

2016

Preparing GTFS Feed Data for Small Urban and Rural Transit Systems

Prepared for:
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 Prepared by:
 Shuman Tan, Texas A&M Transportation Institute

Outline of Topics

For today's presentation



GTFS Introduction



Overview of TTI Practice



Step-by-Step Instructions



Lessons Learned



GTFS INTRODUCTION

- Google Transit Partner Program
- Google's General Transit Feed Specification (GTFS)

Google Maps Transit

A Efficient Trip Plan Tool

- Google launched the [Google Transit Partner Program](#) in December 2005.
- Transit riders can easily plan trips through GMT on their desktop, tablets, and smart phones.
- Transit agencies can join the program at no cost to Google.



Image Source: addtransit.com

How to Join?

A question transit agencies may ask

To join the program,

- Step 1: prepare a dataset that meets GTFS
- Step 2: contact the Google Transit Team to sign up for a partnership and test the data.



Image Source: Google

What is GTFS?

Another question transit agencies may ask

- General Transit Feed Specification
- Standards/rules for preparing data
- Two types of GTFS: **GTFS Static** and GTFS RealTime
- GTFS Static Data Feed = 13 text files created following GTFS
- 13 text files = **6 required** text files + **7 optional** text files
- Optional text files can increase user experience

One example:

stop_times.txt		
File: Required		
Field Name	Required	Details
trip_id	Required	The trip_id field contains an ID that identifies a trip. This value is referenced from the trips.txt file.
arrival_time	Required	The arrival_time specifies the arrival time at a specific stop for a specific trip on a route. The time is measured from "noon minus 12h" (effectively midnight, except for days on which daylight savings time changes occur) at the beginning of the service date. For times occurring after midnight on the service date, enter the time as a value greater than 24:00:00 in HH:MM:SS local time for the day on which the trip schedule begins. If you don't have separate times for arrival and departure at a stop, enter the same value for arrival_time and departure_time .



TTI PRACTICE

- Overview of TTI Experience on GTFS
- Overview of TTI Methodology for Feed Preparation

Our Experience

From four GTFS projects we completed in recent three years

Prepared static GTFS data feed for:

- Capital Area Rural Transportation System, Texas in 2014
- Port Arthur Transit, Texas in 2015
- Beaumont Municipal Transit, Texas in 2015
- Abilene CityLink, Texas in 2016



Our Methodology

From four GTFS projects we completed in recent three years

Four steps:

- **Step 1:** Prepare shapefiles for each route
- **Step 2:** GIS Processing
- **Step 3:** Excel Processing and Formatting
- **Step 4:** Feed Validating

TTI toolset can be downloaded from here:

<https://sites.google.com/site/gtfspreparationtools/home/TTI%20GTFS%20Feed%20Preparation%20Toolset.zip?attredirects=0&d=1>

Our Methodology

From four GTFS projects we completed in the past three years

Toolset applicable transit agency

The transit agency runs a small urban transit system

- With less than 100 fixed-routes, and
- Each route has less than 100 stops

Software requirement

- ArcGIS for Desktop version 10.1 or higher with advanced license (formerly known as ArcInfo)
- Microsoft Excel 2007 or advanced version



