

# Southeast Florida STOPS Planning Model – User Guide

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Prepared for  
Florida Department of Transportation, District 4



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## List of Acronyms

ACS	American Community Survey
APC	Automatic Passenger Counter
BCT	Broward County Transit
BRT	Bus Rapid Transit
CTPP	Census Transportation Planning Products
FDOT	Florida Department of Transportation
FEC	Florida East Coast
FIU	Florida International University
FTA	Federal Transit Administration
GTFS	General Transit Feed Specification
JTW	Journey-to-Work
HBO	Home-Based Work
HBW	Home-Based Other
MDT	Miami-Dade Transit
MPO	Metropolitan Planning Organization
NHB	Non-Home Based
SERPM	Southeast Florida Regional Planning Model
STOPS	Simplified Trips-on-Project Software

# 1. Introduction

AECOM and Connetics Transportation Group (CTG) were retained by FDOT District 4 to implement a STOPS planning model for the tri-county region of Southeast Florida (SEFL STOPS planning model). The model covers West Palm Beach, Broward and Miami-Dade Counties. As part of this effort, the team developed an user interface to automate the preparation of certain STOPS input files for any fixed-guideway transit project in the tri-county region. In addition, the user interface also helps in extracting tables from the STOPS output report file for post-processing in Microsoft Excel.

This user guide mainly describes how to use the interface developed for SEFL STOPS planning model. This user guide is meant to be used in conjunction with the official STOPS user guide available on FTA's website. All users are expected to have a basic understanding of modeling in STOPS and the terminologies associated with it. A separate calibration memo has been developed which describes the data used to develop the SEFL STOPS planning model along with the calibration results.

For illustration purposes, this user guide also describes few example scenarios where the SEFL STOPS planning model was applied using the user interface on different fixed guideway transit corridors in the tri-county region. Also, results from some sensitivity tests performed on various STOPS parameters and inputs are included.

## 2. User Interface

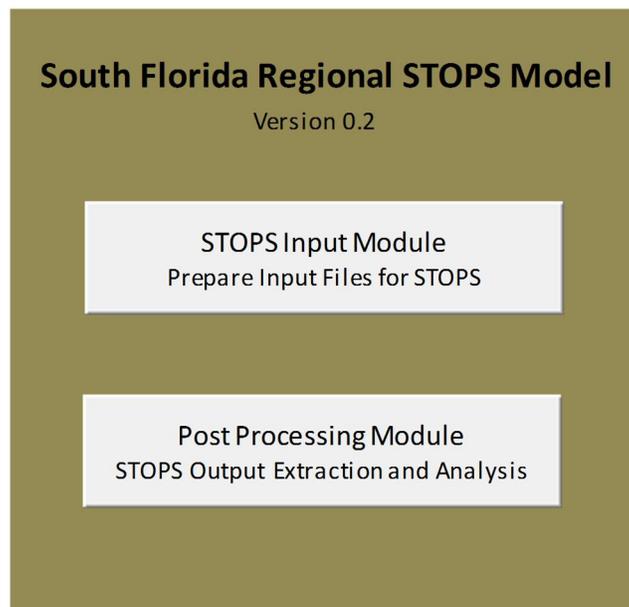
The user interface (“*South\_Florida\_STOPS\_Model\_Interface\_v0.90.xlsm*”) is an Excel macro developed using VBA scripts. The interface as well as STOPS requires the ArcMap and Python software for internal processing of files. The setup also comes with a folder called ‘Model Data’ which contains the various input files required by STOPS for South Florida region. For the user interface to work, both the Excel macro file and the ‘Model Data’ folder should be in the same folder, as shown in Figure 1.

Name	Date modified	Type
Model Data		File folder
South_Florida_STOPS_Model_Interface_v0.90	6/1/2016 4:50 PM	Microsoft Excel Macro-En...
STOPSTablestoExtract	6/1/2016 4:16 PM	TXT File
STOPSTablestoPrint	4/1/2016 6:56 PM	TXT File

**Figure 1: User Interface – Folder Setup**

Figure 2 shows the user interface when the Excel macro is opened. It contains two modules:

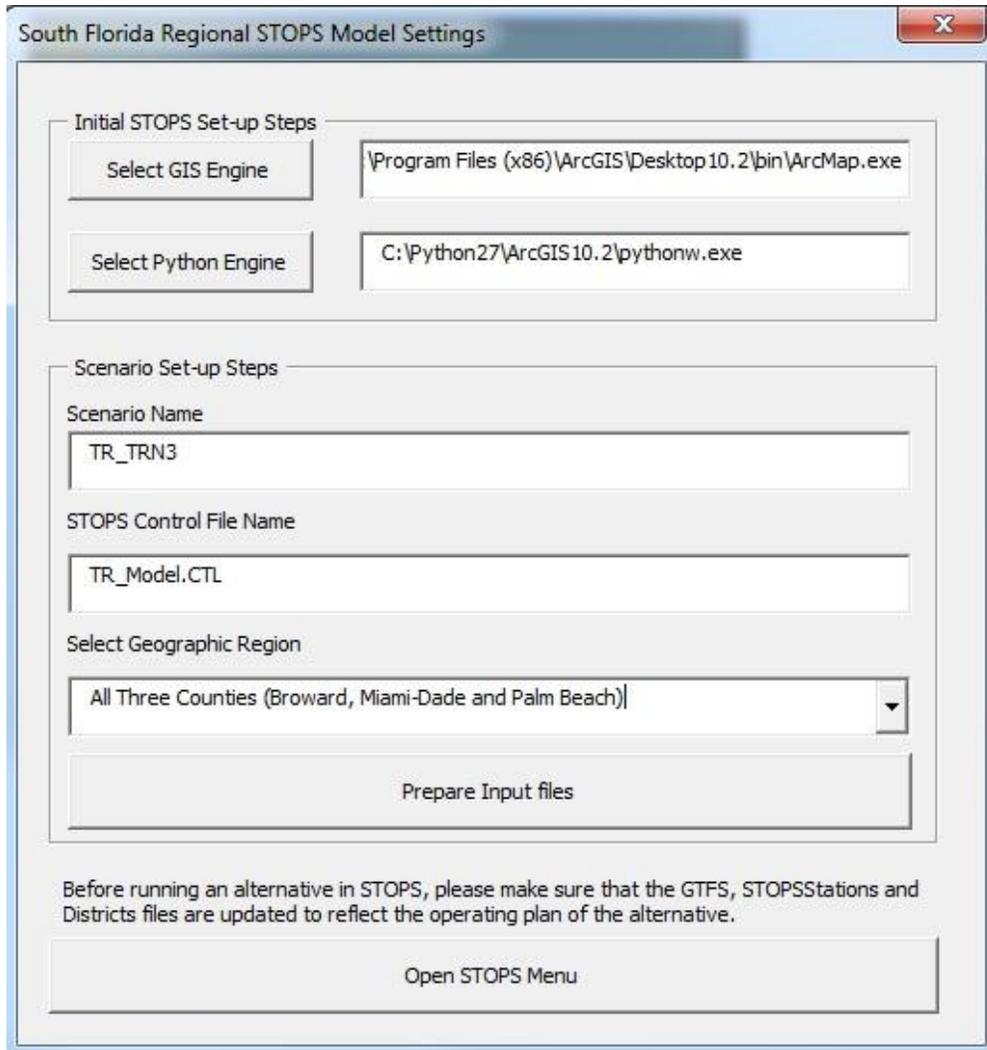
1. A “STOPS Input Module” which can be used to prepare preliminary input files for a specific project; and
2. A post processing module which extracts selected tables from the STOPS output report file into Excel for easier processing.



**Figure 2: South Florida STOPS Planning Model User Interface**

## 2.1 STOPS Input Module

This section describes the STOPS Input Module. Clicking on the corresponding button opens the window shown in Figure 3.



The screenshot shows a dialog box titled "South Florida Regional STOPS Model Settings". It is divided into two main sections: "Initial STOPS Set-up Steps" and "Scenario Set-up Steps".

**Initial STOPS Set-up Steps:**

- Select GIS Engine:** A button next to a text field containing the path: `|Program Files (x86)\ArcGIS\Desktop10.2\bin\ArcMap.exe`
- Select Python Engine:** A button next to a text field containing the path: `C:\Python27\ArcGIS10.2\pythonw.exe`

**Scenario Set-up Steps:**

- Scenario Name:** A text field containing "TR\_TRN3".
- STOPS Control File Name:** A text field containing "TR\_Model.CTL".
- Select Geographic Region:** A dropdown menu with the selected option "All Three Counties (Broward, Miami-Dade and Palm Beach)".

Below these fields are two buttons: "Prepare Input files" and "Open STOPS Menu".

At the bottom, there is a note: "Before running an alternative in STOPS, please make sure that the GTFS, STOPStations and Districts files are updated to reflect the operating plan of the alternative." followed by the "Open STOPS Menu" button.

