

GTFS: Three Steps to Online Trip Planning

October 2, 2024 **October 9, 2024** October 16, 2024

National RTAP
Rural Transit Assistance Program

FTA
U.S. Department of Transportation
Federal Transit Administration

Speaker Introductions



Marcy Jaffe
Transnnovation, Inc.
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FTA
Data Specialist



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FTA
GIS
Specialist

Roadmap

Week 1, Oct 2

Why GTFS?

Required Tools/Set-up

Data Entry

How to Map Stops

Week 2, Oct 9

Routes vs. Trip Groups

Schedules_V3 (one trip)

Generate a GTFS Feed

NTD Reporting via Weblink

Week 3, Oct 16

Validation

Deeper Dive: NTD

Shapes (optional)

Fares (optional)

On-Demand workaround

Questions?

Please use the chat for questions.

Join weekly zoom, Thursdays at 1pm EST no registration needed

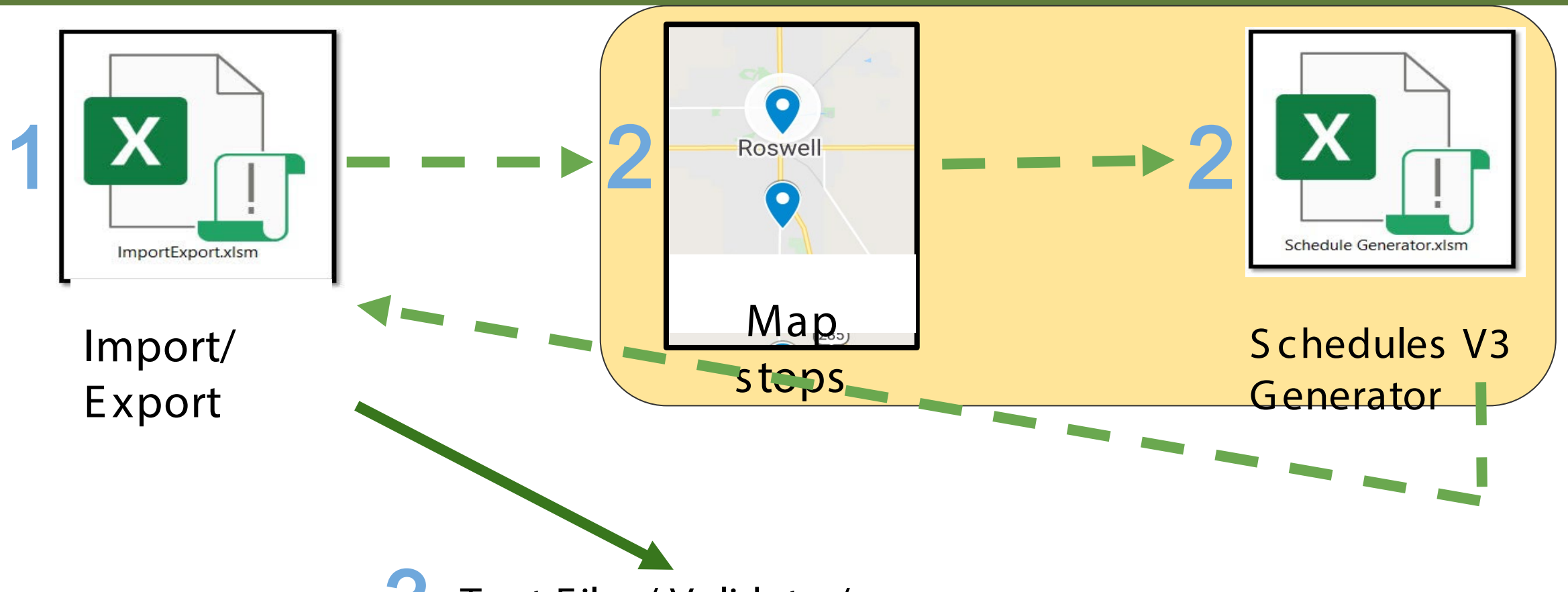
This training is recorded and will be available at the National RTAP website

GTFS Builder Guidebook: Checklist



Task	Section	Estimate	Date	Date	
REQUIRED TASKS					
If Google Transit is the preferred trip planner, confirm the agency can agree to the Google Licensing Agreement.		60 min.			
Download Google Earth Desktop to the PC for this project	1	15 min.		X	
Configure project folder for macros	1	10 min.		X	
Complete the ImportExport tabs: agency, calendar, calendar dates and routes	2,3,4,5	60 min.		X	
Determine if agency bus stop coordinates are available from other organizations. If so, obtain them.	6	30 min.		X	
If not, identify bus stop coordinates from MyMaps and/or Google Earth.	6	60 min.		X	
Enter bus stop coordinates from MyMaps or Google Earth or file into the ImportExport stop tab.	7	20 min.		X	
Complete the Schedule Generator file Schedules_V3 tab by entering timetable/schedule, stop by stop.	8	30 min. (per route)			
Complete the ImportExport tab: feed_info.	10	5 min.		X	
OPTIONAL TASKS					
In the ImportExport file complete the transfers tab	13	5 min			

Agenda


1
ImportExport.xlsm
Import/
Export
2
Roswell
Map
steps
2
Schedule Generator.xlsm
Schedules V3
Generator
3
Text Files/ Validate /
Upload / Create Web Link for NTD

