

# TECHNICAL REPORT

## FSUTMS Transit Model Application Guide

---



Submitted to:

Florida Department of Transportation

Submitted by:

AECOM Consult, Inc.

October 2008

## CONTENTS

<b>LIST OF FIGURES.....</b>	<b>III</b>
<b>LIST OF TABLES .....</b>	<b>III</b>
<b>EXECUTIVE SUMMARY .....</b>	<b>1</b>
<b>CHAPTER 1: IMPORTING THE TRANSIT MODEL APPLICATION .....</b>	<b>2</b>
<b>CHAPTER 2: MODEL PROCEDURE .....</b>	<b>7</b>
2.1    TRANSIT PREP MODULE .....	7
2.2    TRANSIT PATHS MODULE .....	8
2.3    MODE CHOICE MODULE .....	9
2.4    TRANSIT ASSIGNMENT MODULE .....	11
2.5    TRANSIT REPORTING MODULE .....	12
<b>CHAPTER 3: CATALOG KEYS, INPUT AND OUTPUT FILES .....</b>	<b>13</b>
3.1    CATALOG KEYS .....	13
3.2    INPUT FILES .....	14
3.2.1 <i>Highway networks</i> .....	14
3.2.2 <i>Highway skim files</i> .....	15
3.2.3 <i>Production trip rate file (GRATES)</i> .....	16
3.2.4 <i>Dwelling unit weights file (DUWEIGHTS)</i> .....	16
3.2.5 <i>Person trip file (PSNTRIPS_{Alt}{Year}.MAT)</i> .....	16
3.2.6 <i>Zonal data files</i> .....	17
3.2.7 <i>Transit line file (TROUTE_{year}{alt}.LIN)</i> .....	17
3.2.8 <i>System file (TSYSD.pts)</i> .....	18
3.2.9 <i>Fares file (TFAREStp_{year}{alt}.FAR)</i> .....	19
3.2.10 <i>Transit Coefficients file (TRN_COEFFICIENTS.DBF)</i> .....	20
3.2.11 <i>Mode Choice constants file (MC_CONSTANTS.DBF)</i> .....	21
3.2.12 <i>Percent walk file (PCWALK_{Year}{Alt}.DAT)</i> .....	22
3.2.13 <i>Station node and name file –ASCII file (STATREP_{year}{alt}.DAT)</i> .....	23
3.2.14 <i>Mode choice targets (MC_TARGETS.DBF)</i> .....	23
3.3    KEY OUTPUT FILES.....	25
3.3.1 <i>Highway Vehicle Trip Table (HWYTTAB_{Alt}{Year}.MAT)</i> .....	25
3.3.2 <i>Person Trip Table (MODEOUT.MAT)</i> .....	25
3.3.3 <i>Transit assignment summary report (TASUM_{ALT}{YEAR}.PRN)</i> .....	25
3.3.4 <i>Transit Assignment Route-Level Report (TASROUTE_{ALT}{YEAR}.PRN)</i> .....	27
3.3.5 <i>Station Activity Report (Stations_{Alt}{Year}.prn)</i> .....	28
<b>CHAPTER 4: CHANGES IN SCRIPTS .....</b>	<b>29</b>
4.1    TPNET00C.S (TRANSIT SPEED FOR PEAK PERIOD) .....	29
4.2    TPNET00C.S (TRANSIT SPEED FOR OFFPEAK PERIOD) .....	29
4.3    TPPTR00A.S (BUILD PEAK ACCESS CONNECTORS) .....	30
4.4    TPPTR00B.S (BUILD OFFPEAK ACCESS CONNECTORS) .....	30
4.5    TRPTR00A.S (WALK-ACCESS PATHS/SKIMS – PEAK) .....	30
4.6    TRPTR00B.S (AUTO-ACCESS PATHS/SKIMS – PEAK).....	30
4.7    TRPTR00C.S (WALK-ACCESS PATHS/SKIMS – OFFPEAK).....	31
4.8    TRPTR00D.S (AUTO-ACCESS PATHS/SKIMS – OFFPEAK).....	31

4.9 MCPREP.S (AUTO OWNERSHIP PERCENTAGE BY TAZ FOR WORK AND NON-WORK PURPOSES)..... 31  
 4.10 MCPREP.S AND MCMAT00B.S..... 33  
**APPENDIX: TRANSIT MODEL TIER A APPLICATION SCREENSHOTS..... 34**

***LIST OF FIGURES***

FIGURE 1: TRANSIT MODEL APPLICATION 2  
 FIGURE 2: NEW APPLICATION DIRECTORY 3  
 FIGURE 3: NEW APPLICATION DIRECTORY DIALOG BOX 3  
 FIGURE 4: NEW APPLICATION DIRECTORY DIALOG BOX II 4  
 FIGURE 5: NEW APPLICATION DIRECTORY DIALOG BOX III 4  
 FIGURE 6: INSERT APPLICATION GROUP 4  
 FIGURE 7: TRANSIT MODEL APPLICATION IN OLYMPUS TRAINING MODEL 6  
 FIGURE 8: TRANSIT PREP MODULE 8  
 FIGURE 9: TRANSIT PATHS MODULE 9  
 FIGURE 10: MODE CHOICE MODULE 10  
 FIGURE 11: TRANSIT ASSIGNMENT MODULE 11  
 FIGURE 12: TRANSIT REPORTING MODULE 12  
 FIGURE 13: TRANSIT ASSIGNMENT SUMMARY REPORT (SNIPPET) 26  
 FIGURE 14: TRANSIT ASSIGNMENT ROUTE- LEVEL REPORT (SNIPPET) 27  
 FIGURE 15: STATION ACTIVITY REPORT (SNIPPET) 28  
 FIGURE 16: TRANSIT PREP MODULE 35  
 FIGURE 17: TRANSIT PATHS MODULE 36  
 FIGURE 18: MODE CHOICE MODULE 37  
 FIGURE 19: TRANSIT ASSIGNMENT MODULE 38  
 FIGURE 20: TRANSIT REPORTING MODULE 39

***LIST OF TABLES***

TABLE 1: OUTPUT FILES FROM THE HIGHWAY MODEL REQUIRED BY THE TRANSIT MODEL APPLICATION 5  
 TABLE 2: FILES REQUIRED BY THE TRANSIT MODEL 5  
 TABLE 3: CATALOG KEYS 13  
 TABLE 4: HIGHWAY NETWORK LINK VARIABLES 14  
 TABLE 5: HIGHWAY NETWORK NODE VARIABLES 15  
 TABLE 6: HIGHWAY SKIM TABLES FOR AUTOCON PROGRAM 15  
 TABLE 7: HIGHWAY SKIM TABLES FOR MODE CHOICE MODULE 16  
 TABLE 8: COLUMNS IN THE GRATES FILE 16  
 TABLE 9: COLUMNS IN THE DUWEIGHTS FILE 16  
 TABLE 10: REQUIRED FIELDS IN ZONAL DATA FILES 17

TABLE 11: KEYWORDS TO LINE CONTROL STATEMENT AND THEIR RECOMMENDED VALUES	18
TABLE 12: SUB-KEYWORDS TO KEYWORD N IN LINE CONTROL STATEMENT	18
TABLE 13: DEFAULT MODES AND MODE NUMBERS IN SYSTEM.PTS FILE	19
TABLE 14: DEFAULT OPERATORS, OPERATOR NUMBERS, AND FARESYSTEMS IN TSYS.D.PTS FILE	19
TABLE 15: KEYWORDS TO FARESYSTEM CONTROL STATEMENT AND THEIR RECOMMENDED VALUES	20
TABLE 16: DEFAULT FARES USED IN THE FARES FILE	20
TABLE 17: DEFAULT TRANSFER FARES USED IN THE FARES FILE	20
TABLE 18: DEFAULT TRANSIT COEFFICIENTS FOR TIER B/C	21
TABLE 19: DEFAULT MODE CHOICE CONSTANTS FOR TIER B/C	22
TABLE 20: PERCENT WALK FILE FORMAT	23
TABLE 21: STATION NODE AND NAME FILE FORMAT	23
TABLE 22: DEFAULT MODE SHARE TARGETS FOR TIER B/C	24
TABLE 23: TABLES IN THE VEHICLE TRIP TABLES	25
TABLE 24: TRANSIT ASSIGNMENT SUMMARY REPORT FORMAT	26
TABLE 25: TRANSIT ASSIGNMENT ROUTE-LEVEL REPORT FORMAT	27

## ***Executive Summary***

The Florida Department of Transportation updated the standards for transit modeling in Cube Voyager in 2006. A CUBE Voyager transit model application is being developed that incorporates these updated standards. This document provides the instructions for importing the transit model into a travel demand model (Chapter 1), descriptions of the model procedure (Chapter 2), the catalog keys, input and output files of the transit model (Chapter 3), and the scripts that must be modified by the user to customize the transit model application to fit the model at hand (Chapter 4).

Just like a travel demand model, the transit model must be calibrated and validated with observed data. The data required to calibrate and validate the transit model application includes:

- Appropriate zonal area and connections to the highway network (zones larger than one square mile may not be able to connect to transit);
- Reasonable estimates of person travel patterns, which can be verified by using the Census Transportation Planning Package 2000 (work trips only) or other relatively large-sampled surveys;
- Reliable estimates of auto and transit travel times, which could be gathered from car probes, data from freeway management centers, automatic vehicle locators (AVLs) and public transit time tables;
- Observed linked transit trips by trip purpose, access mode, market segments and potentially by other dimensions, which can be developed via a transit on-board survey; and
- Boardings by route and potentially by other dimensions, which could be gathered from ridecheck (on/off) surveys, automated passenger counters (APCs) or fare collections.

The following steps must be followed in order to properly import and modify the transit model application in a travel demand model:

- Import the transit model to the travel demand model (refer to Chapter 1),
- Review the modules within the transit model (Chapter 2),
- Connect input and output files from the model to the files in transit model (Chapter 3),
- Modify the appropriate scripts and input files (Chapter 4),
- For the best year, calibrate the auto and transit speeds (or travel times) and compare them against observed data,
- Calibrate the mode choice model for the base year,
- Validate the base year transit assignments by comparing them to observed counts, and
- Test the transit model against at least one future alternative to assess its forecasting ability.

### CHAPTER 1: Importing the Transit Model Application

This chapter explains the procedures for importing the transit model application into the user’s travel demand model. The formats of the input and output files, the required fields for the input files, and the detailed description of the logic of the different groups of applications are noted in the subsequent chapters. The transit model application can be downloaded from <http://www.fsutmsonline.net/images/uploads/mtf-files/TransitApp.zip>. Separate application has been developed for Tier A (cities with very “modest” transit service) and Tier B/C (cities with “intermediate” transit service) cities. The screenshot of the application for Tier A is shown in Figure 1 below.

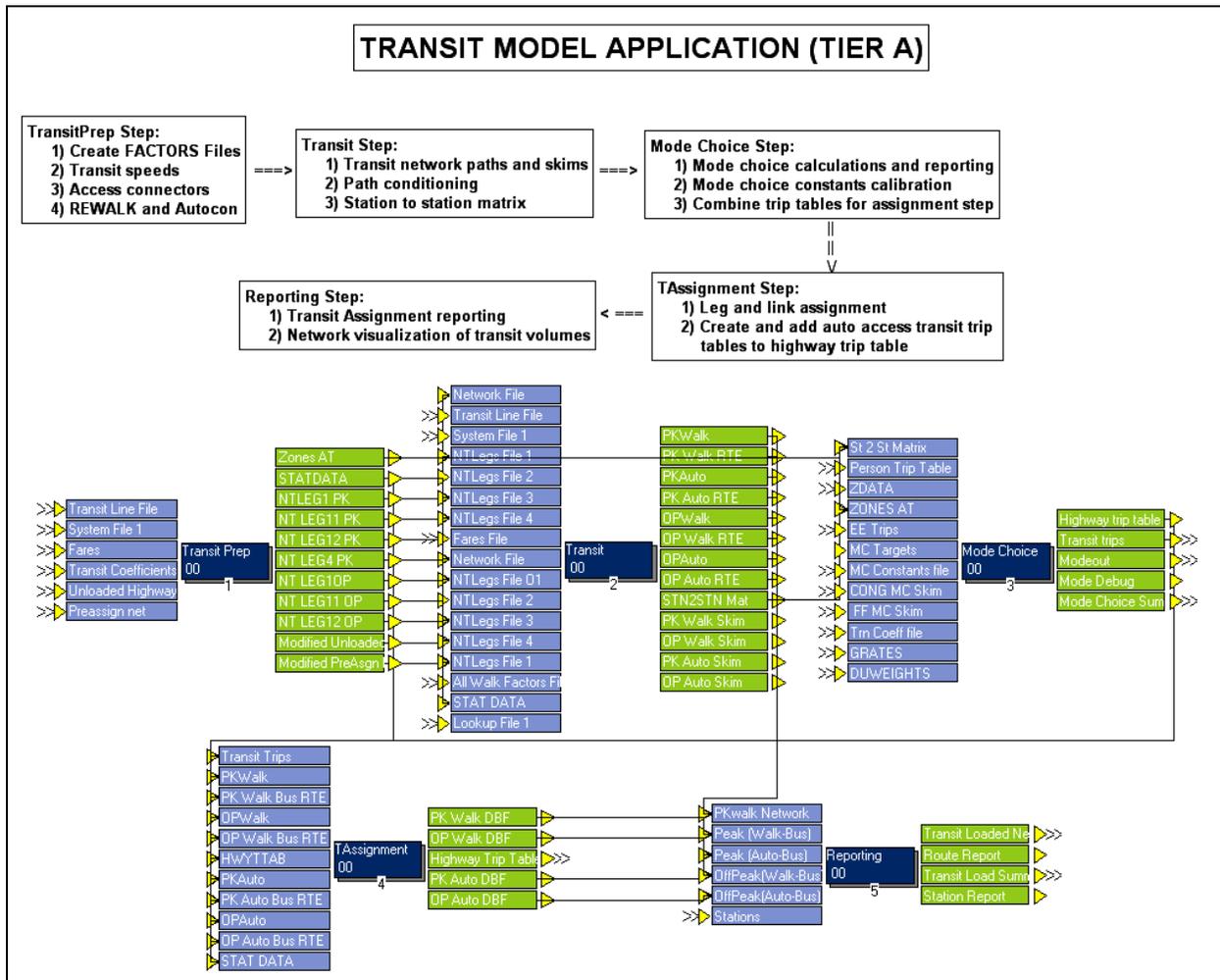


FIGURE1: Transit Model Application

The transit model application is used to prepare the transit network from the highway network, generate transit access connectors, transit skims and paths, obtain the shares and vehicle trips of all the modes/paths (both auto and transit) from the person trip table, assign the transit trips

to transit service routes and produce transit assignment reports (summary, route-level, and station level reports). So, the transit model should be placed after the trip distribution step and before the highway assignment step.

The following steps must be followed to insert the transit model application into a model:

- 1) Open the transit model application in CUBE Voyager
  - a. Open *TRANSITMODEL.app* file from the *applications* folder. The screenshot of the application is shown in Figure 1.
- 2) Create a new directory for this application and save it in the *applications* folder of the model
  - a. Go to 'Application' Tab and click on 'New Application Directory' (see the screenshot below).

