

GTFS: Three Steps to Online Trip Planning

March 8, 2023 March 15, 2023 March 22, 2023

National RTAP
Rural Transit Assistance Program

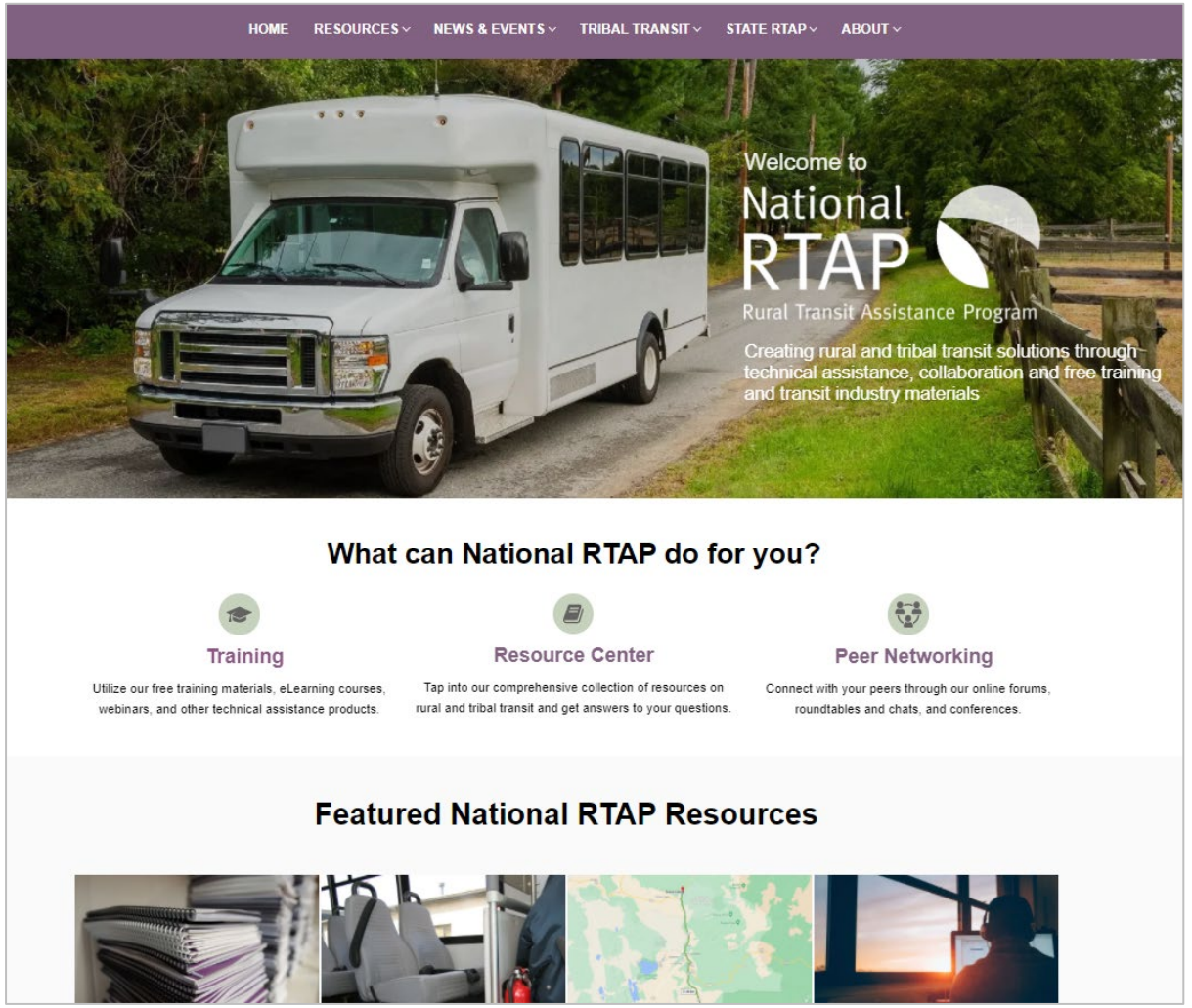
FTA
U.S. Department of Transportation
Federal Transit Administration

National Rural Transit Assistance Program

- Technical assistance center funded by FTA through Section 5311

Vision: Safe, compliant, efficient and effective rural and tribal transit that reflects community needs and values.

- Guided by a 14-member Review Board
- Learn more at nationalrtap.org



National RTAP Resources and Services

Training

Manuals, videos, PPTs, eLearning, webinars

Information

Technical briefs, toolkits, eNews, research

Technology Tools

For procurement, GTFS, websites, cost allocation

Peer Networking

Conferences, roundtables, online forums

Assistance

Reference services – bring us your questions!

Questions?

Please use the chat for questions.