**Figure 3: STOPS Input Module**

The different parameters of the Input Module are:

- **Select GIS Engine:** This corresponds to the location of the ArcMap executable file. This program is typically located at `C:\Program Files (x86)\ArcGIS\Desktop10.x\bin\ArcMap.exe`
- **Select Python Engine:** This corresponds to the location of the python executable file. This program is typically located at `C:\Python27\ArcGIS10.x\pythonw.exe`
- **Scenario Name:** The user has to specify a name for the scenario as shown in Figure 3. This name will be used as the name of the folder which will contain all the files associated with the STOPS run for that particular scenario.
- **STOPS Control File Name:** The user has to specify a name for the STOPS control file for the scenario as shown in Figure 3. This control file is created in the folder created using the 'Scenario Name' as mentioned above.

- Select Geographic Region: Here the user selects the geographic region to model. The associated dropdown box has four options:
  - All Three Counties (Broward, Miami-Dade and Palm Beach)
  - Broward County
  - Miami-Dade County
  - Palm Beach County

The geographic region chosen here directly impacts the input files that will be generated. It should also be noted that Tri-Rail GTFS files will be copied into the scenario folder only if the 'All Three Counties' option is selected. This step also directly impacts the calibration process, which in turn determines the forecasted ridership on any given transit project. The user should select the 'All Three Counties' option if the answer to any of the following four questions is yes:

1. Does the project traverse more than one county?
2. Would you expect any meaningful ridership on the project from more than one county?
3. Does the underlying corridor bus connect with transit services from other counties, and is this connection expected to have a meaningful impact on the project?
4. Do you need Tri-Rail for your analysis?

One of the main reasons for choosing one specific county over the 'All Three Counties' option is to save computer run time and to provide the ability to enhance county-level calibration where detailed ridership data is available. Running STOPS for the entire tri-county region can take up to 7 hours, which can be cut down to as little as 1.5 hours depending on the project and county chosen.

After all the above parameters are defined, the user can click the 'Prepare Input Files' button. This will result in a folder being created in the directory where this user interface resides. The folder's name will correspond to the 'Scenario Name' defined in the input module. This folder will contain the following sub-folders and files:

1. A sub-folder named 'Districts' which contains the district definition for the tri-county region. These districts have been pre-defined for the SEFL STOPS planning model which the user need to update for their project.
2. A sub-folder named 'Inputs' which contains all the inputs needed to run STOPS and also correspond to the geographic region selected in the input module. The following files will always be copied irrespective of what geographic region was selected:
  - ACS Part I, II and III files. It is assumed that all users will be using the latest ACS data in place of the 2000 CTPP data. STOPS 2.0 does provide the option to use the CTPP data as well. If the user wishes to run their project by using the CTPP data, then they have to copy the appropriate Part I, II and III files.
  - Census blocks boundary files
  - ACS state shape layer files
  - Auto skim file
  - MPO population and employment data

The following files will depend on the geographic region selected:

- *GTFS folders*: If a specific county is selected, only the GTFS files associated with the transit agency serving that county will be copied (MDT for Miami-Dade, BCT for Broward and Palm Tran for Palm Beach). There'll be three identical sets of GTFS files for the existing, no-build and build conditions. These will be denoted by an EXIST, NOB and BLD suffixes respectively. If the 'All Three Counties'

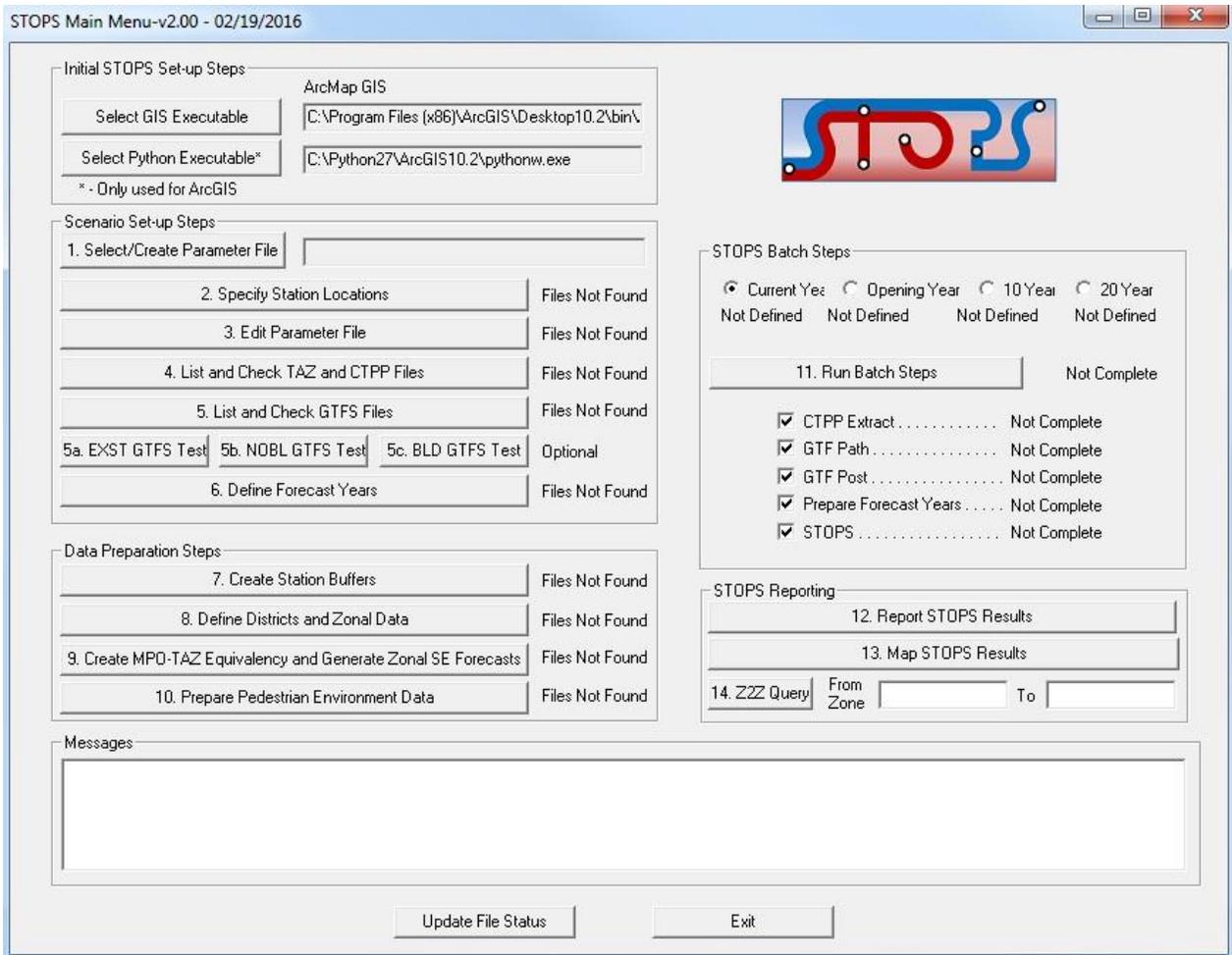
- option is selected in the input module, then the GTFS files for Palm Tran, BCT, MDT and Tri-Rail will be copied.
- *STOPS stations shape layer (STOPStations.shp)*: This will have all the existing fixed guideway stations and bus stops in the tri-county region for which stop level APC data is currently available. It should be noted that ridership data was only available for BCT at a route level. Depending on the geographic region selected, the 'STOPSTYPE' field in the shape file, which indicates whether or not the stop is active for this scenario, will be adjusted accordingly. The following adjustments are made depending on the geographic region selected:
    - § Palm Beach County: Only the stops associated with Palm Tran will be active for calibration in this scenario. Tri-Rail stops will not be active.
    - § Broward County: Since the database does not include any BCT stops due to lack of APC data, none of the stops will be active for calibration in this scenario.
    - § Miami Dade County: Only the stops associated with MDT, including Metrorail and Metromover will be active for calibration in this scenario. Tri-Rail stops will not be active.
    - § All Three Counties: Only the stops associated with Tri-Rail and MDT, including Metrorail and Metromover will be active for calibration in this scenario. Ideally, even the Palm Tran stops should be active in this scenario. But, STOPS has a limit of 10,000 stops that can be active in a given scenario and including the Palm Tran stops would result in going over this limit. Hence, Palm Tran stops are excluded here.
3. A sub-folder named 'STOPSMenu' which contains the actual STOPS setup and executable files.
  4. A control file, corresponding to the STOPS control file name defined in the input module.

In addition to the above changes, the magnitude of the region-wide unlinked transit trips will also be updated depending on the geographic region selected. The user can manually update the number by using the STOPS menu if needed. Figure 4 shows the folder structure after the input files have been prepared.

Name	Date modified	Type
Districts	3/30/2016 1:49 PM	File folder
Inputs	3/30/2016 1:50 PM	File folder
STOPSMenu	3/30/2016 1:49 PM	File folder
Miami.CTL	3/30/2016 1:50 PM	CTL File

**Figure 4: Folder Structure after Input Files are Prepared**

Once the files have been prepared, clicking the 'Open STOPS Menu' button will open the STOPS menu as shown in Figure 5. The user can now open the control file created using the STOPS Input Module.