Locating Bus Stops Review

MyMaps.google.com

Identify Bus Stop Coordinates and Complete the Stops Tab in the ImportExport File

Trip Groups

Routes, Trips and Trip Groups

Route - A single route may have one or more trip groups

- Route A - Trip Group AM/PM - weekdays
- Route A - Trip Group Mid Day - weekdays
- Route A - Trip Group Saturday

Trip Attributes include

- route_id
- service_id
- direction_id
- consecutive bus stops
- shape_id (optional)

Trip Group

- All trips that share the same attributes

Trip Groups - Service Days & Times: two trip groups

	A	B	C	D	E	F	G	P	Q	R	S	T	U
1	Trip_group	route_id	service_id	direction_id	trip_headsign	stop_id	stop_name	wheelchair_accessible	bikes_allowed	T01	T02	T03	T04
2	jtoc_weekday2AmandaPark												
3		JTOC	mtwtf	0	Quinault	222	Hoh Tribal Ce			7:32	11:37	15:12	19:17
4		JTOC	mtwtf	0		224	Cedar Creek			7:38	11:43	15:18	19:23
5		JTOC	mtwtf	0		225	Kalaloch			7:56	12:01	15:36	19:41
6		JTOC	mtwtf	0		226	Queets			8:02	12:07	15:42	20:00
7		JTOC	mtwtf	0		229	Clearwater Rc		*		*	*	
8		JTOC	mtwtf	0		228	Amanda Park			8:27	12:32	16:07	
9	**Leave a blank row between trip groups**												
10													
20	jtoc_Sat2AmandaPark							1	1				
21		JTOC	sat	0	Quinault	222	Hoh Tribal Ce			7:52	15:12		
22		JTOC	sat	0		224	Cedar Creek			7:58	15:18		
23		JTOC	sat	0		225	Kalaloch			8:16	15:36		
24		JTOC	sat	0		226	Queets			8:22	15:42		
25		JTOC	sat	0		229	Clearwater Rc		*		*		
26		JTOC	sat	0		228	Amanda Park			8:47	16:07		

Trip Groups - Service Days & Times: two trip groups

	A	B	C	D	E	F	G	Q	R	S	T	U
1	Trip_group	route_id	service_id	direction_id	trip_headsign	stop_id	stop_name	bikes_allowed	T01	T02	T03	T04
2	jtoc_weekday2AmandaPark							1				
3		JTOC	mtwtf	0	Quinault	222	Hoh Tribal Cente		7:32	11:37		19:17
4		JTOC	mtwtf	0		224	Cedar Creek		7:38	11:43		19:23
5		JTOC	mtwtf	0		225	Kalaloch		7:56	12:01		19:41
6		JTOC	mtwtf	0		226	Queets		8:02	12:07		20:00
7		JTOC	mtwtf	0		229	Clearwater Road		*	*		
8		JTOC	mtwtf	0		228	Amanda Park		8:27	12:32		
9												
10	jtoc_weekday2AmandaPark_1512							1				
11		JTOC	mtwtf	0	Quinault	222	Hoh Tribal Cente				15:12	
12		JTOC	mtwtf	0		224	Cedar Creek				15:18	
13		JTOC	mtwtf	0		228	Amanda Park				16:07	
14												

Trip Groups - Pop Quiz

WEEKDAY SERVICE		
La Push	Forks Hospital	Forks Transit Center
7:20 AM		7:45 AM
11:30 AM	11:50 AM	11:55 AM
3:35 PM		**4:00 PM**

SATURDAY SERVICE		
La Push	Forks Hospital	Forks Transit Center
9:20 AM		9:45 AM
12:25 PM		12:50 PM
4:50 PM		**5:15 PM**

Trip Groups - Correct = 3

	WEEKDAY SERVICE		
	La Push	Forks Hospital	Forks Transit Center
1 →	7:20 AM		7:45 AM
2 →	11:30 AM	11:50 AM	11:55 AM
1 →	**3:35 PM**		**4:00 PM**

	SATURDAY SERVICE		
	La Push	Forks Hospital	Forks Transit Center
3 →	9:20 AM		9:45 AM
3 →	12:25 PM		12:50 PM
3 →	**4:50 PM**		**5:15 PM**

Each Trip Group shares a
- Route ID
- Calendar ID
- Consecutive stops
- Shape ID (optional)

Schedule_V3:

Your Stops
Meet Your
Timetables

Route_id+Service_id+Direction_id: Trip Group



Route: Jefferson Transit Olympic Connection

Monday-Friday Weekday Service					
Forks to Amanda Park					
Hoh Tribal Center	**Cedar Creek**	**Kalaloch**	**Queets**	**Clearwater Road (Flag Stop)**	**Arrive Amanda Park**
7:32 AM	7:38 AM	7:56 AM	8:02 AM	8:07 AM	8:27 AM
11:37 AM	11:43 AM	**12:01 PM**	**12:07 PM**	**12:12 PM**	**12:32 PM**
3:12 PM	**3:18 PM**	**3:36 PM**	**3:42 PM**	**3:47 PM**	**4:07 PM**
7:17 PM	**7:23 PM**	**7:41 PM**	**8:00 PM**	-	-

