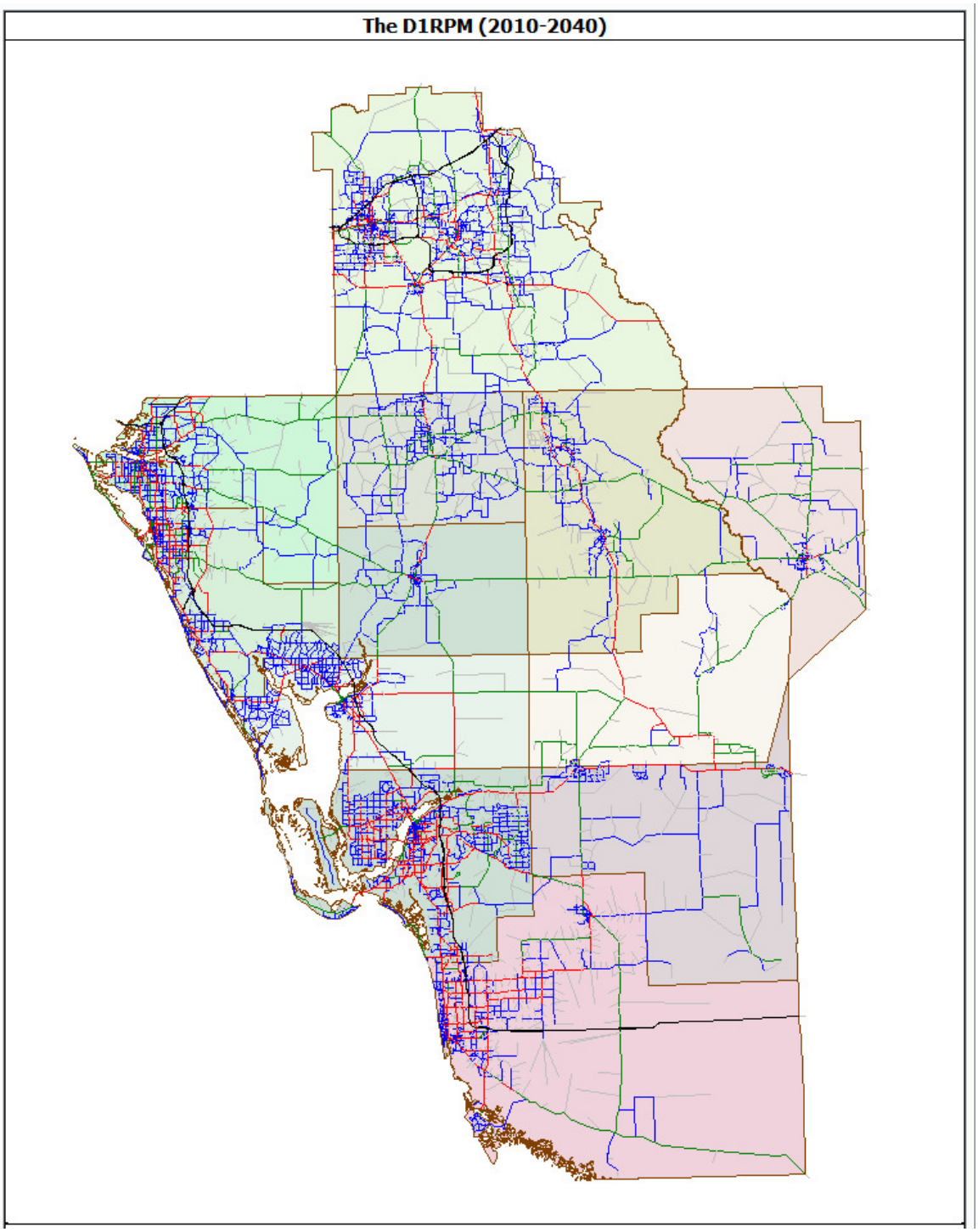
TM-3
District One Regional Model

Technical Resource Guide

February 2016



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This report: *"TM-3 D1RPM Technical Resource Guide"* gives technical users / model developers with a more detailed review of certain critical steps (and associated scripts) within the model and discusses mode choice theory and application. Companion reports, *"TM-1 Executive Summary of the D1RPM Validation"* provides an overall review of the model and summary statistics for the validation year of 2010;.and, *"TM-2 Introduction to the D1RPM and Validation Report"* reviews of the model's development, discusses the structure of the model within CUBE/Voyager environment, and contains summary statistics for the validation year of 2010. These reports are included in the model's \documentation folder.

Introduction

This document is not intended to replace FSUTMS class training, nor is it designed to function as a CUBE scripting class. This report is supplemented with additional documents from the TMU model project and the TRANSITMODEL development and setup. These are contained in the folders: \documentation\reference\TMU and \documentation\reference\AECOM, respectively.

The resulting D1RPM model is complex with many processes and program steps (see box below). This document will discuss all of these program steps, with particular emphasis placed on features that are unique to the D1RPM. Please take notice of : SPECIAL NOTICE tags throughout the text.

PROGRAM BOXES / STEPS IN THE D1RPM MODEL *

main page	program boxes	subroutines	program boxes	subroutines	program boxes	subroutines	program boxes	subroutines	program boxes	subroutines	program boxes	runtime **
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Feedback	1											:01
Distrib	10											2:51
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Model End	4											:014

* the D1RPM model contains 630 lines of CUBE/Voyager script

** runtime is dependent on the number of clusters (cores) utilized and CPU clockspeed. Times shown are for a 4-core laptop (I7) running at 2.70GHz

About Cube / Voyager

Development of the model was achieved within the CUBE/Voyager transportation planning environment, version 6.1.0 which incorporates a new auto-access-to-transit procedure. This means that the model will NOT run in earlier versions of CUBE. A Windows based program, CUBE uses a graphical user interface (GUI) whereby a mouse-click or a function key, activates a "pop up" menu from which the user chooses options to run the model. Programs and features are documented within CUBE/Voyager and on-line classes are available at FDOT's internet site: www.fsutmsonline.com.

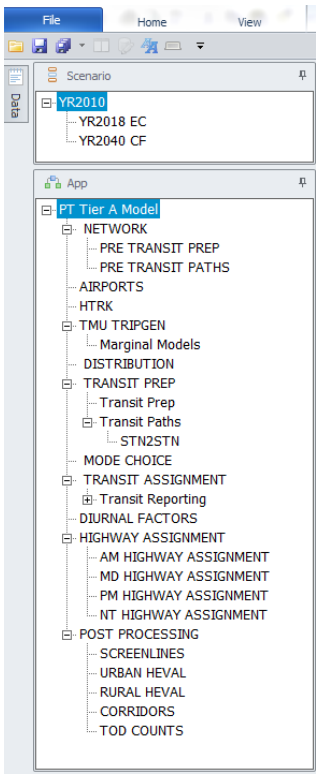
To understand how this model is structured may be helpful to review the CUBE Scenario Manager, the CUBE Application Manager and some job control and command structure. The basis of Cube scenario management is the Catalog which contains information on what applications you want to run, and certain parameters which will be used by the applications within the model.

The Scenario Manager

The purpose of Scenario Manager is to allow a model to be conveniently executed with many alternatives, but using the same model structure -- allowing the user to compare several different scenario's. For example: the graphic shows a validation year, a existing-plus-committed year, and a cost-feasible future year alternative -- all running in the same model structure.

The Manager may contain many Scenario's and each Scenario will have its own sub-folders, a hierarchical structure is assumed. What this means is that: when a model alternative is made (within CUBE) model "Keys" and other parameters are automatically copied

from the "parent" to the "child", the user does not have to re-enter all of this data for each scenario, it will be retained in the model's catalog file D1RPM_100.CAT. This hierarchical structure will look like the following graphic, in Windows Explorer.



- FSUTMS
  - D1
    - D1RPM_v1.0.0
      - applications
      - doc
      - media
      - parameters
      - YR2010
        - input
        - output
        - YR2018 EC
          - input
          - output
        - YR2040 CF
          - input
          - output

Note: When an alternative is created CUBE will create an empty folder, the user will still need to make a copy the *input folder* from the "parent" and copy this to the "child" before making edits to input networks or data files.

The following datasets must be prepared for each alternative and placed in the alternative's INPUT folder:

EETRIPS_10A.DBF	external-to-external trip table
HNET_10A.DBF	highway network
INTEXT_10A.DBF	internal-to-external trip table
PCWALK_10A.DBF	percent of TAZ within short-walk and long-walk access
SPECGEN_A_10A.DBF	special generator attractions
SPECGEN_B_10A.DBF	special generator productions
STATREP_10A.DBF	transit station reports for a station #
TFARES_10A.DBF	transit fares
TROUTE_10A.DBF	transit routes
TURN_10A.DBF	turn prohibition's and turn penalty's
ZONEDATA_10A.DBF	socioeconomic data

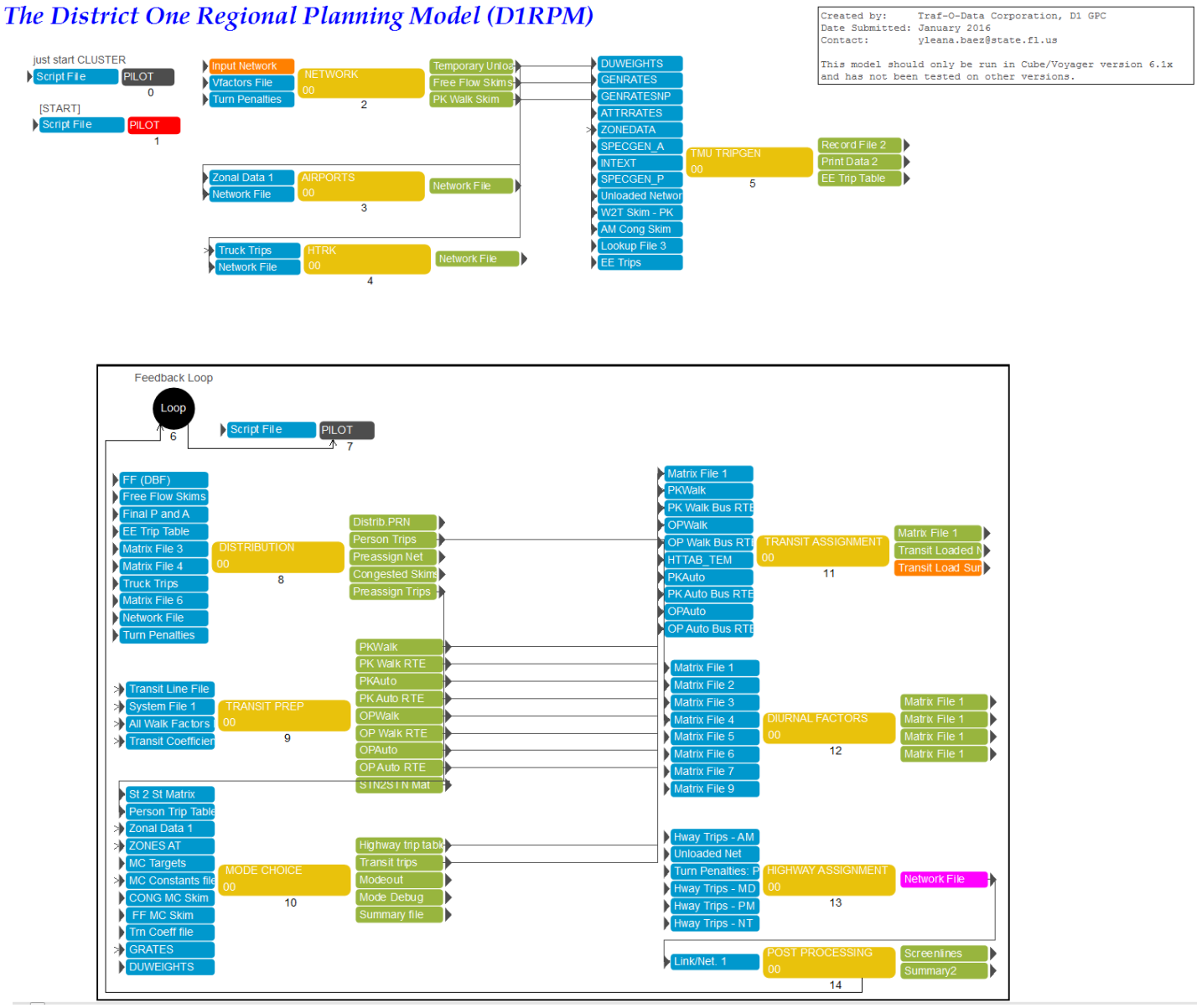
In addition, the following datasets must be available for all alternatives and placed in the model's PARAMETERS folder.
Note: these files are used for model calibration, and should NOT be changed.

Network	
SPDCAP.dbf	speed/capacity lookup
VFACTORS.CSV	BPR curve lookup
Trip Generation	
ATTRRATES.dbf	attraction rates
DUWEIGHTS.dbf	dwelling unit class: trips/household
GENRATES.DBF	rate-permanent pop: person/autos/household
GENRATESNP.DBF	rate-seasonal pop: person/autos/household
HHINCOME_Lookup.dbf	index households by income
HHSeed.csv	random number seed generation
HHSIZE_Lookup.dbf	index by household size
HHWORKER_Lookup.dbf	index by workers/household
NonWork_PRates.dbf	index by income/autos/persons/purpose
PRODRATES.dbf	rate-seasonal pop: person/autos/household
Work_PRates.dbf	rate by income/autos/persons/purpose
FLCOUNTY.DBF	county identifier lookup
Trip Distribution	
FF.dbf	trip length impedances/purpose
Mode Choice	
AllWalk.FAC	program setup
AutoBus.FAC	program setup
AutoProj.FAC	program setup
AutoTransit.FAC	program setup
COEFF_AUTOOWN.DBF	auto ownership coefficients
MC_CONSTANTS.DBF	mode constants
MC_DUWEIGHTS.DBF	rate: trips/household
MC_GRATES.DBF	rate: person/autos/household
MC_TARGETS.DBF	calibration targets/purpose
TRAN_COEFF.DBF	calibration targets/mode
TRN_COEFFICIENTS.DBF	calibration targets/mode
TSYSD.PTS	transit modes & operators
WalkBus.FAC	socioeconomic data
WalkProj.FAC	socioeconomic data
WalkTransit.FAC	socioeconomic data
Assignment	
Diurnal_Fac_tmu.dbf	trips/period/purpose

The Application Manager

Application Manager provides a graphical view of the model processes, as shown on the following page.

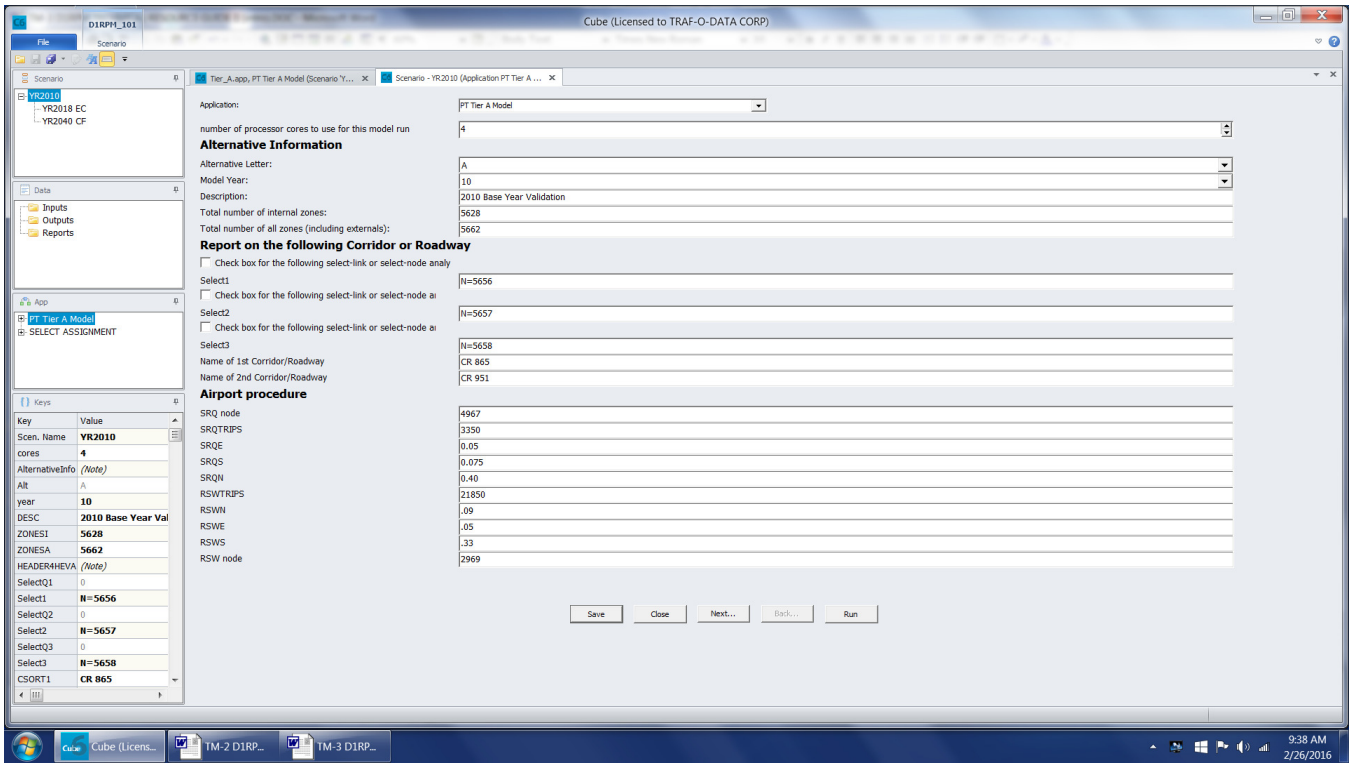
Tasks flow from one process to another, in the numerical sequence shown.



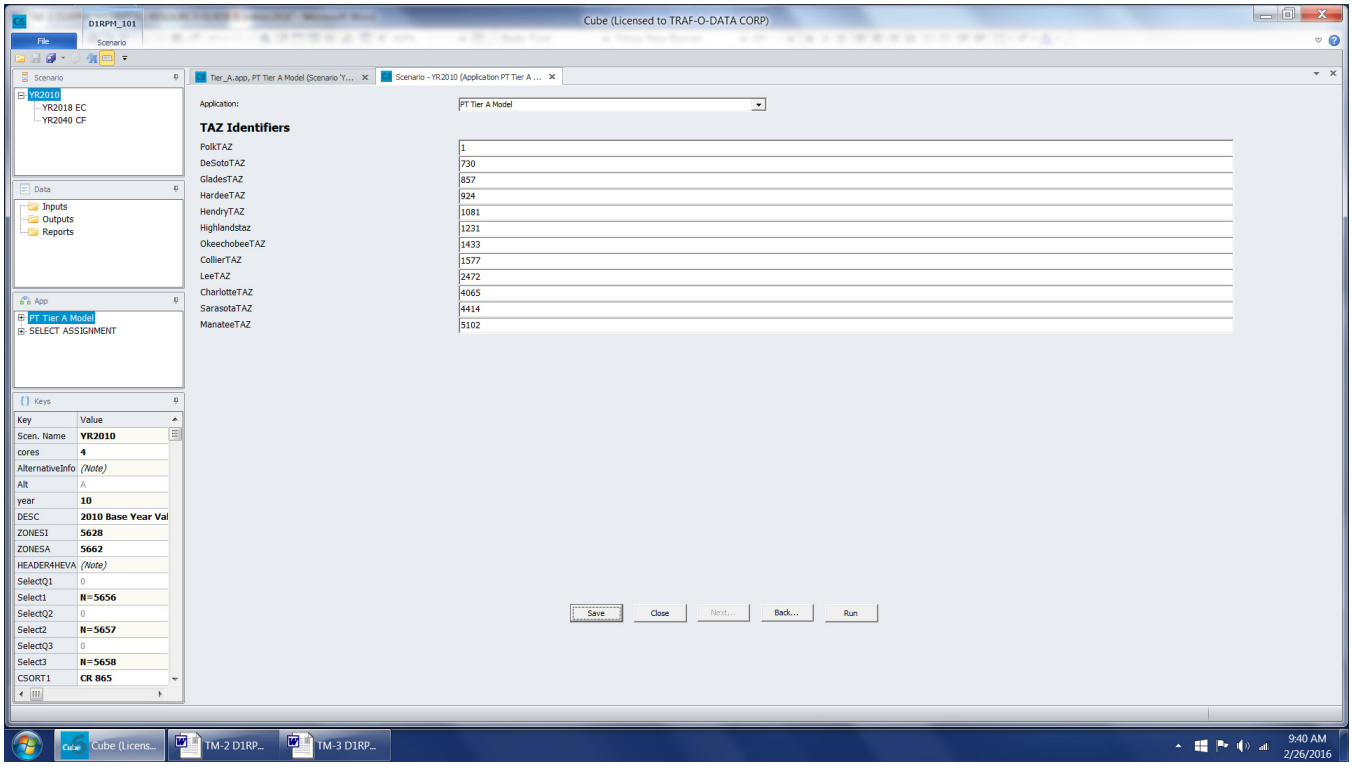
Running the Model

When ready to run a model, users are presented with a series of "KEYS" variables that may be changed by the user. There may be several pages of variables, depending on whether or not the user is in *Applier mode* or *Developer mode:*

(Applier/Developer mode, page 1).