STEP 1: PREPARE SHAPEFILES

- Create shapefiles
- Organize attribute table

Create Shapefiles

Create route and stop shapefiles for each route

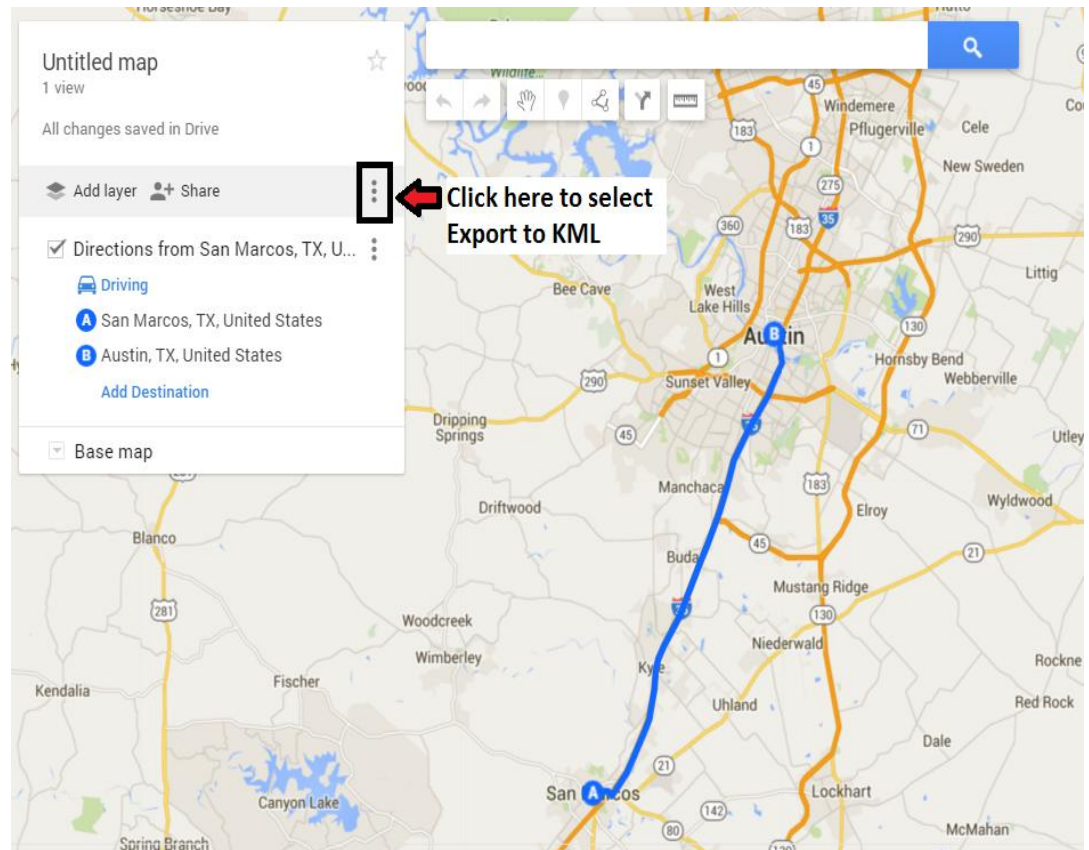
Routes:

Several ways

TIGER/Line shapefiles

Draw in ArcMap, etc.

We recommend the
Google My Maps



Create Shapefiles

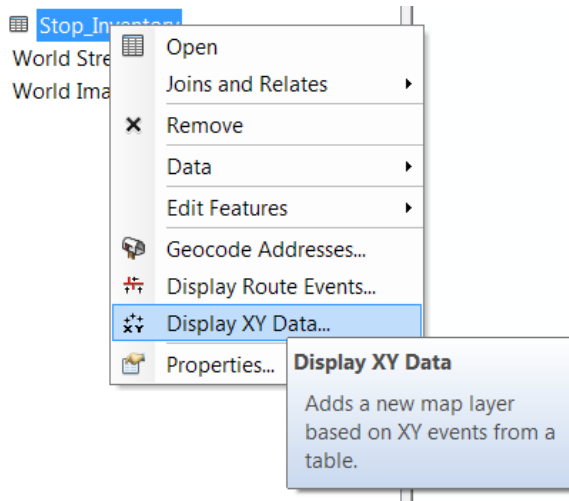
Create route and stop shapefiles for each route

Stops:

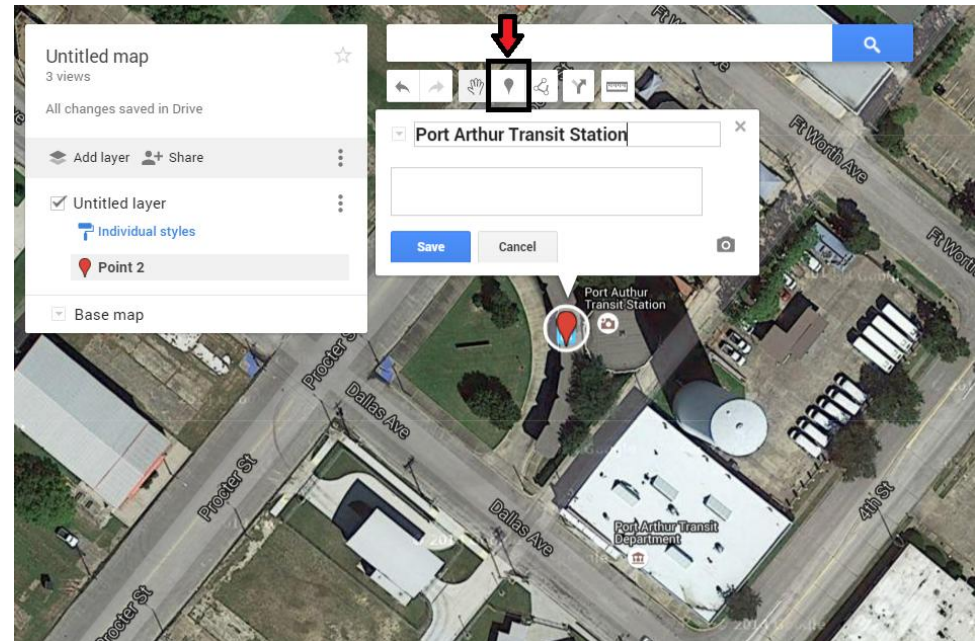
Several ways

Add XY via existing inventory,

Draw in ArcMap, etc.



We recommend the Google My Maps



Organize Attribute Table

For the shapefile you have already created

Routes:

Two fields required: R_GTFSID, R_Name

	OBJECTID *	Shape *	R_GTFSID	R_NAME	Shape_Length
	1	Polyline	Route01	Downtown/Carver	0.06906

Stops:

Three fields required: R_GTFSID, S_ID, S_Name

OBJECTID *	Shape *	R_GTFSID	S_ID	S_NAME
24	Point	Route01	Route0101	Transit Center
1	Point	Route01	Route0102	Cypress & N. 2nd
2	Point	Route01	Route0103	Cypress & N. 5th
3	Point	Route01	Route0104	N. 6th & Cedar