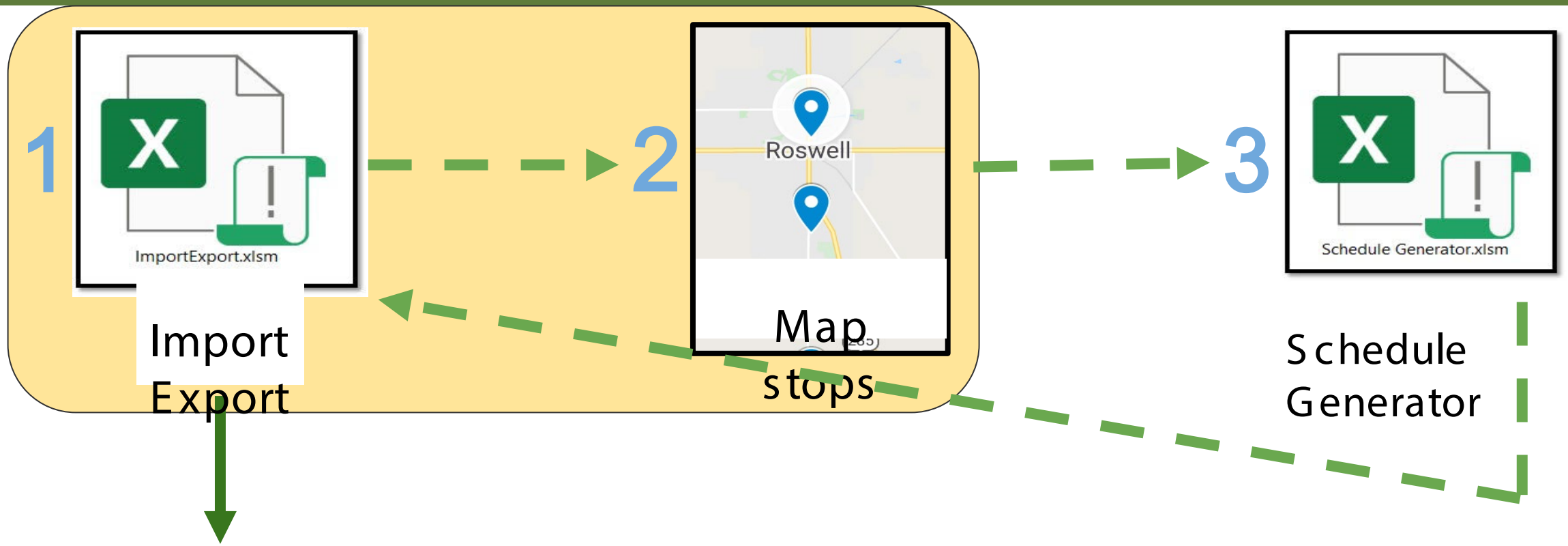
You can also raise your hand to ask a question verbally.

Speaker Introductions



Marcy Jaffe
GTFS Consultant
Transnnovation, Inc.

Agenda


1
ImportExport.xlsm
Import
Export
2
Roswell
Map
stops
3
Schedule Generator.xlsm
Schedule
Generator
4
Text Files/ Validate/ Upload

What Does Trip Planning Data Look Like?

routes tab

	A	B	C	D	E	F	G	H	I
1	route_id	agency_id	route_short_name	route_long_name	route_desc	route_type	route_url	route_color	route_text_color
2	Rt16	CTS	16			3	https://www.clallamtransit.com/route16	FF9999	000000
3									
4									

Notes | agency | calendar | calendar_dates | routes | stops | stop_times | trips | feed_info | shape ...

stops tab

1	stop_id	stop_code	stop_name	stop_desc	stop_lat	stop_lon
2	14_14		Sappho		48.070021	-124.279060
3	14_15		Hwy 101 and Lake Pleasant Road		48.054741	-124.336011
4	14_16		Hwy 101 at Beaver Post Office / Store		48.056136	-124.347966

Notes | agency | calendar | calendar_dates | routes | stops | stop_times | trips | feed_info | shape ...

Routes may have Trip Groups (or Pattern variations)

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

- Route A - Trip Group AM/PM
- Route A - Trip Group Mid Day
- Route A - Trip Group Sat

Trip Groups - Consists of and are unique based on

- *a route, service days,* travel direction: inbound/outbound/loop
- *consecutive bus stops*
- route alignment/shape (optional)