**Figure 5: Initial STOPS Menu**

**Additional steps:** Once the basic input files have been prepared using the user interface, the user still has to develop files corresponding to the specific transit project for which forecasts are being developed. This section describes these additional steps needed before STOPS can be run.

The first thing the user has to do is to code the operating plan of the transit project in the GTFS build files. Any underlying transit service changes that might happen before the project gets built will have to be incorporated in the GTFS no-build files. Any further transit changes once the project gets built will have to be incorporated in the GTFS build files. In addition, the user will have to add the new stops corresponding to the transit project in the STOPSStations.shp file. This can be accomplished by clicking on the '2.Specify Station Locations' button on the STOPS menu. The official STOPS user guide has detailed steps on how to edit GTFS files and add new stops.

Table 1 provides a summary of the GTFS files used by STOPS.

**Table 1: Summary of GTFS Files Used by STOPS**

<b>GTFS file</b>	<b>Summary</b>
Calendar.txt	Contains a listing of valid dates and days-of-week
Calendar_dates.txt	Contains a listing of dates and exceptions to the schedule previously defined in the calendar.txt file
Stops.txt	Contains a list of stop locations
Routes.txt	Contains a list of routes
Trips.txt	Contains a list of trips; one record for each bus or rail trip
Stop_times.txt	Contains time point information for each stop and trip
Frequencies.txt	Defines the start and end time interval during which a trip is repeated according to the headway specified in this file
PNR.txt	Contains a list of park-and-ride locations
Editlist.txt	Contains commands to adjust the GTFS files

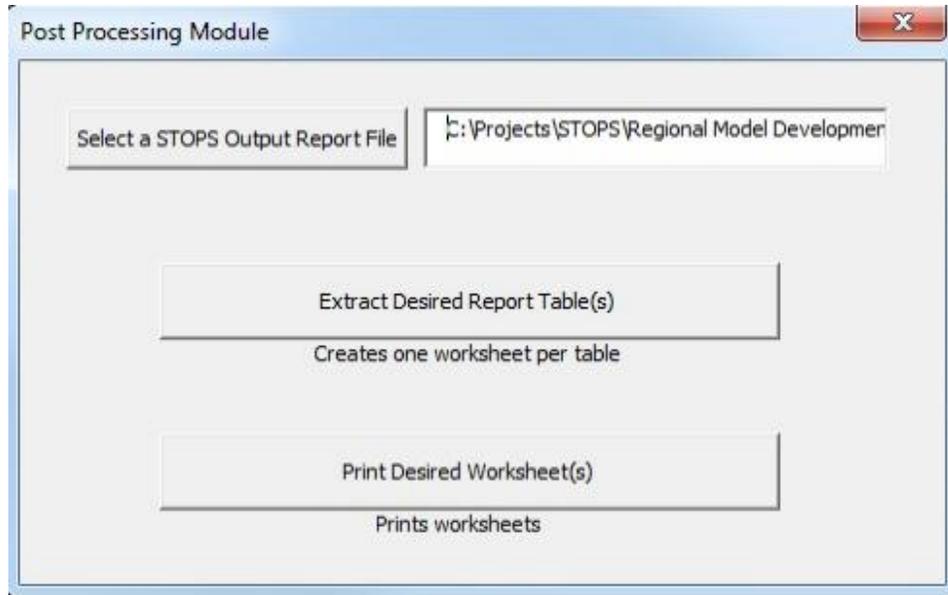
Next, the user has to check the current year and define any additional forecast years. After running the 'STOPS Input Module', the current year is set to 2015 and the 20-year forecast year is set to 2040. The 2015 population and employment data has been obtained by interpolating the 2010 and 2040 MPO data developed for SERPM 7.061. The year 2015 serves as the base year for the SEFL STOPS planning model as well. To use a different forecast year, the user has to develop the data corresponding to that year.

Next, the fixed guideway visibility factor should be adjusted, depending on the transit project for which forecasts are to be generated. In general, the visibility factor of 1.0 for commuter rail and heavy rail projects, 0-0.5 for BRT projects and 0.5-0.75 for streetcars should serve as the starting point. But, users should co-ordinate with FTA in figuring out the visibility factor for their project.

Finally, the user will have to define new districts in the project corridor. The default district file will have the districts developed for the regional model. The user will have to define finer districts in the corridor, making sure to use district numbers that are different from the existing ones. The STOPS user guide developed by FTA has detailed steps on how to do this. The user can leave the districts farther from the corridor as is. Further, creating new districts might also require creation of new stop groups in the STOPSSStations.shp file. Currently, the bus stops are grouped depending on the district in which these stops fall. All bus stops in a given district are coded with the same station group.

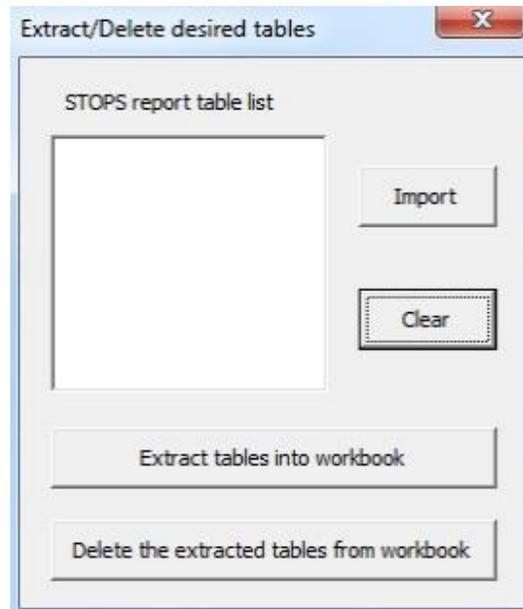
## **2.2 Post Processing Module**

This section describes the Post Processing Module. STOPS generates over 1,000 tables, and it can be time consuming to individually go through these tables and post process them in Excel. The Post Processing Module automates this process by extracting the user-specified set of tables into Excel. Clicking on the 'Post Processing Module' button opens the window shown in Figure 6.



**Figure 6: Post Processing Module**

Clicking the 'Select a STOPS Output Report File' button will allow the user to point to the STOPS output report file containing all the tables. The user then lists the table numbers needed for post processing in the 'STOPSTablestoExtract.txt' file located in the same directory as the user interface. Next, the user clicks on the 'Extract Desired Report Table(s)' button, opening the window shown in Figure 7.



**Figure 7: Extract Desired Tables Interface**

The user can then click on the 'Import' button and point to the *STOPSTablestoExtract.txt* file containing the list of all the table numbers. Clicking the 'Extract tables into workbook' button will extract the tables in the list into the spreadsheet containing the user interface. There will be one new worksheet created in the Excel Interface for every table in the list. 'Delete the extracted tables from workbook' button deletes all the extracted sheets from the workbook. The 'Clear'

button can be used to highlight a specific table in the imported list and be removed before extracting into the workbook.

Extracted tables and any other worksheets can also be printed to PDF format in a batch mode. This can be done by clicking on the 'Print Desired Worksheet(s)' button in the Post Processing Module. This opens the window shown in Figure 8. This functions in the same way as extracting tables from the report file. The user can specify the names of the worksheets to be printed to PDF format in the 'STOPSTablestoPrint.txt' file and import the list. It should be noted that the user needs to set up the print format for each worksheet by clicking on the 'page set-up' tab in Excel before executing this print function.