	A	B	C	D	E	F	G	R	S	T	U
1	Trip_group	route_id	service_id	direction_id	trip_headsign	stop_id	stop_name	T01	T02	T03	T04
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6		JTOC	mtwtf	0		226	Queets	8:02	12:07	15:42	20:00
7		JTOC	mtwtf	0		229	Clearwater Road	*		*	
8		JTOC	mtwtf	0		228	Amanda Park	8:27	12:32	16:07	

Convert a Timetable into GTFS Schedule Generator

What you need to begin

- One route with route_id
- Stops (lat/long) with stop_id
- Copy of a current timetable
- One trip (weekday or weekend)

National RTAP's GTFS Builder Support/Guidebook

https://www.nationalrtap.org/Web-Apps/GTFS-Builder/Support

8. Generate Trip and Stop_times Data in the Schedule Generator File - Guidebook page 20

8. Generate Trip and Stop_times Data in the Schedule Generator File

The Schedule Generator file is used to develop data for the ImportExport file **trips** and **stop_times** tabs. It is not used to directly export data to GTFS text files. Data is manually entered in the **Schedules_V3** tab. Data is then automatically generated in the **trips** and **stop_times** tabs using the file's macros.

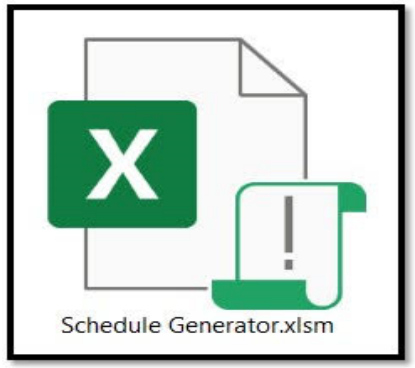
In this file, a trip group includes all trips provided by a route in which the same consecutive bus stops are serviced. For example, if Route Z morning and late afternoon trips service stops 1, 2, 3, 4 and 5 and midday trips services stops 1, 3 and 5, the route would have two trip groups. In this case, the trip groups for Route A could be called RouteZAMPM and RouteZMID. Additional support and a demonstration of the explanations provided in this section are available in this video.

8.1.Enter Schedule Data

1. Open the Schedule Generator file and, if not completed yet, enable macros per the instructions in *Section 2 Enable Macros.*
2. Go to **Schedules_V3** tab.
3. In Row 2
    a. Enter the name of the first trip group in column A.
    b. For trips that will have defined shapes, enter the shape_id associated with trips starting in column R and all columns to the right in that row that have a trip shape associated with it. Shapes are optional. Instructions to create trip shapes are described in *Section 14 Optional – shapes Tab.*

Connect our Files & Trip Data

Schedule Generator
Schedules_V3 tab



ImportExport

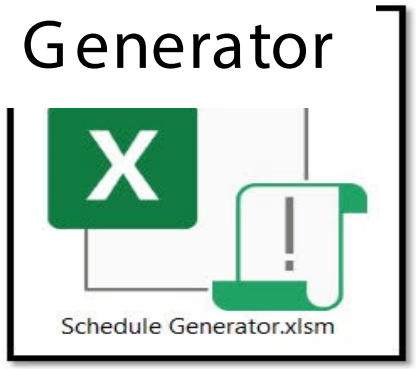


Schedule Generator: Two Required Macros

Clear All	Clears prior data before generating stop_times and trips.
Generate stop-times & trips	Generates stop_times and trips that will be copied to ImportExport workbook to same named tabs

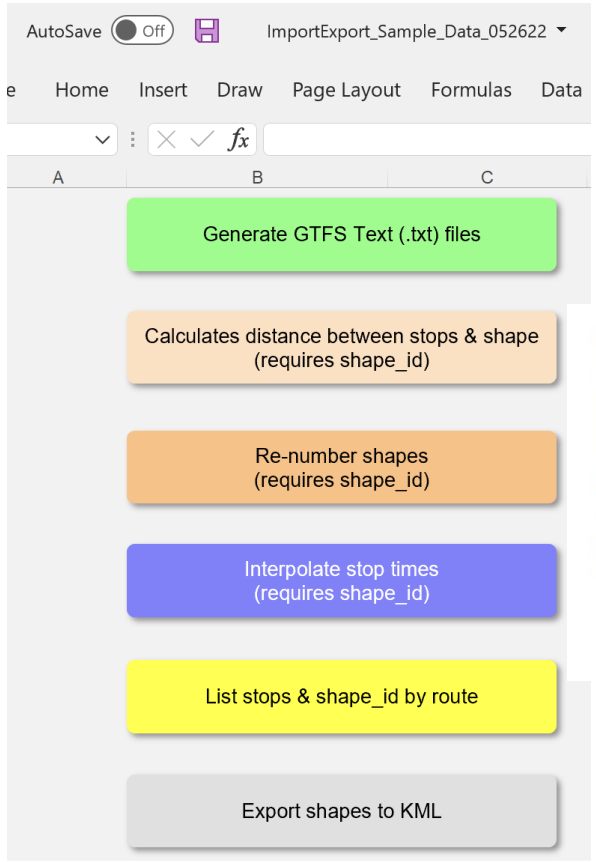
ImportExport: Generate GTFS > Notes tab > File Name