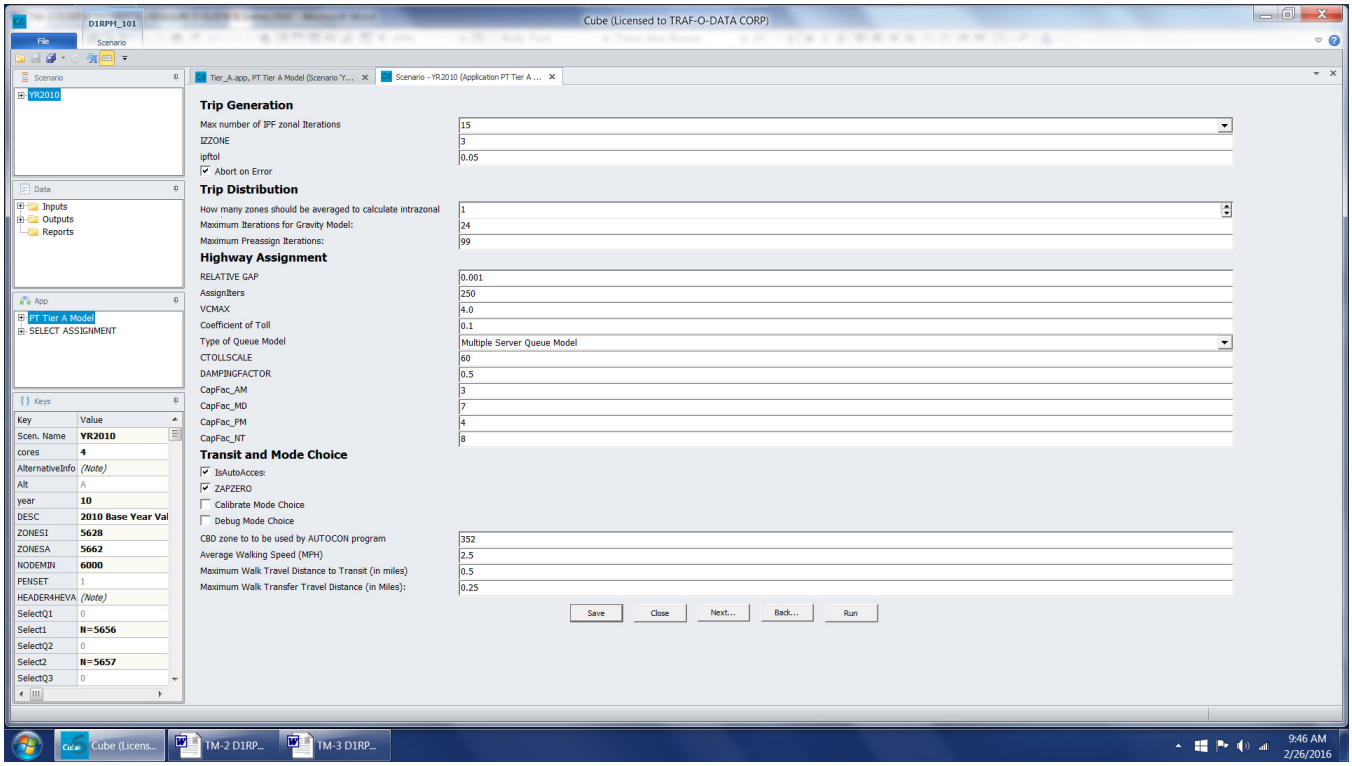


(Applier/Developer mode, page 2).

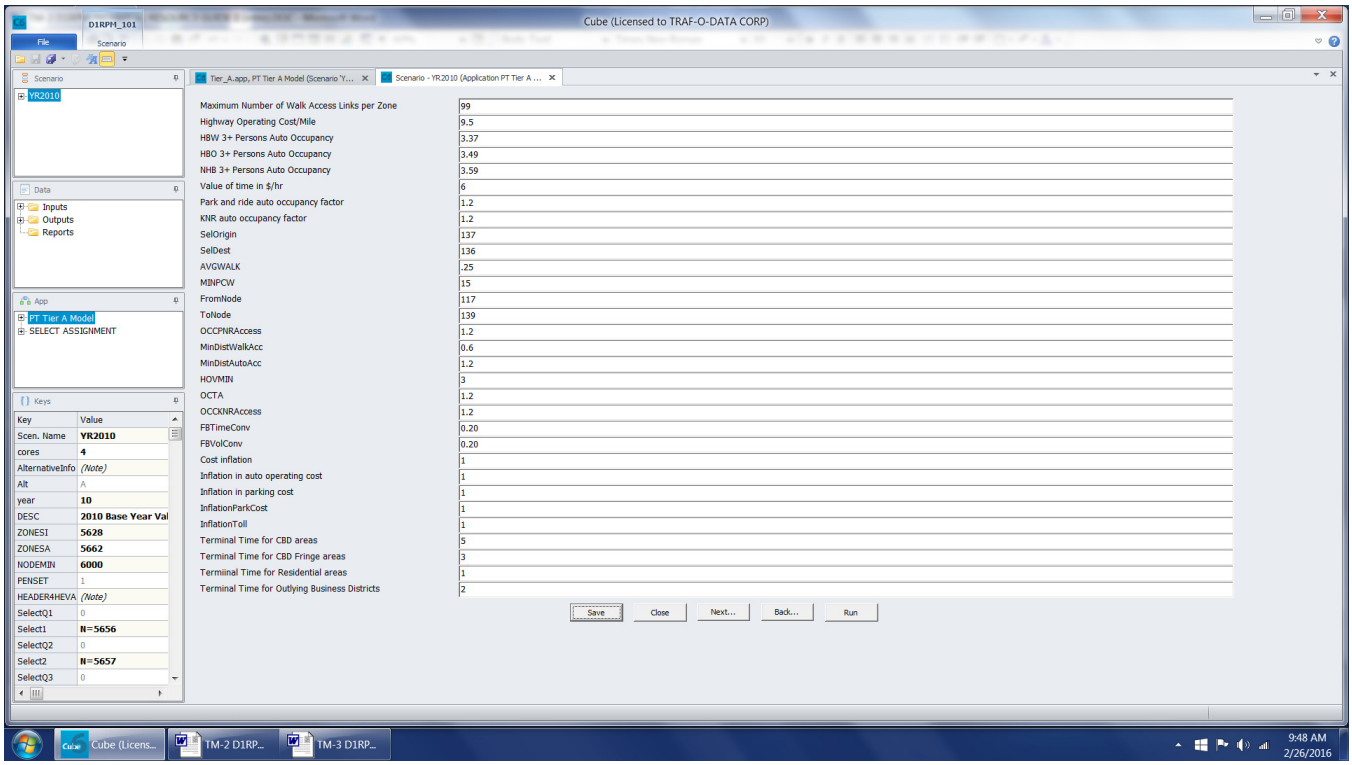


Note: at this point Appliers will mouse-click the "RUN" button to start the model.

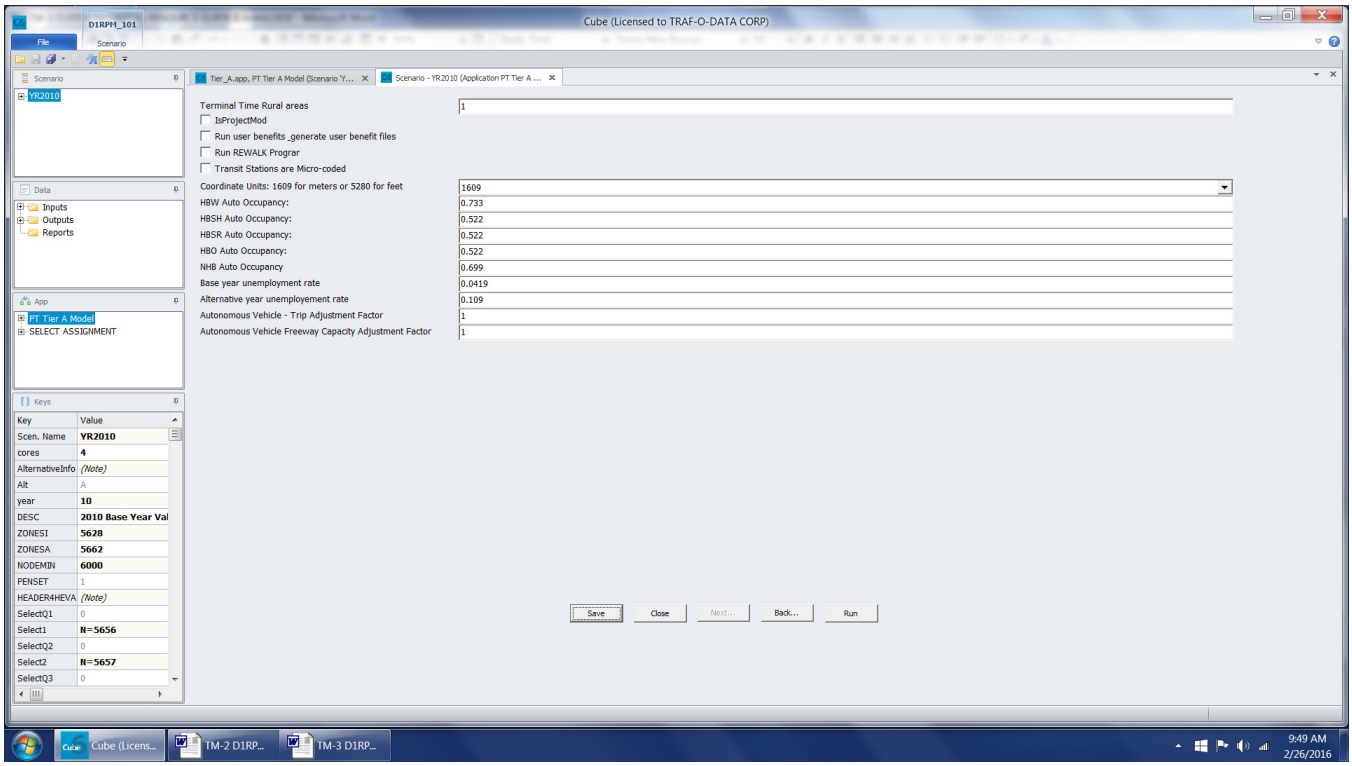
(Developer mode, page 3).



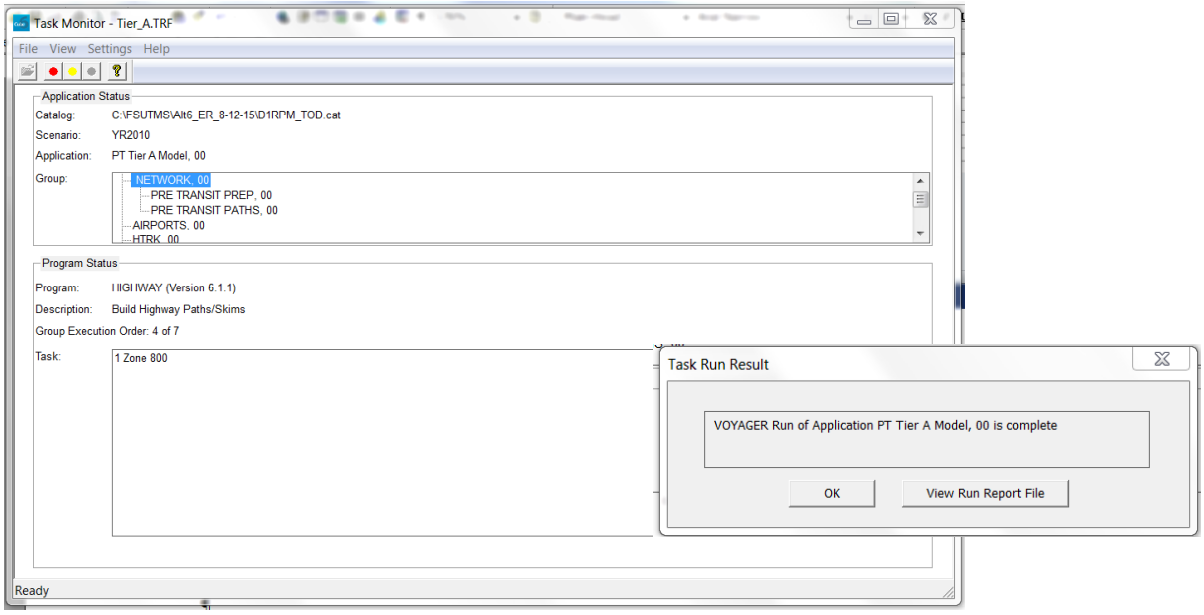
(Developer mode, page 4).



(Developer mode, page 5).



When running, the user is presented with a Task Monitor progress bar, then, the Run Result box.



Run Time

The following 'runtime' report details the model's timeline on a typical laptop computer:
(4 core I-7CPU @ 2.7GHz with 8GB RAM).

```
FSUMTS Model Run - YR2010
Input Directory C:\FSUTMS\D1\D1RPM_2040CF_Alt5\YR2010\input
==================================================================
Begin Run Sun 06/14/2015 17:17:12.10
==================================================================
       HNET: 17:17:12.15
   AIRPORTS: 17:18:54.66
   HVY TRKS: 17:19:33.45
    TRIPGEN: 17:19:55.66
LoopNum= 1
TRIPDISTRIB: 17:23:02.89
TRANSITPREP: 17:53:30.90
 MODECHOICE: 18:07:26.33
    TASSIGN: 19:02:13.08
 DIURNALFAC: 19:04:27.19
 AM HASSIGN: 19:12:55.01
 MD HASSIGN: 19:19:57.75
 PM HASSIGN: 19:23:11.85
 NT HASSIGN: 19:34:10.11
POSTPROCESS: 19:35:25.58
LoopNum= 2
TRIPDISTRIB: 19:43:39.89
TRANSITPREP: 20:14:25.75
 MODECHOICE: 20:28:40.69
    TASSIGN: 21:23:33.22
 DIURNALFAC: 21:25:47.65
 AM HASSIGN: 21:36:46.32
 MD HASSIGN: 21:41:16.85
 PM HASSIGN: 21:44:29.41
 NT HASSIGN: 21:47:02.25
POSTPROCESS: 21:48:19.20
LoopNum= 3
TRIPDISTRIB: 21:56:35.59
TRANSITPREP: 22:26:27.80
 MODECHOICE: 22:40:43.00
    TASSIGN: 23:35:52.78
 DIURNALFAC: 23:38:10.29
 AM HASSIGN: 23:47:33.74
 MD HASSIGN: 23:52:10.60
 PM HASSIGN: 23:53:27.06
 NT HASSIGN:  0:02:37.16
POSTPROCESS:  0:03:56.29
==================================================================
End Run Mon 06/15/2015  0:06:03.48
==================================================================
The model ran for a total of:      409 Minutes ( 6 Hr 49 Min)
```

Hardware Requirements

You may also wish to compare your computer to Citilab's Recommended Workstation Configuration:

Cube 6 | HELP

Introduction > Minimum system requirements > Recommended Workstation Configuration

Recommended Workstation Configuration

Hardware	Requirements
CPU Speed	Minimum: 1.5 GHz single core Recommended: 2.0 GHz dual-core or higher With Cluster: 2.0 GHz quad-core or higher
Processor	Minimum: Intel Pentium 4, AMD Athlon Recommended: Intel Core 2, i5, i7; Intel Xeon; AMD Phenom, II; AMD Athlon II
Memory/RAM	1 GB minimum, 4 GB or higher recommended With Cluster: 2GB per core recommended
Hard Disk	Minimum: ATAPI IDE; 5,400 rpm Recommended: SATA 3 Gb/s or SATA 6 Gb/s; 7,200-10,000 rpm
Hard Disk Space	10 GB for the application and supporting applications and data (like GIS) 100+ GB for output files
Screen Resolution	Minimum: 1024 x 768 higher at Normal size (96dpi); 24 bit color depth
Video/Graphics Adapater	24 bit capable graphics accelerator OpenGL version 2.0 runtime and Shader Model 3.0 or higher is recommended. ATI or Nvidia GPU is strongly recommended for any 3D GIS work or Cube Dynasim microsimulation
Networking Hardware	100BT or 1000BT TCP-IP compatible Ethernet adapter
Peripherals	DVD-ROM drive (1) available USB port, parallel port, or ExpressCard slot for hardware dongle
Operating System	Recommended: Windows 7; 32 or 64-bit; Professional, Enterprise, or Ultimate

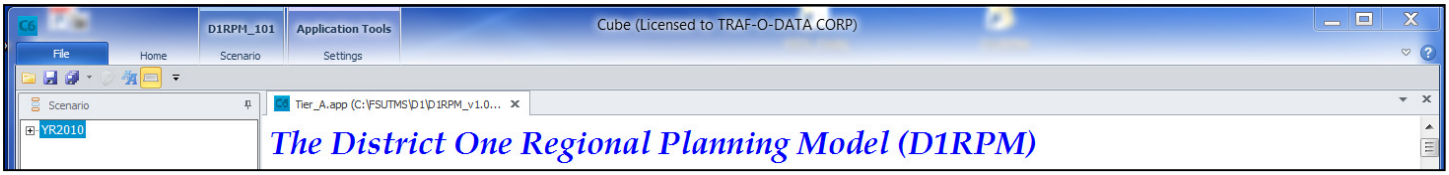
Cube Cluster

Cube Cluster is used to significantly reduce model run time. With many processes and program steps enabling cluster will take advantage of multiple CPU cores or threads as much as possible to reduce model runtime. The D1RPM is setup to use both of the following features:

Distributed processing: Steps in the model flow that are not dependent on one another which are executed simultaneously on distributed or parallel processing nodes; and,
Intrastep processing: In the appropriate Matrix or Highway script processing calculations are apportioned to the number of clusters available.
An example of Distributed Processing: Transit network skim matrices are produced for two periods (peak and off peak travel) and for two separate modes of access (drive and walk). Each of these steps is independent of each other. In the D1RPM each of these steps run in approximately 12 minutes. This implies a total run time for this group of about 48 minutes if run sequentially. But if 4 cluster nodes are available, each step is distributed to a separate node using Cube Cluster, then all four steps would be executed simultaneously. The result under Cube Cluster would be that the run time for the group would now be limited to approximately the time of the longest running individual step in the group. Thus a time saving of approximately 36 minutes is achieved. Since the transit group is nested in a model feedback loop, using cluster saves about 1 hour and 48 minutes.

An example of Intrastep Processing: Performace is enhanced by splitting a computational task across all nodes in the cluster. For example: during a highway assignment, running 4 clusters, the D1RPM, with 5662 zones will distribute computation for zones 1-1415 to the first cluster, zones 1416-2831 to the second cluster, and so on, with all computations running simultaneously. Using (1) core, to run the AM assignment takes 72 minutes, but using (4) cores to run the same assignment takes only 24 minutes. Since the D1RPM highway assignment is nested in a model feedback loop, and there are four periods (AM, MD, PM, NT) the overall, time savings is approximately 10 hours and 36 minutes!

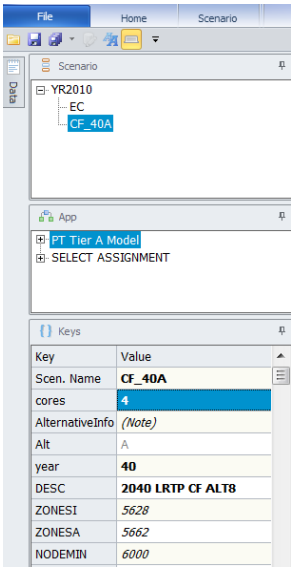
How to you set-up CUBE Cluster? First you must verify the number of CPU cores. A best way of doing this is to open CUBE and mouse-click on the question mark (shown here) ↓



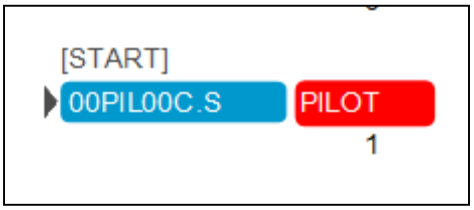
If you select "About", you will be presented with the following information:

Look for "**Processors**" (here it is "4")

Enter that value into your model's Key Field "**cores**", right under Scenario Name in the model's application manager.