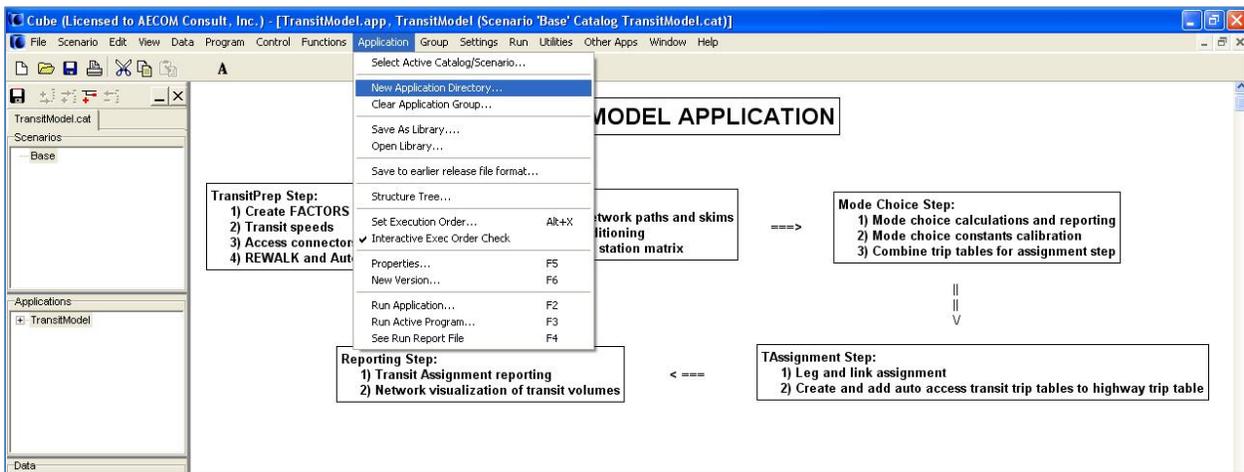


Figure 2: New Application Directory

- b. A dialog box as shown will appear. Click Ok.

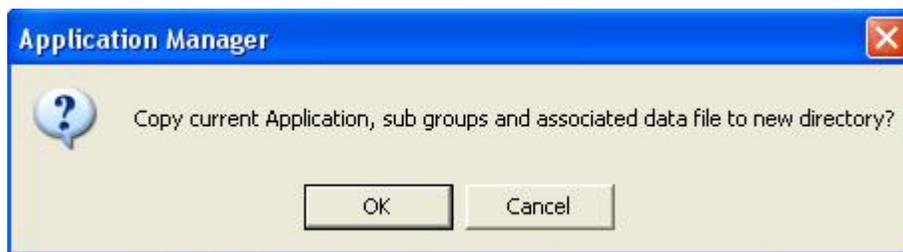


Figure 3: New Application Directory Dialog Box

- c. In the "choose directory" dialog box that follows, select the applications folder of the model. The initial folder points to the folder where the current *TRANSITMODEL.app* file is.
      - d. A dialog box as shown will appear. Click "Yes".



Figure 4: New Application Directory Dialog Box II

- e. A message will pop up saying “the project has program files that contains @...@ and %...%, file names cannot be copied.”. Click OK.



Figure 5: New Application Directory Dialog Box III

- f. Close the application.
- 3) Open the model into which transit model application needs to be imported:
- a. Choose Group tab and Click on ‘Insert Application Group’ (screenshot is shown below).

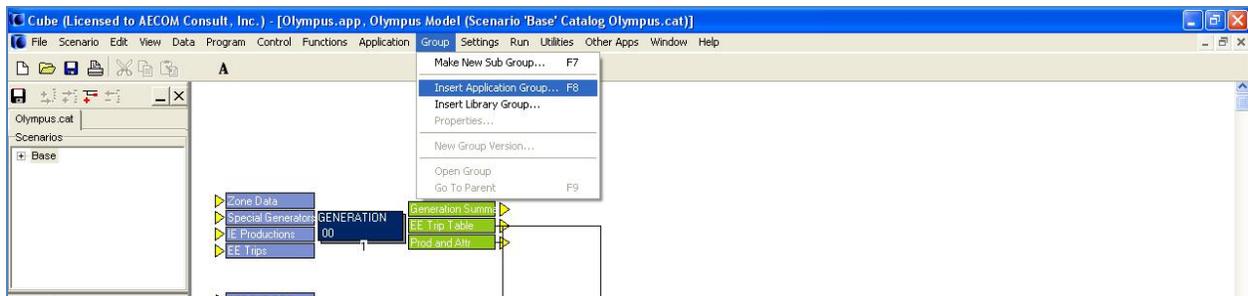


Figure 6: Insert Application Group

- b. Select *TRANSITMODEL.app* from the list. This will insert the TRANSITMODEL subgroup into the model.
- c. Change the execution order of this step so that it is run after the trip distribution step. Execution order can be changed by right-clicking on the subgroup.
- d. Link the input and output files from the transit model application to the files in other steps. The files input to the transit model application are shown with the boxes on the left section of the application and all the output files are shown on the right section. This can be done by dragging and dropping the appropriate files that need to be connected from other steps to the location of the files in transit model application. Similarly, the output files of the transit model that need to be connected to the subsequent steps can be dragged and dropped.

The files that the application requires from the highway model are shown in Table 1. These files should be linked using the drag and drop method in Application Manager. The formats of these files are described in Chapter 3.

**Table 1: Output Files from the Highway Model Required by the Transit Model Application**

File	Default File Name	Folder
Unloaded highway network	UNLOADED_{alt}{year}.NET	Output
Pre-assigned highway network	PREASSGN_{alt}{year}.NET	Output
Person trip table	PSNTRIPS_{alt}{year}.MAT	Output
External-external vehicle trip table	EETABLE_{alt}{year}.MAT	Output
Congested auto skims	CONGSKIM_{alt}{year}.MAT	Output
Free flow auto skims	FREESKIM_{alt}{year}.MAT	Output
Production trip rates file	GRATES_MC.DBF	Input/Output
Dwelling units weight file	DUWEIGHTS.DBF	Input/Output

Apart from the files mentioned in Table 1, the application also requires congested and free flow highway skim files that are used by the AUTOCON program. These files are read in directly by the program and they need not be linked to the highway model. These default file names are *FHSKIMTT\_{Alt}{Year}.MAT* and *RHSKIMTT\_{Alt}{Year}.MAT*.

Table 2 lists the input files that are not generated within the model and are used by the transit model. These files are created before setting up the model. The default file names that have been used in the application are shown in bracket. The formats of these files are described in Chapter 3.

**Table 2: Files Required by the Transit Model**

File	Default File Name	Folder
Zonal Data File	ZONEDATA_{year}{alt}.DBF	Input
Transit Line File	TROUTE_{year}{alt}.LIN	Input
System Data File	TSYSD.PTS	Parameters
Fares File	TFARES.FAR	Parameters
All Walk Factors file	AllWalk.FAC	Parameters
Transit Coefficient File	TRN_COEFFICIENT.DBF	Parameter
Mode Choice Constant file	MC_CONSTANTS.DBF	Parameters
Station list file	STATREP_{year}{alt}.DAT	Input

- e. Follow the instructions mentioned in *Readme.txt* file present in the model folder to install the AUTOCON program.
- f. Refer to Chapter 3 for a detailed account of the formats, required fields, and naming conventions of the input files. All the input files must be consistent with the formats and names mentioned in Chapter 3. The user may have to add some steps to change either the formats or the names of the files before connecting them to the transit model application.
- g. Revise the values of the catalog keys in the Keys section of the model catalog. The list of keys that the application requires is mentioned in Chapter 3.
- h. The transit model application is now imported into the model.

Step 4 of the Olympus model is the transit model application. The transit model application, when imported into the user’s model, should look like the screenshot.

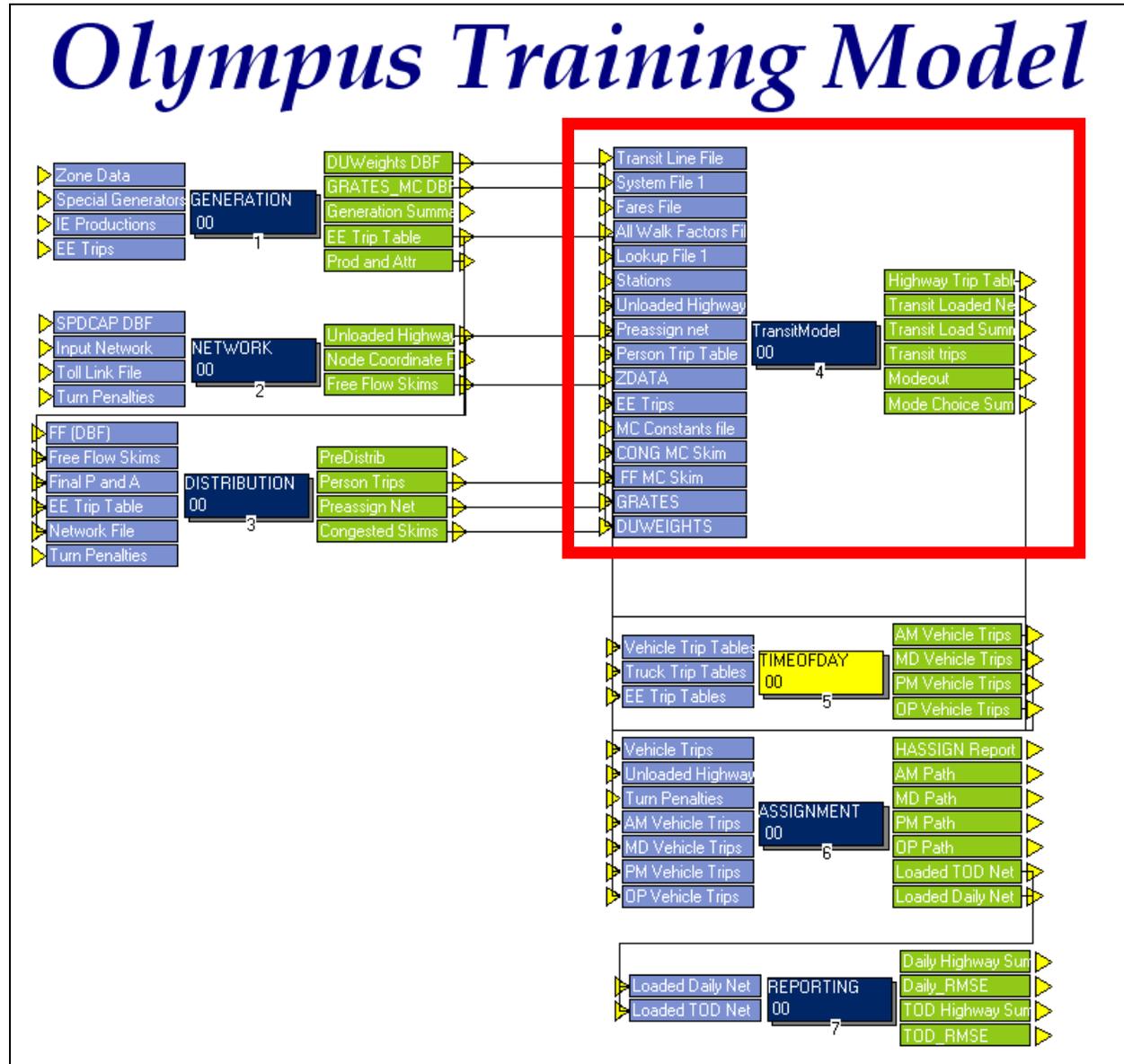


Figure 7: Transit Model Application in Olympus Training Model

## CHAPTER 2: Model Procedure

The transit model consists of five modules. In the *Transit Prep* module, the factors files are created and the speeds of various transit modes are assigned. Next, access connectors are built and adjustments are made to walk access connectors. In the *Transit Paths* module, paths and skims are built. This is followed by path conditioning to eliminate certain paths from evaluation. The modal choice model is scripted in the *Mode Choice Model* module. A calibration routine has been set up in this module to calibrate the mode choice model to observed data specific to the modeling area. Transit trip tables are loaded onto the transit paths in the *Transit Assignment* module. In the *Transit Reporting* module, transit assignment summary reports are generated. A station report that notes the activity at selected stations is also produced. Each of these modules is discussed in detail in this section. The Tier B/C application screenshots are presented in this chapter and the Tier A application screenshots are presented in the Appendix.

### 2.1 Transit Prep Module

The *Transit Prep* module is shown in Figure 8. This module is divided into three groups of steps. In the first group, the TRANSIT.MAS file is created. Next, four factors files that specify the weights of the various travel components (e.g., transit fare, wait time, in-vehicle time, boarding and transfer penalties) are created.

Transit travel times are computed for various transit modes in the second group of steps. Travel times for mixed-flow transit vehicles are typically a function of auto times stratified by mode, area type and facility type. Travel times for vehicles that operate on exclusive right-of-way (e.g., fixed-guideway and bus-only lanes) are commonly computed using equations of motion. By default, transit speeds are set equal to auto speeds and the user has to appropriately change the speeds for all the transit modes present in the model.

Access and transfer connectors are generated in the final group of steps. Two types of access connectors are generated: walk access and auto access. Three types of transfer connectors are generated: one for CBD sidewalks, another to connect transit platforms, and a third to connect fixed-guideway platforms with nearby bus stops. All-walk connectors are also generated in this group of steps. Step 18 of the module is the REWALK application. Please refer to REWALK documentation located at <http://www.fsutmsonline.net/images/uploads/mtf-files/Rewalk-041508.zip> for more details about REWALK application.

In the Tier A application, two factors files are created: WalkTransit.Fac and AutoTransit.Fac. Also, REWALK application is not necessary for Tier A model since percent walks are not calculated for Tier A areas.

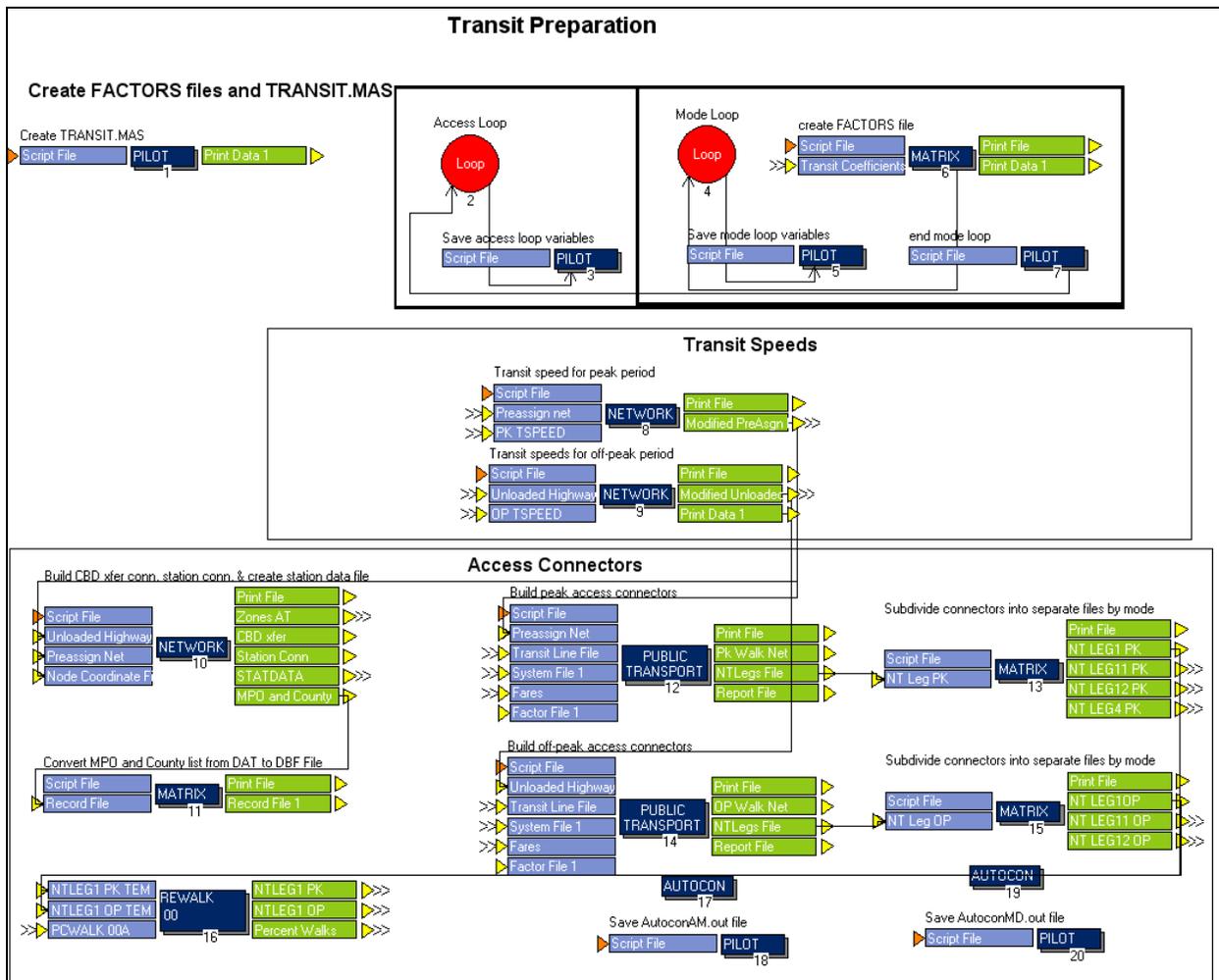


Figure 8: Transit Prep Module

## 2.2 Transit Paths Module

Transit paths and skims are created by period in this module. Figure 9 shows the module for the Tier B/C application. Walk and auto access paths and skims are built in steps 1 through 8. Four different sets of paths are built for the Tier B/C model while two sets of paths are built for the Tier A model. Transit paths for different tier areas are explained in Section 2.2 of the *FSUTMS Transit Model Development Guide* located at [http://www.fsutmsonline.net/images/uploads/mtf-files/TM\\_DevelopmentGuide.pdf](http://www.fsutmsonline.net/images/uploads/mtf-files/TM_DevelopmentGuide.pdf). All-walk paths are also generated in this module.