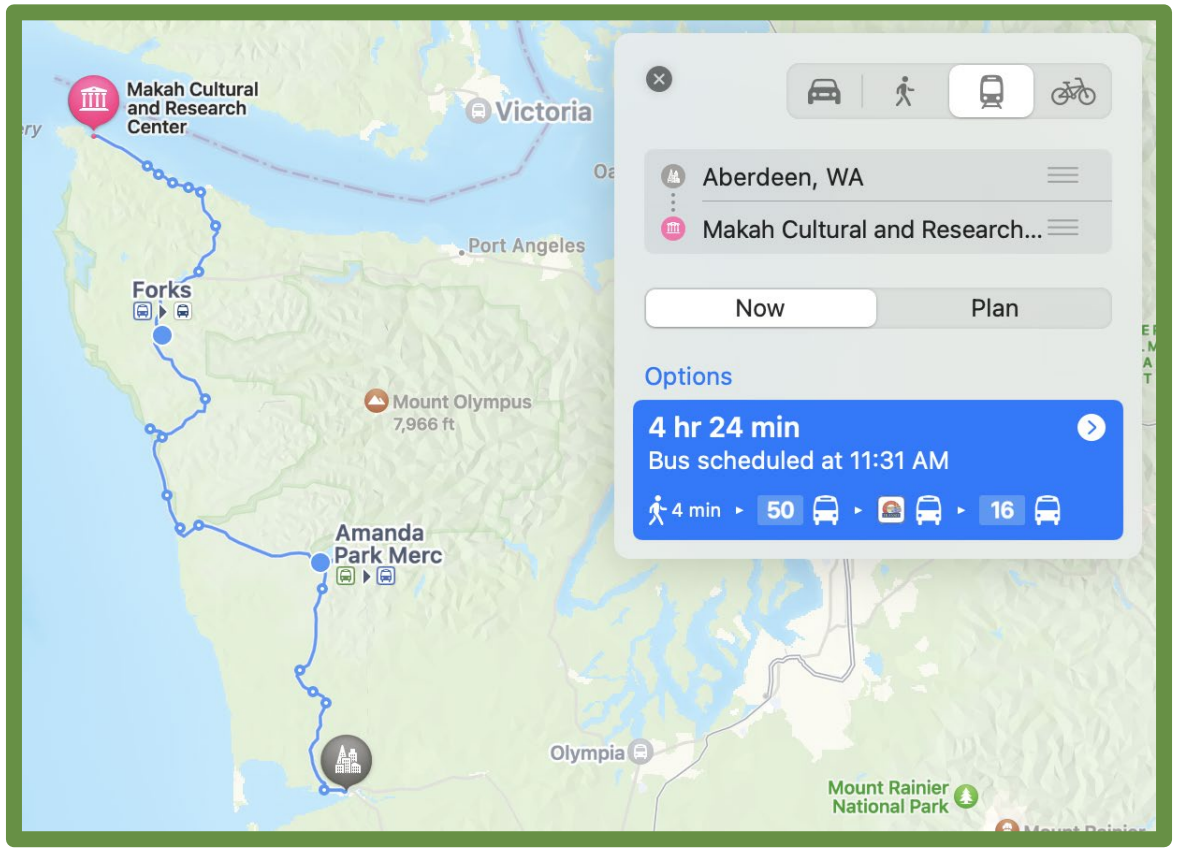
Trip Groups

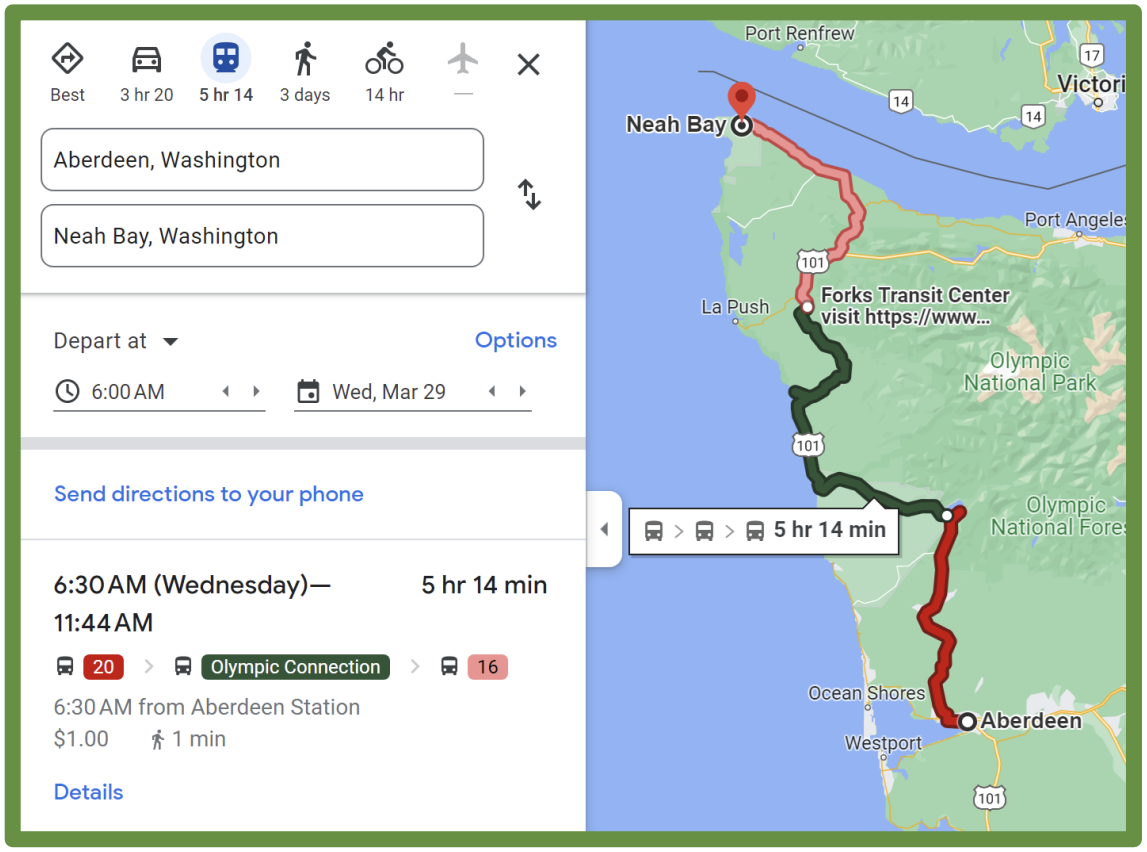
	A	B	C	D	E	F	G	R	S
1	Trip_group	route_id	service_id	direction_id	trip_headsign	stop_id	stop_name	T01	T02
2	16W_NeahBay_viaClallamBay								
3		Rt16	mtwtf	0	Neah Bay via Callam Bay	14_24	Forks Transit Ctr.	6:45:00	
4		Rt16	mtwtf	0		14_29	Tillicum Park and Forks Ave	*	
5		Rt16	mtwtf	0		14_20	Hwy 101 at Smokehouse Restaurant	*	
6		Rt16	mtwtf	0		14_31	Whitcomb Dimmel Rd and Hwy 101	*	
7		Rt16	mtwtf	0		14_32	Gaydeski Rd and Hwy 101	*	
8		Rt16	mtwtf	0		14_33	Iverson and Hwy 101	*	
9		Rt16	mtwtf	0		14_34	Mansfield and Hwy 101	*	
10		Rt16	mtwtf	0		14_35	Salmon Dr and Hwy 101	*	
11		Rt16	mtwtf	0		14_36	Beaver at Hwy 101	*	
12		Rt16	mtwtf	0		14_37	Lake Pleasant at Hwy 101	*	
13		Rt16	mtwtf	0		14_60	Sappho	7:01:00	
33	Note: a row must be skipped between trip_groups. No data can entered in this row.								
34	16_NeahBay_weekday							16toNeah	16toNeahB
35		Rt16	mtwtf	0	Neah Bay	14_24	Forks Transit Ctr.	10:30:00	14:40:00
36		Rt16	mtwtf	0		14_29	Tillicum Park and Forks Ave	*	*
37		Rt16	mtwtf	0		14_20	Hwy 101 at Smokehouse Restaurant	*	*
38		Rt16	mtwtf	0		14_31	Whitcomb Dimmel Rd and Hwy 101	*	*
39		Rt16	mtwtf	0		14_32	Gaydeski Rd and Hwy 101	*	*
40		Rt16	mtwtf	0		14_33	Iverson and Hwy 101	*	*
41		Rt16	mtwtf	0		14_34	Mansfield and Hwy 101	*	*
42		Rt16	mtwtf	0		14_35	Salmon Dr and Hwy 101	*	*
43		Rt16	mtwtf	0		14_36	Beaver at Hwy 101	*	*
44		Rt16	mtwtf	0		14_37	Lake Pleasant at Hwy 101	*	*
45		Rt16	mtwtf	0		14_60	Sappho	10:46:00	14:56:00
46		Rt16	mtwtf	0		16_1	Hwy 113 at Grant Rd	*	*
47		Rt16	mtwtf	0		16_2	Hwy 113 & Hwy 112	*	*
48		Rt16	mtwtf	0		16_3	Hwy 112 & Weel Rd	*	*
49		Rt16	mtwtf	0		16_4	Clallam Bay	11:08:00	15:18:00

Intro.Controls | Schedules V3 | stop_times | trips | ...