[START]

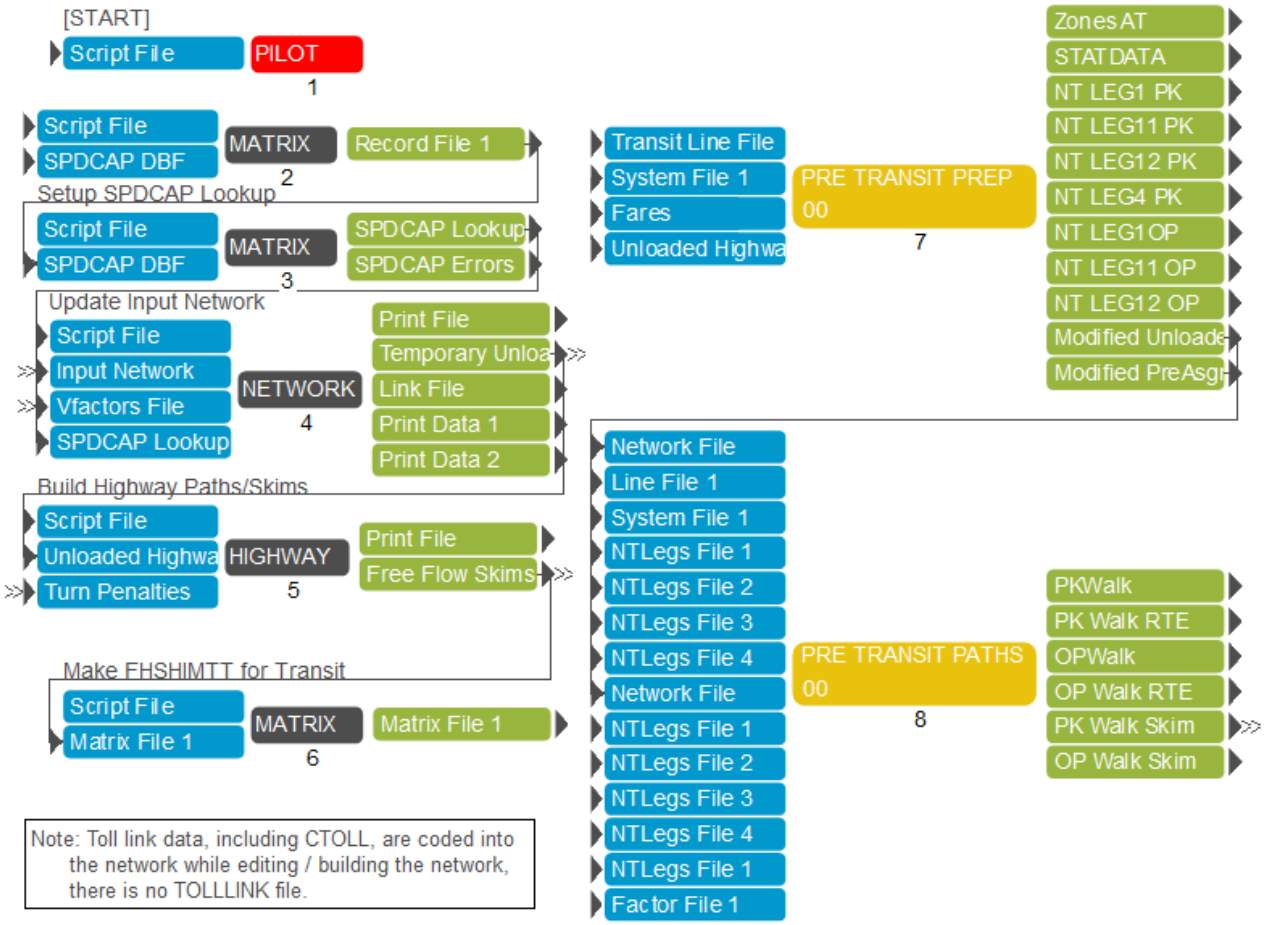


The first step in the model is to initialize (start up) the model. As a courtesy, we check to see if the proper version of CUBE is active, rather than have the model crash after running for two hours. This is necessary due to changes in the PASSENGER TRANPORT program (allowing for replacment of AUTOCON). The D1RPM cannot be run in CUBE versions prior to 6.1

Next we make sure the SCENAIRO's output folder exists, and then CUBE Cluster is started. Lastly, text is added to the RUNTIME file describing the run and start time.

```
; we can't run the wrong version of CUBE
;===============================================================================
IF (SOFTWAREVERSION<60100)

CLEARERROR CODE=0 RESUME=T
   PROMPT QUESTION='WARINING you MUST upgrade CUBE',
          ANSWER='This model will only run on version 6.1.0 SP1 (or higher)'
   IF (RETURNCODE==2) EXIT
GOTO :BADROBOT
ENDIF
;===============================================================================

PAGEHEIGHT=32767
PAGEWIDTH=132

;if output folder accidently deleted
*md "{scenario_dir}\output"

;run-time calculation file
*echo %date%START%time% > "{SCENARIO_DIR}\OUTPUT\XTIME.prn"

; Open cluster nodes
IF ({cores}>1)
*CLUSTER TODdist 1-{cores} STARTHIDE EXIT
ENDIF


*echo FSUMTS Model Run - {SCENARIO_FULLNAME}>"{SCENARIO_DIR}\runtime.prn"
*echo Input Directory {SCENARIO_DIR}\input >>"{SCENARIO_DIR}\runtime.prn"
*echo ============================================================>>"{SCENARIO_DIR}\runtime.prn"
*echo Begin Run %date% %time% >>"{SCENARIO_DIR}\runtime.prn"
*echo ============================================================>>"{SCENARIO_DIR}\runtime.prn"
```

The NETWORK step



Notes:

1) **START**..... puts start-time in runtime file
3) **Setup SPDCAP Lookup**..... reads SPDCAP file, checks for errors, formats lookup table for next step
4) **Update Input Network**..... adds distance, time, vfactors and other data to the network
5) **Build Highway Paths/Skims**..... computes free-flow time and speed
6) **Make FHSKIMTT for Transit**..... converts free-flow time and speed data for mode-choice model"
7) **PRE TRANSIT PREP**
8) **PRE TRANSIT PATHS**

Note: *The Pre Transit Prep* and *Pre Transit Path* procedures included in NETWORK are identical to the procedures in the TRANSITMODEL. Documentation is in the TRANSITMODEL section.

The NETWORK step is where the input HWYNET_yya.NET consisting of NODES and LINKS is processed. Nodes provide shape to links by following roadway geometry, or, serve as a loading point for a TAZ. Links contain all of the roadway information required for the model, such as Area Type (urban, residential, rural) or Facility Type (freeway, arterial, collector) or Lanes (number of lanes) and other attributes (toll costs or transit only). Depending on which options are selected, different attributes are added, or removed, from the network, creating an UNLOADED_ayy.NET .

SPECIAL NOTICE: The INPUT and UNLOADED Networks Are Different!

- The INPUT networks for the E+C and LRTP models contain ALL proposed roadways from all of the proposed roadway configurations developed during the MPO/TPO long range transportation planning process.
- This allows for quick removal (or addition of) roadways, without having to recode links and nodes, again and again. It is expected this feature may be useful during the life of the model, as projects are advanced or set back, depending on fiscal constraints and other unforeseen developments.
- During the network step of the model processes, any link with a LRTP_key of "99" will be deleted from the unloaded network as speed, capacity, distance, time and BPR data are added.
- For example, managed lanes are coded as interior, express, roadways on both I-4 and I-75 (to the maximum of a 6+4 lane configuration). Managed lanes on I-75, however, were not in the SIS plan and were not considered to be "cost feasible" in the 2040 model network – and as such do not appear in the UNLOADED network used throughout the rest of the model processes.
- Therefore please, do not delete roadways with the LRTP_key of "99"
- The Field SV_LOSSTD is used for capacity evaluation (not model capacity) and should be changed as appropriate.

Note that in this step transit routes are merged with highway links so that: 1) errors and omissions may be quickly identified and, 2) transit paths/times are saved for subsequent use in the Trip Generation module.

SPECIAL NOTICE: The model's links on the input network contains all toll coding required to run the model. There is no longer a "tolllink_yya.dbf" file. When new toll roads are added, such as the Central Polk Parkway, the toll links also contain the following information:

TOLL	identification number
CTOLL	toll cost coefficient (see box below)
TOLLTYPE	toll type: 1, 2, 3
PLZADESC	description
PLZALNSMAX	lanes
CARTOLL	dollar amount of the toll
SVCMINUTES	dwell time, minutes
SVCSECONDS	dwell time, seconds

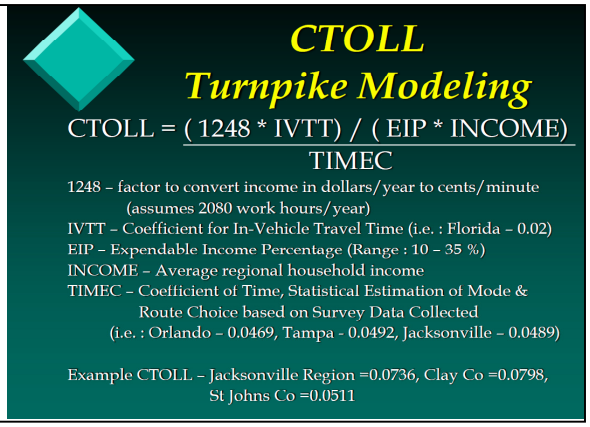
Acceleration and Deceleration links, on either side of the toll were also be coded with:

TOLL	identification number
TOLL_DEC	"1" if deceleration lane
TOLL_ACC	"1" if acceleration lane

SUNPASS lanes should be explicitly coded as separate lanes so no dwell time will be applied for stopping to pay the toll, although deceleration and acceleration lanes are still required (until all tolls are coded as type (3) open-road tolling.

CTOLL	Average HHINC	35% value of time	10% value of time
Charlotte	46,926	0.031	0.108
Collier	58,402	0.025	0.087
Desoto	41,299	0.035	0.123
Glades	39,283	0.037	0.129
Hardee	39,897	0.036	0.127
Hendry	41,767	0.035	0.121
Highlands	37,523	0.039	0.135
Lee	50,761	0.029	0.100
Manatee	53,647	0.027	0.095
Okeechobe	43,562	0.033	0.116
Polk	42,268	**0.034**	0.120
Sarasota	55,149	0.026	0.092

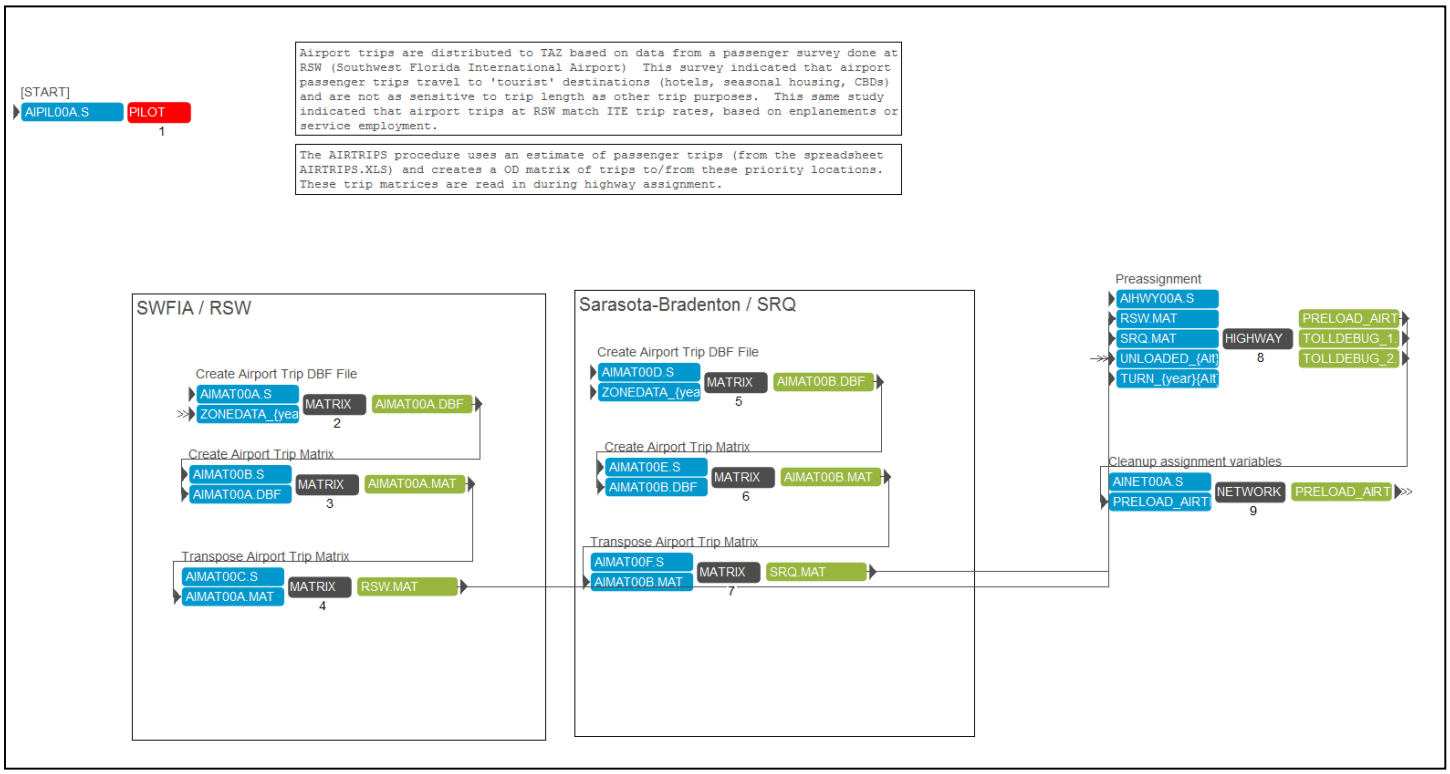
using the coefficient of time for mode route choice based upon Tampa survey: 0.0492



Note: All toll links distances are "corrected" in the NETWORK step, as shown below:

```
; reset toll-link distance
IF (FTYPE=99)
DISTANCE=0.01
DISTANCEFT=52.8
ENDIF
```

The AIRPORTS step
SPECIAL NOTICE: This procedure used for estimation of airport trips, is only found in the D1RPM.



Notes:

1) [**START**] ..... puts start-time in runtime file
2) **Create Airport Trip DBF File** ..... creates an airport trips database file for RSW (SouthWest Florida International Airport) with destinations based upon formulas using socioeconomic data from the ZONEDATA_yya.DBF file and the number of enplanements from the ENPLANEMENTS spreadsheet
3) **Create Airport Trip Matrix** ..... reformats the DBF file into a matrix
4) **Transpose Trip Matrix** ..... self-explanatory.
5) **Create Airport Trip DBF File** ..... creates an airport trips database file for SRQ (Sarasota-Bradenton International Airport) based upon formulas using socioeconomic data from the ZONEDATA_yya.DBF file and the number of enplanements from the ENPLANEMENTS spreadsheet
6) **Create Airport Trip Matrix** ..... reformats the DBF file into a matrix
7) **Transpose Trip Matrix** ..... self-explanatory.
8) **Preassignment** ..... self-explanatory.
9) **Cleanup Assignment Vars** ..... renames cube variables into English i.e. V1_1=SRQtrips

Airport trips are estimated using "*ENPLANEMENTS TO 2043.XLS*" spreadsheet.[1] Additional data from the Florida Aviation System Plan (FASP) and the Federal Aeronautics Administration (FAA) were added to the spreadsheet (contained in the \documentation\reference folder) while developing estimates for the D1RPM 2010-2040 enplanements.

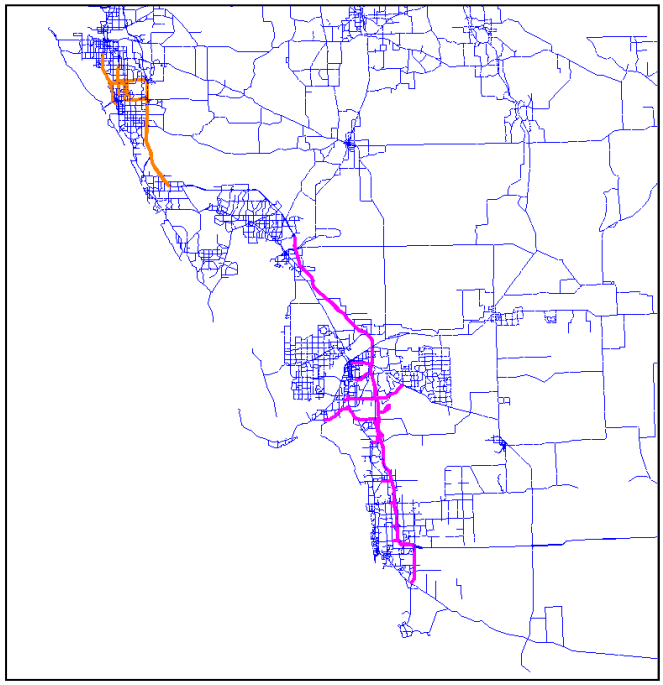
The 1990 Lee County FSUTMS model included a DOS-based special airport trip generation and distribution procedure to better replicate the travel patterns of persons using the Southwest Florida International Airport. For the 2000 model validations, the procedure was modified to use data in the ZDATA1 and ZDATA2 files and run in the job stream. For the 2007 model validations these procedures were replicated using CUBE script.

The distribution of trips based upon an 1989 Airport O & D survey, which indicated that beach and resort areas attract more airport trips than residential areas, regardless of the distance from the airport. Specifically: trip distribution at the airport entrance was as follows: 20% to the north; 41% to the south; 6% to the east; and, 33% to the west. Additionally, the survey also provided percentages of trips crossing the county lines as follows: 33% cross the Lee/Collier County line, 9% cross the Lee/Charlotte county line, with the remaining 58% distributing within Lee County.

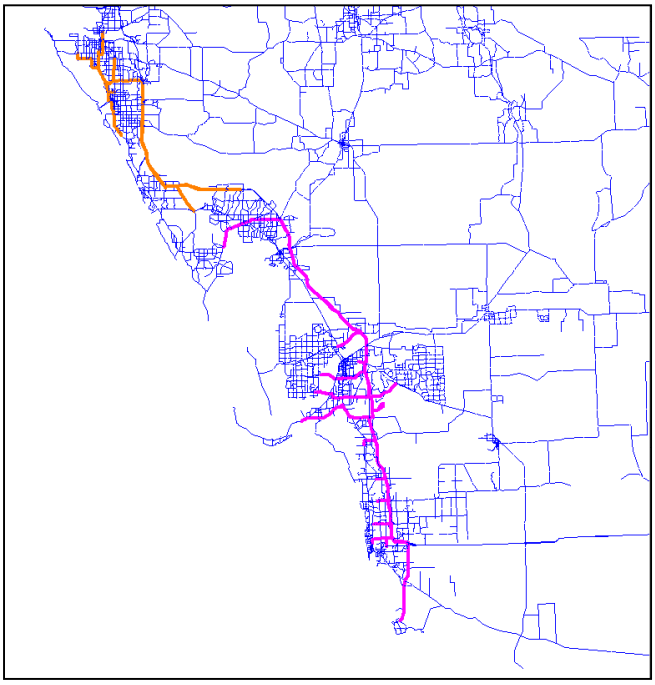
The procedure uses the ZDATA1 and ZDATA2 files, to calculate an "attractiveness" quotient, based upon each TAZs potential to attract air travelers.

As can be seen by comparing Fig1 and Fig2 without the special AIRPORT procedure, Trip Distribution limited trip distance, resulting in trips being distributed to the closest traffic analysis zones. With the special AIRPORT procedure trips are distributed to the beach and resort areas as well as to Collier County and Charlotte County as indicated by the survey.

Before

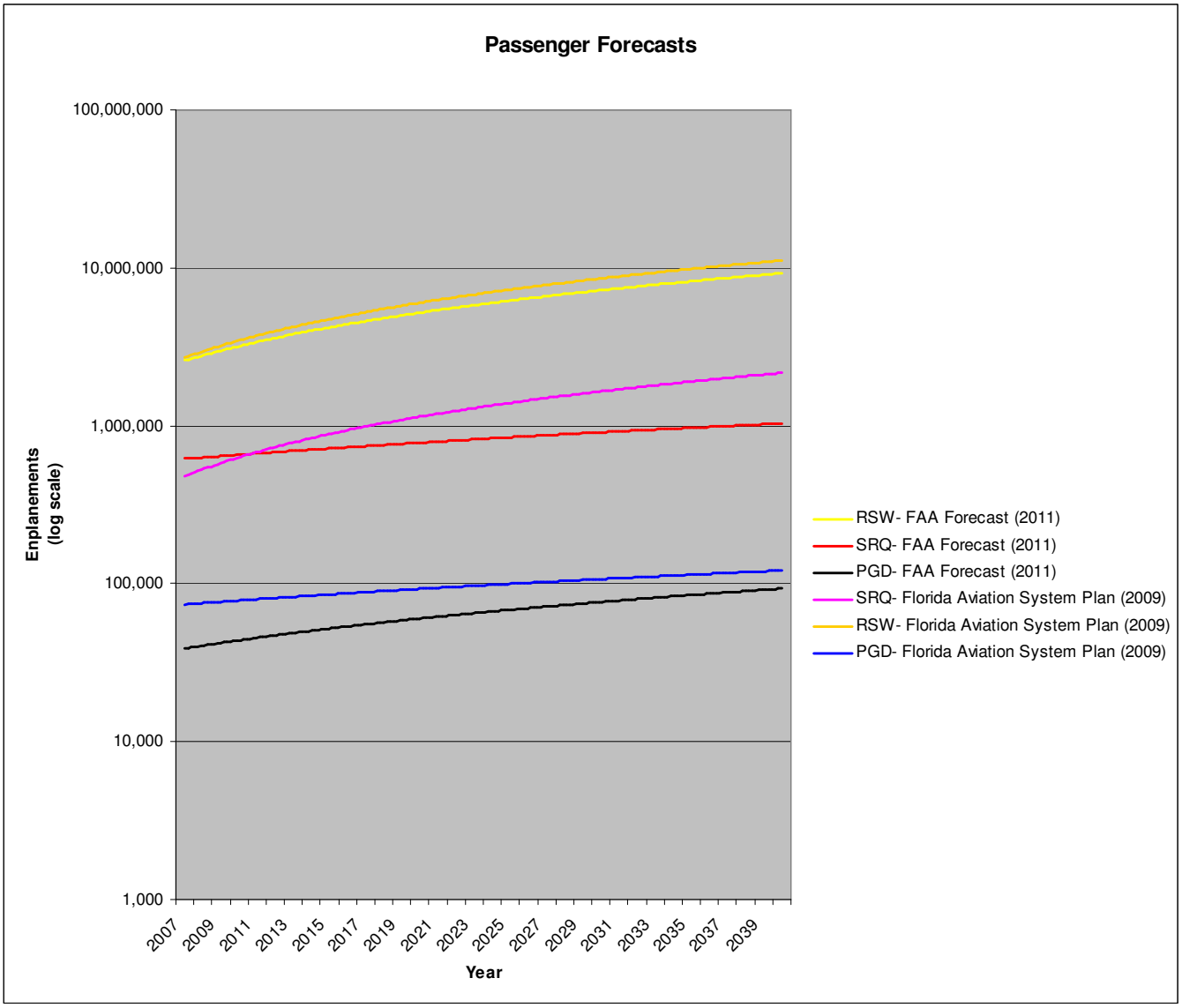


After



[1] The original Air Passenger Vehicular Trip Generation Summary spreadsheet, URS Corporation, May 2001, as amended and supplemented with FAA 2011 forecast data by Traf-O-Data, 2015

The Enplanements Spreadsheet



Enplanement Forecast (2011)