Next, the transit paths are tested through the process of path conditioning to ensure that viable transit paths are evaluated by the mode choice model. For a path to be considered viable it must have in-vehicle time on the path (usually for a specific mode or group of modes) and it must be less onerous than an all-walk path (created in Step 9). Both tests are conducted in steps 11 (for walk-access paths) and 12 (for auto-access paths). Finally, the transit station zone

number of the first boarding, the parking cost and the terminal times at the station are stored in the station-to-station matrix.

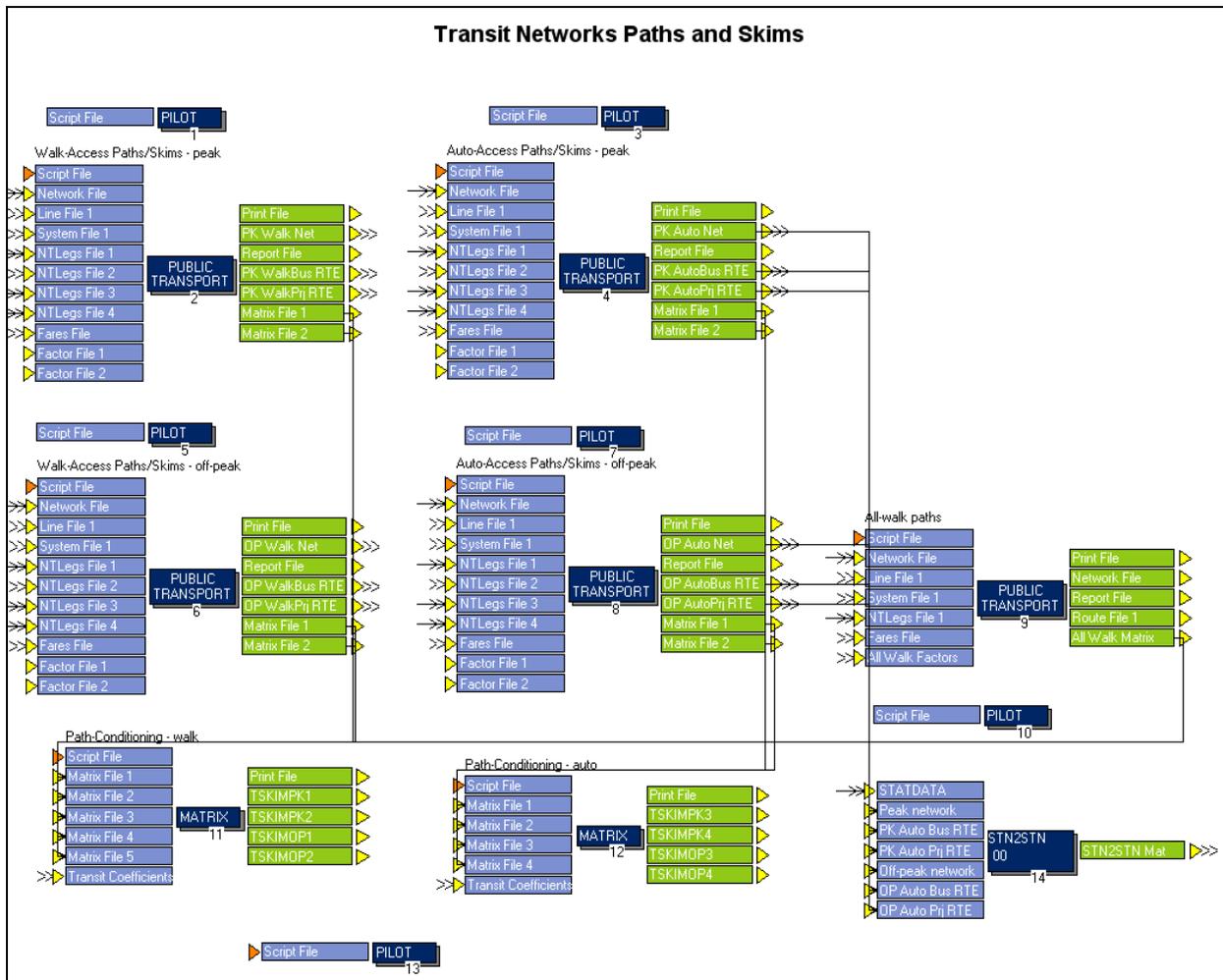


Figure 9: Transit Paths Module

### 2.3 Mode Choice Module

The mode choice model is executed in this module (Figure 10 shows the module). Steps 1 through 7 involve preparations for running the mode choice utility calculations. This includes noting the date and time of model run, calculating the auto ownership markets, and combining the percent walk data, socio-economic data, and area type data to create a single zonal data file. Next, the travel time savings of heavy occupancy vehicles (HOVs) as compared to single occupancy vehicles (SOVs) are computed.

The mode choice utility calculations are performed in step 12. The sub-modal shares of different paths are calculated by access (can walk, must drive, and no transit) and by auto ownership. In the next step, mode choice calculations are reported in a mode choice summary report and the trip tables are combined by purpose.

The mode choice model can then be calibrated by adjusting the bias constants. Please note that this loop does NOT run by default. It must be activated by changing the {MC\_Calib} key, which is described in Table 3 in the next chapter. The trip tables are then combined to create a single transit trip table.

For the Tier A application, percent walks are not used in the zonal data file created during mode choice preparation. Also, the sub-modal shares of different paths are calculated by auto ownership only.

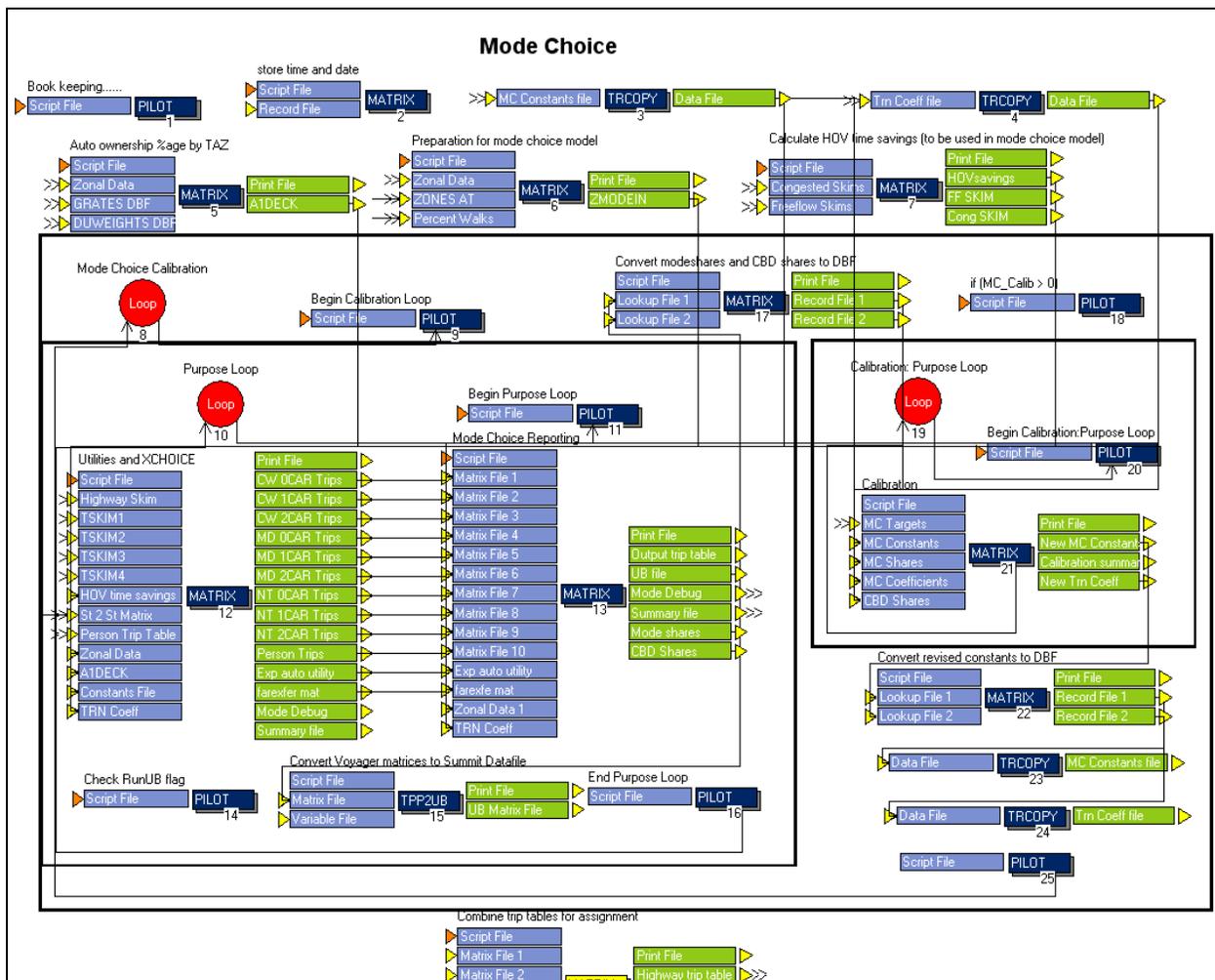


Figure 10: Mode Choice Module

### 2.4 Transit Assignment Module

Figure 11 below shows the *Transit Assignment* module. The transit trip table obtained from the Mode Choice module is loaded onto the various transit paths in this module. Transit trips are assigned to paths in two different iterations by varying transit assignment parameters: legs, and links assignment. For each iteration, transit trips are assigned by period (peak and off-peak), access mode (walk and auto), and transit mode (bus and project). The auto access trips are then added to the highway trip table to be used for highway assignment.

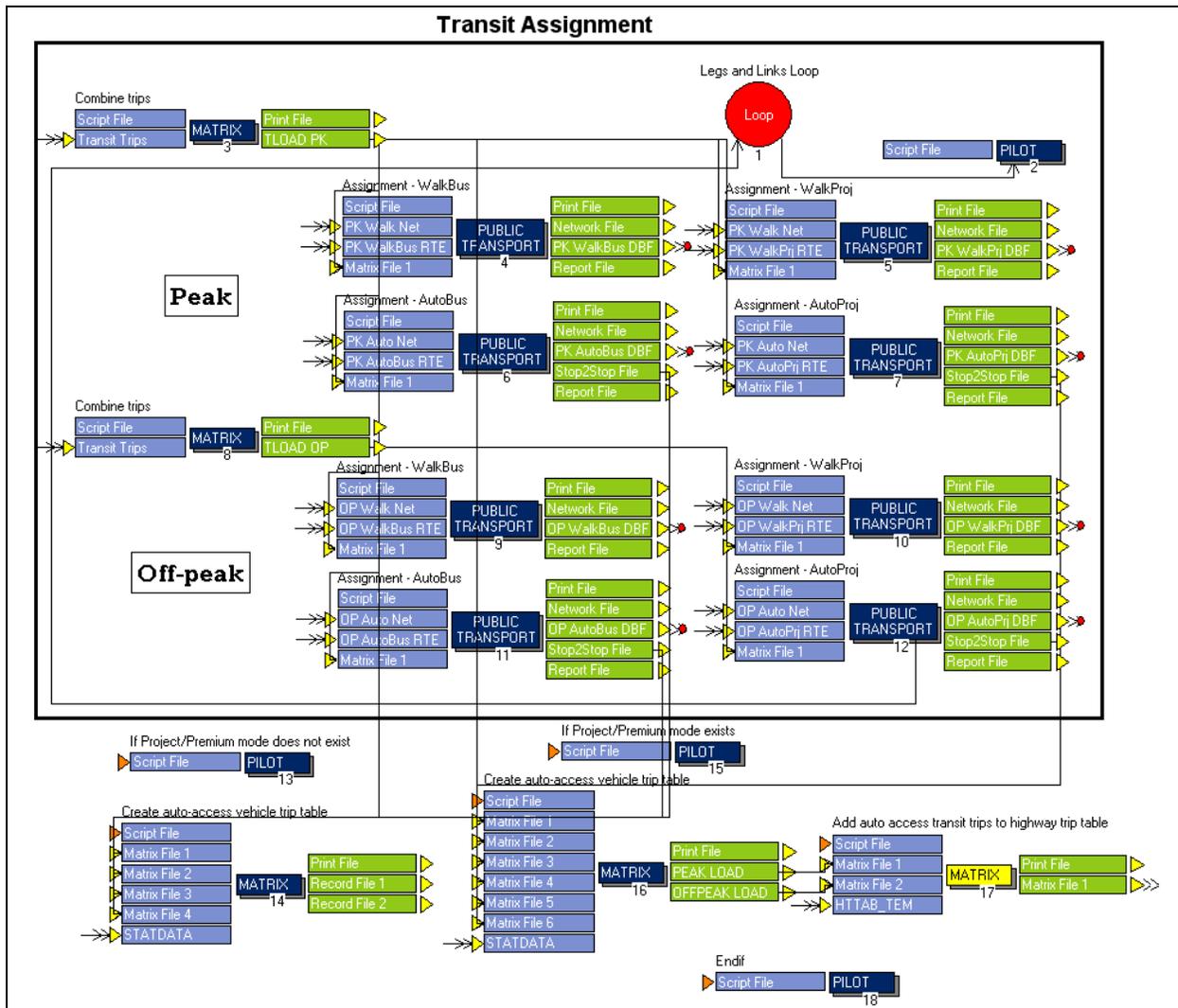


Figure 11: Transit Assignment Module

## 2.5 Transit Reporting Module

Figure 12 shows the *Transit Reporting* module. Three transit assignment reports and a network for visualization are produced in this module. TAREport application produces a summary report, a route-level report and a station activity report. Please refer to TAREport documentation located at <http://www.fsutmsonline.net/images/uploads/mf-files/TAREport-041508.zip> for more details. Next, total transit volumes along corridors (by each link in the corridor) are visually displayed in a specially-prepared network.