Why GTFS?

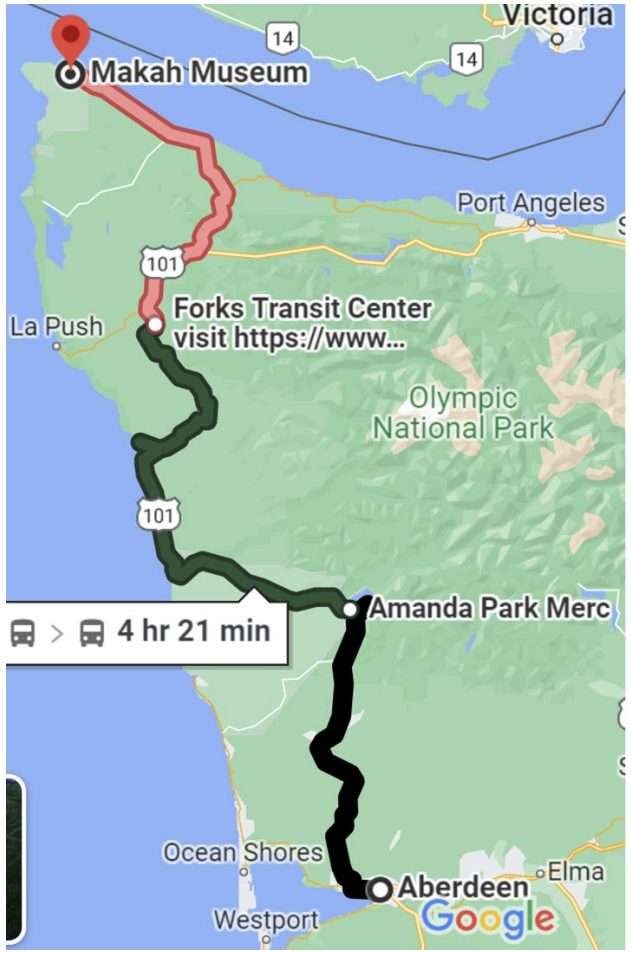
Standardized GTFS Data - Apple (left) or Google (right) Maps