Schedule Generator



Stop_times & trips





feed

- agency
- calendar
- calendar_dates
- fare_attributes
- fare_rules
- feed_info
- routes
- shapes
- stop_times
- stops
- transfers
- trips

Compress/ zip (all)

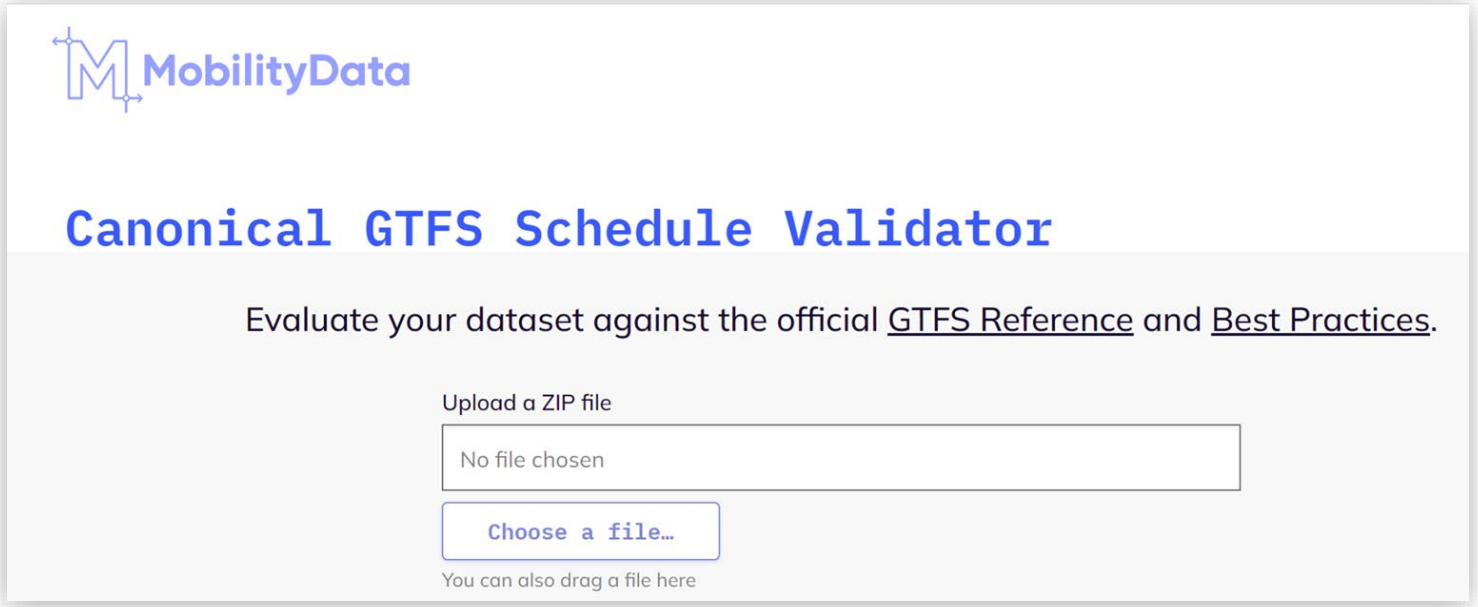


<mygency>_<ST>_gtfs.zip
or
jta_wa_gtfs.zip

Validation

Confirm Data is Internally Consistent = Validate

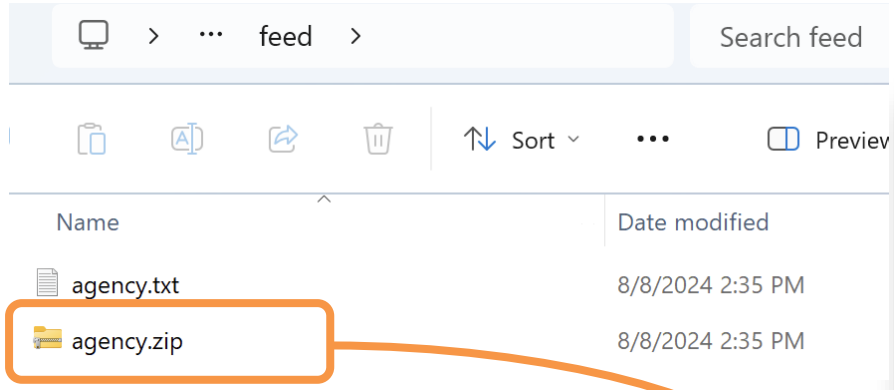
Validation Tool https://gtfs-validator.mobilitydata.org/