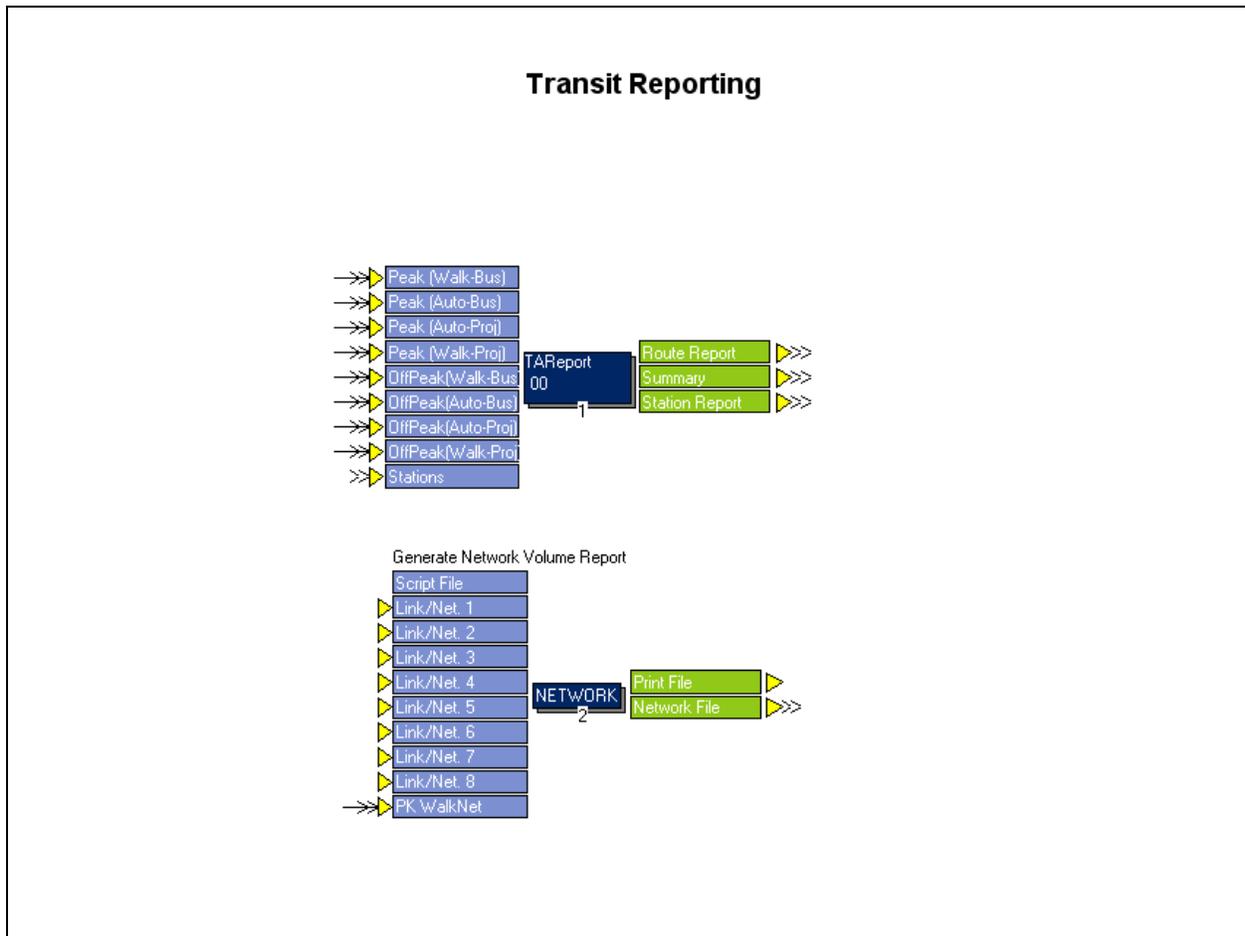


Figure 12: Transit Reporting Module

### CHAPTER 3: Catalog keys, input and output files

This chapter details the catalog keys, input files and output files of the application. The following sections also explain the default input values and how they may be modified by the user to customize the application to fit the model at hand.

#### 3.1 Catalog Keys

Table 3 summarizes the catalog keys that need to be defined before running the transit model application, along with their default values (if applicable) and a brief description.

**Table 3: Catalog Keys**

Catalog Key	Format	Default value	Description
{alt}	A1	-	Alternative letter
{year}	A2	-	Model year
{ZONESI}	I	-	Maximum internal zone number
{ZONESA}	A	-	Total number of zones including internal and external
{NODEMIN}	A	-	Minimum non-centroid node number
{CBDZONE}	I	-	Zone that best represents the core of the area's Central Business District
{FromNode}	A	-	Origin zone number for transit path tracing
{ToNode}	A	-	Destination zone number for transit path tracing
{Units}	-	5280	Coordinate units per mile
{isMicroCode}	Boolean	-	1 if fixed-guideway station nodes (for example skyway or BRT) are coded separately from the bus stop nodes in the network, 0 otherwise
{XFERACC}	-	0.6	Maximum cost on a transfer connector
{MAXWLKACCLNKS}	-	99	Maximum number of walk access connectors per mode
{WALKACC}	-	0.6	Maximum cost on a walk access connector
{AVGWLKSPD}	-	2.5	Average walk speed in mph (usually 2.5)
{AVGWALK}	-	0.5	Average walk distance in miles (usually 0.5 miles)
{MINIPCW}	-	15	Minimum threshold percent walk (usually 15%)
{OCTA}	-	1.2	Average auto occupancy for auto-access transit trips
{IsAutoAccess}	Boolean	0	Boolean key set to 1 if passengers can access transit by auto mode (for example, by a park-and-ride lot), 0 otherwise
{IsProjectMode}	Boolean	0	Boolean key set to 1 if the model contains a project mode, 0 otherwise (only in Tier B/C model)
{TERM10}	I	5	Terminal time (in minutes) in CBD zones
{TERM20}	I	3	Terminal time (in minutes) in CBD fringe zones
{TERM30}	I	1	Terminal time (in minutes) in residential zones
{TERM40}	I	2	Terminal time (in minutes) in OBD zones
{TERM50}	I	1	Terminal time (in minutes) in rural zones
{DebugMC}	-	0	Debug Mode Choice (greater than 0 if yes)
{SelOrigin}	A	-	Selected origin zone for reporting purposes
{SelDest}	A	-	Selected destination zone for reporting purposes
{hwyopcost}	F	9.5	Auto operating cost (cents/mile)
{CTOLL}	F	0.1	Coefficient of Toll used in assignment and pathing
{Zapzero}	I	1	Zero out the drive alone and pnr-access trips for zero-car households
{hbw3p}	F	3.37	Home-based work (HBW)- Avg 3+ Persons/Car
{hbo3p}	F	3.48	Home-based other(HBO)- Avg 3+ Persons/Car
{nhb3p}	F	3.59	Non-home based (NHB) Avg 3+ Persons/Car

{InflationToll}	F	1	Inflation factor for auto tolls
{InflationAOC}	F	1	Inflation factor for auto operating cost
{InflationParkCost}	F	1	Inflation factor for parking cost
{InflationFare}	F	1	Inflation factor for transit fare
{OCCPNRAccess}	F	1.2	Average occupancy rate for PNR access trips
{MinDistWalkAcc}	F	0.6	Minimum distance on I-J pair required for evaluation of walk-access transit paths
{MinDistAutoAcc}	F	1.2	Minimum distance on I-J pair required for evaluation of auto-access transit paths
{OCCKNRAccess}	F	1.2	Auto occupancy for KNR trips
{MC_Calib}	I	0	Mode Choice Calibration (1 if yes)
{RunUB}	Boolean	0	Dummy variable to run (=1) or not run (=0) user benefits & generate user benefit files
{HOVMIN}	F	3	Minimum time savings (in minutes) on HOV lanes before being accounted for in the mode choice equation

### 3.2 Input files

This section describes the input file formats, required fields, naming conventions and their locations. The default versions of all the input files are already present in the model and the user has to replace them with the corresponding files for the model at hand.

#### 3.2.1 Highway networks

The highway networks input the transit model application are created by highway model. The transit model application requires two network files, an unloaded highway network file (UNLOADED\_{Alt}{Year}.NET) and a pre-assigned highway network file (PREASSGN\_{Alt}{Year}.NET) to be present in the *output* folder of the alternative. The unloaded highway network file is the basic highway network file with free flow highway speeds and capacities. The pre-assigned highway network file contains the pre-assignment speeds and volumes along with the unloaded highway network file fields. The following tables show the node and link variables that need to be present in the highway network files. There may be other variables present in the network files but the following variables are required to be present.

**Table 4: Highway Network Link Variables**

Link variable	Type	Description	Units
A	Numeric	A node	-
B	Numeric	B node	-
DISTANCE	Numeric	Calculated distance	Miles
FTYPE	Numeric	Facility type	-
ATYPE	Numeric	Area type	-
TIME (unloaded highway network only)	Numeric	Free flow travel time	Minutes
TIME_1 (loaded highway network only)	Numeric	Congested travel time	Minutes
TBSTIME	Numeric	Travel time for bus transit	Minutes
TBSDIST	Numeric	Distance for bus transit	
TFGDIST	Numeric	Distance for fixed-guideway transit	Miles
TFGTIME	Numeric	Travel time for fixed-guideway transit	Minutes
TFGMODE	Numeric	Applicable fixed-guideway transit mode	-

**Table 5: Highway Network Node Variables**

Node variable	Type	Description	Units
N	Numeric	Node number	-
TSRANGE	Numeric	Maximum roadway distance allowed for auto-access connector	Miles
TSPARK	Numeric	Number of parking spaces (park-and-ride stations only)	-
TCOSTAM	Numeric	Peak parking cost	-
TCOSTMD	Numeric	Off-peak parking cost	-
TSPNRTERM	Numeric	Park and ride terminal time	Minutes
TSKNRTERM	Numeric	Kiss and ride terminal time	Minutes
TSTYPE	Numeric	Set to : <ul style="list-style-type: none"> <li>• “0” for a station not used in the alternative,</li> <li>• “1” for a PNR/KNR station (assumed to be both),</li> <li>• “2” for fringe park-ride locations</li> <li>• “3” for park-ride only locations available throughout the day,</li> <li>• “4” for kiss-ride locations, and</li> <li>• “5” park-ride only locations available only in the peak period</li> </ul>	-
TSNAME	Character	Travel time for fixed-guideway transit	Minutes
MPO	Numeric	A dummy number assigned to each MPO for distinction	
County	Numeric	A dummy number assigned to each County for distinction	

### 3.2.2 Highway skim files

The free-flow (FF) and congested-flow (CF) highway skim files are input to the AUTOCON program and the mode choice model. However, the order of tables in the skim files that AUTOCON and mode choice expect are different. Two different versions of the skim files must be made for the two programs. The skim files for both the programs must be placed in the *output* folder of the alternative. The following tables show the orders of tables for both the programs. The default file names for FF and CF skims used for AUTOCON are *FHSKIMS\_{Alt}{Year}.MAT* and *RHASKIMS\_{Alt}{Year}.MAT* (these filenames can be changed using the script that creates the *transit.mas* file) and those used for the mode choice module are *CONGSKIM\_{ALT}{YEAR}.MAT* and *FREESKIM\_{ALT}{YEAR}.MAT* respectively.

**Table 6: Highway skim tables for AUTOCON program**

Table	Name	Description
1	Cost	Toll cost (in dollars)
2	Distance	Highway distance between interchange (in miles)
3	Time	Travel time (in minutes)
4	Time2	Weighted travel time (including toll) in minutes

**Table 7: Highway skim tables for mode choice module**

Table	Name	SOV/HOV	Description
1	Time	SOV	Travel time (in minutes)
2	Distance		Highway distance between interchange (in miles)
3	Terminal Time		Terminal time at parking lot (in minutes)
4	Toll		Toll cost (in dollars)
5	Time2		Weighted travel time including toll (in minutes)
6	Time	HOV	Travel time (in minutes)
7	Distance		Highway distance between interchange (in miles)
8	Toll		Toll cost (in dollars)
9	Time2		Weighted travel time including toll (in minutes)

**3.2.3 Production trip rate file (GRATES)**

This file is used in the mode choice module to determine the zero, 1, and 2+ car percentages for each zone. It is a DBF file (in the *output* folder of the model) with the following default field names.

**Table 8: Columns in the GRATES File**

Column	Name	Description
1	COUNTER	Row number for lookup (1 through 45)
2	PPDU	Number of persons in the household
3	APDU	Number of autos in the household
4	DUTYPE	Dwelling unit type
5	HBWPR	HBW production rate
6	HBSHPR	HBSshopping production rate
7	HBSRPR	HBSocialRec production rate
8	HBOPR	HBO production rate

**3.2.4 Dwelling unit weights file (DUWEIGHTS)**

This file is also used in the mode choice module. It is a DBF file (in the *output* folder of the model) with the following default field names.

**Table 9: Columns in the DUWEIGHTS File**

Column	Name	Description
1	SIZERANGE	Row number (1 through 17) representing size ranges
2	PCT1PER	Percent of 1 person units
3	PCT2PER	Percent of 2 person units
4	PCT3PER	Percent of 3 person units
5	PCT4PER	Percent of 4 person units
6	PCT5PER	Percent of 5+ person units

**3.2.5 Person trip file (PSNTRIPS\_{Alt}{Year}.MAT)**

The mode choice model expects the “HBW”, “HBO” and “NHB” purpose trip tables (with those table names and order) from the person trip file. This file must be placed in the *output* folder of

the alternative. The module also expects fourth and fifth tables in the person trip file to be “TRKTAXI” and “IE” vehicle trips. Step 26 in the mode choice module combines these two trip table with the output person trips from the mode choice model run to create a vehicle trip table for the final highway assignment.

### 3.2.6 Zonal data files

The zonal data files (placed in *input* folder of the alternative) contain information about the zones in the model. The user can have more than one data file, and may also have field names other than the ones used by default. Section 4.10 mentions the changes in scripts in order to use alternate variable names. Table 10 shows the default fields used in the model.

**Table 10: Required fields in zonal data files**

Field	Description
TAZ	Zone number
SFDU	Total single family dwelling units
SF_PCTVNP	Percent households seasonal+vacant
SF_PCTVAC	Percent households vacant
SFPOP	Population in single families
SF_0AUTO	Percent zero car households in single families
SF_1AUTO	Percent one car households in single families
SF_2AUTO	Percent two car households in single families
MFDU	Total multiple family dwelling units
MF_PCTVNP	Percent households seasonal+vacant
MF_PCTVAC	Percent households vacant
MFPOP	Population in multiple families
MF_0AUTO	Percent zero car households in single families
MF_1AUTO	Percent zero car households in single families
MF_2AUTO	Percent zero car households in single families
HMDU	Number of hotel/motel rooms
HMOCC	Percent hotels/motels occupied
HMPOP	Population in hotels/motels
SHORTPARK	Short term parking cost
LONGPARK	Long term parking cost

### 3.2.7 Transit line file (*TROUTE\_{year}{alt}.LIN*)

The transit line file must represent all time periods in order to simplify data maintenance. Each line is coded with at least two headways (PT can accommodate up to five), one for the AM peak period and another for the off-peak period. If a line does not conduct service in any time period, the headway should be coded as zero for that time period. Two-way coding is used for those lines whose routing does not vary in either direction. The transit line fields and their recommended values are shown in Table 11. The default transit line file has two transit lines and may be used as a guide to code the transit lines of the model. The user has to code the transit lines corresponding to his/her model in the transit line file. The transit line file can be

coded manually offline and must be stored in the *input* folder of the alternative. The keyword N can have sub-keywords to add further details within the node list to show dwell times and layovers. This is explained in Table 12.