**Figure 8: Print Worksheets Interface**

### 3. Example Scenarios

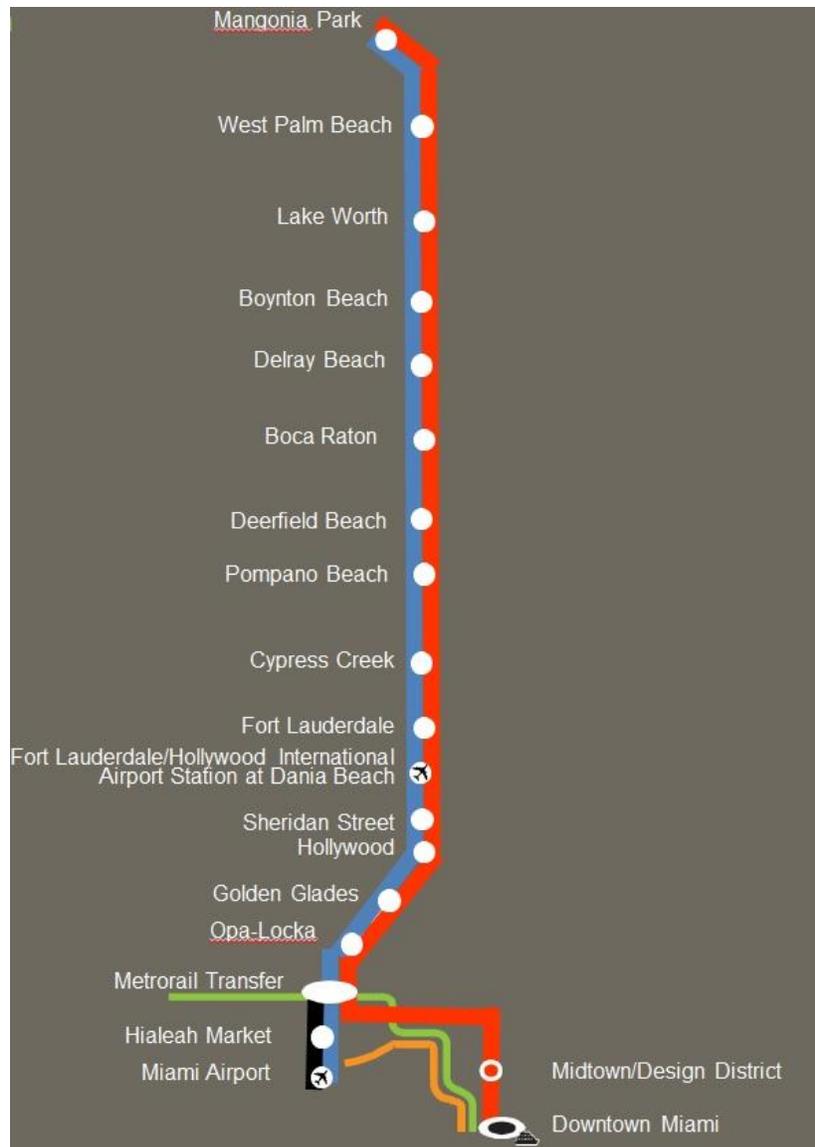
This chapter demonstrates how the user interface can be applied to three fixed guideway transit projects being studied in the tri-county region. The operating plans, station locations, project related details etc shown in this chapter are purely for demonstration purposes only and in no way reflect the actual project details. The district definitions shown are also for demonstration purposes only and any user who might work on one of these projects should in no case consider the districts defined here to be final. Further, the various STOPS parameters, such as the group calibration approach, visibility factor etc are also for demonstration purposes only and do not reflect the actual values that users should use for that project.

#### 3.1 Tri-Rail Interim Service to Downtown Miami (Tri-County)

**Project Description:** This project is an extension of the existing Tri-Rail service to downtown Miami via the Iris rail connection. The alternative modeled here has the following components:

- A service with a 60/120 peak/off-peak headway between Mangonia Park and Miami Airport along the existing Tri-Rail alignment.
- A service with a 60/120 peak/off-peak headway between Mangonia Park and Miami Government Center by utilizing the Iris connection. The trains would follow the existing alignment till the Metrorail transfer station and turn east on the Iris connection before turning south on the FEC tracks serving two stations at the Miami Design Center and Miami Government Center.
- A service with a 60/120 peak/off-peak headway between the Metrorail transfer station and Miami Airport. These trains will be time-transferred to meet the trains serving downtown Miami.

Figure 9 illustrates the proposed interim service to downtown Miami.



**Figure 9: Tri-Rail Interim Service Alignment**

**STOPS Input Module:** In the STOPS Input module, the ‘All Three Counties’ option was selected for this project. Figure 10 shows the Inputs folder immediately after the ‘Prepare Input Files’ button is clicked on the user interface. In this case, no changes were made to the underlying bus services in either the no-build or build scenarios. Only the TRLBLD GTFS folder was edited to reflect the schedule for the interim service.

Name	Date modified	Type	Size
BCTBLD	3/30/2016 1:44 PM	File folder	
BCTEXIST	3/30/2016 1:44 PM	File folder	
BCTNOB	3/30/2016 1:44 PM	File folder	
MDTBLD	3/30/2016 1:44 PM	File folder	
MDTEXIST	3/30/2016 1:44 PM	File folder	
MDTNOB	3/30/2016 1:44 PM	File folder	
PTBLD	3/30/2016 1:44 PM	File folder	
PTEXIST	3/30/2016 1:44 PM	File folder	
PTNOB	3/30/2016 1:44 PM	File folder	
TRLBLD	3/30/2016 1:44 PM	File folder	
TRLEXIST	3/30/2016 1:44 PM	File folder	
TRLNOB	3/30/2016 1:44 PM	File folder	
AC12_d00.DBF	3/18/2016 8:16 AM	excel	2,141 KB
AC12_d00.prj	3/18/2016 8:16 AM	Application Mana...	1 KB
AC12_d00.shp	3/18/2016 8:16 AM	SHP File	32,974 KB
AC12_d00.shx	3/18/2016 8:16 AM	SHX File	96 KB
censusblocks_FL.dbf	3/18/2016 8:16 AM	excel	53,437 KB
censusblocks_FL.prj	3/18/2016 8:16 AM	Application Mana...	1 KB
censusblocks_FL.shp	3/18/2016 8:16 AM	SHP File	336,611 KB
censusblocks_FL.shx	3/18/2016 8:16 AM	SHX File	3,817 KB
FL_ctpp1_t030_t046.ACS	3/18/2016 8:16 AM	ACS File	51,878 KB
FL_ctpp2_t001_t017.ACS	3/18/2016 8:16 AM	ACS File	6,811 KB
FL_ctpp3_sumlv140.ACS	3/18/2016 8:16 AM	ACS File	643,837 KB
MPO0000TAZPopEmp.dat	3/18/2016 8:16 AM	DAT File	148 KB
MPO0000TAZPopEmp.dbd	3/18/2016 8:16 AM	DBD File	1 KB
MPO0000TAZPopEmp.DBF	3/18/2016 8:16 AM	excel	506 KB
MPO0000TAZPopEmp.prj	3/18/2016 8:16 AM	Application Mana...	1 KB
MPO0000TAZPopEmp.sbn	3/18/2016 8:16 AM	SBN File	43 KB
MPO0000TAZPopEmp.sbx	3/18/2016 8:16 AM	SBX File	3 KB
MPO0000TAZPopEmp.shp	3/18/2016 8:16 AM	SHP File	4,363 KB
MPO0000TAZPopEmp.shx	3/18/2016 8:16 AM	SHX File	34 KB
STOPS_PATH_Auto_skim.csv	3/18/2016 8:16 AM	Microsoft Excel C...	1,270,176 KB
STOPSSStations.dbf	3/30/2016 1:44 PM	excel	5,562 KB
STOPSSStations.prj	3/18/2016 8:16 AM	Application Mana...	1 KB
STOPSSStations.sbn	3/18/2016 8:16 AM	SBN File	104 KB
STOPSSStations.sbx	3/18/2016 8:16 AM	SBX File	3 KB
STOPSSStations.shp	3/18/2016 8:16 AM	SHP File	313 KB
STOPSSStations.shp.xml	3/30/2016 1:44 PM	XML Document	15 KB
STOPSSStations.shx	3/18/2016 8:16 AM	SHX File	90 KB
STOPSSYearDef.ctl	3/30/2016 1:44 PM	CTL File	1 KB

**Figure 10: Tri-Rail Interim Service – STOPS Inputs Folder Structure**

Figure 11 and Figure 12 show the STOPS parameter file and year definition. The weekday unlinked regional transit trips reflect all the boardings in the tri-county region across the four transit agencies.

Run Name: TriCounty System Name: RSTOPS Study

Geography Type: AC (ACS 2010) State 1: FL (12-Florida) Optional State 2 (blank if no state 2): Not Defined Optional State 3 (blank if no state 3): Not Defined

MPO Code: 0 (Not Located in an MPO (Cannot use TZ or BG for Geography Type))

GTF File Set 1	Optional GTF File Set 2	Optional GTF File Set 3	Optional GTF File Set 4
Existing Directory: BCTEXIST\	Existing Dir.: MDTEXIST\	Existing Dir.: PTEXIST\	Existing Dir.: TRLEXIST\
No-Bld Directory: BCTNOB\	No-Bld Dir.: MDTNOB\	No-Bld Dir.: PTNOB\	No-Bld Dir.: TRLNOB\
Build Directory: BCTBLD\	Build Dir.: MDTBLD\	Build Dir.: PTBLD\	Build Dir.: TRLBLD\
Optional Suffix: B	Optional Suffix: M	Optional Suffix: P	Optional Suffix: T
Schedule Day: 12/15/2015	Schedule Day: 6/24/2015	Schedule Day: 4/21/2015	Schedule Day: 9/ 9/2009
Route ID Position*: 1 to 100	Route ID Position*: 1 to 100	Route ID Position*: 1 to 100	Route ID Position*: 1 to 100
Trip ID Position*: 1 to 100	Trip ID Position*: 1 to 100	Trip ID Position*: 1 to 100	Trip ID Position*: 1 to 100
Stop ID Position*: 1 to 100	Stop ID Position*: 1 to 100	Stop ID Position*: 1 to 100	Stop ID Position*: 1 to 100

< Previous page of GTF datasets Next page of GTF datasets >

STOPS Parameters

	HBW Trips/JTW	HBW Linked Transit	HBO Trips/JTW	HBO Linked Transit Goal	NHB Trips/JTW	NHB Linked Transit Goal
0-Car HH	1.3200		1.7760		0.5400	
1-Car HH	1.4400		5.2000		2.7857	
2-Car HH	1.5600		5.6000		3.0000	
All-Car HH						

Fraction of Transfer Penalty to apply (0 to 2, default): 1.0000 CTPP Calibration Approach: 00 (none selected)

Fixed Guideway Visibility (1.0=Full, 0.5=Partial): 1.0000 Group Calibration Approach: 09 - Full Group Calibration

Save and Exit Exit Without Saving

Messages:

Notes: \* Optional character position designators for GTF ID Fields. Used when IDs exceed 9 characters in length but a subset of characters would generate a short unique ID.