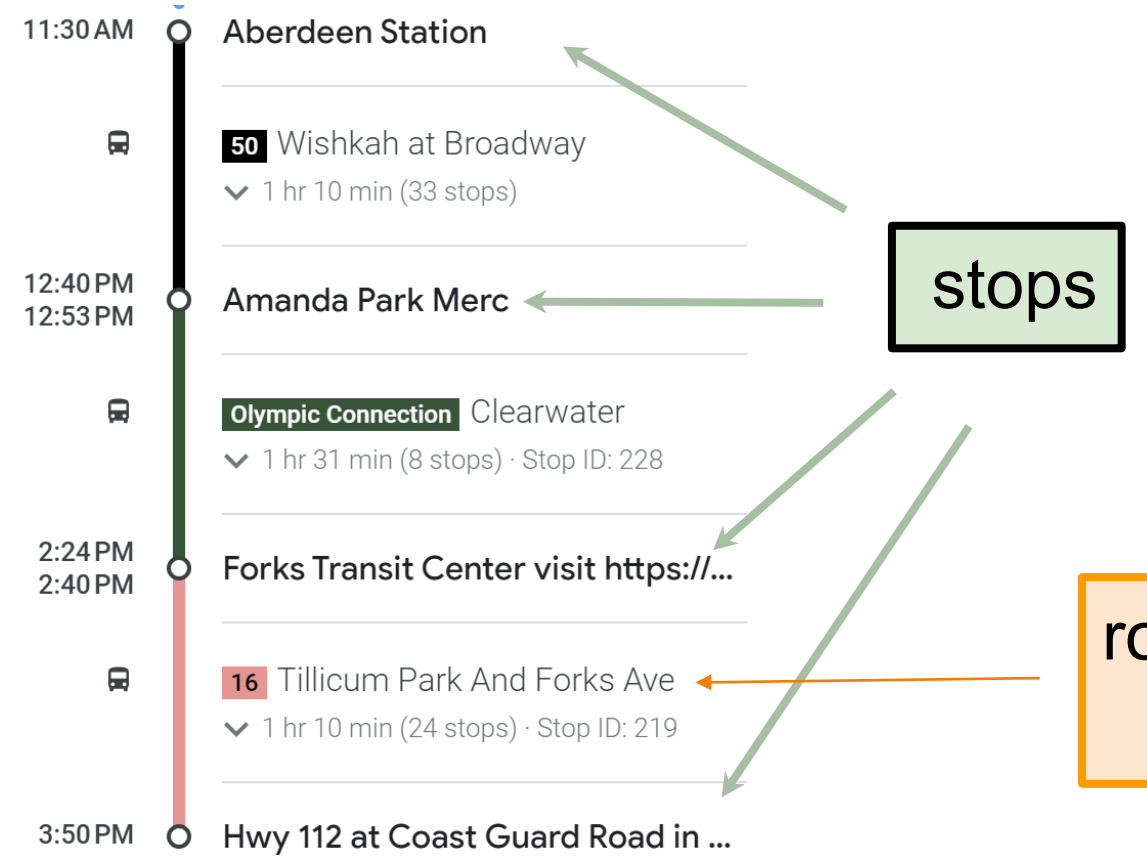




Online, Digitized Trip Plan

Live link to:
https://goo.gl/maps/axmfNnBUSCCUzBmPA



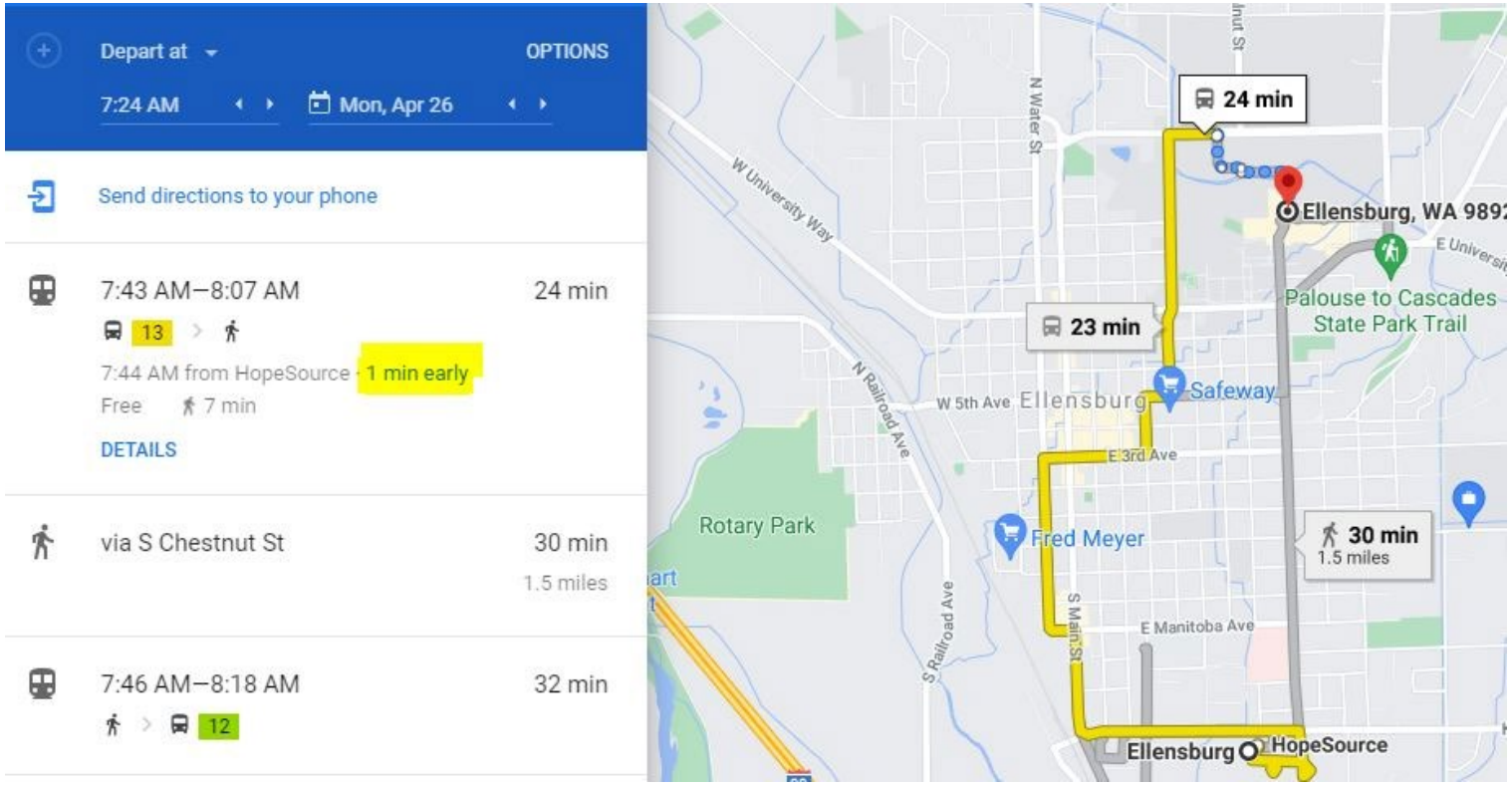


GTFS “flavors”

Static/Schedule

Real-time

Flex - *is underway*



Sample Agreement Processes (as of May, 2021)

Trip Planner	Agreement	Guarantees to Publish	App offers Real-time?
Google Inc.	Formal	Likely	Y
Apple Inc.	Informal	No	Y
Bing	Informal	Yes	Y
Moovit	Informal	Yes	Y
Transit “App”	Yes	When over 1M trips	Y

GTFS Builder Resources

National RTAP's GTFS Builder Support/Guidebook

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

GTFS Builder "How-to" Resources

GTFS Builder Guidebook	The GTFS Builder Guidebook provides a simple step by step instructions for entering data into each tab of the ImportExport file and describes how to use the corresponding Schedule Generator file. The Guidebook includes a checklist which may help to estimate the time to complete each step and track progress.
Tutorial Videos	
What is GTFS and Should My Agency Proceed?	This first video provides an introduction to GTFS and what GTFS looks like on a published trip plan. It also discusses resources needed to develop GTFS, including software and time, and presents options for developing GTFS files.
Trip Planner Licensing Agreements	Understanding trip plan data licensing agreements and what, if any, are the risks. An attorney translates a sample agreement from legalese into English in this video.
An Introduction to GTFS Builder (Download and Setup)	This video offers an introduction to National RTAP's GTFS Builder tool and describes how is it used to develop GTFS data. The video reviews how the application is downloaded from National RTAP's website and how to set up a folder/workspace on a desktop appropriate for GTFS. Other topics include enabling GTFS Builder macros, common GTFS terminology and where to find comprehensive GTFS resources. The video expands on information provided in Section 1 of the GTFS Builder Guidebook.
Agency, Calendar, Calendar_dates, Routes, Fare and Transfer Tabs in the ImportExport File	This video demonstrates how data is entered into each of these tabs. The video supports Sections 2, 3, 4, 5 and 13 of the GTFS Builder Guidebook.