**Table 11: Keywords to LINE Control Statement and Their Recommended Values**

Keyword to LINE control statement	Type	Description	Recommended Value
LONGNAME	Character	40-character description	None
NAME	Character	10-character description	None
ONEWAY	Boolean	If true line travels in coded direction. If false, line travels in both directions	None
HEADWAY[1]	Numeric	Time between consecutive vehicles (1=peak period; 2=offpeak period)	Minutes (0 if not offered in period)
HEADWAY[2]	Numeric		
MODE	Numeric	Transit mode (defined in system data file)	None
OPERATOR	Numeric	Transit operator (defined in system data file)	None
N	Numeric string	String of nodes traversed	Positive if vehicle stops for boarding, negative if vehicle does not stop
TIME	Numeric	Sets the actual node-to-node travel time	None
CIRCULAR	Boolean	If true, the line is circular (it operates in a loop or circle). If false, the line is not circular	None

**Table 12: Sub-keywords to Keyword N in LINE Control Statement**

Sub-keywords to N	Example	Description
DELAY	N=5001,5002,DELAY=5,5004	Additional time delay (minutes) added to link time
DWELL	N=5001,5002,DWELL=8,5004	Dwell time (minutes) at preceding node

### 3.2.8 System file (TSYSD.pts)

The system data file defines the modes, transit operators, vehicle types and wait-curves used in the transit system. This file is stored in the *parameters* folder of the model. The default system file present in the application is for guidance only. The user needs to change this file to tailor it to his/her model. The modes and operators used in the default file are explained below.

#### a) Mode definitions

The default mode definitions used in the transit model application are summarized in the table below. The first 20 mode numbers are reserved for non-transit modes. Each transit route in the transit line file is assigned a mode number. To assist in New/Small Starts analysis, mode 26 is reserved for “other mode” (i.e., a new transit mode that is built between the base and horizon years) and mode 27 is reserved for “project mode” (i.e., the mode under analysis), respectively. The user can define additional modes in the TSYSD.PTS file.

**Table 13: Default Modes and Mode Numbers in SYSTEM.PTS File**

Mode	Number	Type
Walk connectors	1	Non-transit mode
PNR connectors	2	Non-transit mode
All walk connectors	4	Non-transit mode
Transfer connectors	11	Non-transit mode
Sidewalk connectors	12	Non-transit mode
Local bus	21	Transit mode
Premium service	22	Transit mode
Circulators (trolley/streetcar)	23	Transit mode
Urban(light/heavy) rail	24	Transit mode
Commuter rail	25	Transit mode
Other mode	26	Transit mode
Project mode	27	Transit mode

b) Operator definitions

Operators represent different types of services offered by a system. Operators are also used to define the boarding and transfer fares. Each line is assigned an operator number and the fare attached to the line is mapped to the operators in the factors file. The default operators defined in the transit model application are shown in the table below.

**Table 14: Default Operators, Operator Numbers, and FareSystems in TSYS.D.PTS File**

Operator	Operator number	FareSystem
Local service	1	1
Circulator	2	2
Commuter rail	3	3

3.2.9 Fares file (TFAREStp\_{year}{alt}.FAR)

Fare structures are defined in the fares file and stored in the *input* folder of the alternative. A fare structure is related to each transit route using its operator number in the factors file. It is not important that the fare system number correspond to the operator number. Three fare systems are likely to be used: free, flat, and zone-based. The first system is for services that are offered for free. Flat-fare systems charge flat boarding and transfer fares regardless of journey length. Zone-based fare systems base the fare on the number of fare zones encountered during a trip. When using zone-based systems, it is important to remember to code FAREZONE on the node of each station in the highway network. The recommend values for all fare systems are shown below.

**Table 15: Keywords to FARESYSTEM Control Statement and Their Recommended Values**

Keyword to FARESYSTEM control statement	Description	Recommended value
NUMBER	Fare system number	None
LONGNAME	40-character description	None
NAME	10-character description	None
STRUCTURE	Type of fare system	“FREE” (free) “FLAT” (flat-fare) “ACCUMULATE” (zone-based)
SAME	Determines how the fare is produced for consecutive legs using the same fare system	n/a (free) “CUMULATIVE” (flat-fare & zone-based)
IBOARDFARE	Initial boarding fare (in dollars)	n/a (free) None (flat-fare & zone-based)
FAREFROMFS	Transfer fares when transferring from other fare systems	n/a (free) None (flat-fare & zone-based)

The default fares file present in application are for guidance and need to be changed by the user to reflect the fares of the model at hand. The boarding and transfer fares used in the default file are shown below.

**Table 16: Default Fares Used In the Fares File**

Operator	Boarding Fare	FareSystem
Local service	\$1.50	1
Circulator	\$0.00	2
Commuter Rail	\$2.00	3

**Table 17: Default Transfer Fares Used In the Fares File**

Faresystem	From To	1	2	3
1		Free	1.50	Free
2		Free	Free	Free
3		0.50	2.00	Free

3.2.10 Transit Coefficients file (TRN\_COEFFICIENTS.DBF)

This file is named TRN\_COEFFICIENTS.DBF and is located in the *parameters* folder. The CBD constants are also in this file. Their default values are set to 1.00 for Tier B/C and 0.00 for Tier A application and need to be calibrated by the user.

**Table 18: Default Transit Coefficients for Tier B/C**

Row #	HBW	HBNW	NHB	Description
1	-0.025000	-0.012500	-0.025000	IVTT coefficient
2	-0.025000	-0.012500	-0.025000	IVTT coefficient for commuter rail
3	-0.050000	-0.025000	-0.050000	OVT coefficient
4	-0.002500	-0.002500	-0.005000	Cost coefficient
5	-0.037500	-0.018750	-0.037500	Auto access time coefficient
6	-0.250000	-0.125000	-0.250000	Number of transfers coefficient
7	0.000000	0.000000	0.000000	Not used
8	0.000000	0.000000	0.000000	Not used
9	0.000000	0.000000	0.000000	Not used
10	0.500000	0.500000	0.500000	Transit access nest coefficient
11	0.500000	0.500000	0.300000	Transit nest coefficient
12	0.800000	0.800000	0.800000	Auto nest coefficient
13	0.200000	0.200000	0.200000	Auto access nest coefficient
14	0.000000	0.000000	0.000000	Not used
15	1.000000	1.000000	1.000000	CBD Constant Walk Paths
16	1.000000	1.000000	1.000000	CBD Constant PNR Paths
17	1.000000	1.000000	1.000000	CBD Constant KNR Paths
18	0.000000	0.000000	0.000000	Not used

**3.2.11 Mode Choice constants file (MC\_CONSTANTS.DBF )**

This file contains the utility and nesting constants, and is located in *parameters* folder. The default constants are all set to -1.00 and need to be adjusted by the user. Utility constants having a value of -999.99 effectively mandate zero trips for that particular utility. The table below shows the default constants used in the application for Tier B/C. The choices that do not exist in Tier A cities will have values of -999.99.

**Table 19: Default Mode Choice Constants for Tier B/C**

Row #	HBW	HBNW	NHB	Market	Description
1	-999.990000	-999.990000	0.000000	Zero-car households	Drive alone
2	-1.000000	-1.000000	-1.000000		Shared ride 2 passenger
3	-1.000000	-1.000000	-1.000000		Shared ride 3+ passengers
4	-1.000000	-1.000000	-1.000000		Walk bus
5	-1.000000	-1.000000	-1.000000		Walk project
6	-999.990000	-999.990000	5.000000		PNR bus
7	-999.990000	-999.990000	5.000000		PNR project
8	-1.000000	-1.000000	-1.000000		KNR bus
9	-1.000000	-1.000000	-1.000000		KNR project
10	-999.990000	-999.990000	-999.990000		Not used
11	-999.990000	-999.990000	-999.990000		Not used
12	-999.990000	-999.990000	-999.990000		Not used
13	0.000000	0.000000	-999.990000	One-car households	Drive alone
14	-1.000000	-1.000000	-999.990000		Shared ride 2 passenger
15	-1.000000	-1.000000	-999.990000		Shared ride 3+ passengers
16	-1.000000	-1.000000	-999.990000		Walk bus
17	-1.000000	-1.000000	-999.990000		Walk project
18	-1.000000	-1.000000	-999.990000		PNR bus
19	-1.000000	-1.000000	-999.990000		PNR project
20	-1.000000	-1.000000	-999.990000		KNR bus
21	-1.000000	-1.000000	-999.990000		KNR project
22	-999.990000	-999.990000	-999.990000		Not used
23	-999.990000	-999.990000	-999.990000		Not used
24	-999.990000	-999.990000	-999.990000		Not used
25	0.000000	0.000000	-999.990000	Two-car households	Drive alone
26	-1.000000	-1.000000	-999.990000		Shared ride 2 passenger
27	-1.000000	-1.000000	-999.990000		Shared ride 3+ passengers
28	-1.000000	-1.000000	-999.990000		Walk bus
29	-1.000000	-1.000000	-999.990000		Walk project
30	-1.000000	-1.000000	-999.990000		PNR bus
31	-1.000000	-1.000000	-999.990000		PNR project
32	-1.000000	-1.000000	-999.990000		KNR bus
33	-1.000000	-1.000000	-999.990000		KNR project
34	-999.990000	-999.990000	-999.990000		Not used
35	-999.990000	-999.990000	-999.990000		Not used
36	-999.990000	-999.990000	-999.990000	Not used	

**3.2.12 Percent walk file (PCWALK\_{Year}{Alt}.DAT)**

The percent walk of a zone is the proportion of the zonal area within walking distance to transit. This file is generated offline using a GIS buffer of 0.5 mile around the stops. Individual percent walk values are generated for peak and off-peak transit services. The percent walk at attraction end of the trip is twice the percent walk at the production end to reflect that attractions are normally oriented near major streets where transit is located. The format of the percent walk file is shown in the Table 20. The percent walks need to be generated by the user for every alternative. Percent walks are generated for the Tier B/C model only.

**Table 20: Percent Walk File Format**

Columns	Format	Description
1-5	I4	TAZ
6-11	I3	Peak period percent walk at production-end of the trip
12-17	I3	Peak period percent walk at attraction-end of the trip
18-23	I3	Off-peak period percent walk at production-end of the trip
24-29	I3	Off-Peak period percent walk at attraction-end of the trip

**3.2.13 Station node and name file –ASCII file (STATREP\_{year}{alt}.DAT)**

This file contains the list of the stations for which a detailed station level report is generated. This file should be provided in the *input* folder of the alternative. The following table shows the formatting used in this file.

**Table 21: Station Node and Name File Format**

Columns	Format	Description
1-5	I5	Station node number (field may be right or left justified)
8-49	A42	Station name

**3.2.14 Mode choice targets (MC\_TARGETS.DBF)**

This file contains the mode share targets obtained from on-board surveys. When the mode choice model is calibrated, the model shares are matched with the shares present in this file. This file is located in *parameters* folder. The default shares for Tier B/C application are shown in Table 22 below and need to be changed by the user to reflect the shares calculated from surveys.

**Table 22: Default Mode Share Targets for Tier B/C**

No.	HBW	HBO	NHB	Market	Description
1	0.0000	0.0000	0.4770	Zero car households	Drive alone
2	0.6610	0.5700	0.3000		Shared ride 2
3	0.2310	0.3960	0.2170		Shared ride 3+
4	0.1040	0.0330	0.0040		Walk to bus
5	0.0000	0.0000	0.0000		Walk to project
6	0.0000	0.0000	0.0010		PNR bus
7	0.0000	0.0000	0.0000		PNR project
8	0.0040	0.0010	0.0010		KNR bus
9	0.0000	0.0000	0.0000		KNR project
10				Not used	
11				Not used	
12				Not used	
13	0.7690	0.3760	0.0000	One car households	Drive alone
14	0.1520	0.3570	0.0000		Shared ride 2
15	0.0600	0.2630	0.0000		Shared ride 3+
16	0.0150	0.0030	0.0000		Walk to bus
17	0.0000	0.0000	0.0000		Walk to project
18	0.0020	0.0006	0.0000		PNR bus
19	0.0000	0.0000	0.0000		PNR project
20	0.0020	0.0004	0.0000		KNR bus
21	0.0000	0.0000	0.0000		KNR project
22				Not used	
23				Not used	
24				Not used	
25	0.7800	0.3800	0.0000	Two+ car households	Drive alone
26	0.1540	0.3530	0.0000		Shared ride 2
27	0.0610	0.2650	0.0000		Shared ride 3+
28	0.0030	0.0010	0.0000		Walk to bus
29	0.0000	0.0000	0.0000		Walk to project
30	0.0010	0.0005	0.0000		PNR bus
31	0.0000	0.0000	0.0000		PNR project
32	0.0010	0.0005	0.0000		KNR bus
33	0.0000	0.0000	0.0000		KNR project
34				Not used	
35				Not used	
36				Not used	
37	0.1480	0.1700	0.1070	CBD walk constant	
38	0.8400	0.5000	0.5000	CBD PNR constant	
39	0.3130	0.3330	0.1140	CBD KNR constant	

### 3.3 Key output files

#### 3.3.1 Highway Vehicle Trip Table (HWYTTAB\_{Alt}{Year}.MAT)

The HBW, HBO and NHB person trips are converted to vehicle trips in the mode choice module and are assembled together with the truck/taxi and IE trips to create a vehicle trip table for the final highway assignment. By default, the IE trips are divided equally between “SOVIETrips” and “HOVIETrips” in the transit model application.

**Table 23: Tables in the vehicle trip tables**

Table	Name	Description
1	DriveAlone	Drive alone trips
2	Carpool	Shared ride trips
3	TruckTaxi	Truck and taxi trips
4	EETrips	External-external trips
5	SOVIETrips	SOV Internal-External trips
6	HOVIETrips	HOV Internal-External trips

#### 3.3.2 Person Trip Table (MODEOUT.MAT)

Tier A transit model application outputs a person trip table file with 18 tables – 6 choices (Drive alone, shared ride 2, shared ride 3+, Walk to Transit, PNR Access to Transit and KNR Access to Transit) for each of the three purposes. For Tier B/C, this file contains 27 tables – 9 choices for each of the three purposes.

#### 3.3.3 Transit assignment summary report (TASUM\_{ALT}{YEAR}.PRN)

This report is located in the *output* folder and presents the travel time, frequency, number of passengers, passenger miles, passenger hours, and maximum load by route, mode, and operator. The following table shows the formatting used in this file and the figure below shows a screenshot.