Year	RSW faa forecast	RSW fasp	SRQ faa forecast	SRQ fasp	PGD faa forecast	PGD fasp
2007	3,964,603		787,972			
2008	3,821,830		773,211		36,045	76,611
2009	3,682,535	3,668,279	670,705	675,969	45,353	
2010	3,639,445		660,305		45,355	
2011	3,810,750		664,044			
2012	3,458,809		643,008			
2013	3,567,370		648,274			82,532
2014	3,707,127	4,441,607	659,014	826,381		
2015	3,901,552		678,593			
2016	4,099,244		696,712			
2017	4,256,927		709,639			
2018	4,420,752		722,809			88,910
2019	4,590,957	5,377,963	736,227	1,010,262		
2020	4,767,798		749,898			
2021	4,951,535		763,828			
2022	5,142,444		778,021			
2023	5,340,810		792,481			
2024	5,546,932		807,214			
2025	5,761,113		822,224			
2026	5,983,678		837,517			
2027	6,214,960		853,099			
2028	6,455,306		868,976			103,184
2029	6,705,081	7,884,485	885,151	1,509,876		
2030	6,964,661		901,632			
2031	7,234,437		918,424			
2032	7,514,817		935,533			
2033	7,806,228		952,965			
2034	8,109,114		970,726			
2035	8,423,934		988,823			
2036	8,751,170		1,007,261			
2037	9,091,320		1,026,046			
2038	9,444,906		1,045,185			
2039	9,812,472		1,064,685			
2040	10,194,582	11,541,253	1,084,554	2,249,004	92,866	122,323

Sources:
http://www.cfaspp.com/Airport/AirportList.aspx
LCPA, Southwest Florida International Airport (RSW) Enplanement Passengers", 2009
http://www.srq-airport.com/newsroom/srq-documents/airport-statistics.aspx

The AIRTRIPS Program

The AIRTRIPS program, in CUBE script, follows these steps

Get Data From Keys

```
;*****************************************************************************
;get data from KEYS
AIRZONE={RSW}                    ; the airport zone
AIRvTRIPS=({RSWTRIPS} * 0.5)     ; TOTAL airport trips (divided in half, because we will transpose the matrix to get return trips)
AIRNORTH=(AIRvTRIPS*{RSWN})      ; trips to be distributed north of Lee Co.
AIRSOUTH=(AIRvTRIPS*{RSWS})      ; trips to be distributed south of Lee Co.
AIREAST=(AIRvTRIPS*{RSWE})       ; trips to be distributed east Lee Co.
_RSWW=1-{RSWN}-{RSWS}-{RSWE}
AIRTRIPS=(AIRvTRIPS*_RSWW)       ; trips to be distributed within of Lee Co.
```

Get ZONEDATA

```
;get data from TAZ
mzone=zi.1.zone
mpop[mzone]=(zi.1.sfpop+zi.1.mfpop)
mseasonal[mzone]=((zi.1.sf_pctvnp-zi.1.sf_pctvac)+(zi.1.mf_pctvnp-zi.1.mf_pctvac))
mhpop[mzone]=zi.1.hmpop
memp[mzone]=zi.1.tot_emp
```

Accumulate totals

```
; accululates totals
if(zi.1.zone>={CollierTAZ} & zi.1.zone<{LeeTAZ})
   popS=popS+(zi.1.sfpop+zi.1.mfpop)
   seasonalS=seasonalS+((zi.1.sf_pctvnp-zi.1.sf_pctvac)+(zi.1.mf_pctvnp-zi.1.mf_pctvac))
   hotelS=hotelS+zi.1.hmpop
   empS=empS+zi.1.tot_emp
```

Calculate Weighting factors

```
 ; calculate weight factors
 loop x=1,{ZONESI}
 if (X>={CollierTAZ} & X<{LeeTAZ})
    pop[X] = mpop[x]/popS
    seasonal[X]= mseasonal[x]/seasonalS
    hotel[X] = mhpop[x]/hotelS
    emp[X] = memp[x]/empS
       total[X] = pop[X]+seasonal[X]+hotel[X]+emp[X]
       totalS=totalS+total[X]
```

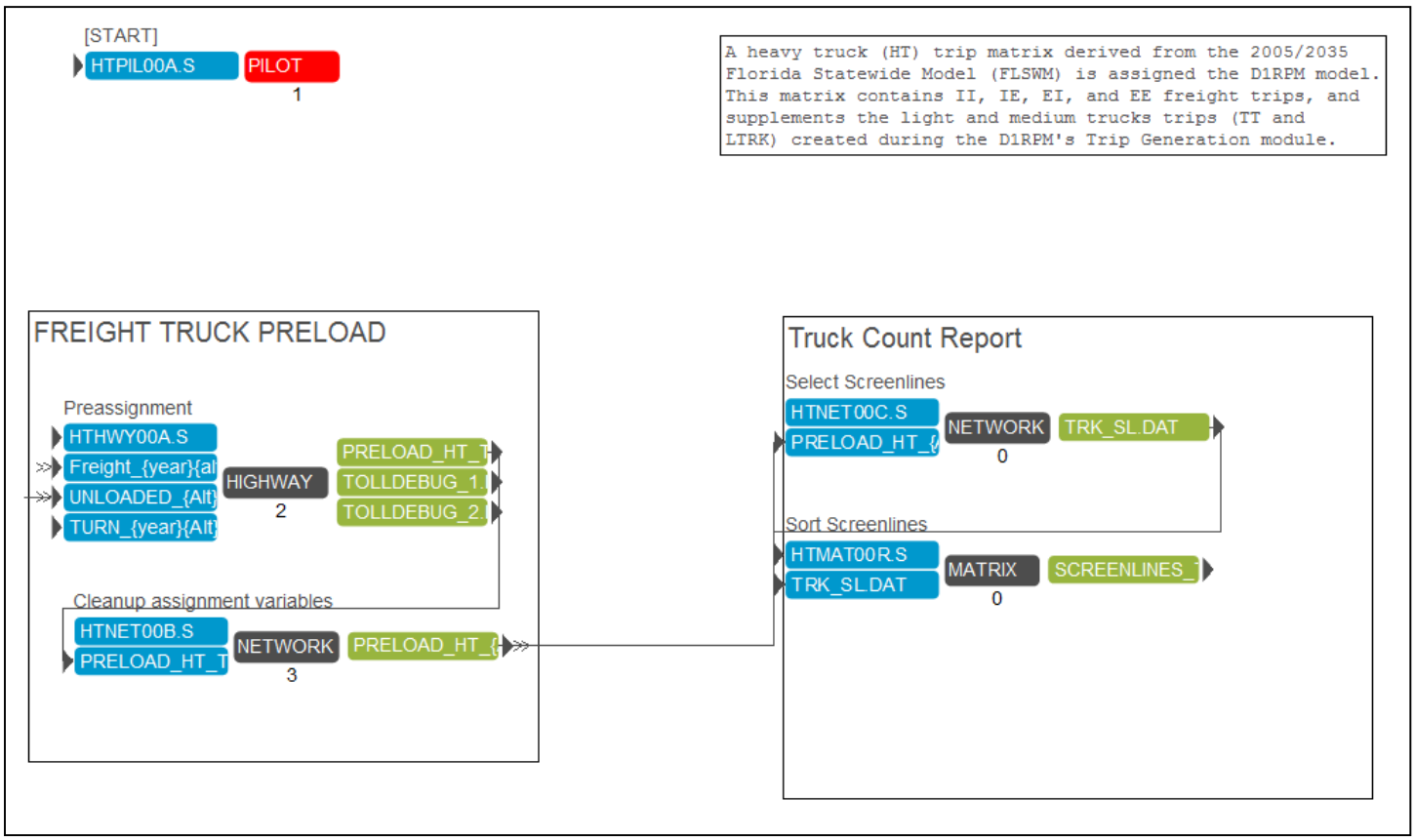
Apply Weighting Factors

```
; apply weights
loop x=1,{ZONESI}
if (X>={CollierTAZ} & X<{LeeTAZ})
 if (totalS=0)
  weight[X]=1
  else
  weight[X] = total[X]/totalS
 endif
```

Write out records to DBF file

```
;*****************************************************************
; write out records
;*****************************************************************
ro.from=   x
ro.to=     AIRZONE
ro.mode=   1
ro.vtrips= attrs[X]
WRITE RECO=1
endloop
endif
ENDRUN
```

The FREIGHT step
SPECIAL NOTICE: This procedure used for estimation of truck trips, is only found in the D1RPM.

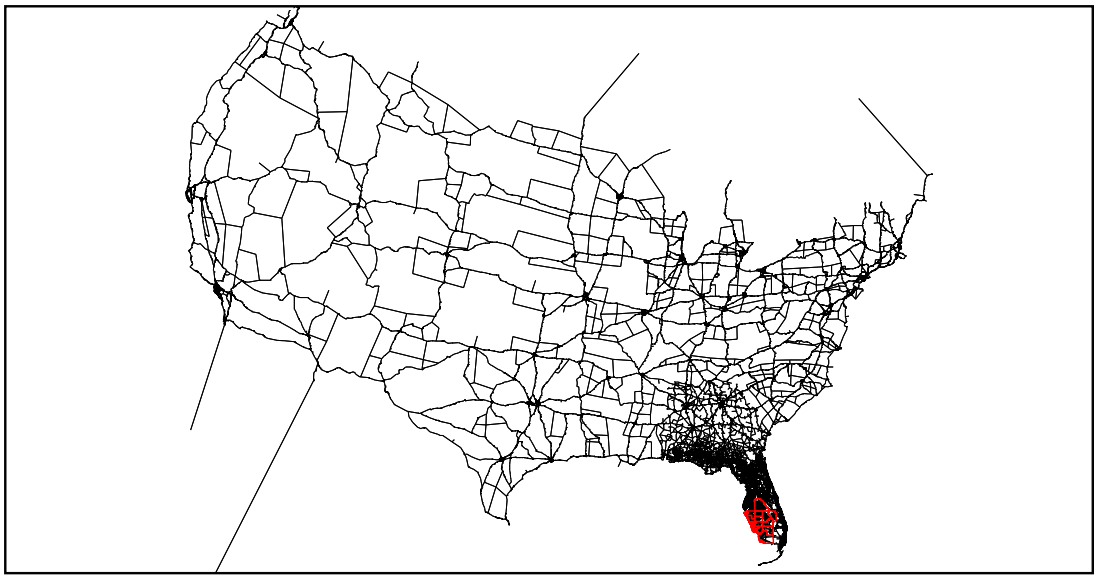


Notes:

1) [**START**] ..... puts start-time in runtime file
2) **Preassignment** ..... a highway load of just HT vehicle trips
3) **Cleanup Assignment Vars** ..... re-names CUBE variables into English sounding variables i.e. V1_1= HT
4) **Select Screenlines** ..... a highway load of just HT vehicle trips
5) **Sort Screenlines** ..... sorts and print report

This process adds to the D1RPM, truck trips estimated by the current Florida Statewide Model (FLSWMv5124) disaggregated to District One Planning model zones.

The Florida Statewide Model (FLSWMv5124) was chosen because the statewide model contains procedures for estimating tons of goods movement by water, rail, highway and air to/from Florida, United States and from around the world (see graphic) It is reasonable to assume that the trips can be disaggregated from the larger FLSWFM TAZs to the smaller D1RPM TAZs based on the share that the truck Productions(Ps) and Attractions(As) in the D1 RPM TAZ are to the Ps and As in the FLSWFM TAZs in which they nest.



The current Florida Statewide Freight Model v. 5124 (FLSWFM) produces freight truck volumes for base and forecast years of trucks by 14 Commodity Groups (CG) as well as non-freight trucks. The process consists of the Generation, Distribution and Mode Choice of tons of freight in 14 Commodity Groups (CG) chosen to represent the primary commodities traveling on Florida's transportation system. After the freight tons have been allocated to the truck model, the table is converted from annual tons to annual truck vehicles and from annual trucks to daily truck vehicles. This conversion is made so that truck trips can be assigned as part of a multiclass assignment of tables of freight trucks, the other trucks that do not carry freight and passenger vehicles. FLSWFM trip rates were calculated using a regression analysis of Florida-specific economic data.

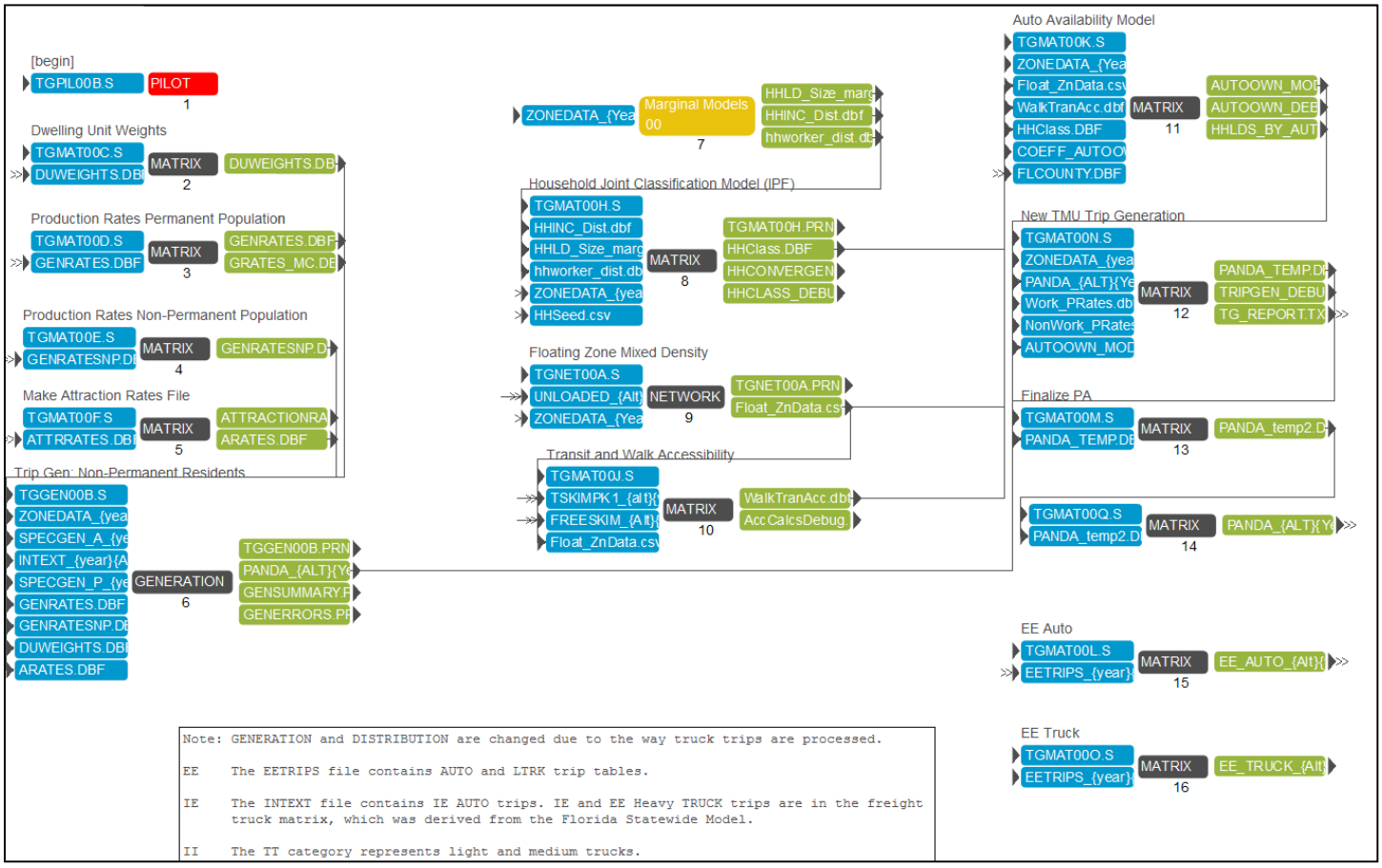
A subarea extraction process by which a trip table that represents a larger area is processed using the network of the larger area, and a list of links that cross the model boundary of the smaller region. was used to create tables of truck trips that pass through links on the model boundary can be treated as external stations of the smaller model region. The trip table TAZs within the model boundary will have the same size and scale of the larger model.

Trips are disaggregated to the more numerous and smaller TAZs within the model region using the FLSWFM equations to calculate Productions and Attractions in the D1RPM TAZs Using this NAICS3 employment, other ZDATA for the D1RPM TAZs, and the Production and Attraction equations from the FLSWFM, it is possible to estimate what the truck Productions (Ps) and Attractions (As) would have been in each D1RPM TAZ using the FLSWFM equations. These Ps and As can then be used as a disaggregation factor, defined as the share of Ps (or As) that a D1RPM TAZs is of the Ps (or As) in the FLSWFM TAZ in which it nests.

The disaggregated tables can be used as the basis for forecasting future truck tables. These future year tables were created by using the base year table as the seed to a FRATAR program where the growth in the Productions (Origins) and in the Attractions (Destinations) is increased by the amount of the growth in the industries that were the explanatory variables in the FLSWFM Production and Attraction equations. Because those equations require detailed NAICS3 industry employment that is available in the base year but is not available in the forecast year, the forecast growth for these trucks was made by associating general employment categories with the productions and attractions of each truck table, and applying that growth, at the D1 RPM TAZ level, to each table in a FRATAR process.

The Trip Generation Step

SPECIAL NOTICE: These procedures are taken directly from the Transit Update Model Project, and, other than the FDOT Olympus Training Model, are only found in the D1RPM.



Notes:

1) **[START]** ..... puts start-time in runtime file
2) **Dwelling Unit Weights** ..... writes DUWEIGHTS file out to standard format, which allows for various input formats (csv, txt, dbf, xls)
3) **Production Rates Permanent Population** ..... writes GENRATES file out to standard format, which allows for various input formats (cave, txt, dbf, xls)
4) **Production Rates Non-Permanent Population** ..... writes GENRATESNP file out to standard format, which allows for various input formats (csv, txt, dbf, xls)
5) **Make Attraction Rates File** ..... writes GENRATESAT file out to standard format, which allows for various input formats (csv, txt, dbf, xls)
6) **TripGen Non-Permanent Residents** ..... trip generation for seasonal residents, puts special generator and external-internal data into temporary PANDA matrix
7) **MARGINAL MODELS** ..... checks for out-of-range household size, household income and household workers
8) **Household Joint Classification (IPF)** ..... Iterative Proportional Fit sub-model process
9) **Floating Point Mixed Density** ..... sub-model
10) **Transit walk accessibility** ..... makes a "walk time" skim
11) **Auto Availability Model** ..... sub-model
12) **New TMU Trip Generation** ..... trip generation

13) **Finalize PA** ..... prepares the trip matrix for the Trip Distribution step. It also applies adjustments for changes in Florida's unemployment rate, as detailed in TM-3
15) **Prepares the EE auto matrix**..... self-explanatory
16) **Prepares the EE truck matrix** ..... self-explanatory

This Trip Generation module, which was developed for the TMU project[1] uses several sub-models in a combination of techniques to estimate the number of trips bound to, or destined from, each Traffic Analysis Zone. The process factors seasonal and permanent populations by the appropriate trip generation rate, which is related to the number of occupied dwelling units, auto ownership and household income. Each grouping is what will be referred to as "market segments".

The trip generation model uses:

- New (Florida) trip generation rates from 2010 from ACS, NHTS and Census data are utilized.
- Trip purposes split trips into 47 “travel markets” using income and auto availability. Also,
- EE and IE trip matrices now contain auto and truck trips.
- New purposes are provided for: college and university trips; there are two classes of home-based work trips (high-income trips travel further); and there is a new purpose for mid-day ‘lunch-hour’ travel.

A trip’s purpose is important in determining trip length during the trip distribution module. For example, people generally do not travel as far on a shopping trip as they would commuting to work. Trip purpose also plays a significant part during the modal choice module. When estimating transit use, the propensity to use public transit and carpools is higher for work trips than for other trip purposes. When converting person-trips to vehicle-trips in the modal choice module, average vehicle occupancies differ by trip purpose. For example, people commonly drive alone to work although they rarely drive alone to the beach or other recreational activities. In the traffic assignment module, trip purpose has been used in some specialized models to help time-of-day travel estimates. Analysis for toll roads and high-occupancy vehicle facilities often focuses on work trips, which predominate during peak hours.

SPECIAL NOTICE: Trip purposes and Trip Rates are changed due to the way truck trips are processed.

The heavy truck (HT) matrix imported from the FLSWM contains all truck trips of that classification: 1) internal-to-internal; 2) internal-to-external, and; 3) external-to-external (through trips).

Two other files, EETRIPS and INTEXT also contain AUTO and TRUCK trips. In both cases "trucks" may be defined as "classifications (non-HT) that we may wish to exclude from special use lanes".

The trip rate for the TT category (which represents a miscellaneous category of "truck" and "taxi" trips) has been reduced to account for the addition of the HT truck matrix,

Addressing Unemployment
Below is a description of the procedure used to adjust trip generation for changes in employment between the base and future year models.

There are several reason a procedure for addressing changes in the unemployment rate has been included in the D1RPM. This requirement came about because Florida's unemployment rate for 2010 was about 10.9 percent -- much higher than the historical long-term unemployment rate, for Florida, which hovers around 5 percent. This is also supported by comparing historical traffic counts to 2010 traffic counts. The downturn in the economy resulted in fewer vehicle trips in the validation year.

[1] *"Task 06, Transit Modeling Update, Technical Memorandum 1, Trip Generation Review and Recommended Model Development Guidance, Florida Standard Urban Travel Model System, May 2011"*

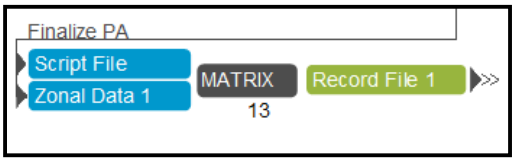
Secondly, the model's trip generation rates, which were developed from a 5 year average of ACS household surveys, reflect the higher trip making with an improved economy. This is typical, as there is a gap between when households are surveyed, when the data is compiled and when data is made available (generally, the trip rates for the model reflect 2007 conditions). Without a correction factor, more trips are generated and the resulting model's volume/count ratio hovers around 1.04-1.06 percent

Additionally. data for the model's validation year, 2010, was developed from the U.S. Census of the population for that year and from the InfoUSA of employers database, which is also keyed to 2010 conditions. Again, there is a lag between the time employers are surveyed and employment data is made available. An inquiry and response from InfoUSA confirms that no correction factors for unemployment rate is included in the data.