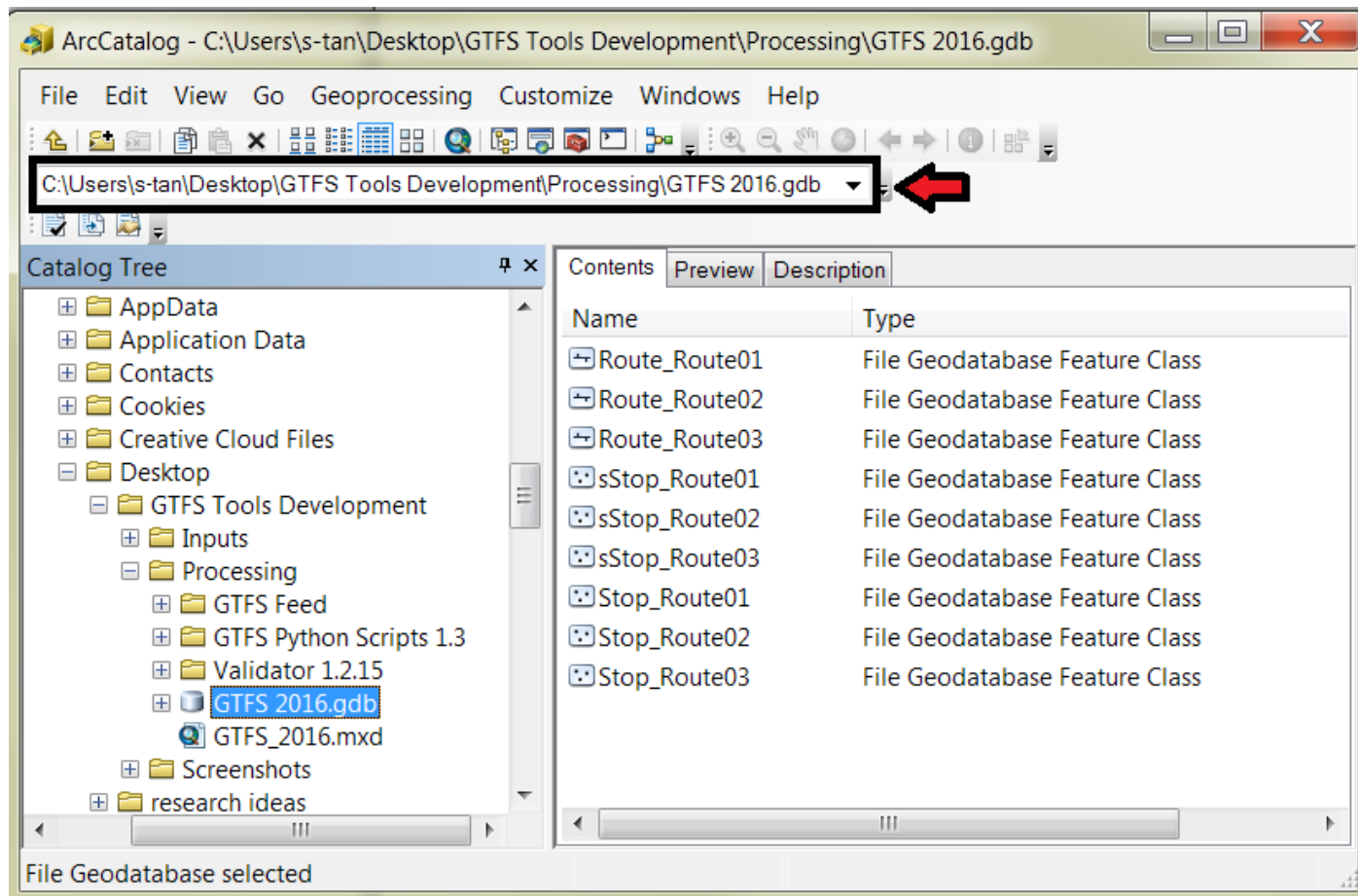


STEP 2: GIS PROCESSING

- Organize ArcCatalog
- Run TTI Python Scripts

Organize ArcCatalog

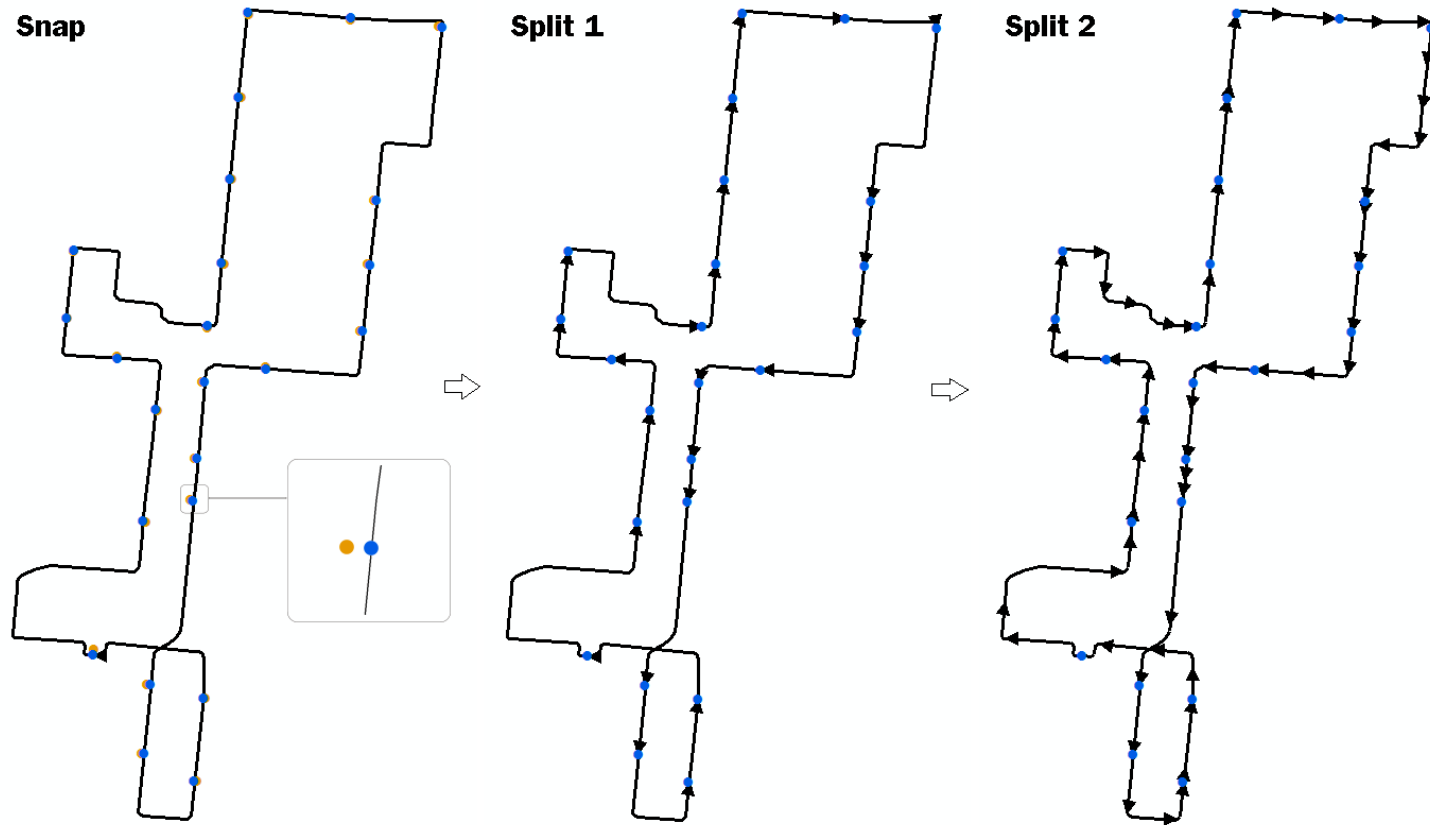
Prepare shapefiles for running Python scripts