**Table 24: Transit Assignment Summary Report Format**

Period	Field	Columns	Format	Description
Route	Route Name	1-16	Character	10-character description
	Mode	21-25	Numeric	Mode number
	Optr	26-30	Numeric	Operator number
	Dist	31-40	Numeric	Distance in miles
	Route Longname	202-241	Character	40-character description
Peak	Time	41-50	Numeric	Transit travel time in minutes
	Freq	51-60	Numeric	Transit service frequency in minutes
	Pax	61-70	Numeric	Total number of passengers boarding a transit route
	Maxld	71-80	Numeric	Maximum passenger load of a transit route
	PaxMi	81-90	Numeric	The total passenger miles of a transit route
	PaxHr	91-100	Numeric	The total passenger hours of a transit route
Off-Peak	Time	101-110	Numeric	Transit travel time in minutes
	Freq	111-120	Numeric	Transit service frequency in minutes
	Pax	121-130	Numeric	Total number of passengers boarding a transit route
	Maxld	131-140	Numeric	Maximum passenger load of a transit route
	PaxMi	141-150	Numeric	The total passenger miles of a transit route
	PaxHr	151-160	Numeric	The total passenger hours of a transit route
Daily	Pax	161-170	Numeric	Total number of passengers boarding a transit route
	Maxld	171-180	Numeric	Maximum passenger load of a transit route
	PaxMi	181-190	Numeric	The total passenger miles of a transit route
	PaxHr	191-200	Numeric	The total passenger hours of a transit route

Transit Assignment Summary Report

Title : Year 2000 Base Validated Network  
 Alternative : A  
 Year : 00

Date: Mon 04/07/2008  
 Time: 9:46:12.58

Route Name	Mode	Optr	Dist (mi)	Peak						Off		
				Time (min)	Freq (min)	Pax	Maxld	PaxMi	PaxHr	Time (min)	Freq (min)	Pax
LASER-Alafay	21	1	2.00	3.68	30.0	6.0	5.3	5.8	0.2	3.07	30.0	26.2
LASER-Alafay-	21	1	2.00	3.69	30.0	12.7	11.9	13.8	0.4	3.07	30.0	18.6
LASER-Quad	21	1	2.09	3.54	30.0	0.6	0.6	0.3	0.0	3.38	30.0	1.6
LASER-Quad -	21	1	2.09	3.54	30.0	2.0	2.0	1.0	0.0	3.38	30.0	3.5
LASER-Resear	21	1	5.04	9.20	30.0	50.1	41.9	106.7	3.4	8.64	30.0	106.0
LY1-OrqAltIB	21	1	12.85	99.36	60.0	166.3	89.1	336.2	44.0	25.74	60.0	429.0
LY1-OrqAltOB	21	1	13.04	70.47	60.0	337.2	188.9	934.2	75.4	26.15	60.0	784.6
LY10-StcldEB	21	1	19.00	35.42	60.0	71.4	50.4	256.5	7.6	30.91	60.0	157.2
LY10-StcldWB	21	1	12.31	22.44	60.0	31.0	15.9	65.3	1.9	18.41	60.0	66.5
LY11-OrOIANB	21	1	13.96	39.71	30.0	318.5	232.9	1075.7	61.5	23.03	30.0	595.7
LY11-OrOIASB	21	1	12.57	35.71	30.0	641.6	540.8	2236.5	119.1	20.89	30.0	971.7
LY12-BoggyCr	21	1	12.49	23.78	60.0	28.0	23.6	158.7	5.0	21.21	60.0	52.1
LY12-BoggyCr-	21	1	12.49	23.44	60.0	28.0	20.8	190.6	5.9	21.21	60.0	52.1
LY13-UCF EB	21	1	15.91	48.11	60.0	409.6	269.5	2274.0	122.5	28.08	60.0	864.1
LY13-UCF WB	21	1	16.49	46.61	60.0	965.9	824.2	3211.4	159.5	29.14	60.0	1310.2
LY13-UCFEB	21	1	16.55	48.82	60.0	405.7	270.6	2362.9	124.3	29.28	60.0	869.4
LY13-UCFWB	21	1	15.85	46.98	60.0	961.7	818.3	3130.9	156.4	27.94	60.0	1305.5
LY14-WestmNB	21	1	7.80	30.01	60.0	134.3	98.6	541.1	33.3	15.14	60.0	397.2
LY14-WestmSB	21	1	8.07	37.32	60.0	160.3	140.9	489.3	32.8	16.06	60.0	228.4
LY15-CurryEB	21	1	13.66	42.94	60.0	166.5	76.2	799.3	43.3	25.70	60.0	382.9
LY15-CurryWB	21	1	13.03	37.26	60.0	524.7	371.0	2886.8	152.4	24.44	60.0	643.0
LY15-Egan IB	21	1	12.80	37.58	60.0	383.2	266.8	1919.7	102.2	24.71	60.0	449.9
LY15-Egan OB	21	1	13.43	44.36	60.0	150.7	74.8	710.5	41.5	25.97	60.0	351.2
LY16-ColleNB	21	1	8.21	36.32	60.0	180.7	144.1	772.7	58.0	15.98	60.0	530.4
LY16-ColleSB	21	1	8.40	34.80	60.0	236.3	222.5	708.2	51.8	16.74	60.0	384.3
LY17-NOBT NB	21	1	14.35	47.99	30.0	549.8	359.3	2571.1	159.8	26.35	30.0	1102.1
LY17-NOBT SB	21	1	15.71	53.52	30.0	776.2	544.4	3777.7	264.1	29.51	30.0	972.8
LY18-OrKisNB	21	1	25.02	62.10	60.0	291.1	135.6	1423.9	65.4	44.01	60.0	501.1
LY18-OrKisSB	21	1	24.78	60.25	60.0	461.0	300.3	2127.4	97.7	43.29	60.0	807.7
LY19-Rich EB	21	1	3.59	14.03	30.0	214.5	178.3	411.9	27.0	7.97	30.0	234.2
LY19-Rich WB	21	1	5.75	21.79	30.0	203.8	161.7	486.4	29.1	12.19	30.0	302.0
LY2-ColonEB	21	1	5.78	18.01	60.0	22.7	20.9	76.3	4.2	11.78	60.0	51.7
LY2-ColonWB	21	1	5.66	18.50	60.0	63.1	55.4	138.7	7.6	11.45	60.0	75.2
LY20-MalibEB	21	1	11.04	49.26	30.0	683.3	398.1	3049.5	240.1	21.82	30.0	1149.9
LY20-MalibWB	21	1	11.10	42.91	30.0	371.1	188.3	1493.8	99.0	21.78	30.0	701.5
LY200-I4Expr	21	2	30.37	74.36	30.0	211.8	163.7	37.0	2.3	29.01	0	0

**Figure 13: Transit Assignment Summary Report (Snippet)**

### 3.3.4 Transit Assignment Route-Level Report (TASROUTE\_{ALT}{YEAR}.PRN)

This report is located in the *output* folder and presents the leg travel time, the cumulative travel time, ons, offs, leg distance, cumulative distance and the load for all the routes. The following table shows the formatting used in this file and the figure below shows a screenshot.

**Table 25: Transit Assignment Route-Level Report Format**

Period	Field	Columns	Format	Description
Link	Node	3-7	Numeric	Anode in anode→bnode link of a transit route
	Dist	8-17	Numeric	Distance of anode→bnode link in miles
	CumDist	18-27	Numeric	Cumulative distance of a transit route till that link
Peak	Time	28-37	Numeric	Transit travel time of anode→bnode link in minutes
	CumTime	38-47	Numeric	Cumulative travel time of a transit route till that link
	On	48-57	Numeric	Boardings at anode in anode→bnode direction
	Off	58-67	Numeric	Alightings at anode in anode→bnode direction
Off-Peak	Load	68-77	Numeric	Passenger load carried from anode to bnode
	Time	78-87	Numeric	Transit travel time of anode→bnode link in minutes
	CumTime	88-97	Numeric	Cumulative travel time of a transit route till that link
	On	98-107	Numeric	Boardings at anode in anode→bnode direction
Daily	Off	108-117	Numeric	Alightings at anode in anode→bnode direction
	Load	118-127	Numeric	Passenger load carried from anode to bnode
	On	128-137	Numeric	Boardings at anode in anode→bnode direction
Daily	Off	138-147	Numeric	Alightings at anode in anode→bnode direction
	Load	148-157	Numeric	Passenger load carried from anode to bnode

Transit Assignment Route Level Report

Title : Year 2000 Base Validated Network  
 Alternative : A  
 Year : 00  
 Date : Mon 02/18/2008  
 Time : 17:33:38.90

Route name : IRide-MainNB  
 Long name : I-Ride Main NB  
 Mode : 23 Operator : 5 Peak Freq : 15.00 min ( 4.0 vph) Off-peak Freq : 15.00 min ( 4.0 vph)

Node	Dist (mi)	CumDist (mi)	Time (min)	CumTime (min)	Peak On (min)	Off (min)	Load	Time (min)	CumTime (min)	Off-peak On (min)	Off (min)	Load	On	Daily Off	Load
16156	0.21	0.21	0.69	0.69	0.4	0	0.4	0.94	0.94	3.38	0	3.38	3.77	0	3.77
16154	0.21	0.42	0.78	1.47	12.9	0	13.2	0.70	1.64	22.64	0	26.02	35.49	0	39.26
16155	0.13	0.55	0.48	1.95	0	0	13.2	0.43	2.07	0	0	26.02	0	0	39.26
16157	0.12	0.67	0.40	2.35	5.1	0	18.3	0.40	2.47	1.86	0	27.88	6.96	0	46.22
14505	0.09	0.76	0.30	2.65	0	0	18.3	0.30	2.77	0	0	27.88	0	0	46.22
18055	0.06	0.82	0.20	2.85	0	0	18.3	0.20	2.97	0	0	27.88	0	0	46.22
23090	0.17	0.99	0.57	3.42	0	0	18.3	0.57	3.54	0	0	27.88	0	0	46.22
14506	0.08	1.07	0.27	3.69	0	0	18.3	0.27	3.81	0	0	27.88	0	0	46.22
14515	0.07	1.14	0.23	3.92	0	0	18.3	0.23	4.04	0	0	27.88	0	0	46.22
23091	0.06	1.20	0.20	4.12	0	0	18.3	0.20	4.24	0	0	27.88	0	0	46.22
23092	0.07	1.27	0.23	4.35	0	0	18.3	0.23	4.47	0	0	27.88	0	0	46.22
14510	0.08	1.35	0.27	4.62	0	0	18.3	0.27	4.74	0	0	27.88	0	0	46.22
14511	0.11	1.46	0.37	4.99	0	0	18.3	0.37	5.11	0	0	27.88	0	0	46.22
14513	0.08	1.54	0.27	5.26	0	0	18.3	0.27	5.38	0	0	27.88	0	0	46.22
14504	0.15	1.69	0.53	5.79	0	0	18.3	0.50	5.88	0	0.06	27.88	0	0.06	46.16
16095	0.15	1.84	0.57	6.36	0	0	18.3	0.50	6.38	0	0	27.88	0	0	46.16
16097	0.27	2.11	0.90	7.26	0	0.02	18.1	0.90	7.28	0	0.15	27.67	0	0.34	45.82
16028	0.11	2.22	0.37	7.63	0	0	18.1	0.37	7.65	0	0	27.67	0	0	45.82
13672	0.26	2.48	0.87	8.50	0	0	18.1	0.87	8.52	0	0	27.67	0	0	45.82
16027	0.34	2.82	1.13	9.63	0	0	18.1	1.13	9.65	0	0	27.67	0	0	45.82
16026	0.34	3.16	1.13	10.76	0	4.8	13.4	1.13	10.75	0	7.91	19.76	0	12.68	33.14
16027	0.26	3.42	0.87	11.63	0	8.2	5.2	0.87	11.65	0	13.38	6.38	0	21.56	11.58
13672	0.11	3.53	0.37	12.00	0	0	5.2	0.37	12.02	0	0	6.38	0	0	11.58
16028	0.27	3.80	0.90	12.90	0	0	5.2	0.90	12.92	0	0	6.38	0	0	11.58
16097	0.15	3.95	0.50	13.40	0	0	5.2	0.50	13.42	0	0	6.38	0	0	11.58
16095	0.18	4.13	0.68	14.08	1.1	0	6.3	0.60	14.02	2.63	0	9.01	3.69	0	15.27
16089	0.15	4.28	0.57	14.65	0	0	6.3	0.50	14.52	0	0	9.01	0	0	15.27
16086	0.09	4.37	0.31	14.96	0	0	6.3	0.30	14.82	1.39	0	10.40	1.39	0	16.66
13886	0.21	4.58	0.73	15.69	0	0	6.3	0.70	15.52	0	0	10.40	0	0	16.66
16084	0.26	4.84	0.87	16.56	0.5	0	6.8	0.87	16.39	0.32	0	10.72	0.84	0	17.50
16092	0.33	5.17	1.14	17.70	0	0	6.8	1.10	17.49	0.68	0	10.80	0.68	0	17.58
16054	0.19	5.36	0.68	18.36	6.9	1.3	13.8	0.63	18.12	4.00	1.06	13.74	10.88	2.33	28.14
15999	0.28	5.64	1.05	19.41	1.7	0	14.1	0.93	19.05	1.01	0	14.75	2.66	0	28.80
13867	0.19	5.83	0.64	20.05	0	2.7	11.4	0.63	19.68	0.20	0.77	14.18	0.20	3.44	25.56
16040	0.12	5.95	0.41	20.46	0	0	11.4	0.40	20.08	0	0	14.18	0	0	25.56
16000	0.39	6.34	1.30	21.76	0	2.6	8.8	1.30	21.38	0.13	0.54	13.77	0.13	3.10	22.59
16002	0.47	6.81	1.57	23.33	0	1.0	7.8	1.57	22.95	0.03	0.25	13.65	0.03	1.29	21.33
16004	0.17	6.98	0.63	23.96	0.3	0.7	7.3	0.57	23.52	0.07	0.49	13.13	0.32	1.18	20.47
1600	0.18	7.16	0.68	24.64	0	0	7.3	0.60	24.12	0	0	13.13	0	0	20.47
13677	0.31	7.47	1.08	25.72	1.0	2.5	6.1	1.03	25.15	0.22	3.83	9.52	1.41	6.29	15.59
16006	0.14	7.61	0.49	26.21	0	0	6.1	0.47	25.62	0	0	9.52	0	0	15.59
17639	0.10	7.71	0.67	27.08	3.1	0.3	6.9	0.33	25.95	0.75	0.07	10.20	3.69	0.42	19.06

**Figure 14: Transit Assignment Route-Level Report (Snippet)**

### 3.3.5 Station Activity Report (Stations\_{Alt}{Year}.prn)

The station activity report, located in the *output* folder, presents the frequency of all the transit services visiting the station, the number of passengers accessing and egressing the station, and the boardings and alightings at the station.

The access and egress data presented in this report are based on P-to-A assignment. For example, if there are 100 trips from zone *i* to zone *j*, and 60 trips from zone *j* to zone *i*, P-to-A assignment assigns 160 trips in the *i-j* direction. The user will have to post process this information to produce O-D results. It should be noted that the boardings at a station can exceed the sum of accesses from all access modes as there can be transfers between transit routes at a station. Such transfers appear in the boardings but not in any of the access modes.

```

STATION ACTIVITY & ACCESS/EGRESS REPORT (station node is in paranthesis after name)

Title : Year 2000 Base Validated Network
Alternative : 00A
Date: Mon 02/18/2008      Time: 12:49:19.30
    
```

---

```

1. Station Name : Suntran Transit Center      (26684)
    
```

Transit Service	PEAK		OFF PEAK	
	Frequency	vph	Frequency	vph
ST1-GreenOB	60.0	1.0	60.0	1.0
ST2-BlueOB	60.0	1.0	60.0	1.0
ST3-PurpleOB	60.0	1.0	60.0	1.0
ST4-OrangeOB	60.0	1.0	60.0	1.0
Total no. of services :	4	4.0	4.0	4.0

Activity	PEAK		OFF PEAK		DAILY	
	Access	Egress	Access	Egress	Access	Egress
Walk Access	12.7	12.2	23.8	21.3	36.5	33.5
Auto Access	0	0	0	0	0	0
Transfer Connector	0	0	0	0	0	0
Sidewalk Connector	0	0	0	0	0	0
Boardings		21.6		37.6		59.4
Alightings		0		0		0

Figure 15: Station Activity Report (Snippet)

## CHAPTER 4: Changes in scripts

This chapter details the parts of scripts that the user may adjust in order to customize the application for individual models. The adjustments discussed in this chapter represent the minimum amount needed but there may be other scripts or other parts in the discussed scripts that the user may have to adjust in the model. The step numbers mentioned in this chapter corresponds to the step numbers in the Tier B/C transit model application. The script sections that the user has to adjust are denoted in the scripts by the following opening and closing lines:

```
;*****
; BEGIN POTENTIAL SCRIPT ADJUSTMENT
;*****

;*****
; END POTENTIAL SCRIPT ADJUSTMENT
;*****
```

### 4.1 TPNET00C.S (Transit speed for peak period)

This script file is located in the *Transit Prep* module (First application in the transit model application). In this module, open the script file for NETWORK step 8 (Transit speed for peak period). The peak period speeds for the various transit modes (modes 21 through 27 in the default case) are defined in this script.