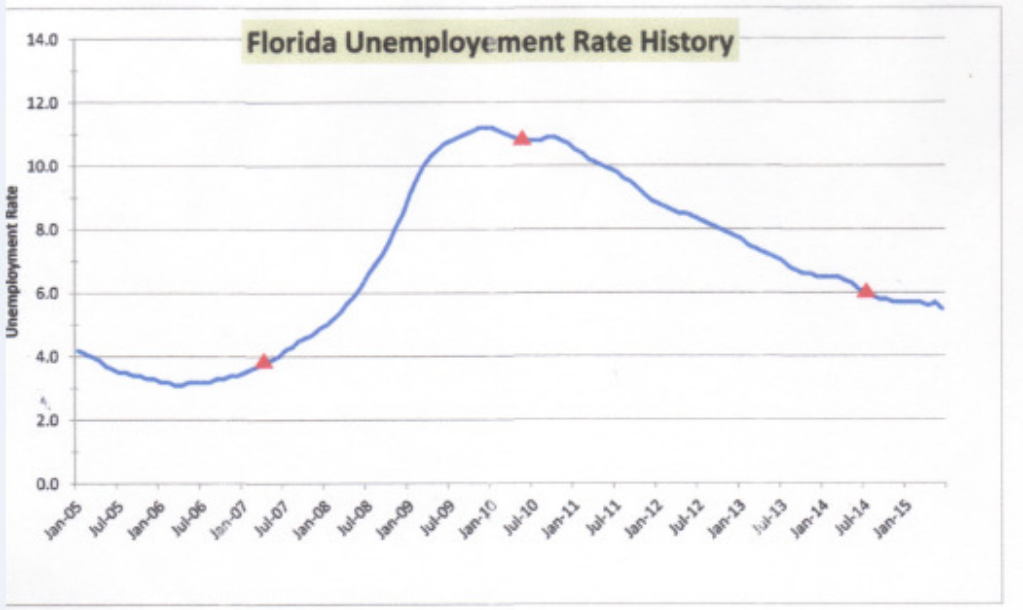
Lastly, uncorrected, future year model volumes would be artificially low. Indeed, traffic counts for 2014 indicate that Florida's economy has returned to normal, and traffic volumes are similar to 2007 traffic count volumes.

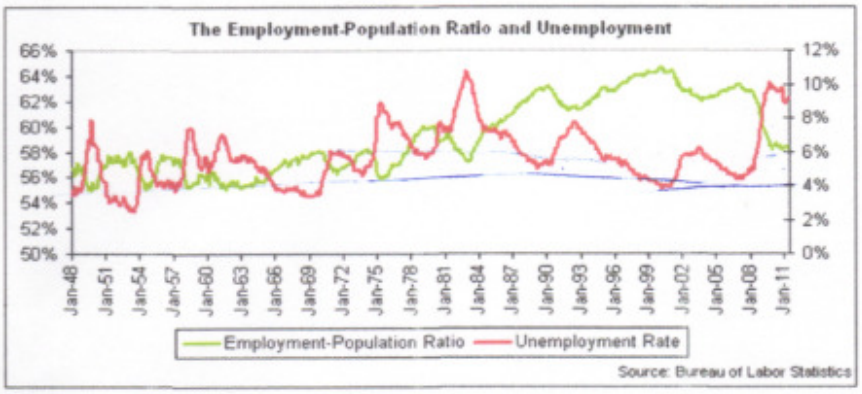
The procedure (which is similar to the process used in D7) is to apply the difference in base year and model year unemployment rates using two "keys" in the model. Keys may be changed by the user. For the validation year 2010 the keys are: *base_unemployment* (0.109), and; *current_unemployment* (0.042) For the future year (2040) the "keys" are the same (0.050)

The rates are applied after Trip Generation in step 13, as shown below:

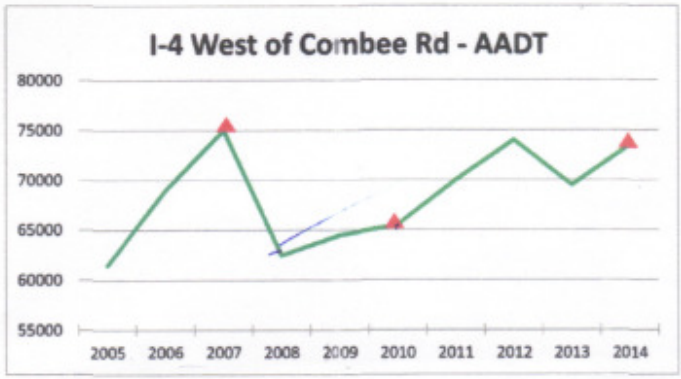



```
; Do not change filenames or add or remove FILEI/FILEO statements using an editor. Use Cube/Application Manager.
RUN PGM=MATRIX MSG='Finalize PA'
FILEI ZDATI[1] = "{SCENARIO_DIR}\OUTPUT\PANDA_TEMP.DBF"
FILEO RECO[1] = "{SCENARIO_DIR}\OUTPUT\PANDA_{ALT}{Year}.DBF",
  FIELDS= Z,HBW1P,HBW1A,HBW2P,HBW2A,HBSHP,HBSHA,HBSRP,HBSRA,HBOP,HBOA,HBSCP,HBSCA,HBCUP,HBCUA,NHBP,NHBA,TTP,TTA,IEP,IEA

PAR ZONES={ZONESA}

 RO.Z=I
; TMU documentation shows that HBW trips from high-income households tend to be longer
; there is no evidence that low income trips tend to be shorter, therefore
; HBW trips are separated into two categories with separate Friction Factors

; HB WORK for income category 1,2,3,5,6
HBW1P=(ZI.1.HBWP1+ZI.1.HBWP2+ZI.1.HBWP3+ZI.1.HBWP5+ZI.1.HBWP6)* ((1-{current_unemp})/(1-{base_unemp}))

; HB WORK for high-income caterogy 4,7
HBW2P=(ZI.1.HBWP4+ZI.1.HBWP7)* ((1-{current_unemp})/(1-{base_unemp}))

HBSHP=(ZI.1.HBSHP1+ZI.1.HBSHP2+ZI.1.HBSHP3+ZI.1.HBSHP4+ZI.1.HBSHP5+ZI.1.HBSHP6+ZI.1.HBSHP7)* ((1-{current_unemp})/(1-{base_unemp}))
HBSRP=(ZI.1.HBSRP1+ZI.1.HBSRP2+ZI.1.HBSRP3+ZI.1.HBSRP4+ZI.1.HBSRP5+ZI.1.HBSRP6+ZI.1.HBSRP7   )* ((1-{current_unemp})/(1-{base_unemp}))
HBOP=(ZI.1.HBOP1+ZI.1.HBOP2+ZI.1.HBOP3+ZI.1.HBOP4+ZI.1.HBOP5+ZI.1.HBOP6+ZI.1.HBOP7)* ((1-{current_unemp})/(1-{base_unemp}))
HBSCP=ZI.1.HBSCP1+ZI.1.HBSCP2+ZI.1.HBSCP3+ZI.1.HBSCP4
HBCUP=ZI.1.HBCUP1+ZI.1.HBCUP2+ZI.1.HBCUP3+ZI.1.HBCUP4
NHBP=(ZI.1.NHBWP+ZI.1.NHBOP)* ((1-{current_unemp})/(1-{base_unemp}))
IEP=ZI.1.IEP
HBW1A=(ZI.1.HBWA1+ZI.1.HBWA2+ZI.1.HBWA3+ZI.1.HBWA5+ZI.1.HBWA6)* ((1-{current_unemp})/(1-{base_unemp}))
HBW2A=(ZI.1.HBWA4+ZI.1.HBWA7)* ((1-{current_unemp})/(1-{base_unemp}))
HBSHA=(ZI.1.HBSHA)* ((1-{current_unemp})/(1-{base_unemp}))
HBSRA=(ZI.1.HBSRA)* ((1-{current_unemp})/(1-{base_unemp}))
HBOA=(ZI.1.HBOA)* ((1-{current_unemp})/(1-{base_unemp}))
HBSCA=ZI.1.HBSCA
HBCUA=ZI.1.HBCUA
NHBA=(ZI.1.NHBWA+ZI.1.NHBOA)* ((1-{current_unemp})/(1-{base_unemp}))
IEA=ZI.1.IEA
; factor TT down to account for Heavy Truck preload
TTA=ZI.1.TTA*.8
TTP=ZI.1.TTP*.8
WRITE RECO=1
ENDRUN
```





	Polk Model SE Data		Growth
	2007	2010	2007-2010
Employees	245928	255593	9665
Population	572048	589811	17763
Emp/Pop	0.43	0.43	0.54



External Trips

Development of the model also required that automobile and truck trip volumes be assigned to roadways that exit the study area at "external stations". There are special considerations that are taken into account at these locations. For 2010, traffic count data were used to establish external station volumes at these locations. For the future year, however, traffic volumes used at these locations in the D1RPM were coordinated with the adjacent FDOT district models.

Loaded model networks from the latest adopted (YR2040) models for FDOT Districts 4, 5 and 7 were provided for this purpose. Total vehicle trips were identified for: drive-alone and shared-ride auto, as well as for light, medium and heavy trucks. These data were presented to each of the MPO's in The District, for discussion and to determine of these volumes agree with expectations of development for their area.

Special consideration was given to:

Internal-to-External vehicle trips to attractions near the model area:
NE Polk County, where about 20% of the home-based trips are attracted to Orange County's Theme-Parks.
Manatee County, where HBW trips are attracted towards Pinellas County and Hillsborough County.
Trips from Rural Areas head East, towards the Florida Coast on SR 70, US 98 and US 27.

Additionally, discussion and agreement was provided on the status of other type of "external station" trip: through-trips. Special consideration was given to:

External-to-External or "through trips" along the following corridors:
I-4 east-to-west vehicle trips (autos and trucks),
I-275-to-I-75 vehicle trips (autos and trucks),
I-75 north-to-south truck trips from Tampa to Miami.

An external trip table worksheet for 2010 and 2040 EETRIPS.XLS (provided in the model's \documentation folder) lists external station counts (autos and trucks) and allows for modifying external productions and attractions, as needed, during validation. It is used to update contained in the model input folder as: INTEXT_10A.DBF, SPECGEN_A_10A.DBF and SPECGEN_P_10A.DBF contained in the model input folder. Relevant parts of this worksheet are shown below:

2040 EXTERNALS PKFIX.NET

Zone	2010 EXT	Name	Dir			PSWT BY DIR	pcnt trks						freight preload	LT EE	LT IE	AUTO EE	AUTO IE	% Prods	intext	specgen Attrs	specgen Attrs
	5629	I-275	W			53,118	3.350	0.0335	1.220	0.0122	3559	1296	4606				101631	0.50	50,815	60,978	31,481
	5630	US 41 N	W			8,006							98				15913	0.50	7,957	9,548	5,012
	5631	I-75 N	S			53,371	12.230	0.1223	9.130	0.0913	13054	9746	12496	1900		4750	88546	0.50	44,273	53,127	25,092
	5632	US 301	S			3,416							12				6819	0.50	3,410	4,092	2,153
	5633	CR 579	S			1,033							0				2065	0.50	1,033	1,239	652
	5634	CR 39	W			4,543							24				9063	0.50	4,531	5,438	2,860
	5635	CR 674	W			1,761							4				3518	0.50	1,759	2,111	1,111
	5636	CR 640 W	W			6,693							58				13329	0.50	6,664	7,997	4,202
	5637	CR 676	W			1,961							0				3921	0.50	1,961	2,353	1,238
	5638	SR 60 W	W			22,500							112				44888	0.50	22,444	26,933	11,141
	5639	Medulla Rd	W			3,062							216				5908	0.50	2,954	3,545	1,838
	5640	US 92 W	W			8,860							10				17709	0.50	8,855	10,625	5,591
	5641	I-4 W	W			120,618	14.340	0.1434	8.260	0.0826	34593	19926	22662	3325		22800	179624	0.50	89,812	107,774	57,012
	5642	Knights Station Rd	W			4,750							116				9384	0.50	4,692	5,630	2,948
	5643	US 98 N	W			8,085							284				15886	0.50	7,943	9,532	4,979
	5644	SR 471	N			2,223							192				4255	0.50	2,127	2,553	1,318
	5645	SR 33	N			5,963							44				11882	0.50	5,941	7,129	3,747
	5646	US 27 N	N			36,141							106				72177	0.50	36,088	43,306	7,059
	5647	Champions Gate Blvd	E			2,495							0				38410	0.50	19,205	23,046	8,936
	5648	I-4 E	E			97,969	18.800	0.1880	15.280	0.1528	36836	29939	27490	3325		22800	129498	0.50	64,749	77,699	40,537
	5649	W Lake Wilson Rd	N			9,722							10				19435	0.50	9,717	11,661	4,975
	5650	US 92 NE	E			7,580							676				14484	0.50	7,242	8,690	4,484
	5651	CR 580 / Cypress Pkwy	E			26,410							54				52766	0.50	26,383	31,660	10,656
	5652	SR 60 E	N			6,973											13947	0.50	6,973	8,368	4,404
	5653	US 441 N	E			3,202											6404	0.50	3,202	3,843	2,022
	5654	CR 68 E	E			2,088							740				3436	0.50	1,718	2,061	986
	5655	SR 70 E	S			6,159							914				11405	0.50	5,702	6,843	3,480
	5656	SR 710 SE	S			7,203							40				14367	0.50	7,183	8,620	4,533
	5657	US 98 / US 441 SE	E			2,923							326				5520	0.50	2,760	3,312	1,700
	5658	US 27 / SR 80 E	E			13,885							300				27469	0.50	13,735	16,482	8,635
	5659	Alligator Alley	W			18,892							84	1900		4750	32000	0.50	16,000	19,200	8,895
	5660	US 41 Collier County	W			2,914							586				5241	0.50	2,621	3,145	1,576
	5661	Marigold	S			18,109							6222				29996	0.50	14,998	17,997	8,895
	5662	Tri-County Rd				4,000							16				7984	0.50	3,992	5,988	1,576
		5661 Marigold					9,531								4654		5000		4408	0.50	2,204	3,306
		5662 Tri-County Rd					1,124								12				2235	0.50	1,118	1,676

During discussions with each MPO it was concluded that "external-stations" traffic volumes would grow at a rate of 3% per year, slightly higher than socioeconomic growth within the D1RPM model area. Exceptions were for higher growth were allowed on SR60, and roadways serving NE Polk county in the vicinity of I-4 east.

County	Zone	Roadway	2010 PSWT	2035 LRTP	% Growth	Adjacent Model	% Growth	Use	% Growth	Notes
Manatee	5629	I-275	55,914	97,528	2.98%	126,764	5.07%	106,237	3.00%	limited bridge capacity
Manatee	5630	US 41 N	8,427	20,406	5.69%	42,128	16.00%	16,011	3.00%	
Manatee	5631	I-75 N	56,180	115,541	4.23%	116,218	4.27%	106,742	3.00%	
Manatee	5632	US 301	3,596	28,643	27.87%	21,036	19.40%	6,831	3.00%	
Manatee	5633	CR 579	1,087	4,220	11.53%	3,368	8.40%	2,065	3.00%	
Manatee	5634	CR 39	4,783	14,551	8.17%	10,028	4.39%	9,087	3.00%	
Polk	5635	CR 674	1,854	4,095	4.84%	4,948	6.67%	3,522	3.00%	
Polk	5636	CR 640 W	7,046	10,500	1.96%	10,733	2.09%	13,387	3.00%	
Polk	5637	CR 676	2,064	2,205	0.27%	3,240	2.28%	3,921	3.00%	
Polk	5638	SR 60 W	18,652	40,375	4.66%	54,397	7.67%	45,000	4.71%	as per Ryan 1/27/15
Polk	5639	Medulla Rd	3,223	1,260	-2.44%	1,500	-2.14%	6,124	3.00%	
Polk	5640	US 92 W	9,326	9,345	0.01%	23,139	5.92%	17,719	3.00%	
Polk	5641	I-4 W	126,966	219,260	2.91%	281,808	4.88%	241,236	3.00%	
Polk	5642	CR 582 / Knights Station Rd	5,000	11,025	4.82%	9,211	3.37%	9,500	3.00%	
Polk	5643	US 98 N	8,511	14,490	2.81%	14,797	2.95%	16,170	3.00%	
Polk	5644	SR 471	2,340	6,510	7.13%	3,425	1.85%	4,447	3.00%	
Polk	5645	SR 33	6,277	12,061	3.69%	15,418	5.83%	11,926	3.00%	
Polk	5646	US 27 N	38,043	94,032	5.89%	91,920	5.66%	72,283	3.00%	
Polk	5647	Champions Gate Blvd	11,500	38,410	9.36%	64,156	18.32%	38,410	7.80%	match previous estmiate
Polk	5648	I-4 E	103,125	189,858	3.36%	158,934	2.16%	195,938	3.00%	
Polk	5649	W Lake Wilson Rd	9,722	19,445	4.00%	26,634	6.96%	19,445	3.33%	match previous estmiate
Polk	5650	US 92 NE	7,979	21,006	6.53%	54,377	23.26%	15,160	3.00%	
Polk	5651	CR 580 / Cypress Pkwy	27,800	21,000	-0.98%	66,446	5.56%	52,820	3.00%	
Polk	5652	SR 60 E	7,340	14,697	4.01%	15,639	4.52%	13,947	3.00%	
Okeechobee	5653	US 441 N	3,371	10,891	8.92%	4,419	1.24%	6,404	3.00%	
Okeechobee	5654	CR 68 E	2,198	4,673	4.50%	3,650	2.64%	4,176	3.00%	
Okeechobee	5655	SR 70 E	6,484	21,332	9.16%	7,613	0.70%	12,319	3.00%	
Okeechobee	5656	SR 710 SE	7,582	23,211	8.24%	5,165	-1.28%	14,407	3.00%	
Okeechobee	5657	US 98 / US 441 SE	3,077	7,578	5.85%	3,927	1.11%	5,846	3.00%	
Hendry	5658	US 27 / SR 80 E	14,615	29,051	3.95%	22,200	2.08%	27,769	3.00%	
Collier	5659	Alligator Alley	19,886	21,576	0.34%	na		37,784	3.00%	
Collier	5660	US 41 Collier County	3,067	7,474	5.75%	na		5,827	3.00%	
Polk	5661	Marigold	19,062	26,355	1.53%	41,293	4.67%	36,218	3.00%	

EE Trips (2% growth rate)

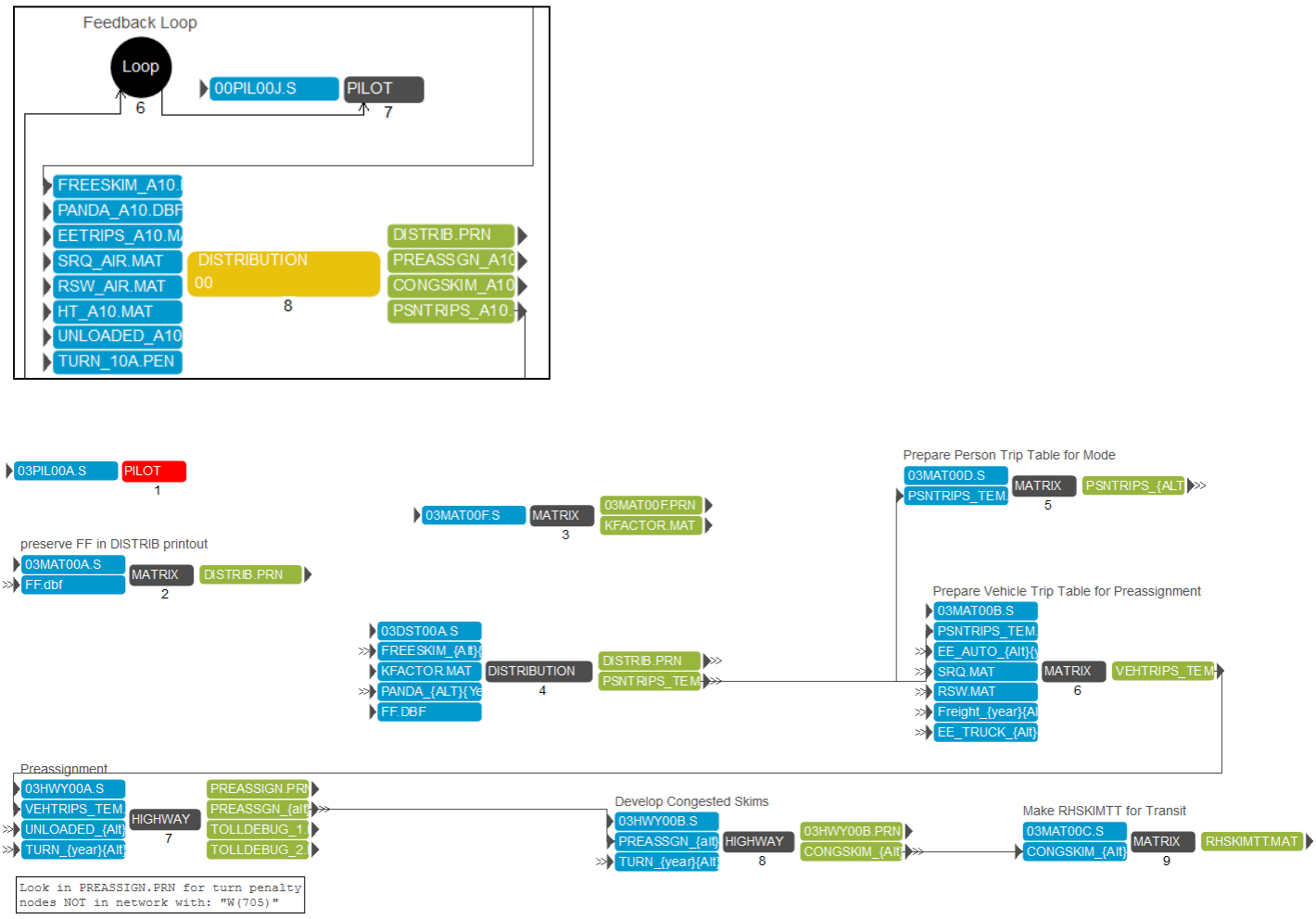
2010							2040						
ORIGN_NAME	ORIGN_ZONE	AUTO	LT	DESTN_ZONE	DESTN_NAME		ORIGN_NAME	ORIGN_ZONE	AUTO	LT	DESTN_ZONE	DESTN_NAME
ie adjust	475	6100	0	5646	ie adjust	1.00	ie adjust	475	6100	0	5646	ie adjust
ie adjust	477	3600	0	5646	ie adjust	1.00	ie adjust	477	3600	0	5646	ie adjust
ie adjust	479	3400	0	5646	ie adjust	1.00	ie adjust	479	3400	0	5646	ie adjust
I-75 N	5631	2500	1000	5659	Alligator	1.50	I-75 N	5631	3750	1500	5659	Alligator
I-4 W	5641	12000	3500	5648	I-4 E	1.50	I-4 W	5641	18000	5250	5648	I-4 E
ie adjust	5646	6100	0	475	ie adjust	1.00	ie adjust	5646	6100	0	475	ie adjust
ie adjust	5646	3600	0	477	ie adjust	1.00	ie adjust	5646	3600	0	477	ie adjust
ie adjust	5646	3400	0	479	ie adjust	1.00	ie adjust	5646	3400	0	479	ie adjust
I-4 E	5648	12000	3500	5641	I-4 W	1.50	I-4 E	5648	18000	5250	5641	I-4 W
CR 580	5651	5000	0	5661	Marigold	1.50	CR 580	5651	7500	0	5661	Marigold
Alligator	5659	2500	1000	5631	I-75 N	1.50	Alligator	5659	3750	1500	5631	I-75 N
Marigold	5661	5000	0	5651	CR 580	1.50	Marigold	5661	7500	0	5651	CR 580

The D1RPM imports heavy truck (HT) from the Florida Statewide Model. The HT matrix contained the following "external-stations" traffic volumes.