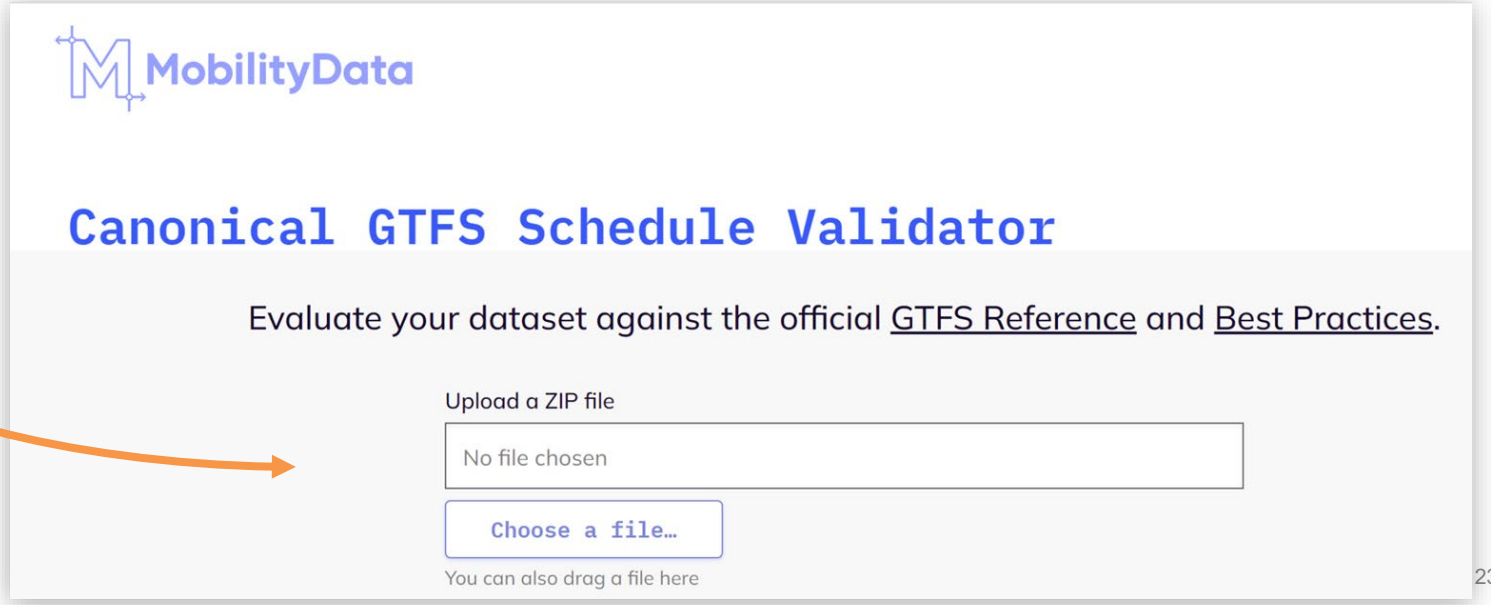


Confirm Data is Internally Consistent = Validate

Drag & drop the “agency”.zip file (update the name later)

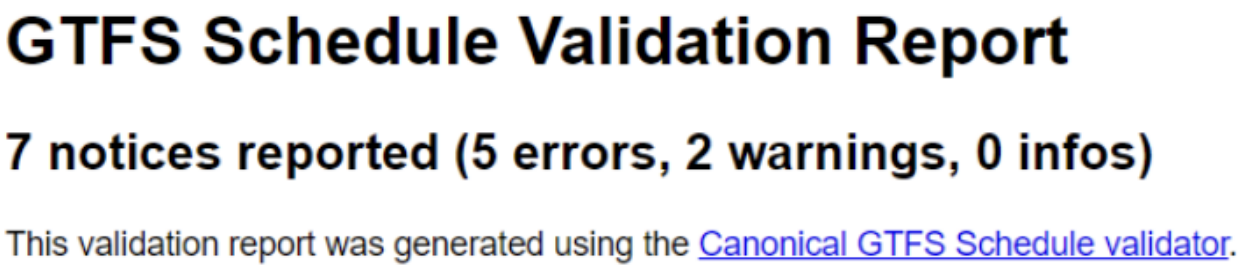
onto the page (or select the file from your PC)





Validation Results: Warnings vs. Errors - More on Oct 16

Errors: Must be resolved



Warnings: (look over, improve data quality)

- Too fast travel from shape
- Extra columns
- Stops too far
- No calendar dates

NTD General Transit Feed Specification Requirements

Report Year 2024

Applicability and Obligation

- Applicability
  - If you operate a fixed route or deviated fixed route (directly or contracted) AND
  - submit service data (i.e., ridership data) to the NTD annually
- Year 1- Submit publicly hosted weblinks once
- Year 2 and going forward
  - Update data
  - Reporter Transit Manager/CEO certifies that the data is up-to-date

P-50 – Validate First & Upload Weblink

1. Validate GTFS Feed using MobilityData's GTFS Validator (fix errors)

1. Upload valid data to a stable URL (National RTAP can help!)
   https://www.nationalrtap.org/Technology-Tools/GTFS-Builder#UploadGTFS