TTI Python Scripts

General function of python scripts

We developed **seven** python scripts.

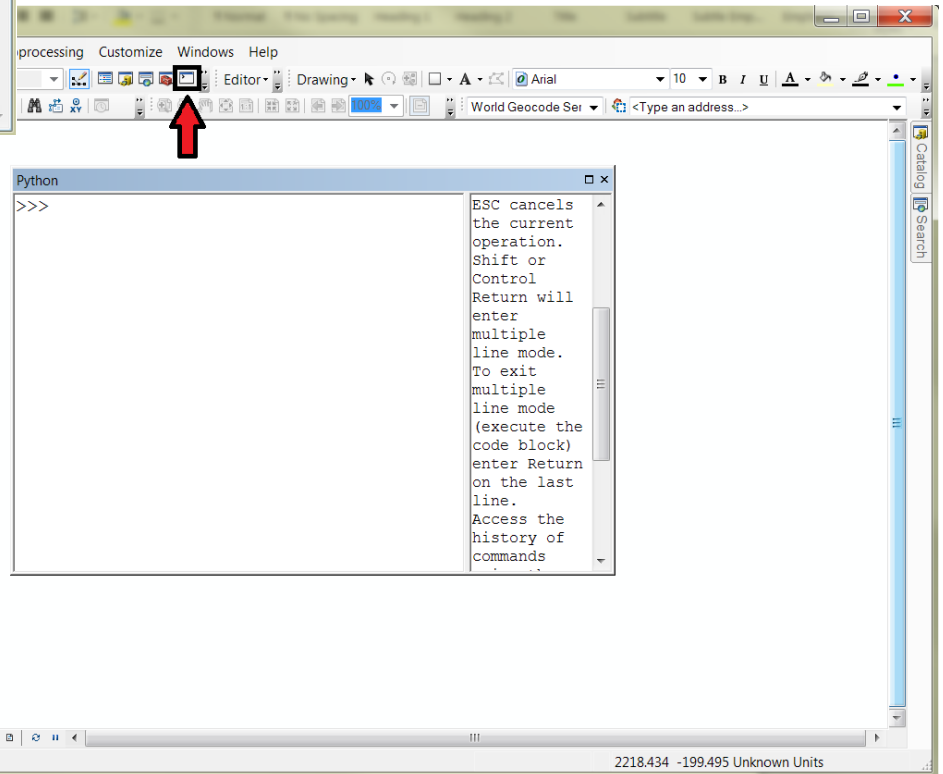


TTI Python Scripts

How to run?

```
1 snap stops to route.py - Notepad
File Edit Format View Help
import arcpy
from arcpy import env
env.workspace=r"Copy and paste the address of your geodatabase here"
fcs=arcpy.ListFeatureClasses("sStop_*","Point")
for fc in fcs:
    snapFeature="Route_Route"+str(fc[11:13])
    snapEnv=[snapFeature,"EDGE","5"]
    arcpy.Snap_edit(fc,[snapEnv])
```