2010 EETRIPS

ORIGN_NAME	ORIGN_ZONE	HT	DESTN_ZONE	DESTN_NAME
I-275	5629	14	5630	US 41 N
US 41 N	5630	14	5629	I-275
I-275	5629	19	5631	I-75 N
I-75 N	5631	19	5629	I-275
I-275	5629	351	5659	Alligator
Alligator	5659	351	5629	I-275
US 41 N	5630	5	5659	Alligator
Alligator	5659	8	5630	US 41 N
I-75 N	5631	67	5659	Alligator
Alligator	5659	69	5631	I-75 N
Medulla Rd	5639	123	5648	I-4 E
I-4 E	5648	123	5639	Medulla Rd
I-4 W	5641	33	5645	SR 33
SR 33	5645	22	5641	I-4 W
I-4 W	5641	14275	5648	I-4 E
I-4 E	5648	13091	5641	I-4 W
I-4 W	5641	69	5650	US 92 NE
US 92 NE	5650	69	5641	I-4 W
I-4 W	5641	5	5652	SR 60 E
SR 60 E	5652	5	5641	I-4 W
CR 582	5642	5	5648	I-4 E
I-4 E	5648	5	5642	CR 582
US 98 N	5643	75	5648	I-4 E
I-4 E	5648	75	5643	US 98 N
SR 471	5644	58	5648	I-4 E
I-4 E	5648	58	5644	SR 471
US 441 N	5653	21	5657	US 98 / US 441 SE
US 98 / US 441 SE	5657	21	5653	US 441 N
I-275	5629	4	5658	US 27 / SR 80 E
US 27 / SR 80 E	5658	4	5629	I-275
I-75 N	5631	10	5658	US 27 / SR 80 E
US 27 / SR 80 E	5658	10	5631	I-75 N

The TRIP DISTRIBUTION Step



Notes:

1) **[START]** ..... puts start-time in runtime file
2) **Preserve FF in DISTRIB** ..... writes FRICTION FACTORS out to standard format, which allows for various input formats (csv, txt, dbf, xls)
3) **KF** ..... creates K-factors to reduce trip interactions with Polk County.
4) **Trip Distribution** ..... self-explanatory
5) **Prepare Person Trip Table for Mode** ..... formats a matrix of person trips for mode choice
6) **Prepare Vehicle Trip Table for Pre-assignment** ..... formats a matrix of vehicle trips for PRE-ASSIGN
7) **Pre-assignment** ..... self explanatory.
8) **Develop Congested Skims** ..... adds terminal times and turn penalty times to get a matrix of congested travel time.
9) **Make RHSKIMTT for Transit** ..... makes a matrix of congested travel times for mode choice

Trip Distribution converts trip productions and attractions to trips with a Origin and a Destination. This is accomplished using on a "Gravity Model." All trips starting in a TAZ are attracted to all other TAZ, proportional to the number of attractions and inversely proportional to the distance. Friction factors control the probability of making a certain length trip, for a certain trip purpose. For instance, going to work is relatively insensitive to how long the trip is while shopping depends much more on travel time in selecting possible destinations. These factors are developed based on observed trip lengths for the local population and come from Census and

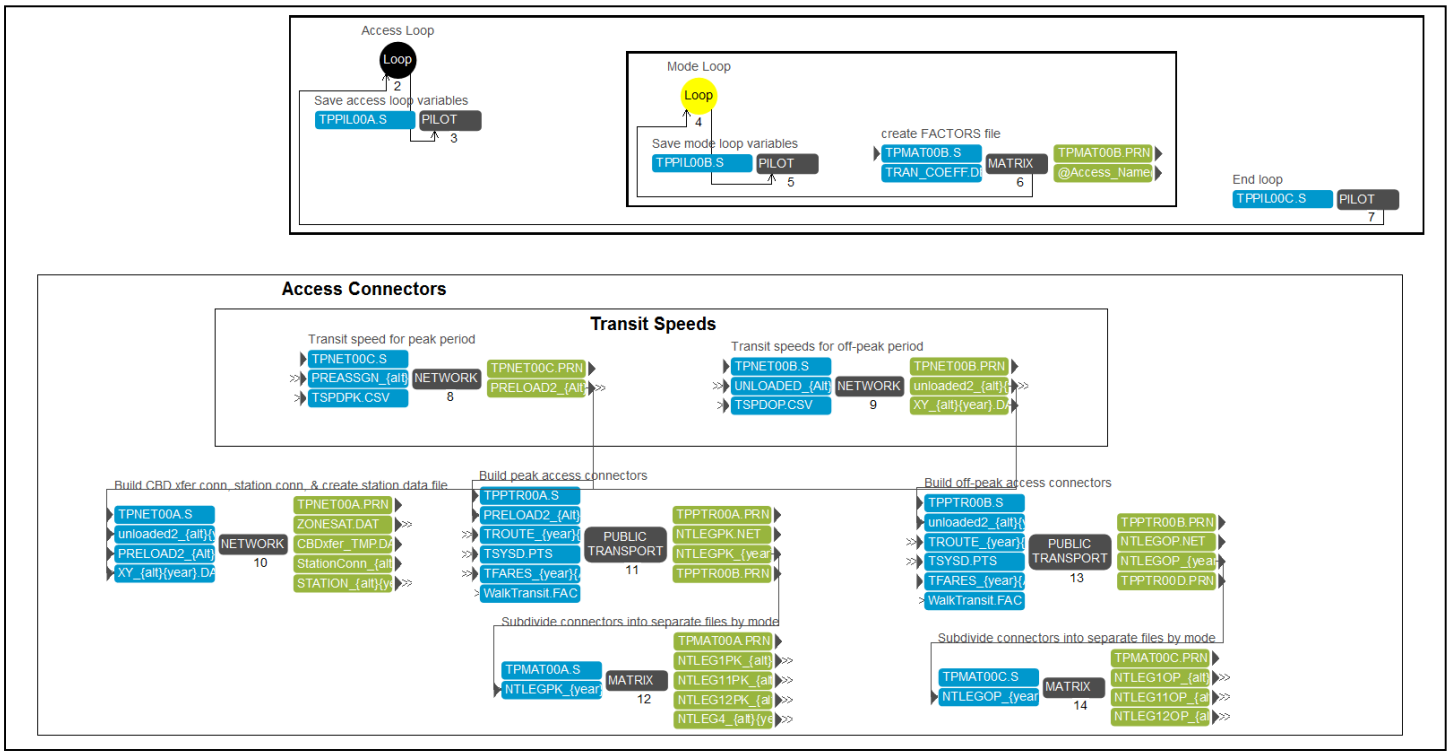
survey data. Also, vehicle trips are loaded onto the highway network, so that congested travel times may be determined, for use in mode choice.

As shown, Trip Distribution is the first step included in the feedback-loop methodology (as recommended by the TMU project) where a weighted average of speeds and travel time from all prior highway assignments are used to minimizes differences in travel time/speed between the last highway assignment and this loop's trip distribution, mode choice, and highway assignment.

The Transit Prep step
The "TRANSITMODEL" developed by AECOM for FDOT in 2008 as the "new standard" for FSUTMS and was retained by the TMU project, and is essentially the same Mode Choice used by earlier District One MPO models (see \doc\reference\AECOM).

The model consists of four parts:
Transit Prep, links transit routes to the model's highway network and prepares auto-access park-n-ride links;
Transit Path, generates zone-to-zone travel times and costs; and
Mode Choice, a multi-path/single-period nested-logit sub-model, assigns trips to automobiles or transit services, and;
Transit Assignment, which puts riders on routes and generates reports.

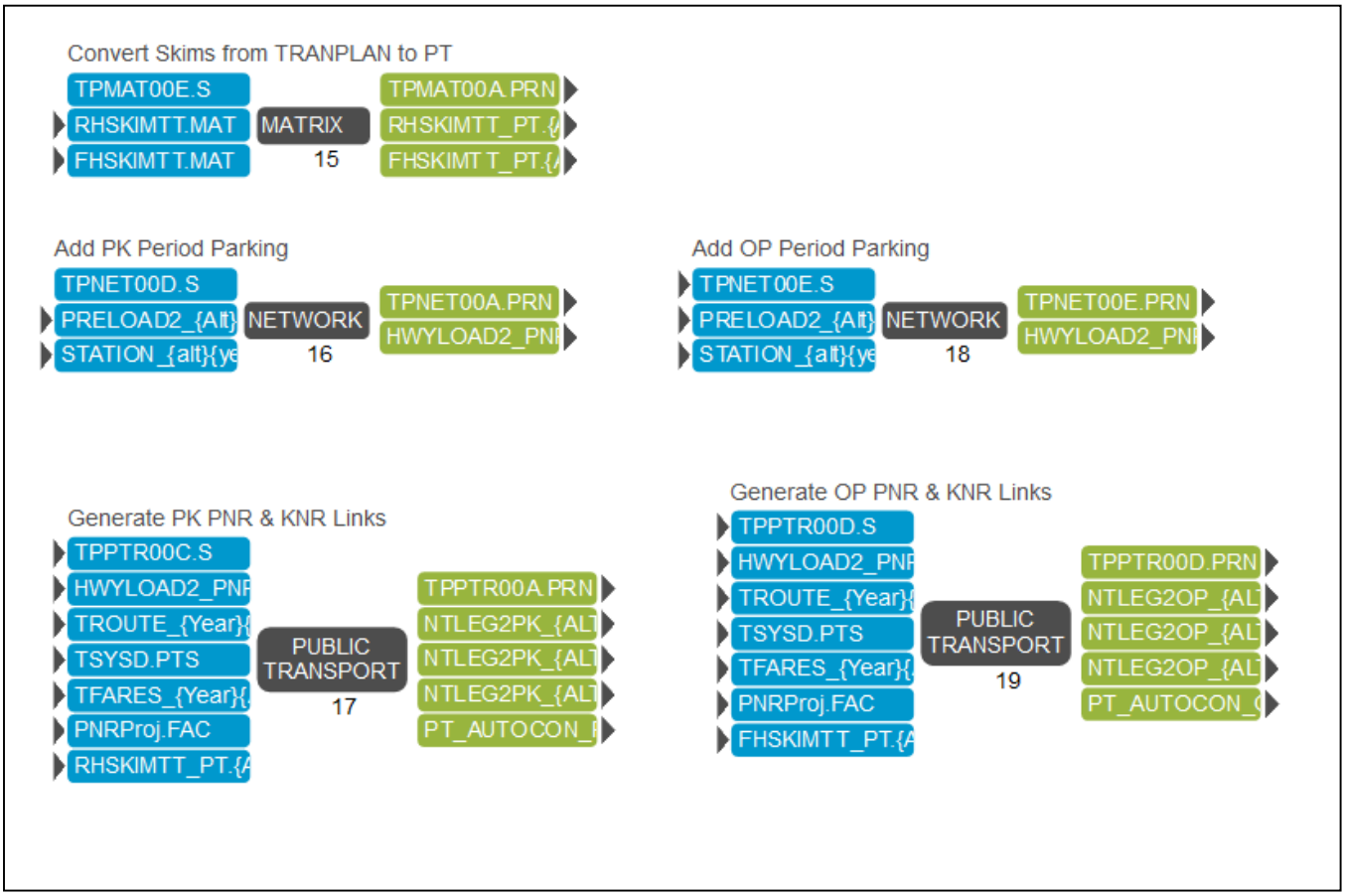
Most of the effort in validating the transit accessibility and path building is focused on:
Transit Routes: ensuring that transit routes match the highway network and accurately reflecting base year conditions, and;
Calibration of Mode Choice: ensuring that trips, by trip purpose, compare favorably to household travel time surveys and estimated transit system ridership.
(This section contains "Tier A Transit" steps, as documented by AECOM please refer to documents in the \doc folder)



Notes:
1) [**START**] ..... self explanatory
2) **Loop** ..... self explanatory
3) **Save Access Loop Variables** ..... set up for "walk" "PNR" and "KNR" modes
4) **Loop** ..... self explanatory
5) **Save Mode Loop Variables** ..... set up for "bus" or "project" modes
6) **Create FACTORS file** ..... sets up PT factors by reading and formatting TRAN_COEFF.DBF
7) **Loop end** ..... self explanatory
8) **Transit speed for Peak Period** ..... computes PK transit speeds as a percent of auto travel time
9) **Transit speed for Off-Peak Period** ..... computes OP transit speeds as a percent of auto travel time
10) **Build CBD transfer connections** ..... makes file to generate CBD sidewalk coding and extracts transit station data for later use
11) **Build Peak Access Connectors** ..... builds lists of PEAK transit travel nodes from each zone to each zone

12) **Subdivide connectors into separate files by mode** ..... subdivides the above list into Type 1-walk, Type11- Type 12-transfer, and Type 4-walk to destination only
13) **Builds off-peak access connectors** ..... self-explanatory
14) **Subdivide connectors into separate files by mode** ..... makes lists of mode11 mode12 and mode 4 (

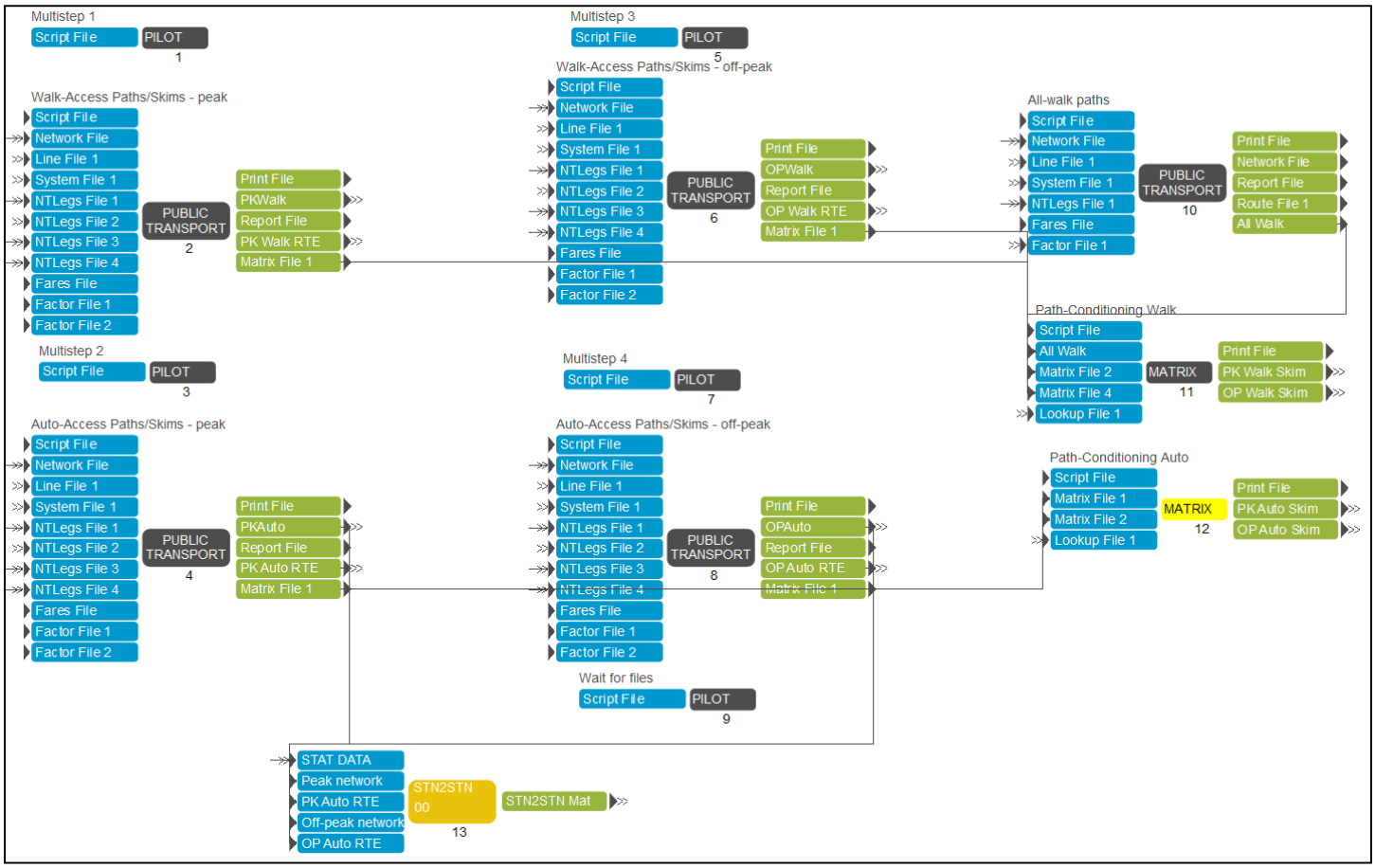
(This section contains NEW steps and processes which replace AUTOCON.EXE, and was documented by Citilabs)



Notes:
These processes replace the AUTOCON program previously used to create auto-access connectors to transit stations.

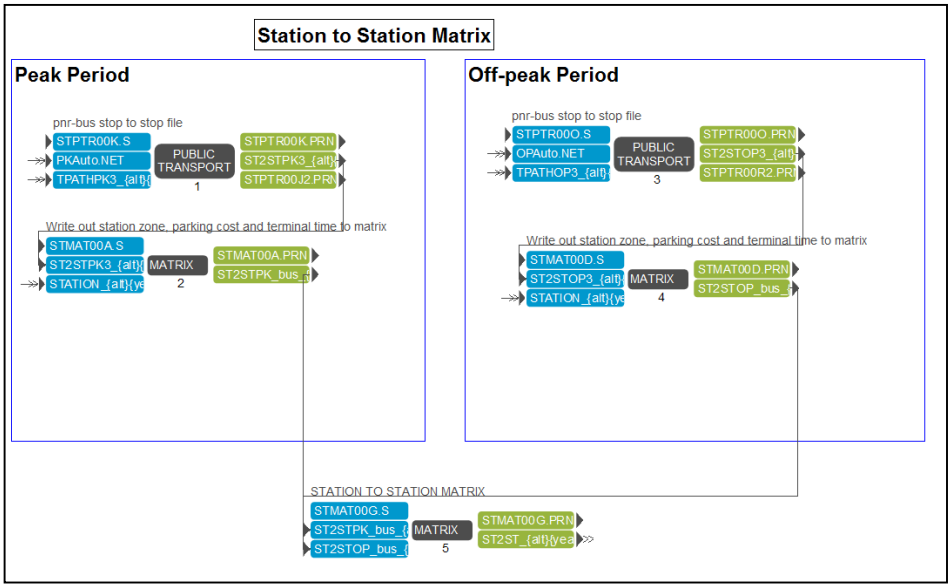
15) **Convert Skims from TRANPLAN to PT** ..... converts skims from TRANPLAN format to PT format
16) **Add PK Period Parking** ..... adds PEAK period transit station data to a temporary network
17) **Generate PK PNR & KNR Links** ..... generates PEAK period "PNR" and "KNR" links to transit stations
18) **Add OP Period Parking** ..... adds OFF-PEAK period transit station data to a temporary network
19) **Generate OP PNR & KNR Links** ..... generates OFF-PEAK period "PNR" and "KNR" links to transit stations

The Transit Path step
(This section contains steps, documented by AECOM)



Notes:
These processes run in parallel when using cluster.

