What is GTFS?

- Transit agencies can be producers of “Big Data”
- General Transit Feed Specification (GTFS)
- Universal language for documenting transit data
- Set of text files with specified sets of attributes
What is in a GTFS Data Set?

- **Required**
  - Agency/Feed Info
  - Stops/Stop Times
  - Routes
  - Trips
  - Calendar/Dates

- **Optional**
  - Fare Attributes/Rules
  - Shapes
  - Frequencies
  - Transfers
  - Others…
Working with GTFS Data

- Sources of GTFS data:
  - https://511ny.org/developers/resources
  - Agency generated
- Bring .txt file into Spreadsheet or GIS
- Join additional data sets
  - Ridership
  - Travel times
  - Land use
- Map/Analyze
GTFS Applications

• Integration with developer API
  • Trip planners

• Integration with GIS
  • Route Alignments
  • Stop Locations
  • Ridership by Stop/Route
  • Segment Run Times
  • Frequent Service Corridors
Use of GTFS for Transit Reliability

Minutes Matter: A Bus Transit Service Reliability Guidebook

To view the report, visit: https://www.nap.edu/read/25727/chapter/1

To download, visit: http://www.nap.edu/download/25727
Why is Reliability Important: Travel Time Budget

• If a trip normally takes 20 minutes, but takes 30 minutes once a week — a very typical situation for bus riders — then the customer must budget 30 minutes.

• By reducing trip length variability, an agency can save customers time, without speeding up buses!
Declines in Travel Time Reliability

Customer Point of View
- Current Customer Behavior
  - Budgeting extra time for trip
  - Health and safety impacts (comfort)
  - Monetary impacts
    (other modes of last-minute transportation)
- Future Customer Behavior
  - Choice riders turn to other modes
  - Decreased desire to use transit
- Decreased Satisfaction and Ridership

Agency Point of View
- Route Cycle Time
  - Increases time
  - Increases variability

Operator Point of View
- Operator Health
  - Stress
  - Fatigue
    - Lack of personal recovery time
- Operator and Passenger Safety
  - Potential for crashes
  - Negative interactions with passengers
- Issues with Morale and Retention

Addressing and Improving Reliability

Continuous Performance Monitoring
- Diagnose Underlying Causes of Unreliability
- Select and Implement Strategies for Improvement

Improvements in Travel Time Reliability
Guidebook: Selecting Measurements, Standards, and Monitoring Data

• Comprehensive list of measures
• The metrics selected must inform standards or targets to measure goals being accomplished

<table>
<thead>
<tr>
<th>Aspect of Reliability</th>
<th>Data Needed</th>
<th>Reliability Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Punctuality</td>
<td>Arrival and departure times</td>
<td>On-time performance/schedule adherence</td>
</tr>
<tr>
<td>Variability</td>
<td>Trip start and end times</td>
<td>Running time</td>
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<tr>
<td></td>
<td>Dwell time at stops</td>
<td>Dwell time</td>
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<tr>
<td></td>
<td>Customer travel times</td>
<td>Travel time</td>
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<tr>
<td></td>
<td>Time between buses</td>
<td>Headways</td>
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<td></td>
<td>Customer wait times</td>
<td>Wait times</td>
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<tr>
<td>Non-operation</td>
<td>Records of missed service</td>
<td>Pullouts missed</td>
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<td></td>
<td>Counts of service disruptions</td>
<td>Missed hours of service</td>
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<td>Scheduled trips cancelled</td>
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<td>Multiple</td>
<td>Number of crashes</td>
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<tr>
<td></td>
<td>Customer surveys</td>
<td>Mean distance between failures</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Passenger ratings of reliability</td>
</tr>
</tbody>
</table>
Guideline: Reliability Treatment Menus

Physical

- Encourage roadway agencies to incorporate bus-supportive features
- Far-side stop placement
- Dedicated transitways
- Queue jump lanes
- Level boarding and low-floor buses
- Right-sized terminals and layovers
- Curb extensions at bus stops
- Articulated buses
BRT Stop Consolidation Case Study

Study Goals:

- Identify factors that suppress BRT ridership
- Assess stop locations in BRT corridors
- Improve efficiency in BRT corridors
- Encourage use of new BRT service
Bus Stop Spacing Standards

Stop removal standards based on:

- Transit development plan/existing stop spacing standards
- Sidewalk network/ability to walk to/from nearest stop
- Transit network/ability to transfer
- Transit dependent land uses
- Ridership?
Existing Conditions – Desktop Evaluation

- GTFS data for all stops
- Filter to stops along BRT corridors
  - By Route? – Join Route Data
  - By Location?
- Identify travel direction
  - GTFS Data?
  - Ridership Data?
- Calculate distance
  - Move stops to line first!
Identify Route Direction

Calculate Stop Spacing

Identify Stops Below Standards
Existing Conditions - Field Visit

- Confirm stop locations and route info
- Assess pedestrian network
- Identify transit dependent land uses
Findings

• 355 Stops located along BRT corridors
• 60 Stops recommended for removal
  • Some were already inactive due to local service restructure
• Two new stops proposed in Downtown Albany
Thank You

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