CTtransit CT fastrak

CTTRANSIT

CTTRANSIT REAL-TIME DATA FEEDS DOCUMENTATION (V 0.9.1)

FEBRUARY 6, 2015

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1. PURPOSE OF THIS DOCUMENT

This document provides necessary information for the development of applications for CT***fastrak***, the new Bus Rapid Transit system that will serve travelers in central Conneticut.

Notes:

- CT***fastrak*** will start service on March 28, 2015.
- This document is for information purposes only and may change.

2. CTTRANSIT OPEN DATA OVERVIEW

CT*transit* will publish the following data for CT***fastrak***:

- **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 feed**

Currently, real-time feeds in GTFS-realtime and JSON formats will be available only for CT***fastrak*** services. More information about CT***fastrak*** services can be found at http://www.ctfastrak.com/.

The release of real-time data feeds for CT***fastrak*** is the first phase of an initiative which will make similar information available for CT*transit* 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 CT*transit* data feeds is governed by the language in the CT*transit* License Agreement (http://www.cttransit.com/about/developers/gtfsdata/) in addition to the following conditions:

- CT*transit* 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 CT*transit*'s system may be suspended or terminated from the data feed.

2.2 Getting help and updates

CT*transit* is happy to answer developer questions at developer@cttransit.com.

Developers are encouraged to join the CT*transit* Developers discussion forum at https://groups.google.com/d/forum/cttransit_developers to get the latest updates.

3. GTFS SCHEDULE DATASET OVERVIEW

CT*transit* publishes full schedule and route configuration information for all its services in GTFS format. CT*transit*'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 CT*transit* divisions in separate datasets.
- Until start of service for CT***fastrak***, a test GTFS dataset will be provided for the Hartford division which includes CT***fastrak***, 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, CT***fastrak*** schedule information will be included in the dataset for the Hartford division.
- CT***fastrak*** 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

CT*transit* 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 CT***fastrak*** services.

4.1 Accessing the Feed

CT*transit* 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 all service alerts.

Note: Links to access each feed will be provided before start of service for CT***fastrak*** as part of an update to this document.

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 specification is detailed at https://developers.google.com/transit/gtfs-realtime/. The Protocol Buffer format is detailed at http://code.google.com/p/protobuf/.

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**. Set to SCHEDULED if trip is working as scheduled, 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**
    - **delay**
    - **time**
  - **departure**
    - **delay**
    - **time**
  - **schedule_relationship**. Set to SCHEDULED if stop is scheduled or SKIPPED if stop is is skipped.

vehicle

- **trip**
  - **trip_id**. See additional information in Section 4.4.
  - **route_id**
  - **start_date**
  - **schedule_relationship**. Set to SCHEDULED if trip is working as scheduled, 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 routes and stops are supported.
    - **route_id** (if applicable)
    - **stop_id** (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.
- 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: 1333101600
}
entity {
  id: "2"
  trip_update {
    trip {
      trip_id: "12345678"
      route_id: "1234"
      start_date: "20120330"
      schedule_relationship: "SCHEDULED"
    }
    vehicle {
      id: "1234"
      label: "1234"
    }
    stop_time_update {
      stop_sequence: 1
      stop_id: "1234"
      arrival {
        delay: 5
        time: 1333104000
      }
      departure {
        delay: 5
        time: 1333104000
      }
      schedule_relationship: SCHEDULED
    }
    stop_time_update {
      stop_sequence: 2
      stop_id: "1235"
      arrival {
        delay: 1
        time: 1333104360
      }
      departure {
        delay: 1
        time: 1333104360
      }
      schedule_relationship: SCHEDULED
    }
}
```

4.5.2 SAMPLE OF THE VEHICLE POSITIONS FEED

```
header {
  gtfs_realtime_version: "1.0"
  timestamp: 1333101600
}
entity {
 id:  "1"
 vehicle {
   trip {
     trip_id: "12345678"
     route_id: "1234"
     start_date: "20120330"
     schedule_relationship: "SCHEDULED"
   }
   vehicle {
     id: "1234"
     label: "1234"
   }
   position {
     latitude: 42.0310601
     longitude: -91.6490485
   }
   timestamp: 1333101500
 }
}
```

4.5.3 SAMPLE OF THE SERVICE ALERTS FEED