← Use Notepad



Use ArcMap
Python window →



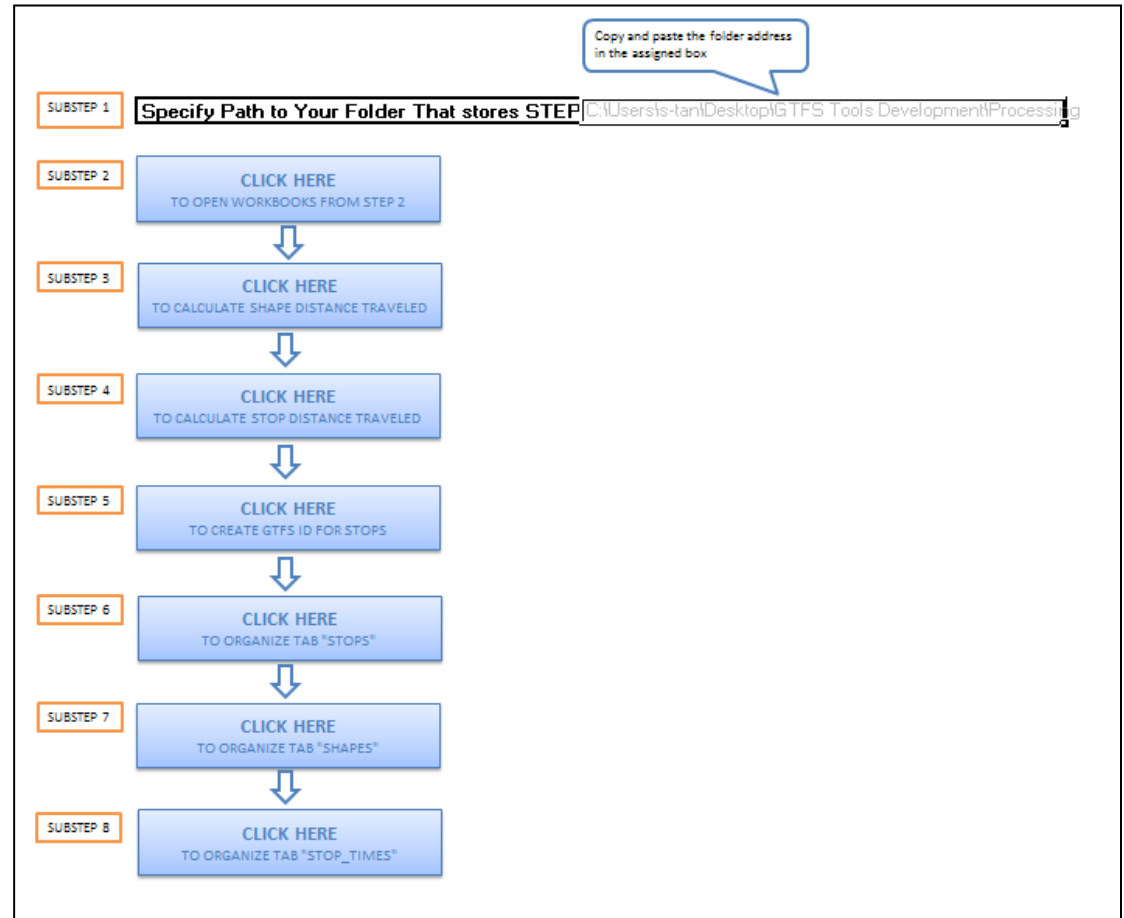
STEP 3: EXCEL PROCESSING

- Prepare *stops*, *stop_times*, and *shapes* Files
- Prepare Others Files

stops, stop_times, and shapes.txt

3 out of 13 text files

Toolset Part 2 interface →



Other Text Files

The remaining text files

Toolset Part 3 interface



Copy and paste the folder address in the assigned box

SUBSTEP 1

Specify Path to Your Folder: C:\Users\s-tan\Desktop\GTFS Tools Development\Processing\GTFS Feed