Figure 11: Tri-Rail Interim Service – STOPS Parameter File

Numeric TAZ Field Name\*: TAZ\_REG

Year	CTPP Year**	Current Year***	Opening Year	10-Year Forecast	20-Year Forecast
2008	2008	2015			2040
Population/Household Field Name	POP_10	POP_15			POP_40
Employment Field Name	TOTE_10	TOTE_15			TOTE_40

\* NOTE: Numeric TAZ field is required to run STOPS

\*\* NOTE: ACS CTPP Year (2008) field names for population/household and employment are required to run STOPS

\*\*\* NOTE: Current year number, population/household field and employment field are required to run STOPS

Weekday Unlinked Regional Bus and Rail Transit Trips (blank= do not calibrate to regional transit trips): 506046

Weekday Regional Linked Transit Trips Made by Travelers from Home-to-Work or Work-to-Home

Growth Factor Geography:  Zone  District

OK Cancel

Figure 12: Tri-Rail Interim Service – STOPS Year Definition

**GTFS Files:** The GTFS files were edited in the TRLBLD folder to reflect the interim service. This is a manual step that the user has to do after the 'STOPS Input Module' has been run in the user interface. In order to properly update the GTFS files, the user should refer to the official STOPS user guide.

**STOP Locations and Districts:** The other manual step involves adding the new stop locations to the STOPStations.shp file and creating new district definitions. For this project, no new districts or stop groups were added to the default districts and stop groups that get copied when the input files are prepared in the user interface. Figure 13 shows the districts and station locations.

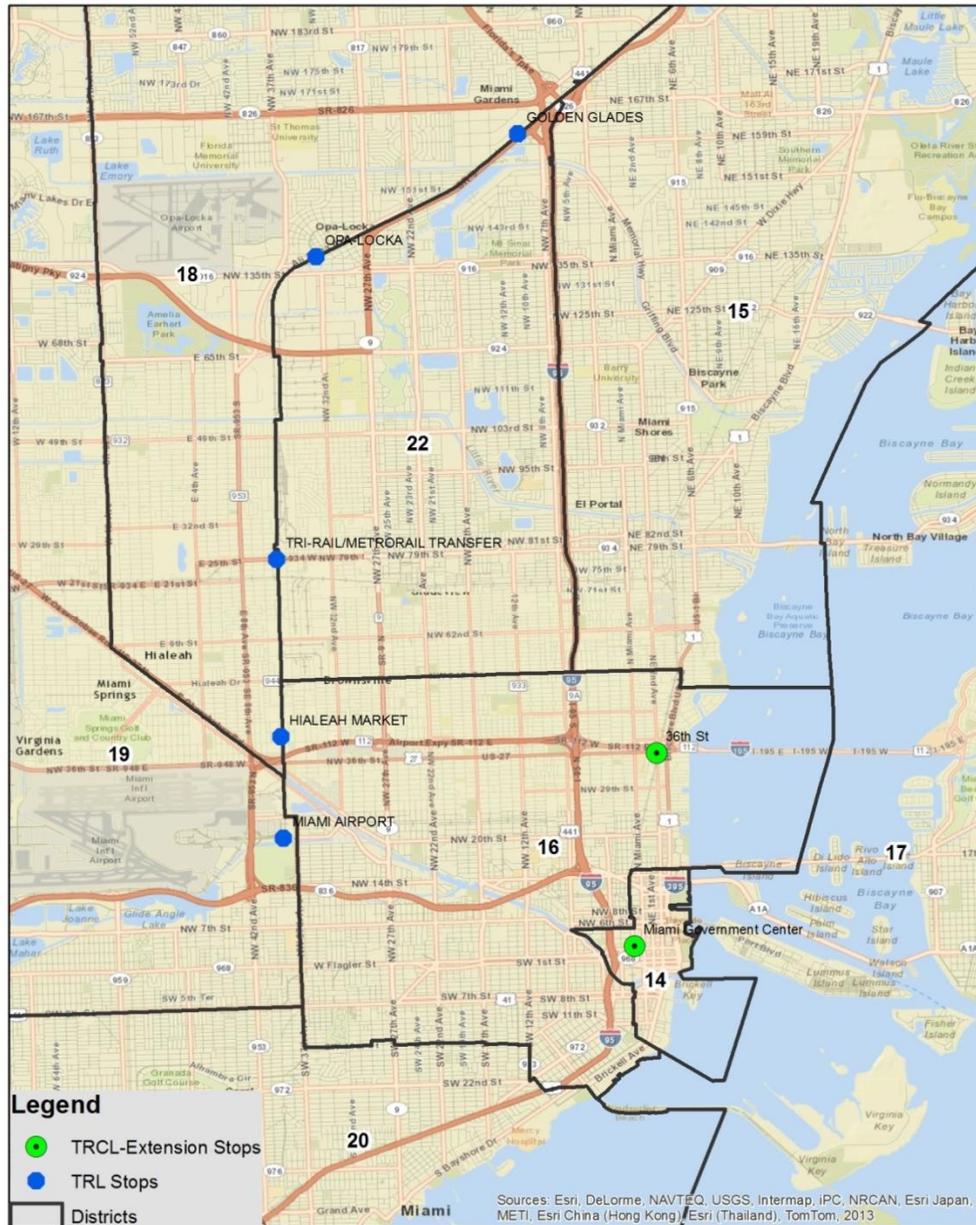


Figure 13: Tri-Rail Interim Service – STOPS Districts and Station Locations

### 3.2 Flagler BRT (Miami-Dade County)

**Project Description:** This BRT route runs along Flagler Street from the FIU main campus to Downtown Miami. The modeled route has a length of 11.8 miles with an average operating speed of 16.5 miles per hour and 10/20 peak/off-peak headway.

Figure 14 illustrates the alignment of the proposed Flagler BRT service.

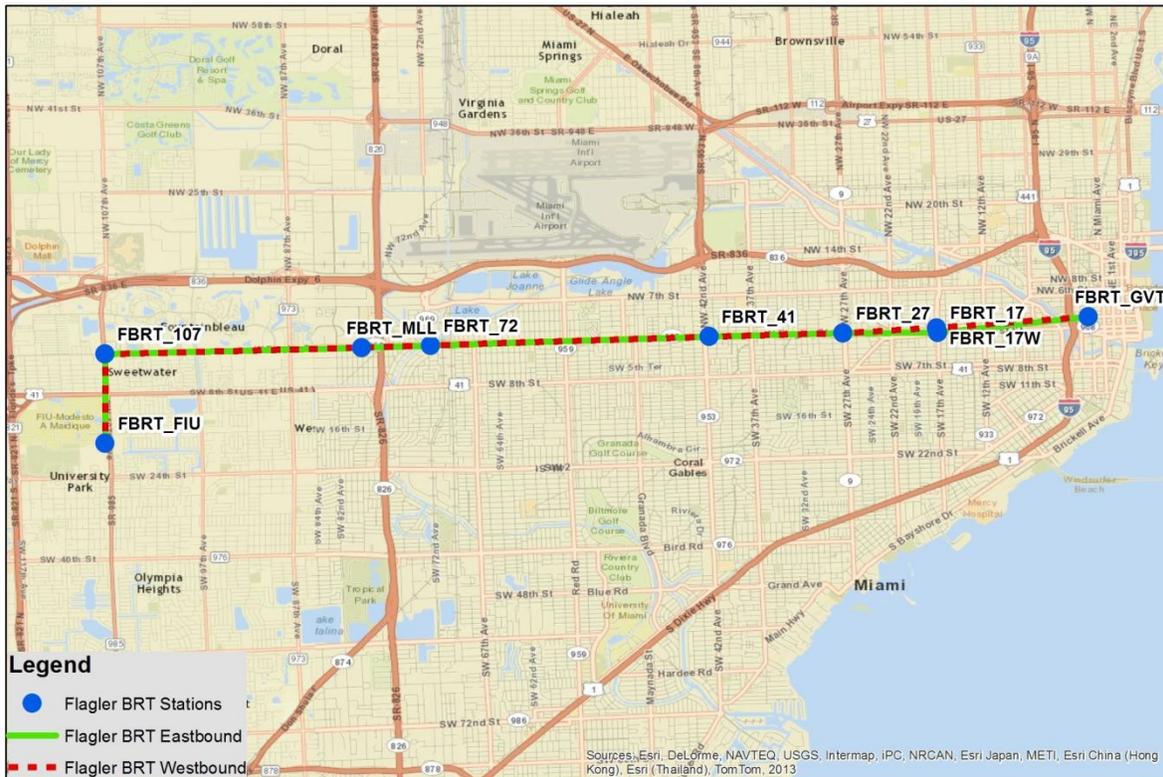


Figure 14: Flagler BRT Alignment

**STOPS Input Module:** In the STOPS Input module, the 'Miami-Dade County' option was selected for this project. Figure 15 shows the Inputs folder immediately after the 'Prepare Input Files' button is clicked on the user interface. In this case, changes were made to the underlying bus services in the build scenarios of MDT GTFS files. MDTBLD folder was edited to reflect the schedule for the proposed BRT service and the changes to the underlying bus services.

