



CTTRANSIT

CTTRANSIT REAL-TIME DATA FEEDS DOCUMENTATION (V 0.9.2)

---

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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 Connecticut.

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

CTtransit 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 feeds**
    - **Trip Updates**
    - **Vehicle Positions**
    - **Service Alerts**

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 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/>) 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](mailto:developer@cttransit.com).

Developers are encouraged to join the CTtransit Developers discussion forum at [https://groups.google.com/d/forum/cttransit\\_developers](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 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

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 CT **fastrak** 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 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'.

#### 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**. 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.

- 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"
    }
  }
}
```

```

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"
    }
  }
}
}

```



```
description_text {  
  translation {  
    text: "Test Service Notice Route and Stop Detailed Text"  
    language: "en"  
  }  
}
```

WORKING DRAFT

## 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**

**vehicle**

- **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)

- **stop\_id** (if applicable)
- **header\_text**
  - **translation**
    - **text**
    - **language**. Set to "en".
- **description\_text**
  - **translation**
    - **text**
    - **language**. Set to "en".

## 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

```
{
  "entity": [
    {
      "alert": null,
      "id": "705356",
      "trip_update": {
        "stop_time_update": [
          {
            "arrival": {
              "delay": 0,

```

```

        "time": 1425069780
      },
      "departure": {
        "delay": 0,
        "time": 1425069780
      },
      "schedule_relationship": 0,
      "stop_id": "CTFEMAIS",
      "stop_sequence": 11
    },
    {
      "arrival": {
        "delay": 0,
        "time": 1425069900
      },
      "departure": null,
      "schedule_relationship": 0,
      "stop_id": "CTFNEWW",
      "stop_sequence": 12
    }
  ],
  "timestamp": 1425069663,
  "trip": {
    "route_id": "101",
    "schedule_relationship": 0,
    "start_date": "20150227",
    "trip_id": "705356"
  },
  "vehicle": {
    "id": "2431",
    "label": "1431"
  }
},
"vehicle": null
}
],
"header": {
  "incrementality": 0,
  "timestamp": 1425069685
}
}

```

### 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

```

{
  "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

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
0.9.2	2015/3/4	Ritesh Warade (IBI)	Changes to feed structure and samples in Sections 4 and 5.