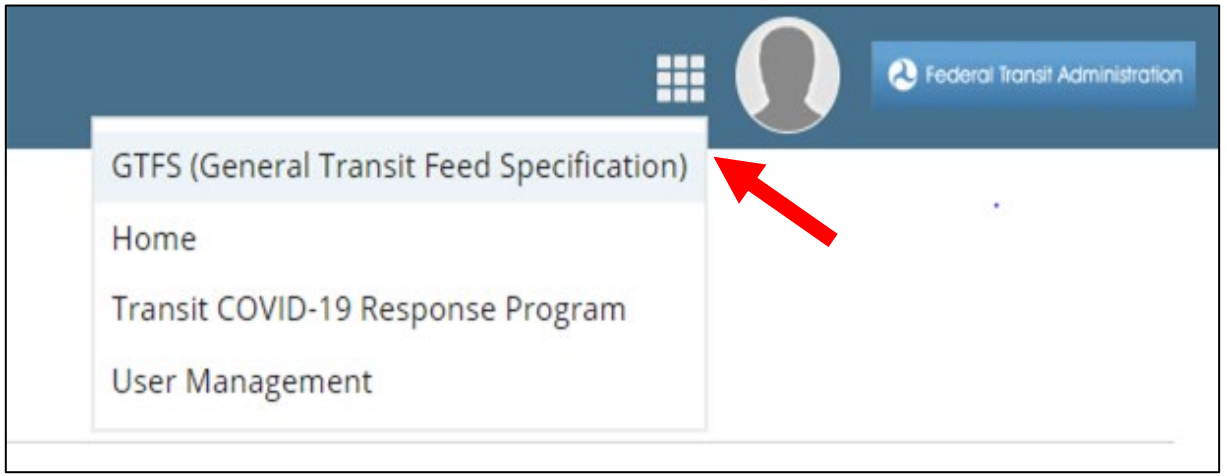
Valid weblinks will usually have ending ".zip" or ".ashx" like this example:

https://rapid.nationalrtap.org/GTFSFileManagement/UserUploadFiles/7869/fresno_ca_gtfs.zip

if the ".zip" has a period after it, i.e. is ".zip.", it will NOT work!

P-50 Form – GTFS Dashboard Page

1. Navigate to the grid at the top-right of the page and selecting "GTFS (General Transit Feed Specification)."



General Transit Feed Specification (P-50)

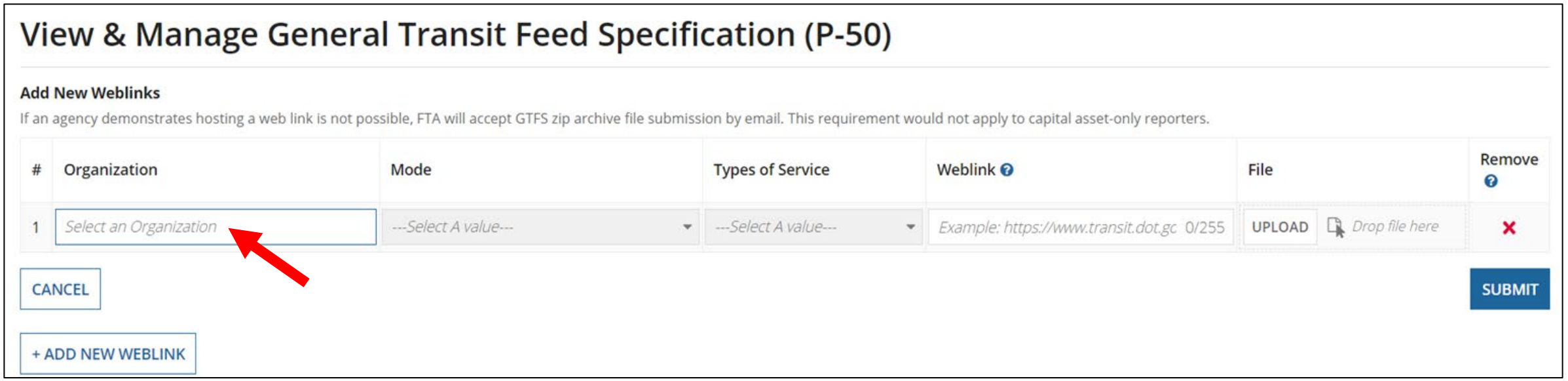
appian

+ CREATE WEBLINK

Search Weblinks | SEARCH | STATUS | Active

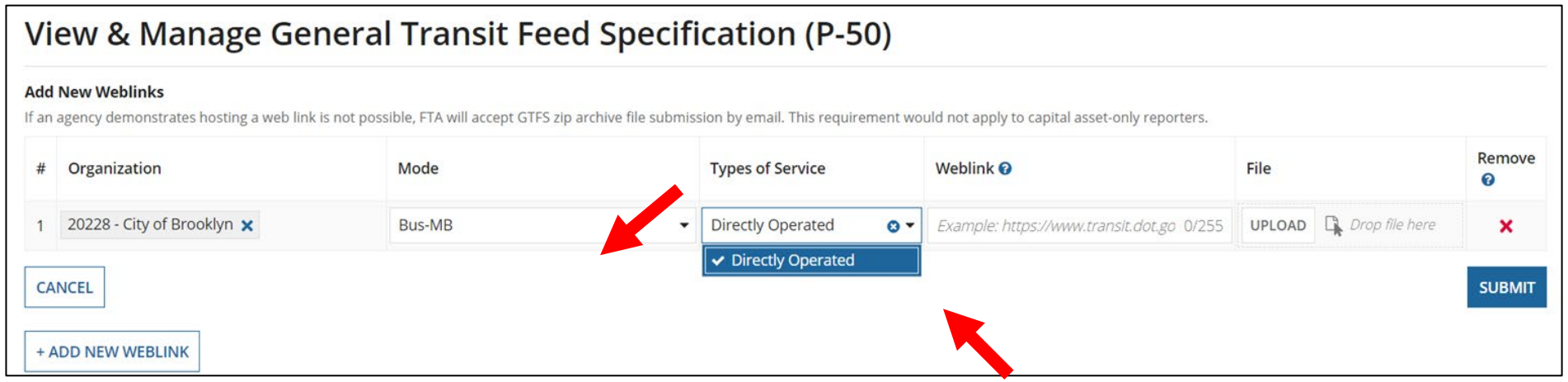
ID	NTD ID	Organization	Mode Description	Type of Sevice Description	Weblink	Document	Created By	Created Date	Updated By	Updated Date	Status
33	20228	City of Brooklyn	Bus	Directly Operated	https://transit.dot.gov/ntd/GTFSTEST		censuseditor@mailinator.com	8/28/2023 9:57 PM	censuseditor@mailinator.com	8/28/2023 9:57 PM	Active