National RTAP's GTFS Builder Support/Guidebook



2. Complete the agency Tab in the ImportExport File

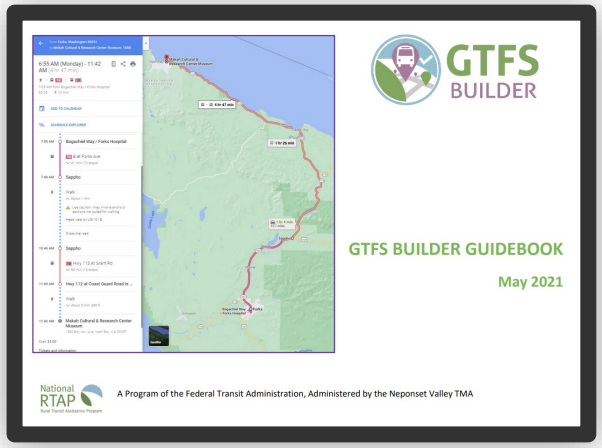
Using the example data and explanatory information in Table 2.1 enter data in the **agency** tab. Figure 2.1 depicts how the public facing data is depicted on a trip plan. Additional support and a demonstration of the explanations provided in this section are available in this video.

Table 2.1 agency Tab

Field	agency_id	agency_name	agency_url	agency_timezone
Sample Data	CTS	Clallam Transit System	https://www.clallamtransit.com	America/Los_Angeles
				America/Phoenix
Public Facing	No	Yes	Yes	Yes
Required/Optional	**Required**	**Required**	**Required**	**Required**
Format	Text	Text	URL	Time zone
Notes	Any name, abbreviation or number is acceptable.	Agency name is identical to what is published at the agency_url.	This is the URL of the agency's public website. It allows riders to link back to the agency website for additional information. If an agency does not have a website, visit **Website Builder 3.0** for information on a no-cost Website Builder tool.	For a list of time zones, refer to: **https://en.wikipedia.org/wiki/List_of_tz_database_time_zones** In this website, and in the table called List, use the TZ database name shown in the third column. Timezones (TZ), in this specification are not "Pacific" or "Mountain" or "Central".

This table continues on the next page.

GTFS Builder Guidebook: Checklist



National RTAP GTFS Builder Checklist

Agency Name: _____ Staff Contact: _____

Task	Guidebook Section	Time Estimate	Begin Task Date	End Task Date	Notes
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.			
Configure project folder for macros	1	10 min.			
Complete the ImportExport tabs: agency, calendar, calendar dates and routes	2,3,4,5	60 min.			
Determine if agency bus stop coordinates are available from other organizations. If so, obtain them.	6	30 min.			
If not, identify bus stop coordinates from MyMaps and/or Google Earth.	6	60 min.			
Enter bus stop coordinates from MyMaps or Google Earth or file into the ImportExport stop tab.	7	20 min.			
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.			
OPTIONAL TASKS					
In the ImportExport file complete the transfers tab.	13	5 min.			
In the ImportExport file complete the fares and fare_attributes tabs.	13	20 min.			

Set-up GTFS Builder Workspace

What You Need



image courtesy: wikipedia

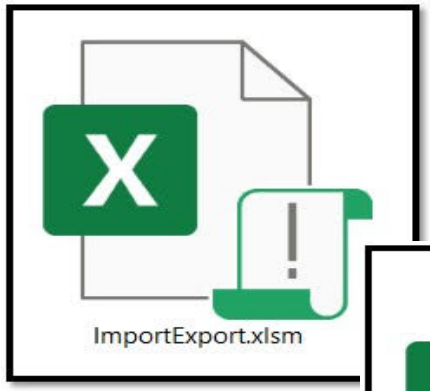
Google Earth Pro
Desktop Version
https://www.google.com/earth/

