SAMPLE OF THE TRIP UPDATES FEED

```json
{
    "entity": [
        {
            "alert": null,
            "id": "705356",
            "trip_update": {
                "stop_time_update": [
                    {
                        "arrival": {
                            "delay": 0,
                            "time": null
                        }
                    }
                ]
            }
        }
    ]
}
```
5.5.2 SAMPLE OF THE VEHICLE POSITIONS FEED

{
  "entity": [
    {
      "alert": null,
      "id": "1442",
      "trip_update": null,
      "vehicle": {
        "position": {
          "latitude": 41.7706223,
          "longitude": -72.67449
        },
        "timestamp": 1425069667,
        "trip": {
          "route_id": "46",
          "schedule_relationship": 0,
          "start_date": "20150227",
          "trip_id": "700806"
        },
        "vehicle": {
          "id": "2442",
          "label": "1442"
        }
      }
    }
  ],
  "header": {
    "incrementality": 0,
    "timestamp": 1425069685
  }
}
5.5.3  SAMPLE OF THE SERVICE ALERTS FEED

```json
{
  "entity": [
    {
      "alert": {
        "active_period": [
          {
            "end": 1425167581,
            "start": 1424991373
          }
        ],
        "description_text": {
          "translation": [
            {
              "language": "en",
              "text": "Test Service Notice Route and Stop Detailed Text"
            }
          ]
        },
        "header_text": {
          "translation": [
            {
              "language": "en",
              "text": "Test Service Notice Route and Stop"
            }
          ]
        },
        "informed_entity": [
          {
            "agency_id": "",
            "route_id": "101",
            "stop_id": "CTFEMAIS"
          }
        ],
        "id": "68",
        "trip_update": null,
        "vehicle": null
      }
    },
    "header": {
      "incrementality": 0,
      "timestamp": 1425069685
    }
  ]
}
```
6. ABOUT THIS DOCUMENT

6.1 Version History

<table>
<thead>
<tr>
<th>Version #</th>
<th>Date</th>
<th>Change Author</th>
<th>Description of Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.9</td>
<td>2015/02/06</td>
<td>Ritesh Warade (IBI)</td>
<td>Working draft (pre-launch)</td>
</tr>
<tr>
<td>0.9.1</td>
<td>2015/02/06</td>
<td>Ritesh Warade (IBI)</td>
<td>Clarified wording in Sections 1. Purpose and 2. Overview</td>
</tr>
<tr>
<td>0.9.2</td>
<td>2015/3/4</td>
<td>Ritesh Warade (IBI)</td>
<td>Changes to feed structure and samples in Sections 4 and 5.</td>
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</table>