P-50 – Adding a New GTFS Weblink



2. Enter your NTD ID under the “Organization” field.

P-50 – Mode and Type of Service



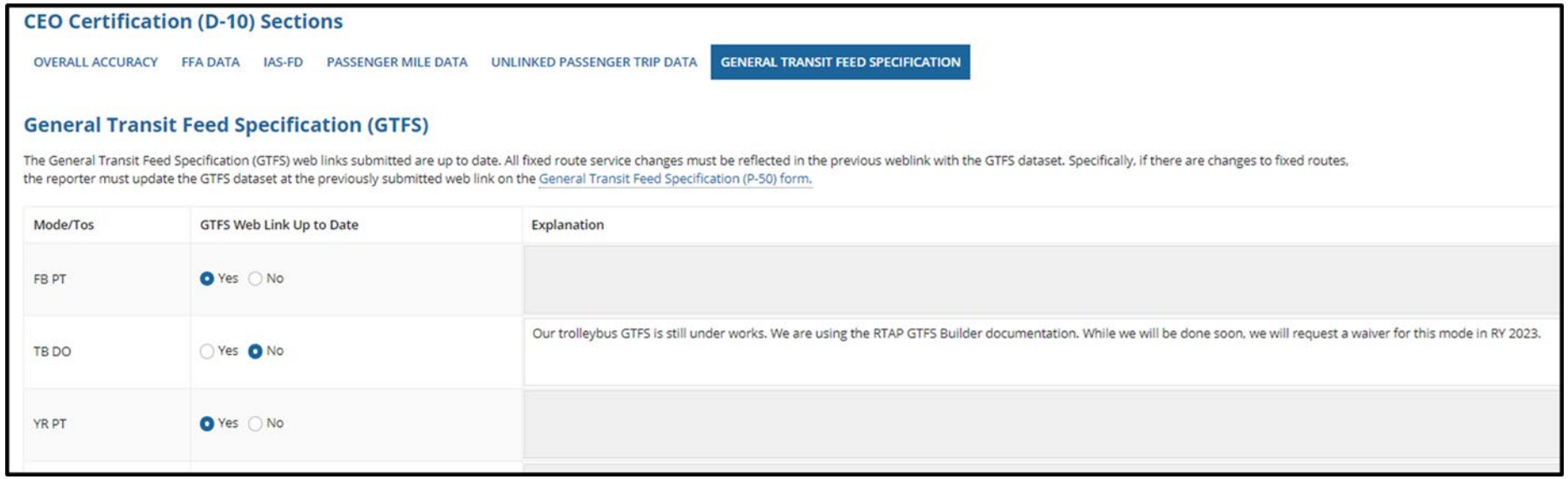
3. Select the Mode from the drop-down menu

4. Select Type of Service.
   - ➢ This list will populate modes from the P-20 Form.
   - ➢ If you have multiple Types of Service for one mode, you can select multiple Types of Service in the drop-down.

D-10 – General Transit Feed Specification

5. CEO must certify the GTFS weblink is up-to-date as of the time of certification in the D-10 form.

6. This may require coordination between you and your CEO or CEO Delegate certifying the report.



CEO Certification (D-10) Sections

OVERALL ACCURACY | FFA DATA | IAS-FD | PASSENGER MILE DATA | UNLINKED PASSENGER TRIP DATA | **GENERAL TRANSIT FEED SPECIFICATION**

General Transit Feed Specification (GTFS)

The General Transit Feed Specification (GTFS) web links submitted are up to date. All fixed route service changes must be reflected in the previous weblink with the GTFS dataset. Specifically, if there are changes to fixed routes, the reporter must update the GTFS dataset at the previously submitted web link on the General Transit Feed Specification (P-50) form.

Mode/Tos	GTFS Web Link Up to Date	Explanation
FB PT	(•) Yes ( ) No	
TB DO	( ) Yes (•) No	Our trolleybus GTFS is still under works. We are using the RTAP GTFS Builder documentation. While we will be done soon, we will request a waiver for this mode in RY 2023.
YR PT	(•) Yes ( ) No	

Upload Creates Weblink at National RTAP

National RTAP Free hosting Upload Generates Weblink

1. Validate GTFS Feed using MobilityData's GTFS Validator (fix errors)

1. Upload valid data to a stable URL (National RTAP can help!)
   https://www.nationalrtap.org/Technology-Tools/GTFS-Builder#UploadGTFS

Trip Groups Recap

Pop Quiz 2 - Number of Trip Groups

	Weekday			
Transit Center	7:30	11:30	**3:45**	**5:00**
Senior Center		11:40		
High School	7:45	11:45	**4:00**	
Grocery Store	7:55	11:55	**4:10**	**5:10**
Transit Center	8:00	12:00	**4:15**	**5:15**