Name	Date modified	Type	Size
MDTBLD	4/5/2016 1:18 PM	File folder	
MDTEXIST	4/5/2016 1:18 PM	File folder	
MDTNOB	4/5/2016 1:18 PM	File folder	
AC12_d00	3/18/2016 8:16 AM	DBF File	2,141 KB
AC12_d00	3/18/2016 8:16 AM	Application Mana...	1 KB
AC12_d00.shp	3/18/2016 8:16 AM	SHP File	32,974 KB
AC12_d00.shx	3/18/2016 8:16 AM	SHX File	96 KB
censusblocks_FL	3/18/2016 8:16 AM	DBF File	53,437 KB
censusblocks_FL	3/18/2016 8:16 AM	Application Mana...	1 KB
censusblocks_FL.shp	3/18/2016 8:16 AM	SHP File	336,611 KB
censusblocks_FL.shx	3/18/2016 8:16 AM	SHX File	3,817 KB
FL_ctpp1_t030_t046.ACS	3/18/2016 8:16 AM	ACS File	51,878 KB
FL_ctpp2_t001_t017.ACS	3/18/2016 8:16 AM	ACS File	6,811 KB
FL_ctpp3_sumlv140.ACS	3/18/2016 8:16 AM	ACS File	643,837 KB
MPO0000TAZPopEmp.dat	3/18/2016 8:16 AM	DAT File	148 KB
MPO0000TAZPopEmp.dbd	3/18/2016 8:16 AM	DBD File	1 KB
MPO0000TAZPopEmp	3/18/2016 8:16 AM	DBF File	506 KB
MPO0000TAZPopEmp	3/18/2016 8:16 AM	Application Mana...	1 KB
MPO0000TAZPopEmp.sbn	3/18/2016 8:16 AM	SBN File	43 KB
MPO0000TAZPopEmp.sbx	3/18/2016 8:16 AM	SBX File	3 KB
MPO0000TAZPopEmp.shp	3/18/2016 8:16 AM	SHP File	4,363 KB
MPO0000TAZPopEmp.shx	3/18/2016 8:16 AM	SHX File	34 KB
STOPS_PATH_Auto_skim	3/18/2016 8:16 AM	Microsoft Excel C...	1,270,176 KB
STOPSStations	4/5/2016 1:19 PM	DBF File	5,973 KB
STOPSStations	3/27/2016 11:51 PM	Application Mana...	1 KB
STOPSStations.sbn	4/5/2016 1:19 PM	SBN File	104 KB
STOPSStations.sbx	4/5/2016 1:19 PM	SBX File	3 KB
STOPSStations.shp	3/28/2016 1:57 PM	SHP File	312 KB
STOPSStations.shp	4/5/2016 1:19 PM	XML Document	2 KB
STOPSStations.shx	3/28/2016 1:57 PM	SHX File	90 KB
STOPSYearDef.ctl	4/5/2016 1:19 PM	CTL File	1 KB

**Figure 15: Flagler BRT – STOPS Inputs Folder Structure**

Figure 16 and Figure 17 show the STOPS parameter file and year definition. The weekday unlinked regional transit trips reflect all the boardings on MDT.

STOPS Control File Editor - E:\South\_Florida\_STOPS\_Model\FlaglerBRT\FlaglerBRT.CTL

Run Name:  System Name:

Geography Type:  State 1:  Optional State 2 (blank if no state 2):  Optional State 3 (blank if no state 3):

MPO Code:

GTF File Set 1	Optional GTF File Set 2	Optional GTF File Set 3	Optional GTF File Set 4
Existing Directory: <input type="text" value="MDTEXIST\"/>	Existing Dir.: <input type="text"/>	Existing Dir.: <input type="text"/>	Existing Dir.: <input type="text"/>
No-Bld Directory: <input type="text" value="MDTNOB\"/>	No-Bld Dir.: <input type="text"/>	No-Bld Dir.: <input type="text"/>	No-Bld Dir.: <input type="text"/>
Build Directory: <input type="text" value="MDTBLD\"/>	Build Dir.: <input type="text"/>	Build Dir.: <input type="text"/>	Build Dir.: <input type="text"/>
Optional Suffix: <input type="text" value="M"/>	Optional Suffix: <input type="text"/>	Optional Suffix: <input type="text"/>	Optional Suffix: <input type="text"/>
Schedule Day: <input type="text" value="6/24/2015"/>	Schedule Day: <input type="text" value="4/ 5/2016"/>	Schedule Day: <input type="text" value="4/ 5/2016"/>	Schedule Day: <input type="text" value="4/ 5/2016"/>
Route ID Position*: <input type="text" value="1"/> to <input type="text" value="100"/>	Route ID Position*: <input type="text" value="1"/> to <input type="text" value="100"/>	Route ID Position*: <input type="text" value="1"/> to <input type="text" value="100"/>	Route ID Position*: <input type="text" value="1"/> to <input type="text" value="100"/>
Trip ID Position*: <input type="text" value="1"/> to <input type="text" value="100"/>	Trip ID Position*: <input type="text" value="1"/> to <input type="text" value="100"/>	Trip ID Position*: <input type="text" value="1"/> to <input type="text" value="100"/>	Trip ID Position*: <input type="text" value="1"/> to <input type="text" value="100"/>
Stop ID Position*: <input type="text" value="1"/> to <input type="text" value="100"/>	Stop ID Position*: <input type="text" value="1"/> to <input type="text" value="100"/>	Stop ID Position*: <input type="text" value="1"/> to <input type="text" value="100"/>	Stop ID Position*: <input type="text" value="1"/> to <input type="text" value="100"/>

< Previous page of GTFS datasets      Next page of GTFS datasets >

STOPS Parameters						
	HBW Trips/JTW	HBW Linked Transit	HBO Trips/JTW	HBO Linked Transit Goal	NHB Trips/JTW	NHB Linked Transit Goal
0-Car HH	<input type="text" value="1.3200"/>	<input type="text"/>	<input type="text" value="1.7760"/>	<input type="text"/>	<input type="text" value="0.5400"/>	<input type="text"/>
1-Car HH	<input type="text" value="1.4400"/>	<input type="text"/>	<input type="text" value="5.2000"/>	<input type="text"/>	<input type="text" value="2.7857"/>	<input type="text"/>
2-Car HH	<input type="text" value="1.5600"/>	<input type="text"/>	<input type="text" value="5.6000"/>	<input type="text"/>	<input type="text" value="3.0000"/>	<input type="text"/>
All-Car HH	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Fraction of Transfer Penalty to apply (0 to 2, default):  CTPP Calibration Approach:

Fixed Guideway Visibility (1.0=Full, 0.5=Partial):  Group Calibration Approach:

Save and Exit      Exit Without Saving

Notes: \* Optional character position designators for GTF ID Fields. Used when IDs exceed 9 characters in length but a subset of characters would generate a short unique ID.