By default, all the transit mode speeds are set equal to auto speeds. The user has to apply appropriate logic in this section to define the transit speeds to be used in the model. In the default case, the variable for the speed of transit mode 21 is `_TSPD21`. Similarly, the variables for the speeds of transit modes 22 through 27 are `_TSPD22` through `_TSPD27`. The user may follow the same naming convention to define transit speeds for new transit modes being defined. After defining the new transit speeds, the user has to delete the lines that set the default peak transit speeds for transit modes. At the end of this step, the variables `_TSPD21`, `_TSPD22`, `_TSPD23`, `_TSPD24`, `_TSPD25`, `_TSPD26`, `_TSPD27`, and the similar variables for any new transit modes must contain the speed for that transit mode.

### 4.2 TPNET00C.S (Transit speed for offpeak period)

This script file is located the *Transit Prep* module. In this module, open the script file for NETWORK step 9 (Transit speed for offpeak period). The offpeak period speeds for the transit modes are defined in this script. The user has to delete those lines from the script file that set the default offpeak transit speeds for transit modes, just as in Section 4.1 and define new transit mode speeds.

#### 4.3 TPPTR00A.S (Build peak access connectors)

This script file is located in “Transit Prep” module. In this module, open the script file for PUBLIC TRANSPORT step 12 (Build peak access connectors). In this script, TRANTIME[xx] denotes the transit time for mode number xx. If the user defines transit times for new transit modes in a model, the transit times of these modes can be added in this script file. If the transit time of a mode is not added here, it is assigned the transit time of mode 21 (local bus) by default. A comma needs to be added at the end of each transit time definition except the last.

#### 4.4 TPPTR00B.S (Build offpeak access connectors)

This script file is located in “Transit Prep” step (step 1). In this step, open the script file for PUBLIC TRANSPORT step 14 (Build offpeak access connectors). The transit times for new user defined modes can be added here similar to the TPPTR00A.S script in Section 4.3 above.

#### 4.5 TRPTR00A.S (Walk-Access Paths/Skims – peak)

This script file is located in the *Transit Paths* module (Second application in the transit model application). In this step, open the script file for PUBLIC TRANSPORT step 2 (Walk-Access Paths/Skims – peak). Two separate sections are identified for adjustment in the script. In the first section, the transit times for new user defined modes can be similar to the TPPTR00A.S script in Section 4.3 above. In the second section, the travel times are calculated for all the modes of the model and this is used to develop the transit skims. If the user defines new modes in a model, accordingly, they need to be added in the skim files. For example, if the user defines a new local bus service mode with mode number 31, and a new commuter rail mode 34, then this section must be changed to read the following:

```

PROCESS PHASE=SKIMIJ
MW[1]=TIMEA(0,1) ; Walk time
MW[2]=TIMEA(0,2) ; Auto time
MW[3]=TIMEA(0,11)+TIMEA(0,12) ; Sidewalk time
MW[4]=TIMEA(0,21)+TIMEA(0,31) ; Local bus time
MW[5]=TIMEA(0,22) ; Premium bus time
MW[6]=TIMEA(0,23) ; Circulator time
MW[7]=TIMEA(0,24)+TIMEA(0,34) ; Light/Heavy Rail time
MW[8]=TIMEA(0,25) ; Commuter Rail time
MW[9]=TIMEA(0,26) ; Other mode time
MW[10]=TIMEA(0,27) ; Project mode time

```

#### 4.6 TRPTR00B.S (Auto-Access Paths/Skims – peak)

This script file is located in the *Transit Paths* module. In this step, open the script file for PUBLIC TRANSPORT step 4 (Auto-Access Paths/Skims – peak). The changes that need to be made in this script file are similar to the changes to be made in TRPTR00A.S in Section 4.5 above.

#### 4.7 TRPTR00C.S (Walk-Access Paths/Skims – offpeak)

This script file is located in the *Transit Paths* module. In this step, open the script file for PUBLIC TRANSPORT step 6 (Walk-Access Paths/Skims – offpeak). The changes that need to be made in this script file are similar to the changes to be made in TRPTR00A.S in Section 4.5 above.

#### 4.8 TRPTR00D.S (Auto-Access Paths/Skims – offpeak)

This script file is located in the *Transit Paths* module. In this step, open the script file for PUBLIC TRANSPORT step 8 (Auto-Access Paths/Skims – offpeak). The changes that need to be made in this script file are similar to the changes to be made in TRPTR00A.S in Section 4.5 above.

#### 4.9 MCPREP.S (Auto ownership percentage by TAZ for work and non-work purposes)

This script file is located in the *Mode Choice Model* module. In this step, open the script file for MATRIX step 5 (Auto ownership %age by TAZ for work and non-work purposes). This script computes the work and non-work purpose auto ownership percentages at a TAZ. If the model consists of a number of regions with different sets of trip generation rates, each of them can be accommodated in this step. By default, only one set of trip generation rates are used in the script. The user can modify this script to add more sets of trip generation rates. In order to do so, the user has to add a file that maps the TAZs to different sets of rates, and the files that contain the different sets of trip generation rates.

The script file provides an example of this with some commented lines. It must be noted that by default, only one set of trip generation rates is used (GRATES\_MC.DBF). The script contains some commented lines that demonstrate a case of multiple sets of trip generation rates. This is intended for guidance only. The user needs to change this file appropriately to tailor it to his/her model. In the example, the model has three MPOs and each MPO has a different set of trip generation rates. The mapping file contains the MPO number of each TAZ. A section of the script file reads the following:

```
;LOOKUP LOOKUPI=3,
;      NAME=TYPE,
;      LOOKUP[4]=1, RESULT=5,           ; Two-digit area type
;      LOOKUP[5]=1, RESULT=6,           ; County
;      LOOKUP[6]=1, RESULT=7,           ; MPO
;      FAIL[1]=0,FAIL[2]=0,FAIL[3]=0
```

In these lines, the lookup file that maps TAZ numbers with MPO numbers is read in. The first column of the lookup file is the TAZ number. Column 5 contains the two-digit area type, column 6 contains the county number and column 7 contains the MPO number. Now, different sets of generation rates can be based on area type or county or MPO. MPO numbers are used in this

example. The user has to similarly add and read in a lookup file that maps the TAZs to different sets of trip generation rates.

The following lines of the script read in the trip generation rates from the two MPOs (other than the default MPO):

```
;LOOKUP LOOKUPI=4,
;   NAME=RATES2,
;   LOOKUP[1]=COUNTER, RESULT=PPDU,
;   LOOKUP[2]=COUNTER, RESULT=APDU,
;   LOOKUP[3]=COUNTER, RESULT=DUTYPE,
;   LOOKUP[4]=COUNTER, RESULT=HBWPR,
;   LOOKUP[5]=COUNTER, RESULT=HBSHPR,
;   LOOKUP[6]=COUNTER, RESULT=HBSRPR,
;   LOOKUP[7]=COUNTER, RESULT=HBOPR,
;   FAIL[1]=0,FAIL[2]=0,FAIL[3]=0

;LOOKUP LOOKUPI=5,
;   NAME=RATES3,
;   LOOKUP[1]=COUNTER, RESULT=PPDU,
;   LOOKUP[2]=COUNTER, RESULT=APDU,
;   LOOKUP[3]=COUNTER, RESULT=DUTYPE,
;   LOOKUP[4]=COUNTER, RESULT=HBWPR,
;   LOOKUP[5]=COUNTER, RESULT=HBSHPR,
;   LOOKUP[6]=COUNTER, RESULT=HBSRPR,
;   LOOKUP[7]=COUNTER, RESULT=HBOPR,
;   FAIL[1]=0,FAIL[2]=0,FAIL[3]=0
```

The user has to similarly add and read in lookup files that correspond to the different trip generation rates of the different model regions. So, the file that maps TAZs to MPOs and the files that contain the trip generation rates of the three MPOs are read in. The MPO number of a TAZ is identified in the following IF loop in the example case:

```
:_mpo = TYPE(5,I)
:_gendist = 1
;IF (_mpo==1)           ; Region 1
;  _gendist = 1
;ELSEIF (_mpo==2)      ; Region 2
;  _gendist = 2
;ELSEIF (_mpo==3)      ; Region 3
;  _gendist = 3
;ENDIF
```

The user has to similarly add an IF loop that notes the different model regions that contain different trip generation rates.

In the example, three different rates of trip generations are read in the following lines:

```
; IF (_gendist==1)
   _HMTRIP = RATES1(L+3,_tmp1)*HMDUM[x]
   _SFTRIP1 = RATES1(L+3,_tmp2)*SFDUM1[x]
```

```

    _SFTRIP2 = RATES1(L+3,_tmp3)*SFDUM2[x]
    _SFTRIP3 = RATES1(L+3,_tmp4)*SFDUM3[x]
    _MFTRIP1 = RATES1(L+3,_tmp5)*MFDUM1[x]
    _MFTRIP2 = RATES1(L+3,_tmp6)*MFDUM2[x]
    _MFTRIP3 = RATES1(L+3,_tmp7)*MFDUM3[x]

;   ELSEIF (_gendist==2)
;       _HMTRIP = RATES2(L+3,_tmp1)*HMDUM[x]
;       _SFTRIP1 = RATES2(L+3,_tmp2)*SFDUM1[x]
;       _SFTRIP2 = RATES2(L+3,_tmp3)*SFDUM2[x]
;       _SFTRIP3 = RATES2(L+3,_tmp4)*SFDUM3[x]
;       _MFTRIP1 = RATES2(L+3,_tmp5)*MFDUM1[x]
;       _MFTRIP2 = RATES2(L+3,_tmp6)*MFDUM2[x]
;       _MFTRIP3 = RATES2(L+3,_tmp7)*MFDUM3[x]
;   ELSEIF (_gendist==3)
;       _HMTRIP = RATES3(L+3,_tmp1)*HMDUM[x]
;       _SFTRIP1 = RATES3(L+3,_tmp2)*SFDUM1[x]
;       _SFTRIP2 = RATES3(L+3,_tmp3)*SFDUM2[x]
;       _SFTRIP3 = RATES3(L+3,_tmp4)*SFDUM3[x]
;       _MFTRIP1 = RATES3(L+3,_tmp5)*MFDUM1[x]
;       _MFTRIP2 = RATES3(L+3,_tmp6)*MFDUM2[x]
;       _MFTRIP3 = RATES3(L+3,_tmp7)*MFDUM3[x]
; ENDIF

```

The user has to similarly add an IF loop that reads in different trip generation rates corresponding to different model regions.

#### 4.10 MCPREP.S and MCMAT00B.S

These two scripts are located in the *Mode Choice Model* module. In this step, MCPREP.S is the script file for MATRIX step 5 and MCMAT00B.S is the script file for MATRIX step 6. In these two scripts, the default zonal data file variables mentioned in Section 3.2.11 are used. The user may change these scripts to use alternative variable names. A variable X is used in the script as ZI.1.X and if the variable name is to be changed to Y, all instances of ZI.1.X in these two scripts need to be changed to ZI.1.Y.

