GTFS Best & Worst Practices

A New Guide Created Collaboratively by Data Consumers, Producers, and the Rocky Mountain Institute

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Agenda

• Motivation

• A Solution: Best Practices

• Process – How did we get here?

• Next steps
Why do we care about GTFS Best Practices?

MOTIVATION
Amazing data => Amazing apps!

• Over 860 GTFS public feeds in online directories
  – Transit.land
  – Transitfeeds.com
• (Real-time) transit information has many benefits:
  – Trip Planning [8]
  – Shorter perceived wait time [1]
  – Shorter actual wait time [1]
  – Lowers learning curve for new riders [2]
  – Increased ridership[3][7]
  – Increased feeling of safety (e.g., at night) [5][6]
• Any disconnect between agency data and app developers is jarring to riders

Key feature - Saving Favorite Stops

- Fletcher Ave @ Magnolia Dr Metrora... Westbound
- Mckinley Dr @ Fowler Av Northbound
- N 42nd St @ Lazy Oak Dr Northbound
- University Area Transit Center
Key feature - Saving Favorite Stops

• The app saves the stop_id for the favorite stop
  – stop_id = 1234

• stop_id is used to request real-time information:
  – http://api.agency.org/arrivals?stop_id=1234

• What happens when the stop_id changes?
Changed Stop ID => Broken favorite!

★ University Area Transit Center

Sorry, that particular stop can't be found. If this was a shortcut, it's possible your link is out of date, or the wrong region is selected (Your current region is Tampa Bay. Change in "Preferences->Your region").
Stops not merged / No parent station

Each “stop” shows different routes!!!
Repeated Directions in Headsign

- West to where???
Route Number Included in Headsign

- Redundant “Gold” pushes text to 2 lines
  - Can be hard to read on mobile
Poorly formatted stop names

- Atc!!!
Agency name not spelled out

Report a Step Problem

Hillsborough Area Regional Transit

PSTA

Submit and vote on future improvements
No route/trip shape data

• Flying buses!!
A solution to (some of) our problems!

GTFS BEST PRACTICES
gtfs.org/best-practices

What you will find:

• Recommendations & examples
• Organized by file, field, and “cases”
• Matches recommendations to type of consuming application:
  – Trip planning
  – Arrival estimation
  – Timetable generation
EXAMPLES
How to publish data?

Datasets should be published at a public, permanent URL, including the zip file name. (e.g., www.agency.org/gtfs/gtfs.zip).

(http://gtfs.org/best-practices/#publishing_1)
Service changes?

One GTFS dataset should contain current and upcoming service (sometimes called a “merged” dataset).

• At any time, the published GTFS dataset should be valid for \textit{at least} the next 7 days.

• If possible, the GTFS dataset should cover at least the next 30 days of service.

(\texttt{http://gtfs.org/best-practices/#publishing_4})
Naming stations and child stops

Stop and station names should be well-recognized by riders

• Helps riders identify station and boarding facility (bus bay, platform, wharf, gate, etc.).
• [http://gtfs.org/best-practices/#stops_14](http://gtfs.org/best-practices/#stops_14)

<table>
<thead>
<tr>
<th>Parent Station Name</th>
<th>Child Stop Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicago Union Station</td>
<td>Chicago Union Station Platform 19</td>
</tr>
<tr>
<td>San Francisco Ferry Building Terminal</td>
<td>San Francisco Ferry Building Terminal Gate E</td>
</tr>
<tr>
<td>Downtown Transit Center</td>
<td>Downtown Transit Center Bay B</td>
</tr>
</tbody>
</table>
## Headsigns