Messages:

Figure 16: Flagler BRT – STOPS Parameter File

Forecast Year Parameters

Numeric TAZ Field Name\*:

Year	CTPP Year**	Current Year***	Opening Year	10-Year Forecast	20-Year Forecast
2008	<input type="text" value="2008"/>	<input type="text" value="2015"/>	<input type="text"/>	<input type="text"/>	<input type="text" value="2040"/>
Population/Household Field Name	<input type="text" value="POP_10"/>	<input type="text" value="POP_15"/>	<input type="text"/>	<input type="text"/>	<input type="text" value="POP_40"/>
Employment Field Name	<input type="text" value="TOTE_10"/>	<input type="text" value="TOTE_15"/>	<input type="text"/>	<input type="text"/>	<input type="text" value="TOTE_40"/>

\* NOTE: Numeric TAZ field is required to run STOPS

\*\* NOTE: ACS CTPP Year (2008) field names for population/household and employment are required to run STOPS

\*\*\* NOTE: Current year number, population/household field and employment field are required to run STOPS

Weekday Unlinked Regional Bus and Rail Transit Trips (blank= do not calibrate to regional transit trips):

Weekday Regional Linked Transit Trips Made by Travelers From Home-to-Work or Work-to-Home:

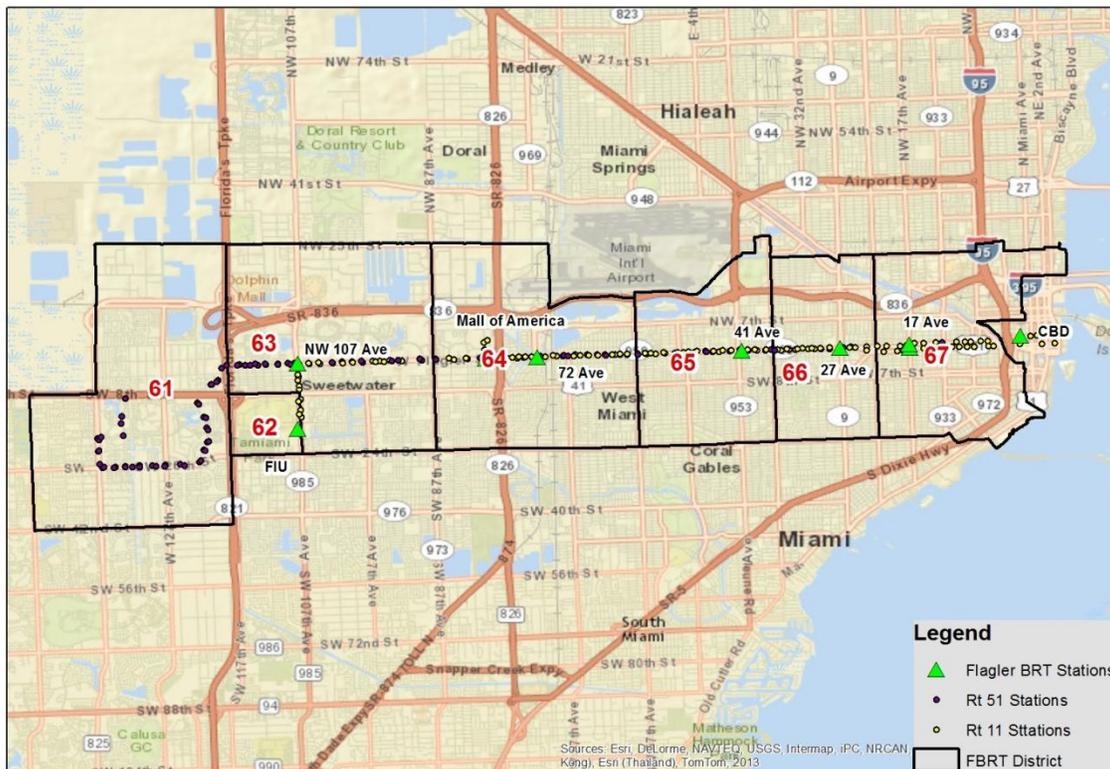
Growth Factor Geography:  Zone  District

OK      Cancel

Figure 17: Flagler BRT – STOPS Year Definition

**GTFS Files:** Some of the GTFS files were edited in the MDTBLD folder to reflect the Flagler BRT service. This is a manual step that the user has to do after the ‘STOPS Input Module’ has been run in the user interface. In order to properly update the GTFS files, the user should refer to the official STOPS user guide.

**STOP Locations and Districts:** The other manual step involves adding the new stop locations to the STOPStations.shp file and creating new district definitions. For this project, new districts and hence new stop groups were added to the default districts and stop groups that get copied when the input files are prepared in the user interface. Figure 18 shows the districts and station locations.

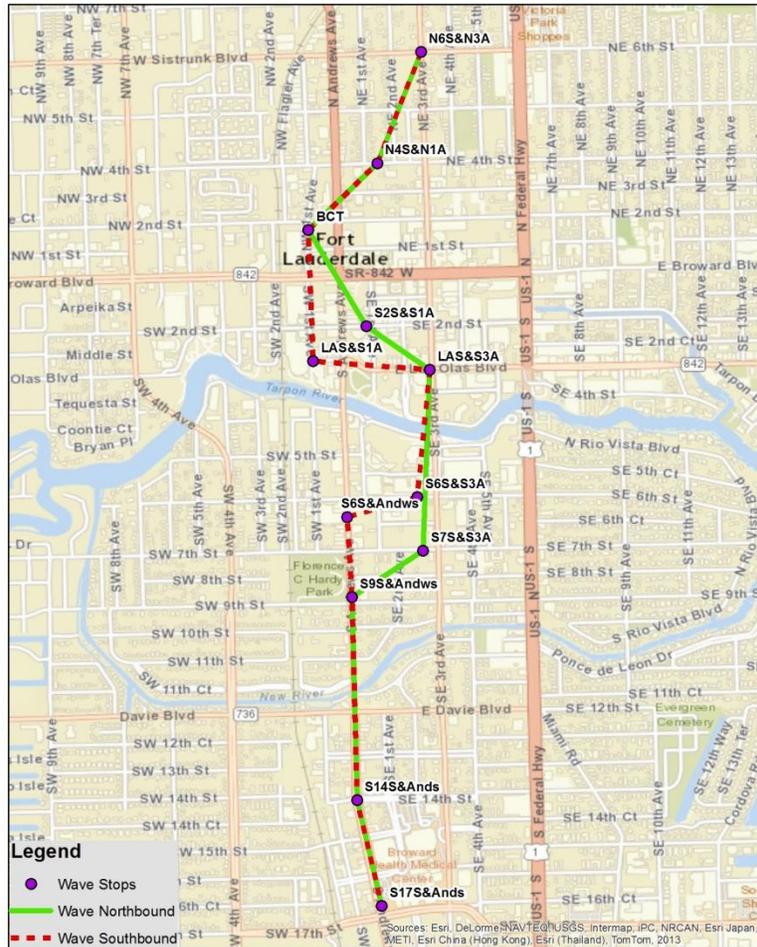


**Figure 18: Flagler BRT – STOPS Districts and Station Locations**

### 3.3 WAVE Streetcar (Broward County)

**Project Description:** This project is a streetcar in downtown Fort Lauderdale. The alternative has a length of approximately 3 miles (one way) with an average speed of 10.4 miles per hour and 8/16 peak/off-peak headway

Figure 19 illustrates the proposed alignment for the Wave streetcar.



**Figure 19: Wave Streetcar Station Locations**

**STOPS Input Module:** In the STOPS Input module, the “Broward County” option was selected. Figure 20 shows the Inputs folder immediately after the ‘Prepare Input Files’ button is clicked on the user interface. In this case, changes were made to the underlying bus services in the build scenario of BCT GTFS files. BCTBLD folder was edited to reflect the schedule for the proposed WAVE streetcar service and the changes on the underlying bus services.

Name	Date modified	Type	Size
BCTBLD	3/30/2016 4:43 PM	File folder	
BCTEXIST	3/30/2016 4:43 PM	File folder	
BCTNOB	3/30/2016 4:44 PM	File folder	
AC_District.ASC	3/31/2016 10:01 AM	ASC File	184 KB
AC_District.DCT	3/31/2016 10:01 AM	DCT File	1 KB
AC12_d00	3/18/2016 8:16 AM	DBF File	2,141 KB
AC12_d00	3/18/2016 8:16 AM	Application Mana...	1 KB
AC12_d00.shp	3/18/2016 8:16 AM	SHP File	32,974 KB
AC12_d00.shx	3/18/2016 8:16 AM	SHX File	96 KB
censusblocks_FL	3/18/2016 8:16 AM	DBF File	53,437 KB
censusblocks_FL	3/18/2016 8:16 AM	Application Mana...	1 KB
censusblocks_FL.shp	3/18/2016 8:16 AM	SHP File	336,611 KB
censusblocks_FL.shx	3/18/2016 8:16 AM	SHX File	3,817 KB
FL_ctpp1_t030_t046.ACS	3/18/2016 8:16 AM	ACS File	51,878 KB
FL_ctpp2_t001_t017.ACS	3/18/2016 8:16 AM	ACS File	6,811 KB
FL_ctpp3_sumlv140.ACS	3/18/2016 8:16 AM	ACS File	643,837 KB
MPO0000TAZPopEmp.dat	3/18/2016 8:16 AM	DAT File	148 KB
MPO0000TAZPopEmp.dbd	3/18/2016 8:16 AM	DBD File	1 KB
MPO0000TAZPopEmp	3/18/2016 8:16 AM	DBF File	506 KB
MPO0000TAZPopEmp	3/18/2016 8:16 AM	Application Mana...	1 KB
MPO0000TAZPopEmp.sbn	3/18/2016 8:16 AM	SBN File	43 KB
MPO0000TAZPopEmp.sbx	3/18/2016 8:16 AM	SBX File	3 KB
MPO0000TAZPopEmp.shp	3/18/2016 8:16 AM	SHP File	4,363 KB
MPO0000TAZPopEmp.shx	3/18/2016 8:16 AM	SHX File	34 KB
STOPS_PATH_Auto_skim	3/18/2016 8:16 AM	Microsoft Excel C...	1,270,176 KB
STOPSStations	3/25/2016 5:10 PM	DBF File	11 KB
STOPSStations	10/22/2014 12:33 ...	Application Mana...	1 KB
STOPSStations.sbn	3/28/2016 11:50 AM	SBN File	1 KB
STOPSStations.sbx	3/28/2016 11:50 AM	SBX File	1 KB
STOPSStations.shp	3/25/2016 5:10 PM	SHP File	1 KB
STOPSStations.shp	3/30/2016 4:25 PM	XML Document	2 KB
STOPSStations.shx	3/25/2016 5:10 PM	SHX File	1 KB
STOPSYearDef.ctl	3/30/2016 4:55 PM	CTL File	1 KB

**Figure 20: Wave Streetcar – STOPS Inputs Folder Structure**

Figure 21 and Figure 22 show the STOPS parameter file and year definition. The weekday unlinked regional transit trips reflect all the boardings on BCT.