```
header {
  gtfs_realtime_version: "1.0"
  timestamp: 1333101600
}
entity {
  id: "0"
  alert {
    active_period {
      start: 1333101600
      end: 1222188000
    }
    informed_entity {
      route_id: "219"
    }
    informed_entity {
      stop_id: "16230"
    }
    header_text {
      translation {
        text: "Stop at Elm street is closed, temporary stop at Oak street"
        language: "en"
      }
    }
    description_text {
      translation {
        text: "Due to construction at Elm street the stop is closed. The temporary
       stop can be found 300 meters north at Oak street"
        language: "en"
      }
    }
  }
}
```

5. JSON REAL-TIME FEED OVERVIEW

CT*transit* 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

CT*transit* will provide one JSON feed, which will include arrival/departure predictions, vehicle locations, and service alerts.

Note: Links to access the feed will be provided before start of service for CT***fastrak*** as part of an update to this document.

5.2 Relationship with Other CTtransit Data Feeds

The JSON feed has to be linked to CT*transit*'s GTFS schedule data for most applications.

5.3 JSON Schema

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

The JSON schema is provided below:

top level

```
{
   "$schema": "http://json-schema.org/draft-04/schema#",
   "title": "Real Time Feed",
   "type": "object",
   "properties": {
      "timestamp": {
         "type": "number"
      },
      "vehicle_feed": [{

      }],
      "trip_update_feed": [{

      }],
      "alert_feed": [{

      }]
   }
}
```

trip_update_feed

```
{
   "title": "trip update",
   "type": "object",
   "properties": {
      "trip_update": {
         "trip": {
            "trip_id": {
               "type": "string"
            },
            "route_id": {
               "type": "string"
```

```
            },
            "start_date": {
               "type": "string"
            },
            "schedule_relationship": {
               "type": "string"
            }
         },
         "vehicle": {
            "id": {
               "type": "string"
            },
            "label": {
               "type": "string"
            }
         },
         "stop_time_update": [{
            "stop_sequence": {
               "type": "number"
            },
            "stop_id": {
               "type": "string"
            },
            "arrival": {
               "delay": {
                  "type": "number"
               },
               "time": {
                  "type": "number"
               }
            },
            "departure": {
               "delay": {
                  "type": "number"
               },
               "time": {
                  "type": "number"
               }
            },
            "schedule_relationship": {
               "type": "string"
            }
         }],
         "timestamp": {
            "type": "number"
         }
      }
   }
}
```

vehicle_feed

```
{
   "title": "Vehicle",
   "type": "object",
   "properties": {
      "vehicle": {
         "trip": {
            "trip_id": {
               "type": "string"
            },
            "route_id": {
               "type": "string"
```

```
            },
            "start_date": {
               "type": "string"
            },
            "schedule_relationship": {
               "type": "string"
            }
         },
         "vehicle": {
            "id": {
               "type": "string"
            },
            "label": {
               "type": "string"
            }
         },
         "position": {
            "latitude": {
               "type": "number"
            },
            "longitude": {
               "type": "number"
            }
         },
         "timestamp": {
            "type": "number"
         }
      }
   }
}
```

alert_feed

```
{
   "title": "Alert",
   "type": "object",
   "properties": {
      "alert": {
         "active_period": {
            "start": {
               "type": "number"
            },
            "end": {
               "type": "number"
            }
         },
         "informed_entity": [{
            "route_id": {
               "type": "string"
            },
            "stop_id": {
               "type": "string"
            }
         }],
         "header_text": {
            "translation": {
               "text": {
                  "type": "string"
               },
               "language": {
                  "type": "string"
               }
            }
```

```
            },
            "description_text": {
               "translation": {
                  "text": {
                     "type": "string"
                  },
                  "language": {
                     "type": "string"
                  }
               }
            }
         }
      }
}
```

5.4 Samples

JSON feed samples will be provided prior to start of service.

6. ABOUT THIS DOCUMENT

6.1 Version History

Version #	Date	Change Author	Description of Change
0.9	2015/02/06	Ritesh Warade (IBI)	Working draft (pre-launch)
0.9.1	2015/02/06	Ritesh Warade (IBI)	Clarified wording in Sections 1. Purpose and 2. Overview