SUBSTEP 2

CLICK HERE
TO SPLIT THIS WORKBOOK TO SEPARATE SHEETS

SUBSTEP 3

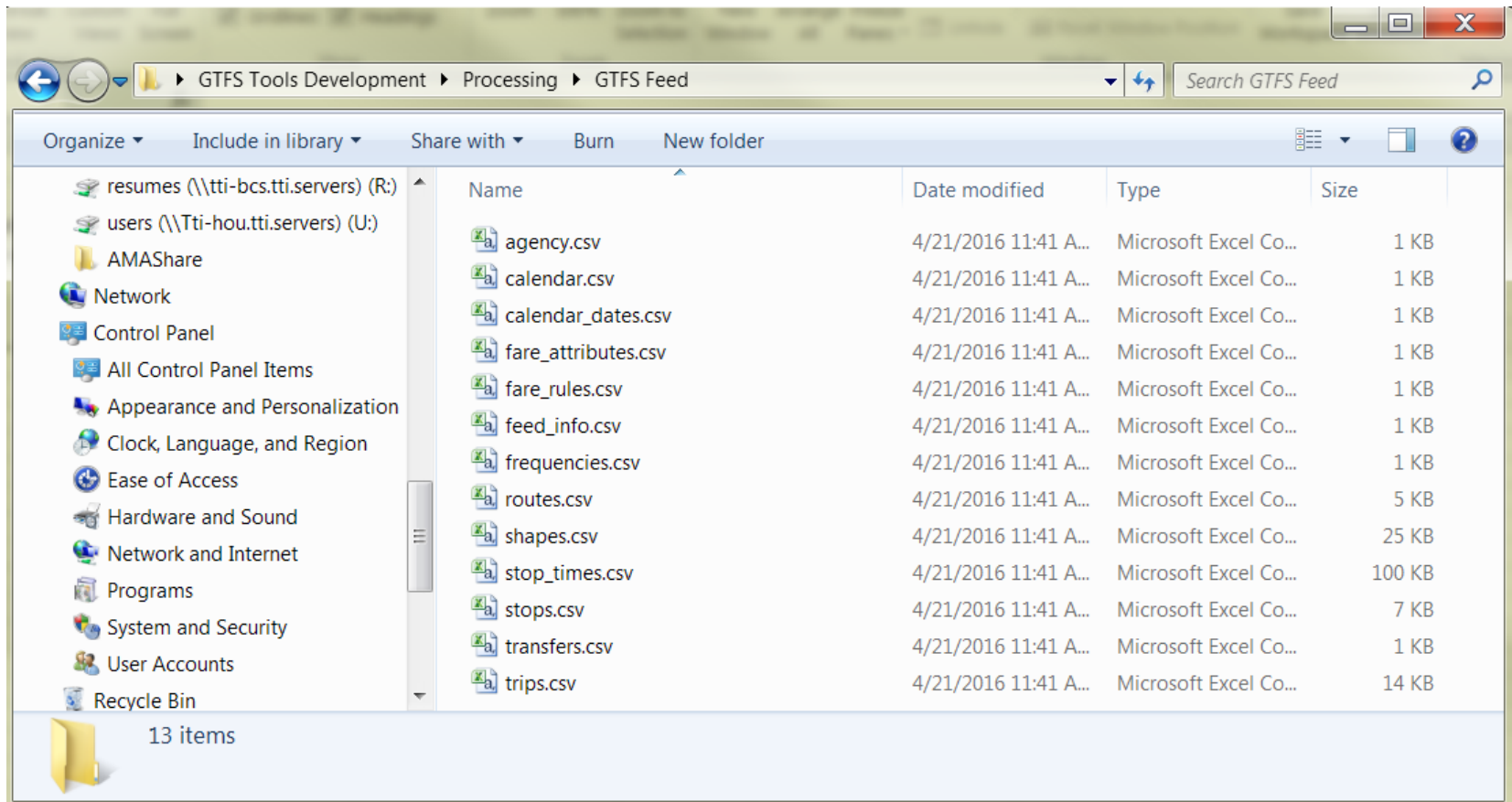
Check Your Folder and Continue to STEP 4

CONTENTS IN GREEN AREAS ARE EXAMPLES. REPLACE THEM WITH YOUR AGENCY'S INFORMATION. COPY AND PASTE STOPS, STOP_TIMES, AND SHAPES FROM TOOLSET PART2.

End Product of Step 3

What will you have by the end of step 3?

A set of **CSV** files.





STEP 4: FEED VALIDATION

- Download GTFS validator from here:
<https://github.com/google/transitfeed/releases>
- Test GTFS feed
- Revise the data feed until “feed validated successfully”



LESSON LEARNED

- Transfer Issues
- Sunday Schedule Display
- Time Frame From Uploading to Final Live

Lesson Learned

What did we learn from our experience?

- Google requires at least 4 minutes to enable a transfer. Transit agencies may revise schedule slightly to make transfer display correctly.
- Google Maps Transit always display the next available service. This may cause confusing for transit agencies without weekend service.
- Google testing phase may take 1 to 3 month(s) and may need several rounds of revision.

THANK YOU AND QUESTIONS?



Contact Information

Shuman Tan

979-458-0233

s-tan@tti.tamu.edu