Google My Maps

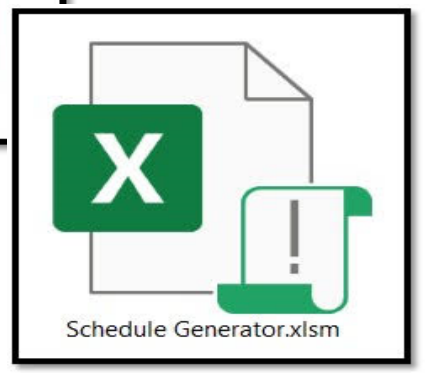
https://www.google.com/maps/d/

GTFS Builder

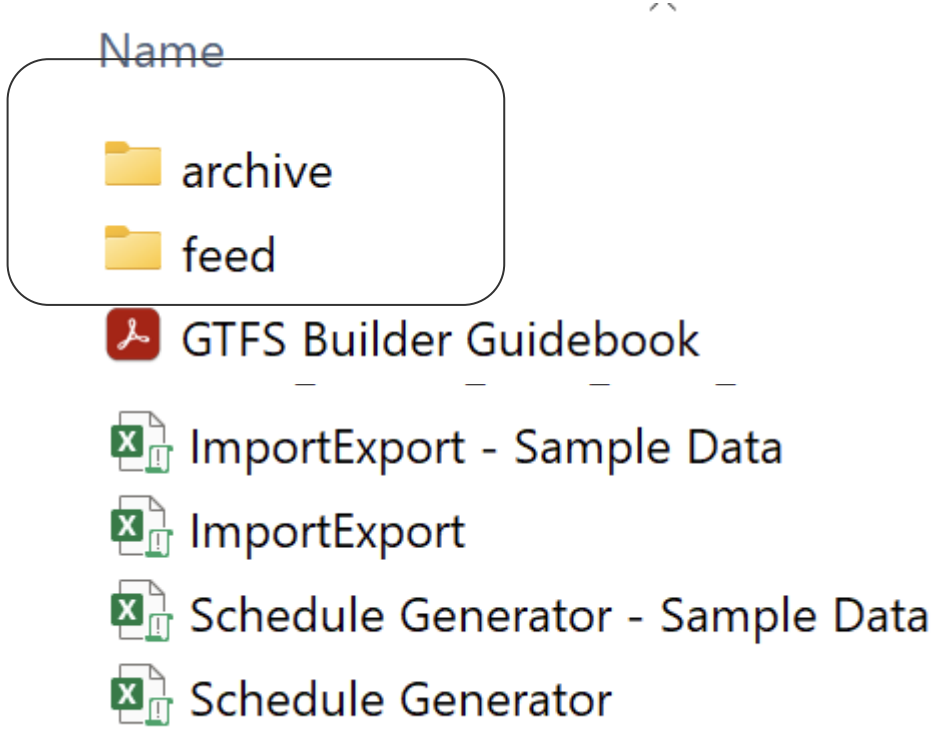
ImportExport

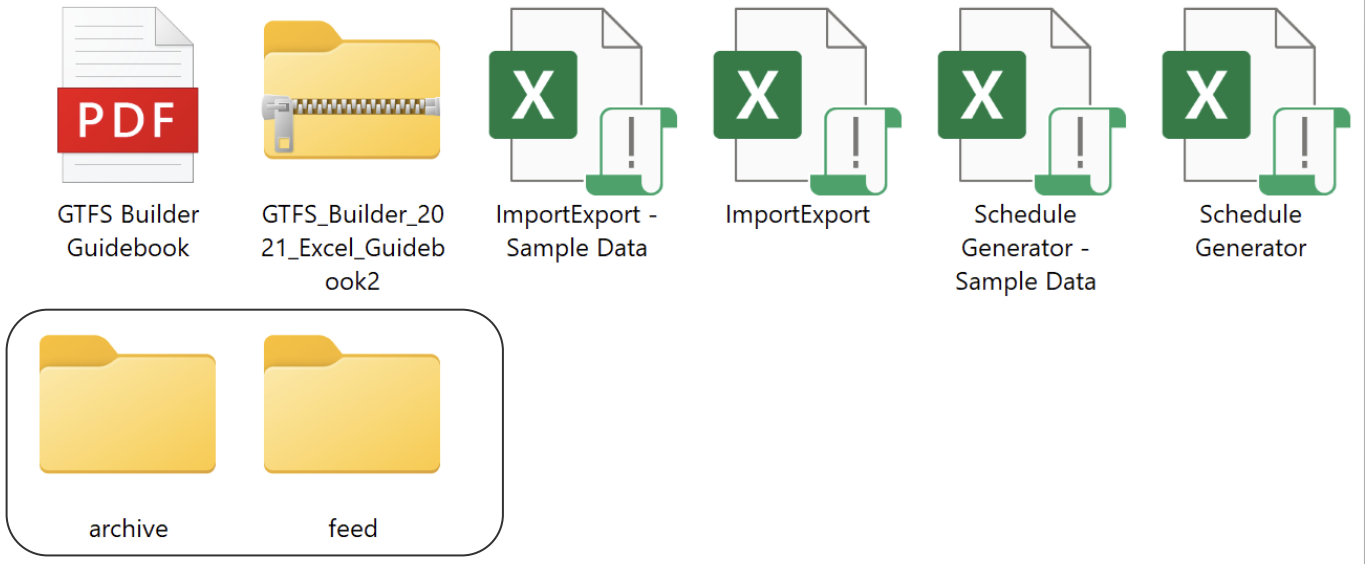


Schedule Generator

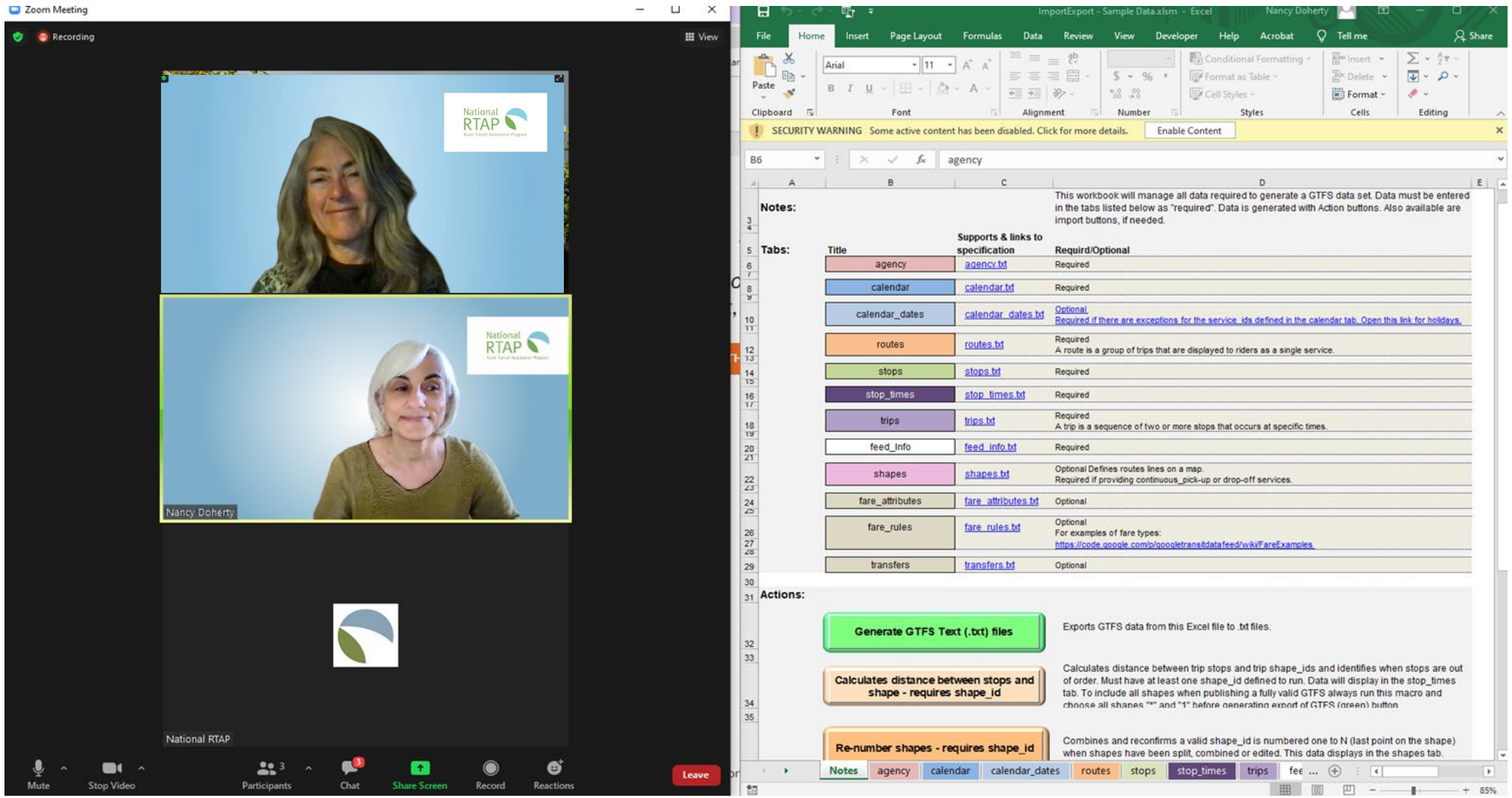


GTFS File Folder





Single Screen - Let's Split It!



ImportExport Notes tab: Required Tabs (for one route or trip)

Title	Supports & links to specification	Requird/Optional
agency	agency.txt	Required
calendar	calendar.txt	Required
calendar_dates	calendar_dates.txt	Optional Required
routes	routes.txt	Required A route is a group of trips that ar
stops	stops.txt	Required
stop_times	stop_times.txt	Required
trips	trips.txt	Required A trip is a sequence of two or m
feed_Info	feed_info.txt	Required

My Maps or Google Earth? Geocode Bus Stops

Bus Stop Locations/Coordinates

Operations/Contractor

Software: Paratransit, scheduling, realtime

GIS office

Regional Planning

Asset Management Plan

Other?

Latitude and Longitude in WGS 84 match website bus stops' name

Geocoding Bus Stops

Method I   Google Earth Pro	Method II  Google Earth Pro
Best for: • For 5 or more stops	**Best for:** 1 to 4 stops
Advantages • Coordinates stored in a Google Map • Easy to share/edit • Expedites shapes creation	**Advantages:** Quick and easy
Requires: • Google Account/Google MyMaps • Google Earth Pro	**Requires:** Google Earth Pro

MyMaps: Locate 3-5 stops

Live Demonstration - view it in the recording at

https://www.youtube.com/watch?v=3DhaSFKx_Tg#t=39m59s

March 15: Schedule Generator and Validate

Prep for next Weds:

1. Confirm downloads and macros working
2. Complete ImportExport tabs: agency, calendar, calendar_dates, routes, feed_info
3. Place or view your bus stops on MyMaps & **ImportExport file/stops tab** - review video / our GTFS Builder support page
4. Open your Guidebook > Checklist

Questions?

Upcoming and Recent National RTAP Events

UPCOMING:

Resource Share Overview Webinar