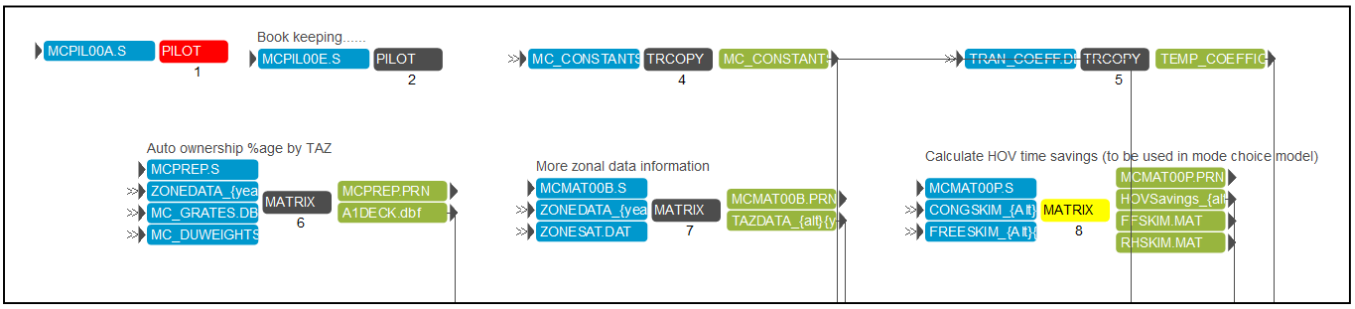
1) **Mulistep 1** ..... begins "distributemultistep" process
2) **Walk Access Paths/Skims - peak** ..... computes walk-access-to-transit skims PK.
3) **Mulistep 2**..... begins "distributemultistep" process
4) **Auto Access Paths/Skims - peak** ..... computes auto-access-to-transit skims PK.
5) **Multitep 3**..... begins "distributemultistep" process
6) **Walk-Access Paths/Skims - off-peak** ..... computes walk-access-to-transit skims OP.
7) **Multistep 4**..... begins "distributemultistep" process
8) **Auto-Access Paths/Skims - off-peak** ..... computes auto-access-to-transit skims OP.
9) **Wait-for-files** ..... wait until all 4 multistep processes are finsihed.
10) **All Walk Paths** ..... computes walk-to-destination paths.
11) **Path Conditioning Walk** ..... compares transit skims to walk skims / keep if better than walk skims
12) **Path Conditioning Auto** .... compares auto-to-transit skims to transit and walk skims / keep if better than either.
13) **STN2STN**



Notes:

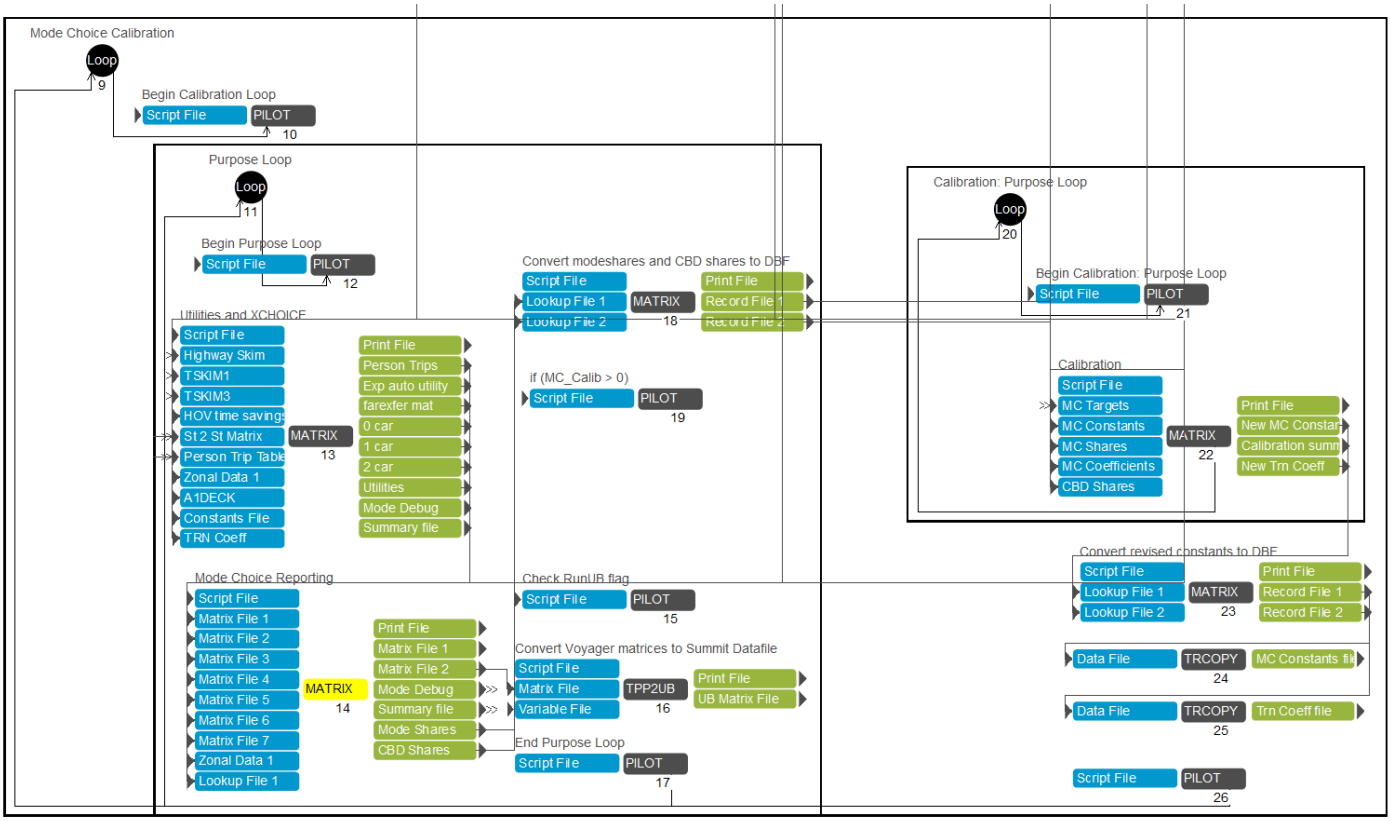
1) **PNR bus stop-to-stop file PK** ..... retrieves PK period data from temporary network for next step.
2) **Write out station parking cost and terminal time to a travel time matrix** ..... self-explanatory
3) **PNR bus stop-to-stop file OP** ..... retrieves OP period data from temporary network for next step.
4) **Write out station parking cost and terminal time to a travel time matrix** ... . self-explanatory
5) **STATION TO STATION MATRIX**

The Mode Choice step
(This section contains steps, documented by AECOM)



Notes:

1) **[START]** ..... puts start-time in runtime file
2) **Book Keeping** ..... deletes temporary files
3) **TRCOPY** ..... writes MC_CONSTANTS out to standard format, which allows for various input formats (csv, txt, dbf, xls)
4) **TRCOPY** ..... writes TRAN_COEFFFNSTANTS out to standard format, which allows for various input formats (csv, txt, dbf, xls)
5) **Auto ownership %age by TAZ** ..... sets up TAZ data for district reporting, if districts were previously identified
6) **More zonal data information** ..... sets up TAZ data for URBAN and EXURBAN zones
7) **Calculate HOV time savings** ..... compares HOV and non-HOV time savings (for mode choice)

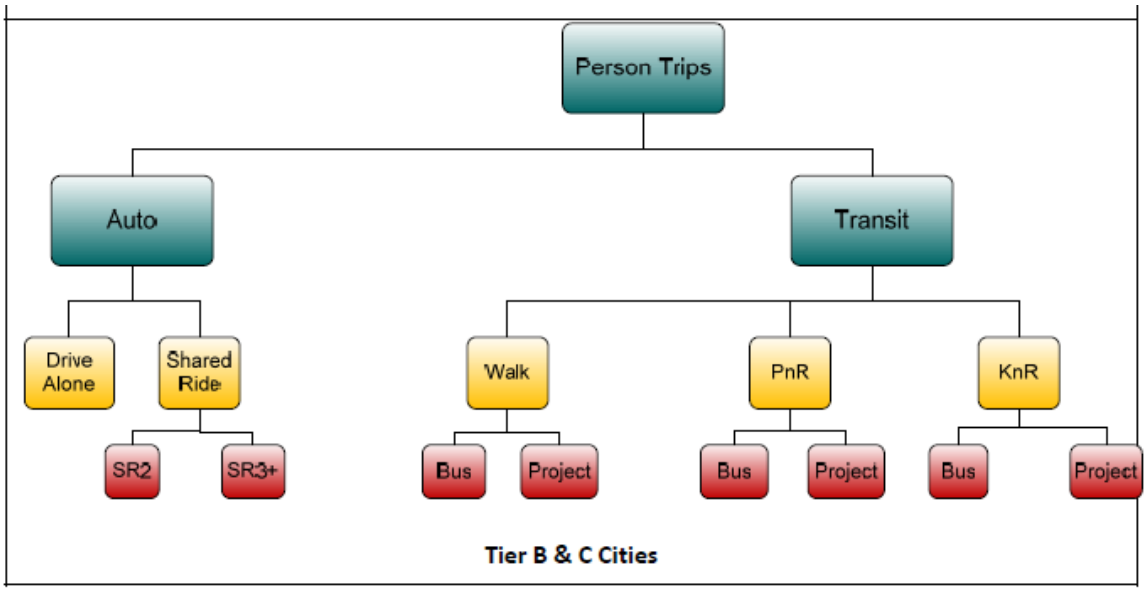


Notes:

1) **Mode Choice Calibration** ..... loop
2) **Begin Calibration Loop** ..... deletes temporary files
3) **Purpose Loop** ..... loop
4) **Begin Purpose Loop** ..... set up for "HBW" "HBO" and "NHB" purposes
5) **Utilities and XCHOICE** ..... applies constants and coefficients to each skim thereby making matrices of trips by trip purpose from 0, 1, and 2+ auto households for all modes of travel.
6) **Mode Choice Reporting** ..... reports the results of the above step
7) **Check Run flag** ..... if (User Benefit Reports are desired)
8) **Convert Voyager matrices to Summit Datafile** ..... converts matrices from step 13 into a Summit data file
9) **End Purpose Loop** ..... end if loop
10) **Convert modeshares and CBD shares to DBF** ..... converts mode shares and CBD shares from a matrix to a DBF format
11) **IF (MC_Calib)** ..... if calibration is requested
12) **Calibration Purpose Loop** ..... loop
13) **Begin Calibration Purpose Loop** ..... sets variables for PK HBW and OP HBO and OP NHB loops
14) **Calibration** ..... calibration, looks up coefficients and mode shares and makes adjustments as necessary
15) **Convert revised constants to DBF** ..... convert constants from above to DBF
16) **TRCOPY** ..... copy constants to proper format
17) **TRCOPY** ..... copy coefficients to proper format
18) **ENDIF** ..... end calibration loop
19) **Combine trip tables for assignment** ..... combines all trips for subsequent highway and transit assignment processes

Understanding Mode Choice Theory and Application

The FSUTMS mode choice model is a behavioral model that is used to predict a traveler's choice of one alternative (mode of transportation) from a set of alternatives (all forms of transportation available), as represented in the following graphic:



The nested logit mode choice model works by computing the utility for each of the lower level choices. This utility represents the total economic "cost" in terms of travel time to travel a given mode. This "cost" is typically constructed as a linear function of the different components of time and cost The utility for an upper level choice is computed by taking the log sum of the lower level nests. For example, the utility for the auto nest is computed from the utilities for LOV, 1-PASS, 2-PASS The total market is divided into zero-car, one-car, and two-car households for HBW and HBNW purposes, but market segmentation is done for the NHB trip purpose.

The "Tier A Transit" mode choice model evaluates three auto sub-modes (LOV, HOV2 and HOV3+) and three transit sub-modes, by mode of access (WALK , PNR and KNR).

The final step in the mode choice application is placing the auto vehicle portion of the access-to-transit trip onto the highway trip table.

The Mode Choice procedures included in the D1RPM provide for a rather straightforward method for achieving proper calibration of the model. A table of *"model share targets"* is utilized, which represents the most recent ridership and home-based travel surveys. An example is illustrated below:

PERCENT OF TRIPS

HBW	Total Person		Drive Alone	One Pax	Two+ Pax	Total Auto	Walk Bus	PNR Bus	KNR-RS Bus	Total Percent
Zero Car HHs	**68120**	3.2439%		73.15%	23.85%	97.00%	3.00%	0.00%	0.00%	100.00%
One Car HHs	**674229**	32.1068%	78.27%	15.23%	6.22%	99.72%	0.28%	0.01%	0.00%	100.00%
Two+ Car HHs	**1357608**	64.6493%	78.20%	15.36%	6.28%	99.85%	0.15%	0.01%	0.00%	100.00%
TOTAL	**2099957**									
Auto Occu=	1.16									

HBO	Total Person		Drive Alone	One Pax	Two+ Pax	Total Auto	Walk Bus	PNR Bus	KNR-RS Bus	Total
Zero Car HHs	**127000**	4.3371%		51.45%	40.05%	91.50%	8.50%	0.00%	0.00%	100.00%
One Car HHs	**1235569**	42.1956%	37.64%	35.66%	26.42%	99.72%	0.28%	0.01%	0.00%	100.00%
Two+ Car HHs	**1565627**	53.4673%	37.98%	35.38%	26.49%	99.85%	0.15%	0.01%	0.00%	100.00%
TOTAL	**2928197**									
Auto Occu=	1.60									

NHB	Total Person		Drive Alone	One Pax	Two+ Pax	Total Auto	Walk Bus	PNR Bus	KNR-RS Bus	Total
	2842339	100.0000%	47.92%	30.02%	21.78%	99.72%	0.28%	0.01%	0.00%	100.00%
TOTAL	**2842341**									
Auto Occu=	1.44									

PERSON TRIPS

HBW	Total Person	Drive Alone	One Pax	Two+ Pax	Total Auto	Walk Bus	PNR Bus	KNR-RS Bus	Total Transit
Zero Car HHs	**68120**		49,832	16,244	66,076	2,044	0	0	2,044
One Car HHs	**674229**	527,719	102,685	41,937	672,341	1,854	34	0	1,888
Two+ Car HHs	**1357608**	1,061,622	208,588	85,293	1,355,504	2,036	68	0	2,104
TOTAL	**2099957**	1,589,341	361,106	143,474	2,093,921	5,934	102	0	6,036
	aofac=	1.00	2.00	3.37					
	vtrips=	1,589,341	180,553	42,574					

HBO	Total Person	Drive Alone	One Pax	Two+ Pax	Total Auto	Walk Bus	PNR Bus	KNR-RS Bus	Total Transit
Zero Car HHs	**127000**		65,341	50,864	116,205	10,795	0	0	10,795
One Car HHs	**1235569**	465,050	440,568	326,492	1,232,109	3,398	62	0	3,460
Two+ Car HHs	**1565627**	594,672	553,864	414,664	1,563,201	2,348	78	0	2,427
TOTAL	**2928197**	1,059,722	1,059,774	792,020	2,911,515	16,541	140	0	16,681
	aofac=	1.00	2.00	3.49					
	vtrips=	1,059,722	529,887	236,494					

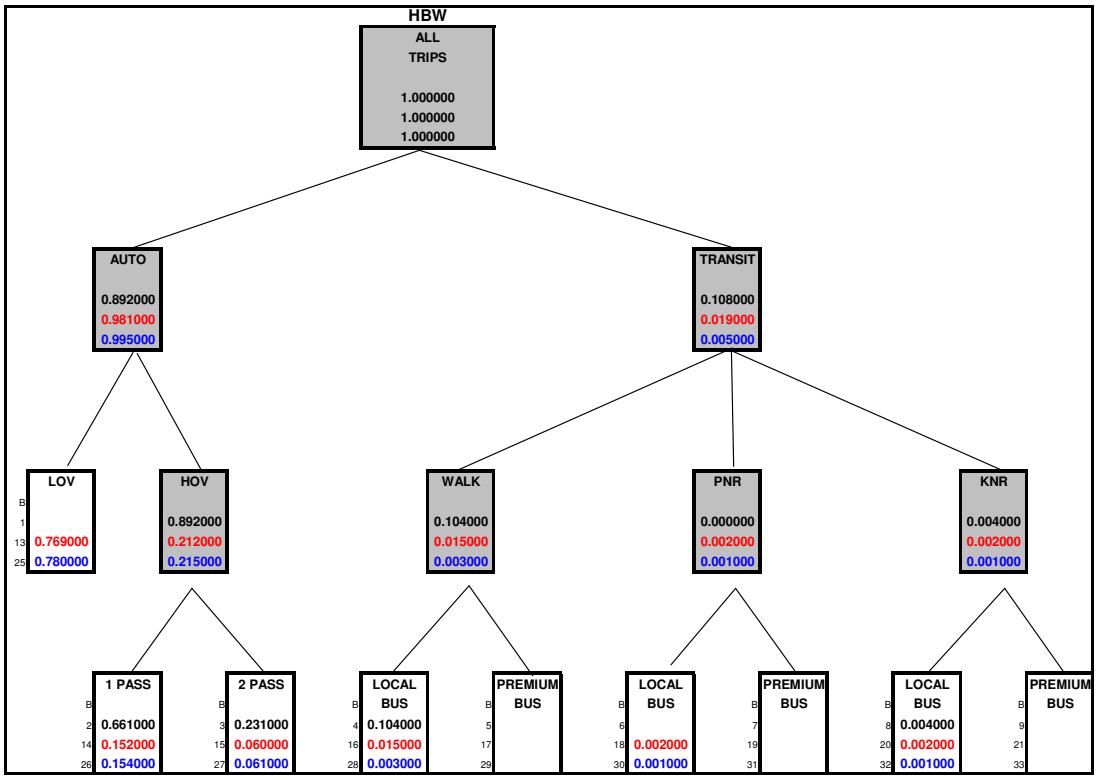
NHB	Total Person	Drive Alone	One Pax	Two+ Pax	Total Auto	Walk Bus	PNR Bus	KNR-RS Bus	Total Transit
	2842339	1,362,049	853,270	619,061	2,834,380	7,816	142	0	7,959
TOTAL	**2842339**	1,362,049	853,270	619,061	2,834,380	7,816	142	0	7,959
	aofac=	1.00	2.00	3.59		30,292	384	0	30,676
	vtrips=	1,362,049	426,635	184,299					

Note: This table can be expanded for additional modes of travel.

These "Targets" may be checked in a spreadsheet, formatted to look just like the nesting structure on page 38, as shown.

MC_CONSTANTS

N1	HBW	NAME
1	0.000000	DA AUTO0
2	**0.661000**	SR1PASS AUTO0
3	**0.231000**	SR2PASS AUTO0
4	**0.104000**	WALKBUS AUTO0
5	0.000000	WLKPRJ AUTO0
6	0.000000	PNRBUS AUTO0
7	0.000000	PNRPRJ AUTO0
8	**0.004000**	KNRBUS AUTO0
9	0.000000	KNRPRJ AUTO0
10		CBDKNRBUS AUTO0
11		CBDKNRPRJ AUTO0
12		FRINGEPNR AUTO0
13	**0.769000**	DA AUTO1
14	**0.152000**	SR1PASS AUTO1
15	**0.060000**	SR2PASS AUTO1
16	**0.015000**	WALKBUS AUTO1
17	0.000000	WLKPRJ AUTO1
18	**0.002000**	PNRBUS AUTO1
19	0.000000	PNRPRJ AUTO1
20	**0.002000**	KNRBUS AUTO1
21	0.000000	KNRPRJ AUTO1
22		CBDKNRBUS AUTO1
23		CBDKNRPRJ AUTO1
24		FRINGEPNR AUTO1
25	**0.780000**	DA AUTO2
26	**0.154000**	SR1PASS AUTO2
27	**0.061000**	SR2PASS AUTO2
28	**0.003000**	WALKBUS AUTO2
29	0.000000	WLKPRJ AUTO2
30	**0.001000**	PNRBUS AUTO2
31	0.000000	PNRPRJ AUTO2
32	**0.001000**	KNRBUS AUTO2
33	0.000000	KNRPRJ AUTO2
34		CBDKNRBUS AUTO2
35		CBDKNRPRJ AUTO2
36		FRINGEPNR AUTO2



There are mode choice *constants* and mode choice *coefficients* which are used to set the sensitivity of the logit model to other factors, such as:

Level of Service Coefficients	*Nesting Coefficients*
In-vehicle time	Transit access
In-vehicle time, commuter rail	Transit mode
Out-of-vehicle time	Auto mode
Drive access time	Auto occupancy
Cost	*Constants(default values)*
Zero cars, all income	CBD, all transit
Insufficient cars	Drive alone (3)
Income < $25K(4)	Shared ride (2 & 3+)(3)
Income $25K-$50K	Shared ride 3+(3)
Income > $50K	Transit (all ride modes) (3)
Sufficient cars	Drive-transit (all ride modes) (3)
Income < $25K	KNR-transit (all ride modes) (3)
Income $25K-$50K	Express bus
Income > $50K	Urban rail
Number of Transfers	Commuter rail

A simple spreadsheet example is another way to show the inter-relationships between constants and coefficients and costs.