***Appendix: Transit Model Tier A Application Screenshots***

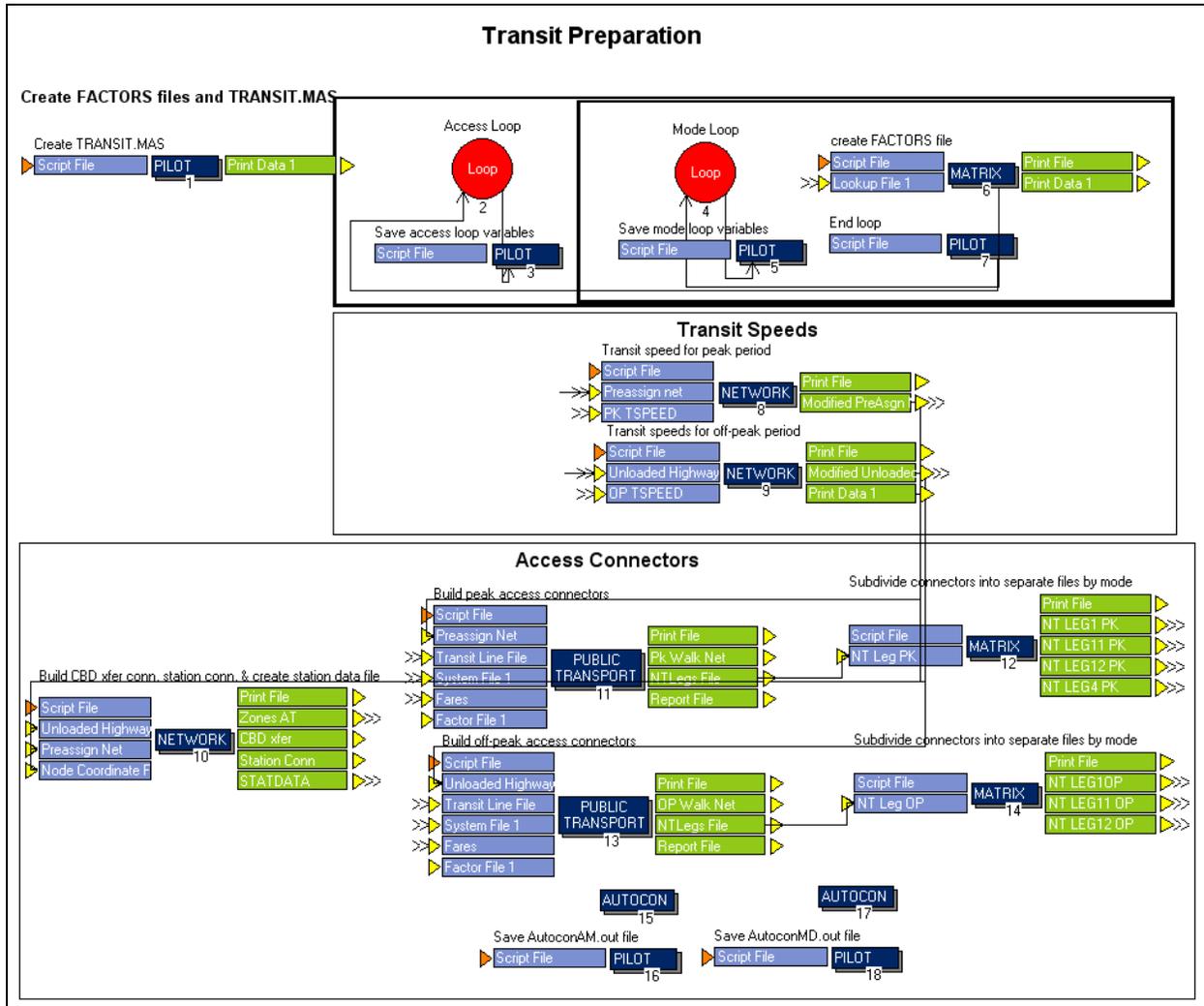


Figure 16: Transit Prep Module

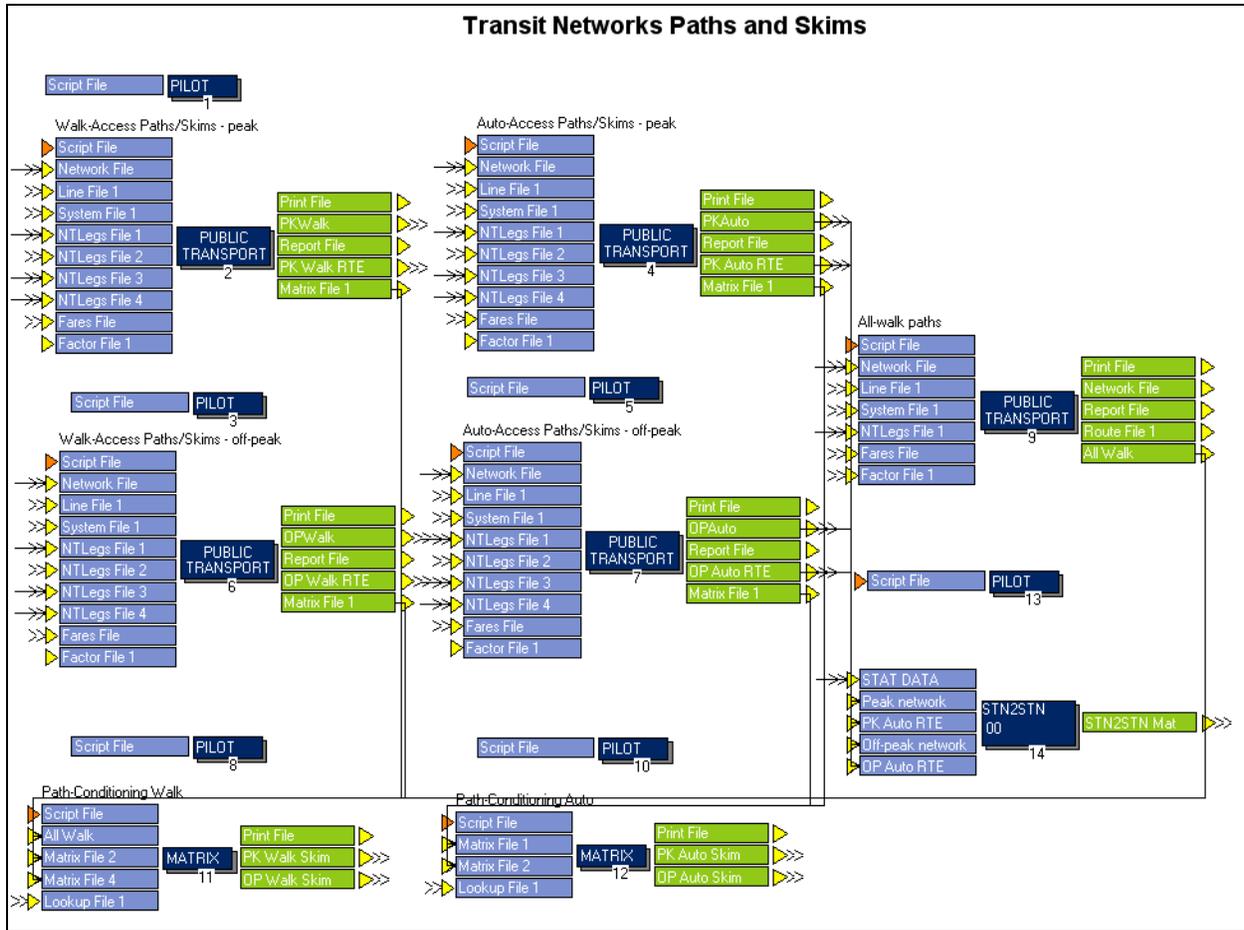


Figure 17: Transit Paths Module

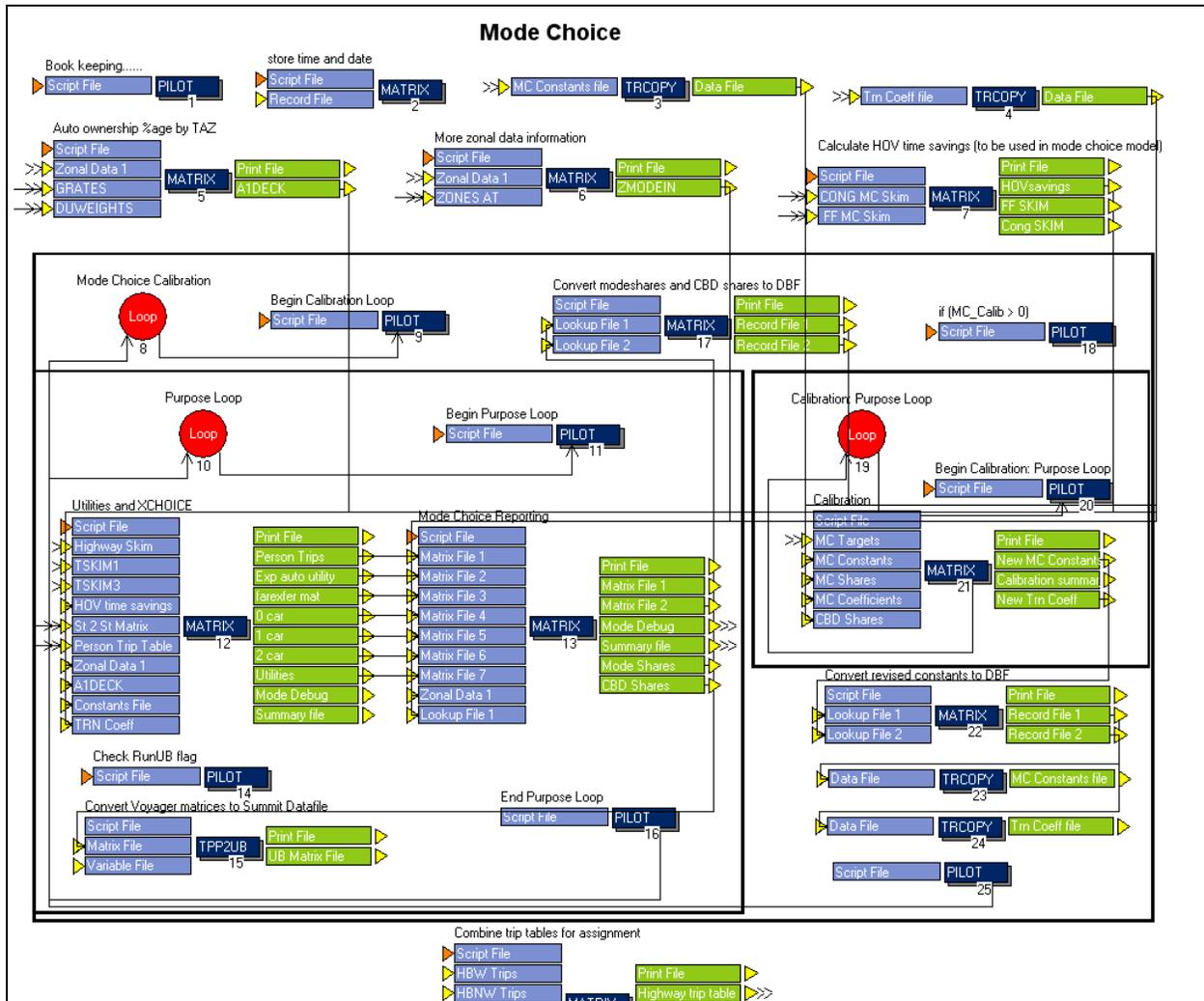


Figure 18: Mode Choice Module

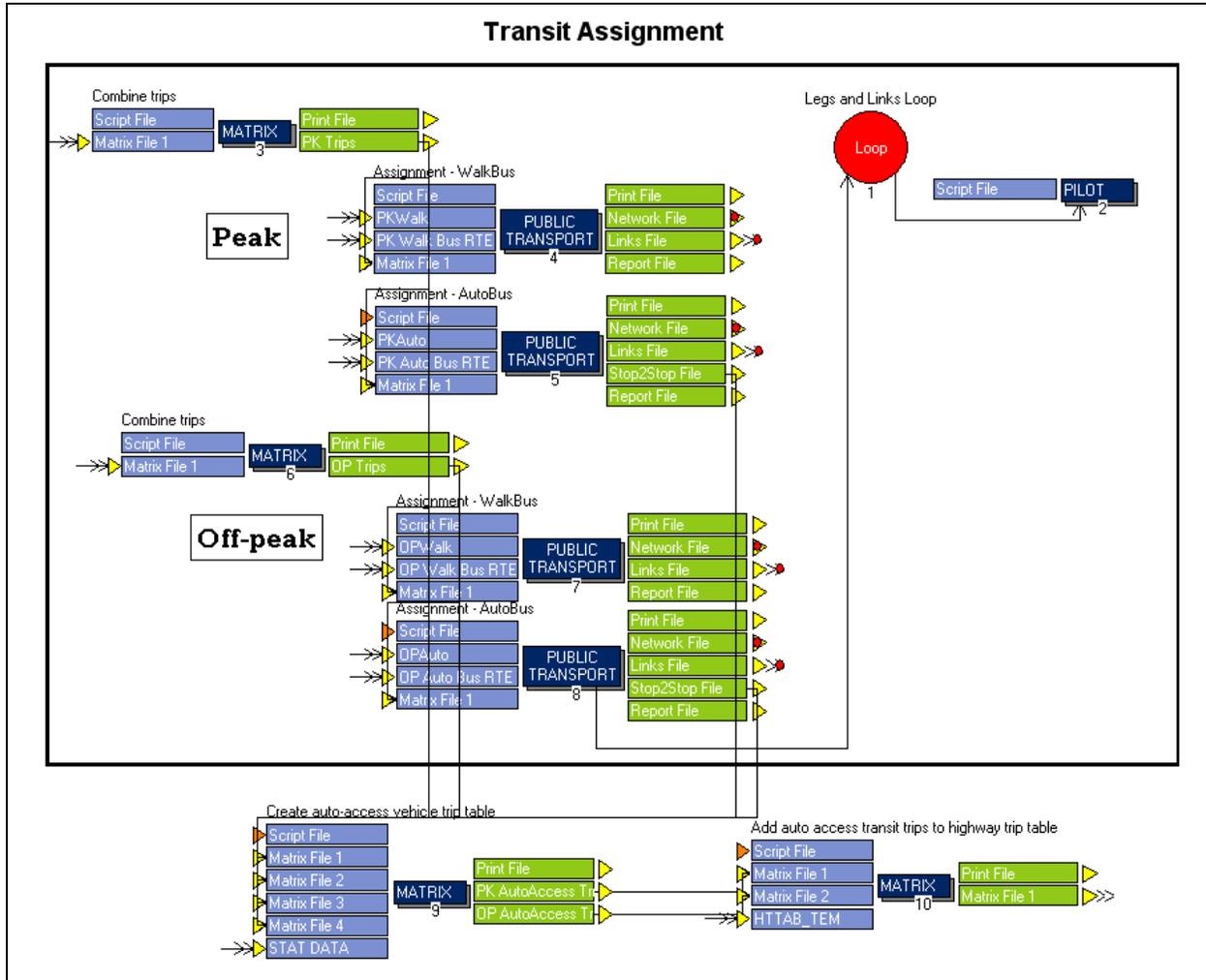


Figure 19: Transit Assignment Module

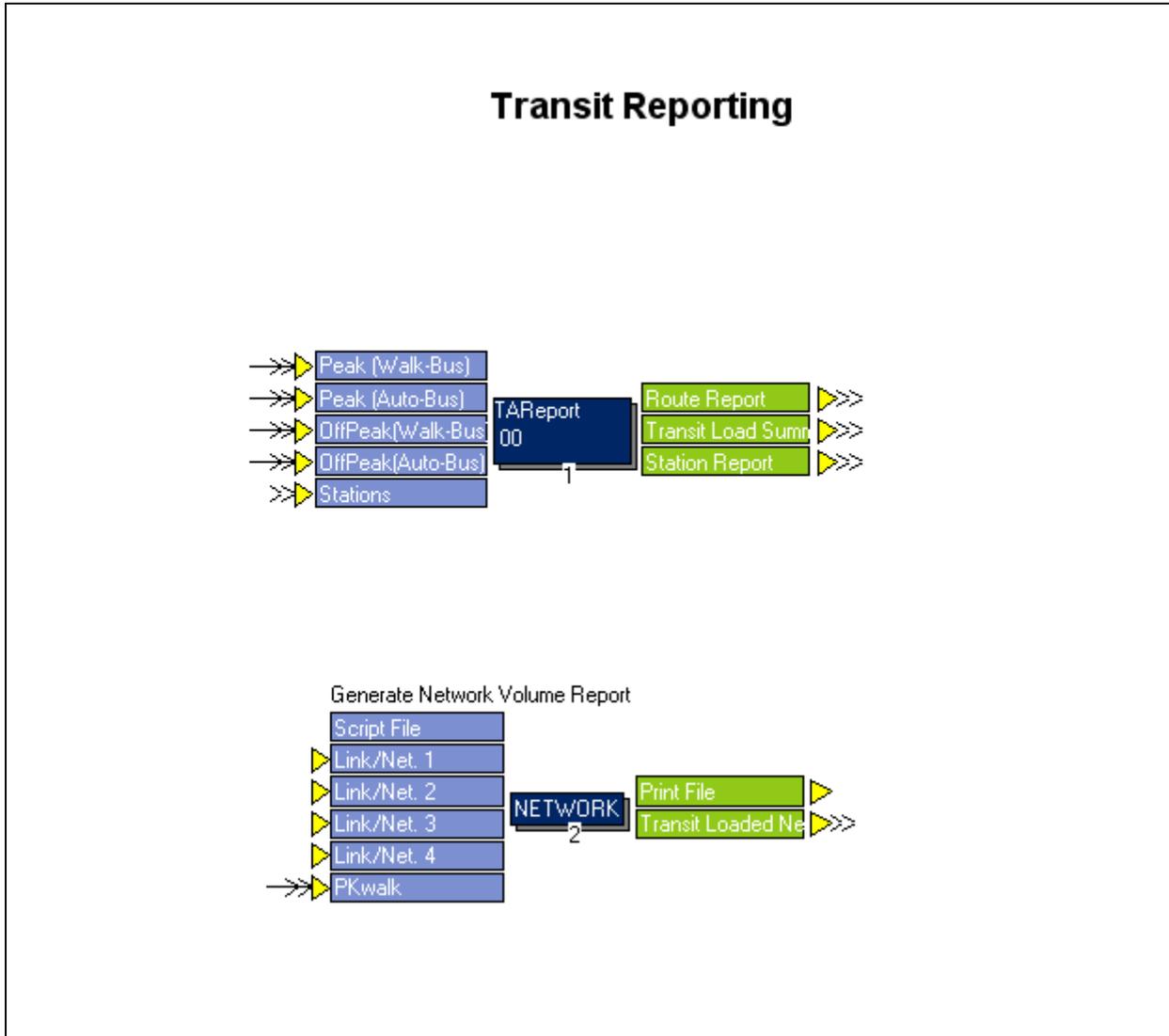


Figure 20: Transit Reporting Module