<table>
<thead>
<tr>
<th>Route Description</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2A. Destination-only</td>
<td>Provide the terminus destination. e.g. &quot;Transit Center&quot;, “Portland City Center”, or “Jantzen Beach”</td>
</tr>
<tr>
<td>2B. Destinations with waypoints</td>
<td><code>&lt;destination&gt; via &lt;waypoint&gt; “Highgate via Charing Cross”</code>. If waypoint(s) are removed from the headsign show to passengers after the vehicle passes those waypoints, use <code>stop_times.stop_headsign</code> to set an updated headsign.</td>
</tr>
<tr>
<td>2C. Regional placename with local stops</td>
<td>If there will be multiple stops inside the city or borough of destination, use <code>stop_times.stop_headsign</code> once reaching the destination city.</td>
</tr>
<tr>
<td>2D. Direction-only</td>
<td>Indicate using terms such as “Northbound”, “Inbound”, “Clockwise,” or similar directions.</td>
</tr>
<tr>
<td>2E. Direction with destination</td>
<td><code>&lt;direction&gt; to &lt;terminus name&gt;</code> e.g. “Southbound to San Jose”</td>
</tr>
<tr>
<td>2F. Direction with destination and waypoints</td>
<td><code>&lt;direction&gt; via &lt;waypoint&gt; to &lt;destination&gt;</code> (&quot;Northbound via Charing Cross to Highgate&quot;).</td>
</tr>
</tbody>
</table>
Loop route

No outbound/inbound: The vehicle returns to the starting point in one trip, and then travels the loop again.
<table>
<thead>
<tr>
<th>Field Name</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>trips.trip_id</td>
<td>Use a single trip to describe the whole loop.</td>
</tr>
<tr>
<td>stop_times.stop_id</td>
<td>The first and last stop will be the same.</td>
</tr>
<tr>
<td>trips.direction_id</td>
<td>Distinguish opposite travel directions (i.e. clockwise and counterclockwise) with direction_id = 0 or 1.</td>
</tr>
<tr>
<td>trips.block_id</td>
<td>Use block_id for continuous loops trips.</td>
</tr>
</tbody>
</table>
Also included: Lassos and Branches!

Deviation branch

Multiple termini

Extension branch
Teamwork is awesome!

COLLABORATIVE PROCESS
Agreed on by 16 organizations – GTFS Best Practices Working Group

1. Began with proposed (draft practices)
2. Voting to identify consensus and controversial recommendations
3. Discussion in person and on Slack channel (gtfs.slack.com)
4. Participants agreed to compromise:
   – “A clear, unified standard is more important than every recommendation going our way.”
5. Published at gtfs.org
Relationship to the GTFS Reference

5 changes to official GTFS Reference from GTFS Best Practices Working Group process:
   – https://github.com/google/transit/pulls

Good way to build consensus for best practices that should become “law”
What can we fix next?

NEXT STEPS
A CONSORTIUM APPROACH TO TRANSIT DATA INTEROPERABILITY

BY JACKSON CRANE AND GREG RUCKS

The Consortium Approach

• Industry-led: Convenes public and private transportation organizations
• Prevent inconsistent and low-quality data
• Structure to find alignment and agreement among the many thousands of organizations involved in transportation data
• Borrows from W3C, SUTI, and existing GTFS process
GTFS-realtime Best Practices

• Over 50 agencies now have [GTFS-rt](https://github.com/CUTR-at-USF/gtfs-realtime-validator) feeds!
• Same challenges as GTFS
• Potential GTFS-realtime “Best Practices”:
  – “Warning” rules from GTFS-realtime validator\(^1\)
    • Refresh interval more than 35 seconds
    • Header timestamp older than 65 seconds
    • Missing optional (but important) fields - timestamps, IDs
  – Proposals without unanimous agreement
    • Timestamp integrity - [https://github.com/google/transit/pull/55](https://github.com/google/transit/pull/55)

\(^1\) [https://github.com/CUTR-at-USF/gtfs-realtime-validator](https://github.com/CUTR-at-USF/gtfs-realtime-validator)
General Bikeshare Feed Specification (GBFS)

- Real-time bike/rack locations and availability/capacity
- Adopted by all North American Bikeshare Association vendors

https://github.com/NABSA/gbfs
GBFS - Challenge adopting proposals

• Include deep link URL
  – https://github.com/NABSA/gbfs/pull/25
  – 18 months old
  – No producer

• Service area polygons for station-less bikes
  – https://github.com/NABSA/gbfs/issues/65
  – 5 months old
  – No producer
Conclusions

• GTFS Best Practices will:
  – help agencies create better data
• ...which will:
  – help developers build better apps
• ...which will:
  – make riders happy!
• Happy riders => Better perception of agency
  => Increased ridership!
• Next steps => Consortium, GTFS-rt, GBFS