March 9, 2023, 2:00-3:00 PM ET

RECENT:

Transit Manager Peer Roundtables

Summaries available with valuable tips

Risky Business Webinars: Insurance for Nonprofits and Small Transit Agencies

Six-Part Marketing Workshop Series

Learn about TACL

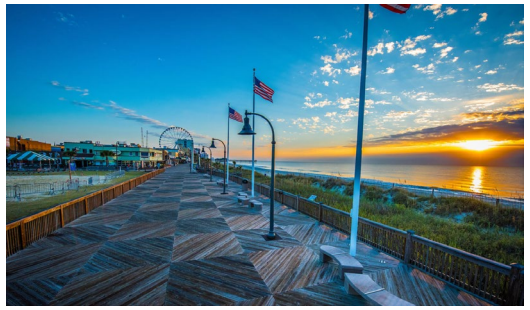
To register or to access recordings, slides, or summaries, go to:

nationalrtap.org/Training/Peer-Roundtables-and-Chats and nationalrtap.org/Webinars.

5th National RTAP Conference

Navigating the Tides of Change with Rural & Tribal Transit

December 3 -6, 2023



Marriott Myrtle Beach Resort & Spa

Night out at Brookgreen Gardens

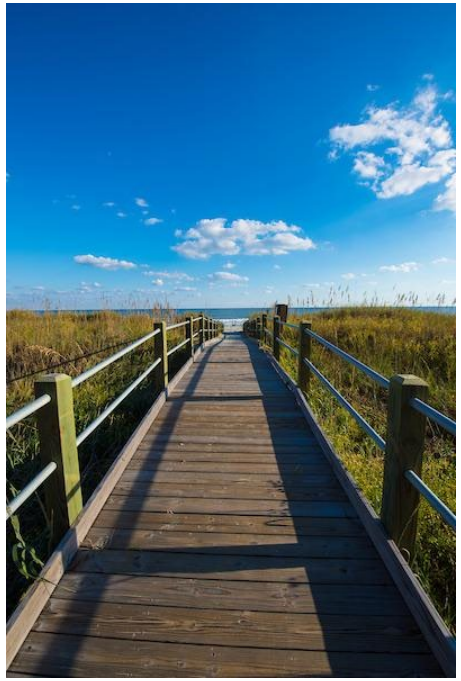


NationalrtaP.org/News/Conference/2023 -Myrtle -Beach

Call for presentations and **hotel booking link** are live!

Conference schedule and registration coming soon

Join us for training, networking & peer information sharing



TACL: The Transportation Technical Assistance Coordination Library



http://transportation -tacl.org

TACL provides access to transportation coordination resources from the Federal Transit Administration (FTA)and a diverse range of transportation technical assistance centers, including:

- National Aging & Disability Transportation Center (NADTC)
- National Center for Applied Transit Technology (N-CATT)
- National Center for Mobility Management (NCMM)
- National Rural Transit Assistance Program (National RTAP)
- Shared-Use Mobility Center (SUMC)
- Transit Workforce Center (TWC)

Learn about TACL Resources

View Recording:
nationalrtap.org/Webinars

Thank You and See You Next Week

National Rural Transit Assistance Program

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Find us on Facebook, Twitter, YouTube, LinkedIn & Instagram

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National RTAP
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Thank You!

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FTA

U.S. Department of Transportation
Federal Transit Administration