Number of Trip Groups = 3

	Weekday			
Transit Center	7:30	11:30	**3:45**	**5:00**
Senior Center		11:40		
High School	7:45	11:45	**4:00**	
Grocery Store	7:55	11:55	**4:10**	**5:10**
Transit Center	8:00	12:00	**4:15**	**5:15**

1. Deeper Dive NTD: Validation Errors & warnings
2. Hosting
3. Optional Data: Shapes, Fares, Transfers
4. Flex, On-Demand Workaround

October 16

October 16

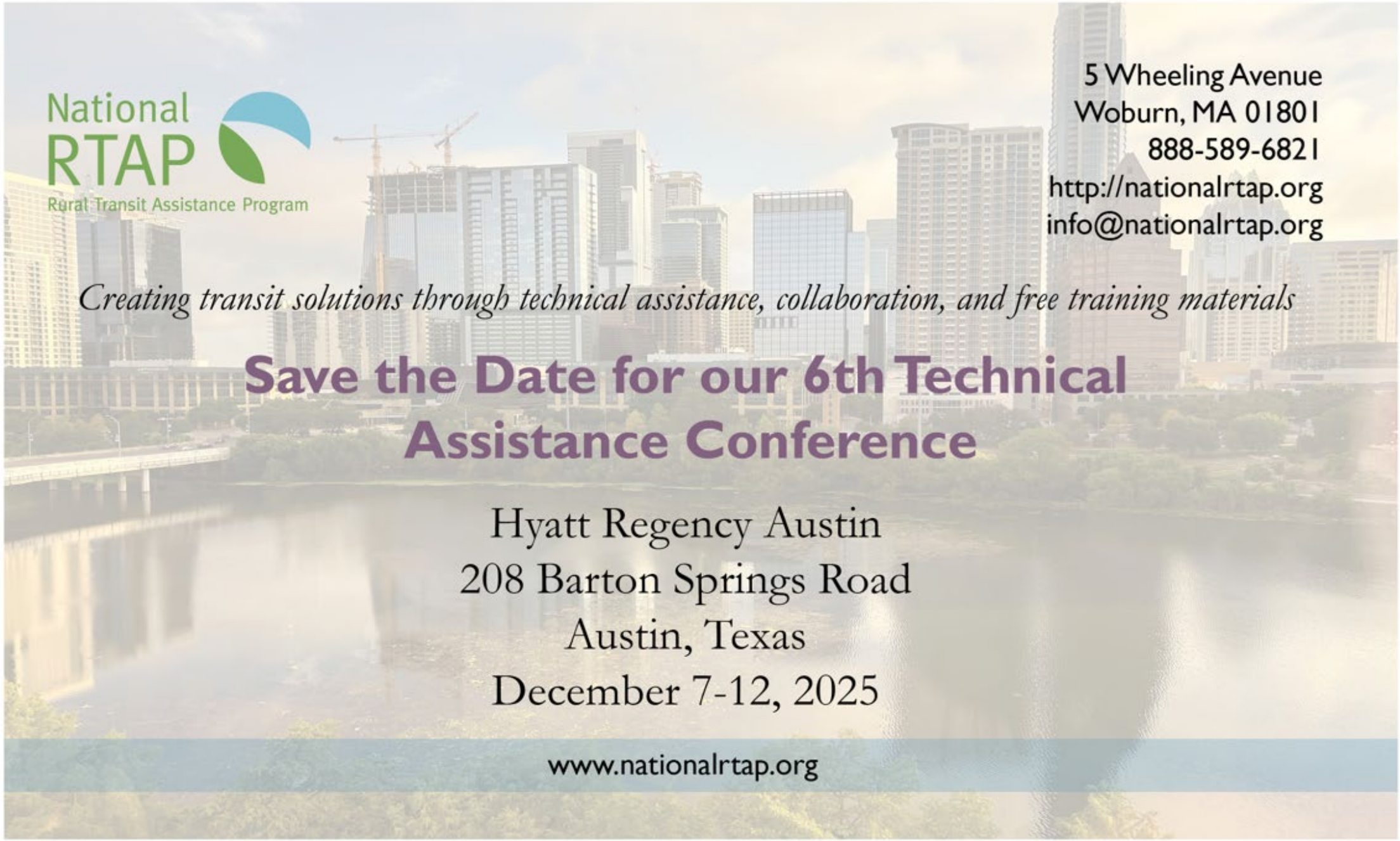
Prep for next session:

1. Generate one trip or entire route (weekday, weekend, variations)
2. Validate (test) data - resolve all errors, review warnings
3. Watch “Shapes” video - display route alignment on the road
4. Watch Demand Response Services video

https://www.nationalrtap.org/Technology-Tools/GTFS-Builder/Support

Questions?

Office hours: Thursdays at 1:00pm EST


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info@nationalrtap.org
Creating transit solutions through technical assistance, collaboration, and free training materials
Save the Date for our 6th Technical Assistance Conference
Hyatt Regency Austin
208 Barton Springs Road
Austin, Texas
December 7-12, 2025
www.nationalrtap.org

Thank You and See You Next Week

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FTA
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Federal Transit Administration