STOPS Control File Editor - E:\South\_Florida\_STOPS\_Model\BrowardWave1\Wave1.CTL

Run Name:  System Name:

Geography Type:  State 1:  Optional State 2 (blank if no state 2):  Optional State 3 (blank if no state 3):

MPO Code:

GTF File Set 1: Existing Directory:  No-Bld Directory:  Build Directory:  Optional Suffix:  Schedule Day:  Route ID Position\*:  to  Trip ID Position\*:  to  Stop ID Position\*:  to

Optional GTF File Set 2: Existing Dir.:  No-Bld Dir.:  Build Dir.:  Optional Suffix:  Schedule Day:  Route ID Position\*:  to  Trip ID Position\*:  to  Stop ID Position\*:  to

Optional GTF File Set 3: Existing Dir.:  No-Bld Dir.:  Build Dir.:  Optional Suffix:  Schedule Day:  Route ID Position\*:  to  Trip ID Position\*:  to  Stop ID Position\*:  to

Optional GTF File Set 4: Existing Dir.:  No-Bld Dir.:  Build Dir.:  Optional Suffix:  Schedule Day:  Route ID Position\*:  to  Trip ID Position\*:  to  Stop ID Position\*:  to

STOPS Parameters

	HBW Trips/JTW	HBW Linked Transit	HBD Trips/JTW	HBD Linked Transit Goal	NHB Trips/JTW	NHB Linked Transit Goal
0-Car HH	<input type="text" value="1.3200"/>	<input type="text"/>	<input type="text" value="1.7760"/>	<input type="text"/>	<input type="text" value="0.5400"/>	<input type="text"/>
1-Car HH	<input type="text" value="1.4400"/>	<input type="text"/>	<input type="text" value="5.2000"/>	<input type="text"/>	<input type="text" value="2.7857"/>	<input type="text"/>
2-Car HH	<input type="text" value="1.5600"/>	<input type="text"/>	<input type="text" value="5.6000"/>	<input type="text"/>	<input type="text" value="3.0000"/>	<input type="text"/>
All-Car HH	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Fraction of Transfer Penalty to apply (0 to 2, default):  CTPP Calibration Approach:

Fixed Guideway Visibility (1.0=Full, 0.5=Partial):  Group Calibration Approach:

Save and Exit  Exit Without Saving

Notes: \* Optional character position designators for GTF ID Fields. Used when IDs exceed 9 characters in length but a subset of characters would generate a short unique ID.

Messages:

Figure 21: Wave Streetcar – STOPS Parameter File

Forecast Year Parameters

Numeric TAZ Field Name\*:

Year:  CTPP Year\*\*:  Current Year\*\*\*:  Opening Year:  10-Year Forecast:  20-Year Forecast:

Population/Household Field Name:  POP\_10 POP\_15 POP\_40

Employment Field Name:  TOTE\_10 TOTE\_15 TOTE\_40

\* NOTE: Numeric TAZ field is required to run STOPS

\*\* NOTE: ACS CTPP Year (2008) field names for population/household and employment are required to run STOPS

\*\*\* NOTE: Current year number, population/household field and employment field are required to run STOPS

Weekday Unlinked Regional Bus and Rail Transit Trips (blank = do not calibrate to regional transit trips):

Weekday Regional Linked Transit Trips Made by Travelers from Home-to-Work or Work-to-Home:

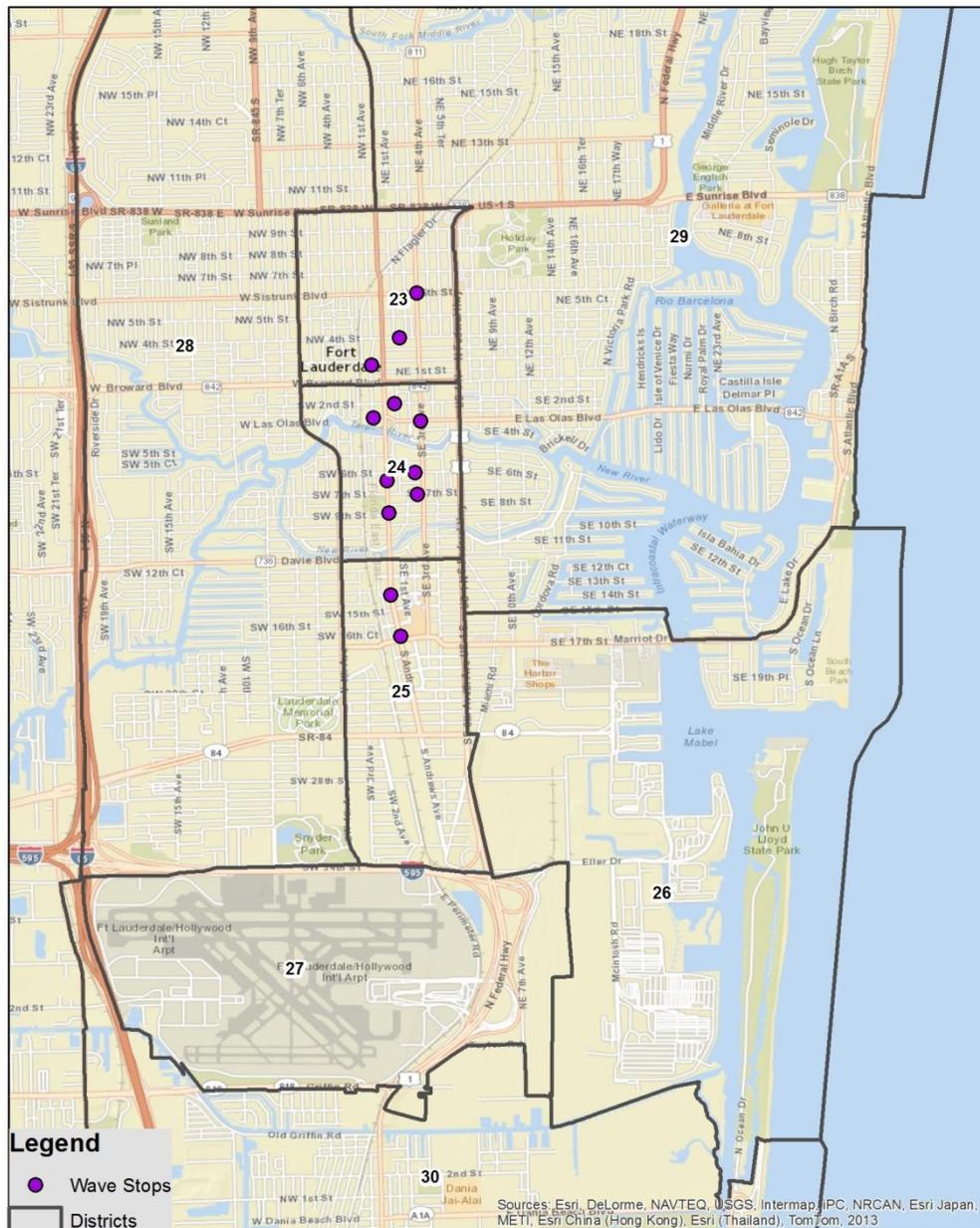
Growth Factor Geography:  Zone  District

OK  Cancel

Figure 22: Wave Streetcar – STOPS Year Definition

**GTFS Files:** Some of the GTFS files were edited in the BCTBLD folder to reflect the Wave Streetcar service. This is a manual step that the user has to do after the ‘STOPS Input Module’ has been run in the user interface. In order to properly update the GTFS files, the user should refer to the official STOPS user guide.

**STOP Locations and Districts:** The other manual step involves adding the new stop locations to the STOPStations.shp file and creating new district definitions. For this project, new districts and hence stop groups were added to the default districts and stop groups that get copied when the input files are prepared in the user interface. Figure 23 shows the districts and station locations.



**Figure 23: Wave Streetcar – STOPS Districts and Station Locations**