Attributes

Mode	Attribute: In-Vehicle Time	Walk Time	Wait Time	Cost (cents)
Drive-Alone	20	2	0	600
Shared-Ride	20	2	0	600
Bus	45	7	10	175
LRT	35	12	5	175

Assumptions

Distance to Bus Stop Fr	0.25	miles
Distance to LRT Stop Fi	0.5	miles
Distance to Work From	0.1	miles
Distance to Work From	0.1	miles
Distance from Home to	10	miles
Automobile Average Co	10	cents
Parking Cost at Work	5	dollars
AM Peak Bus Frequenc	20	minutes
AM Peak LRT Frequenc	10	minutes

Parameters

Coefficient	Abbreviation	Value		
				-0.30048
				0.049516
				0.049516
In-Vehicle Time	IVT	-0.0250	(*minutes)	
Out-pocket Cost	OPC	-0.0020	(*cents)	
Wait Time	WAIT	-0.0500	(*minutes)	2
Walk Time	WALK	-0.0375	(*minutes)	1.5
Drive-Alone	DA_ASC	0.0000	(*1 if mode is Drive Alone)	
Shared-Ride	SR_ASC	-0.3000	(*1 if mode is Shared-Ride)	
Bus	BUS_ASC	-0.5000	(*1 if mode is Bus)	
LRT	LRT_ASC	-0.4000	(*1 if mode is LRT)	

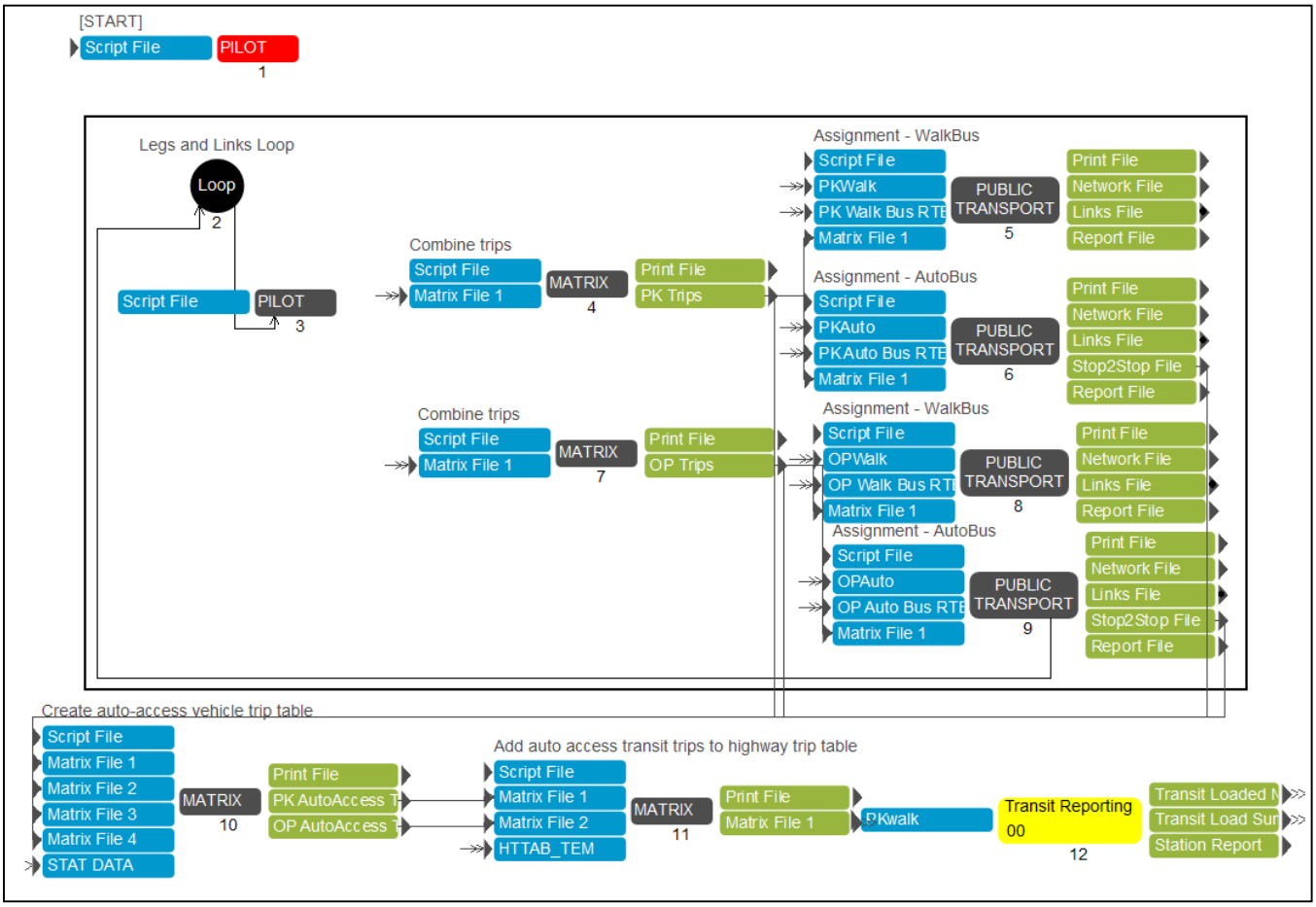
The Multinomial Logit Model

	Utility	Exp(Utility)	Probability	Original Probs	%change due to increased BUS fare $120 to $175
Drive-Alone	-1.7750	0.1695	0.37041086	0.355720	4.13%
Shared-Ride	-2.0750	0.1256	0.27440711	0.263524	4.13%
Bus	-2.7375	0.0647	0.14147356	0.151660	-6.72%
LRT	-2.3250	0.0978	0.21370847	0.229096	-6.72%
Sum		0.4576	1.00000000		
Total Auto Share			64.5%	61.9%	
Total Transit Share			35.5%	38.1%	

Note: During the self-calibration mode, the model will require 30-50 iterations of the mode choice model to achieve targets.

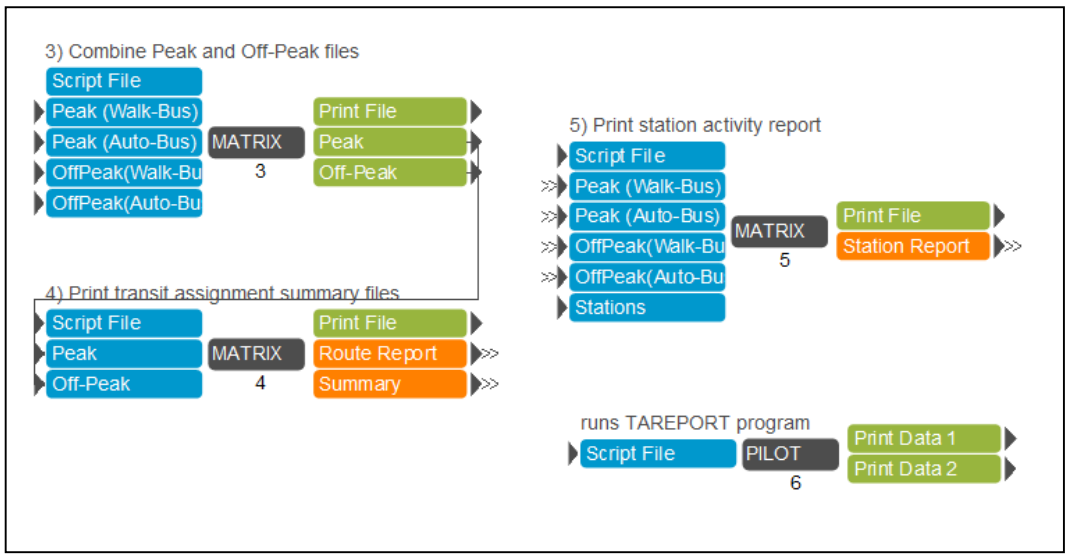
Calibration of Mode Choice is twofold: First, auto occupancy rates are compared with other household travel time surveys, and, as can be seen in this table, the D1RPMis within expected parameters.

The Transit Assignment step



Notes:

1) **Start** ..... puts start-time in runtime file
2) **Legs and Links Loop** ..... loop
3) **loop** ..... loop options
4) **Combine Trips** ..... combines walk and auto-access trips for PK
5) **Assigment WalkBus** ..... loads passengers on routes
6) **Assignment AutoBus** ..... loads passengers on routes
7) **Combine Trips** ..... combines walk and auto-access trips for OP
8) **Assignment WalkBus** ..... loads passengers on routes
9) **Assignment AutoBus** ..... loads passengers on routes
10) **Create auto access vehicle trip table** ..... self-explanatory
11) **Add auto access transit trips to highway trip table** ..... self-explanatory
12) **TRANSIT REPORTING**



Notes:

3) **Combine Peak and Off-Peak Files** ..... self explanatory
4) **Print Transit Assignment Summary Files** ..... self explanatory
5) **Print Station Activity Report** ..... self explanatory
6) **Run TAREPORT program** ..... self explanatory

Average Fare Calculations

Each Transit service provider submitted monthly ridership and revenue reports (on following pages) from which weekday passenger ridership was calculated These reports, also yielded data to code "average fares" into the initial TFARES_10A.FAR file, shown below.

```
FARESYSTEM, NUMBER=1, LONGNAME="LAKELAND", NAME="CITRUS",
  STRUCTURE="FLAT"  SAME="CUMULATIVE",
  IBOARDFARE=1.00,
  FAREFROMFS=0.00,0.00,0.50,0.50,0.50,0.50
FARESYSTEM, NUMBER=2, LONGNAME="WINTER HAVEN", NAME="WHAT",
  STRUCTURE="FLAT"  SAME="CUMULATIVE",
  IBOARDFARE=1.03
  FAREFROMFS=0.00,0.00,0.50,0.50,0.50,0.50
FARESYSTEM, NUMBER=3, LONGNAME="PCTS", NAME="PCTS",
  STRUCTURE="FLAT"  SAME="CUMULATIVE",
  IBOARDFARE=1.02,
  FAREFROMFS=0.00,0.00,0.50,0.50,0.50,0.50
FARESYSTEM, NUMBER=4, LONGNAME="COLLIER", NAME="CAT",
  STRUCTURE="FLAT"  SAME="CUMULATIVE",
  IBOARDFARE=1.04,
  FAREFROMFS=0.00,0.00,0.50,0.50,0.50,0.50
FARESYSTEM, NUMBER=5, LONGNAME="LEE", NAME="LEETRAN",
  STRUCTURE="FLAT"  SAME="CUMULATIVE",
  IBOARDFARE=0.85
  FAREFROMFS=0.00,0.00,0.50,0.50,0.50,0.50
FARESYSTEM, NUMBER=6, LONGNAME="SARASOTA", NAME="SCAT",
  STRUCTURE="FLAT"  SAME="CUMULATIVE",
  IBOARDFARE=1.08
  FAREFROMFS=0.00,0.00,0.50,0.50,0.50,0.50
FARESYSTEM, NUMBER=7, LONGNAME="MANATEE", NAME="MCAT",
  STRUCTURE="FLAT"  SAME="CUMULATIVE",
  IBOARDFARE=0.85,
  FAREFROMFS=0.00,0.00,0.50,0.50,0.50,0.50
```

Note that for simplification and testing with future year model alternatives, the TFARES_10A.FAR file, shown below is utilized.

```
FARESYSTEM, NUMBER=1, LONGNAME="REGULAR FARES", NAME="LINEHAUL",
  STRUCTURE="FLAT"  SAME="CUMULATIVE",
  IBOARDFARE=1.00,
  FAREFROMFS=0.00,0.00,0.50,0.50,0.50,0.50
FARESYSTEM, NUMBER=2, LONGNAME="EXPRESS/BRT FARES", NAME="EXPRESS",
  STRUCTURE="FLAT"  SAME="CUMULATIVE",
  IBOARDFARE=1.50,
  FAREFROMFS=0.00,0.00,0.50,0.50,0.50,0.50
FARESYSTEM, NUMBER=3, LONGNAME="FREE FARES", NAME="FREE",
  STRUCTURE="FREE"
```

The graphics, below, are summaries of transit ridership and revenue reports provided by each MPO. Each graphic portrays the data, as received, on the left -- while data in the colored box at right were used to develop weekday ridership and "average" fare for use in the D1RPM. These are estimates: not all providers provided revenue data, or passengers by fare category.

Collier Area Transit
Route Statistics
Dec-10

MONTHLY

Route	Full Passengers	Full Revenue	Reduced Passengers	Reduced Revenue	Txfr Passengers	Txfr Revenue	Passes Passengers	Passes Revenue	DAYS
1A	2,334	$3,502	610	$458	566	$35	2,453	$4,519	30
1B	2,818	$4,228	1,061	$796	793	$37	4,005	$7,569	30
1C	3,249	$4,877	986	$740	839	$26	3,648	$7,001	30
2A	2,755	$4,135	1,345	$1,009	1,154	$42	4,232	$6,311	30
2B	2,676	$4,013	1,138	$854	956	$37	3,669	$6,139	30
3A	3,914	$5,871	1,523	$1,142	1,049	$37	5,246	$7,490	30
3B	2,476	$3,715	724	$543	505	$25	2,785	$4,169	30
4A	1,358	$2,038	751	$563	743	$28	2,613	$4,733	30
4B	1,153	$1,725	378	$284	490	$9	2,023	$3,072	30
5	2,796	$4,359	532	$399	604	$8	2,346	$4,487	30
6	2,270	$3,408	894	$671	426	$37	1,801	$2,611	30
7 M CIR	0	$0	0	$0	0	$0	628	$1,645	30
7 M EXP	1,532	$2,293	335	$251	426	$5	857	$1,731	30
8A CIRCULATOR	1,488	$2,231	911	$683	104	$1	1,174	$692	30
8B CIRCULATOR	1,246	$1,869	776	$582	75	$0	996	$616	30
9	2,465	$3,695	1,097	$823	734	$22	2,506	$3,428	4
System Total	**34,530**	**$51,958**	**13,061**	**$9,796**	**9,464**	**$350**	**40,982**	**$66,211**	

23 weekday
4 Saturday

DAILY

Cash Passengers Regular	Reduced	Txfr	Subtotal	Free Under 6	Passes / Transfers	Total	Dollar Amt
78	20	19	117	0	82	199	$133.16
94	35	26	156	0	134	289	$168.70
108	33	28	169	0	122	291	$188.08
92	45	38	175	0	141	316	$172.84
89	38	32	159	0	122	281	$163.46
130	51	35	216	0	175	391	$235.00
83	24	17	124	0	93	216	$142.76
45	25	25	95	0	87	182	$87.65
38	13	16	67	0	67	135	$67.28
93	18	20	131	0	78	209	$158.87
76	30	14	120	0	60	180	$137.19
0	0	0	0	0	21	21	$0.00
51	11	14	76	0	29	105	$84.98
50	30	3	83	0	39	123	$97.18
42	26	3	70	0	33	103	$81.69
616	274	184	1074	0	627	1701	$1,134.90
592	222	179	992		775	1767	$1,061.24
33%	13%	10%			44%	100%	
$1.25	$1.00	$0.60			$1.00		
$739	$222	$107	$1,069		$775		$1,844
			$1.08				**$1.04**

PCTS
Monthly Ridership Report-25
MARCH

Monthly Ridership Report-25

	Cash Passengers Regular	Std	Eld/ Dis	Subtotal	Free Under 6	Transfers Regular	Passes Ride Picker	Citi-pack	Adult	Student	Eld/Dis	Adult (1)	Student (1)	Total	Days
Monthly Total	405	147	140	692	130	614	310	8	44	16	12	84	86	1996	27
Monthly Total	849	467	495	1811	188	732	144	77	33	6	0	89	50	3080	27

23 weekday
4 Saturday

DAILY

Cash Passengers Regular	Std	Eld/ Dis	Subtotal	Free Under 6	Transfers Regular	Total
15	5	5	26	0	59	74
31	17	18	67	0	188	114
46	23	24	93	0	247	188
25%	12%	13%		0%	131%	100%
$1.25	$1.00	$0.60				
$58.06	$22.74	$14.11	$94.91			
			$1.02			

Winter Haven Transit

2010 MONTHLY FARES & RIDERS REPORT

ROUTE	Cash Passengers Regular	Student	Eld/ Dis	Subtotal	Free Under 6	Passes / Transfers	Dollar Amt	Days
15	2791	789	742	4322	202	2056	$582.00	27
22XW	150	13	11	174	8	89	$33.60	4
30	2602	2201	711	5514	210	3298	$563.85	27
40/44	1521	560	186	2267	203	1100	$308.75	27
12	313	46	68	427	23	208	$47.55	4
50	1531	868	415	2814	242	1316	$408.95	27
Total	7064	3563	1650	12277	623	6543	$1,944.70	
	58%	29%	13%					

23 weekday
4 Saturday

DAILY

Cash Passengers Regular	Student	Eld/ Dis	Subtotal	Free Under 6	Passes / Transfers	Total	Dollar Amt
103	29	27	160	7	76	244	$21.56
38	3	3	44	2	22	68	$8.40
96	82	26	204	8	122	334	$20.88
56	21	7	84	8	41	132	$11.44
78	12	17	107	6	52	165	$11.89
57	32	15	104	9	49	162	$15.15
429	178	96	703	39	362	1104	$89.31
39%	16%	9%		4%	33%	100%	
$1.25	$1.00	$0.60			$1.00		
$536	$178	$57	$772		$362		$1,134
			$1.10				**$1.03**

LEETRAN FY 2010 Route Statistics
Passengers, Revenue, Miles, and Hours, by Route
March, 2010

ROUTE #	MONTHLY RIDERSHIP	GFI REVENUE	TOTAL MILES	TOTAL HOURS	RIDERS /MILE	RIDERS /HOUR	REVENUE /MILE	REVENUE /HOUR	Revenue/ Passengers
10	15,652	8,288	11,414	763	1.38	20.50	0.73	10.86	$0.53
15	7,147	4,698	6,693	477	1.07	14.99	0.70	9.85	$0.66
20	14,091	8,928	9,013	731	1.57	19.27	0.99	12.21	$0.63
30	10,078	7,471	12,037	782	0.84	12.89	0.62	9.55	$0.74
40	4,575	4,025	9,003	483	0.51	9.48	0.45	8.34	$0.88
50	10,215	8,173	19,125	1,007	0.54	10.14	0.43	8.12	$0.80
60	3,199	2,098	8,544	389	0.38	8.23	0.25	5.40	$0.66
70	16,843	12,909	14,190	819	1.19	20.56	0.91	15.76	$0.77
80	2,361	1,140	4,548	262	0.52	9.02	0.25	4.36	$0.48
90	7,229	6,411	16,775	848	0.43	8.52	0.38	7.56	$0.89
100	24,302	21,350	20,967	1,164	1.16	20.88	1.02	18.35	$0.88
110	10,524	9,330	13,127	603	0.81	17.45	0.71	15.47	$0.89
120	4,604	3,582	7,744	444	0.60	10.37	0.46	8.07	$0.78
130	12,208	10,145	10,947	685	1.12	17.82	0.93	14.81	$0.83
140	88,923	60,064	62,333	3,946	1.43	22.53	0.96	15.22	$0.68
150	6,028	7,010	6,716	318	0.90	18.95	1.04	22.04	$1.16
160	104	111	1,276	43	0.08	2.40	0.09	2.57	$1.07
400	56,196	36,408	30,067	1,969	1.88	28.54	1.21	18.49	$0.65
450	5,025	3,056	6,384	426	0.79	11.79	0.48	7.17	$0.61
490	28,014	18,647	11,011	1,072	2.56	26.14	1.69	17.40	$0.67
System Total	**327,318**	**233,845**	**281,916**	**17,231**	**19.77**	**310.50**	**14.30**	**231.58**	$0.71

23 weekday
4 Saturday

DAILY

Passengers	Revenue	Revenue/ Passengers
580	$307	$0.53
265	$174	$0.66
522	$331	$0.63
373	$277	$0.74
169	$149	$0.88
378	$303	$0.80
118	$78	$0.66
624	$478	$0.77
87	$42	$0.48
268	$237	$0.89
900	$791	$0.88
390	$346	$0.89
171	$133	$0.78
452	$376	$0.83
3,293	$2,225	$0.68
223	$260	$1.16
4	$4	$1.07
2,081	$1,348	$0.65
186	$113	$0.61
1,038	$691	$0.67
12,123	8,661	15

23 weekday
4 Saturday

DAILY

Cash Passengers Regular	Reduced	Txfr	Subtotal	Free Under 6	Passes / Transfers	Total
194	73	59	325	0	143	580
89	33	27	149	0	65	265
175	66	53	293	0	129	522
125	47	38	210	0	92	373
57	21	17	95	0	42	169
127	48	38	212	0	93	378
40	15	12	67	0	29	118
209	78	63	350	0	154	624
29	11	9	49	0	22	87
90	34	27	150	0	66	268
301	113	91	505	0	222	900
130	49	39	219	0	96	390
57	21	17	96	0	42	171
151	57	46	254	0	111	452
1102	414	333	1849	0	811	3293
75	28	23	125	0	55	223
1	0	0	2	0	1	4
697	262	210	1169	0	512	2081
62	23	19	104	0	46	186
347	130	105	583	0	255	1038
4058	1524	1225	6806	0	2985	12123
33%	13%	10%			44%	100%
$1.25	$1.00	$0.60			$1.00	
$5,072	$1,524	$735	$7,331		$2,985	
			$1.08			

Lakeland Regional Routes FY10-FY11

Trip Count Month	Dec-10	Daily
#10 Shuttle	2,887	111
#12 Connector	9,047	348
#11 E. Main	6,920	266
#20 Grove Park	7,861	302
#21 Edgewood	2,700	104
#22XL Bartow Express	8,053	310
#30 Clvd Heights	2,011	77
#31 S. Fla.	17,648	679
#32 Medulla Lksd	382	15
#33 S.Fl Carter Rd	4,519	174
#37 Bradley	808	31
#40 Ariana Beacon	1,838	71
#41 Central	7,580	292
#42 W. Mem	9,551	367
#50 Kath/Prov	6,456	248
#51 Mall	17,163	660
#52 N Fla	14,064	541
#53 Lksd	4,116	158
#56 Mall Hill	6,728	259
#57 Kidron Flightline	1,055	41
Sub Total	131,387	5053

DAILY

	Cash Passengers Regular	Std	Eld/ Dis	Subtotal	Free Under 6	Transfers Regular	Total	Dollar Amt
	37	14	11	62	0	49	111	
	116	44	35	195	0	153	348	
	89	33	27	149	0	117	266	
	101	38	31	170	0	133	302	
	35	13	10	58	0	46	104	
	104	39	31	174	0	136	310	
	26	10	8	43	0	34	77	
	227	85	69	381	0	298	679	
	5	2	1	8	0	6	15	
	58	22	18	98	0	76	174	
	10	4	3	17	0	14	31	
	24	9	7	40	0	31	71	
	98	37	29	164	0	128	292	
	123	46	37	206	0	161	367	
	83	31	25	139	0	109	248	
	221	83	67	371	0	290	660	
	181	68	55	304	0	237	541	
	53	20	16	89	0	69	158	
	87	33	26	145	0	113	259	
	14	5	4	23	0	18	41	
	1691	635	511	2837	0	2216	5053	$0
	33%	13%	10%			44%	100%	
Fare	$1.25	$1.00	$0.60			$0.00		
Revenue	$2,114	$635	$306	$3,056		$0		$3,056
Avg Fare				$1.08				$0.60

Manatee County Area Transit
Passenger Trips FY 09/10

WEEKDAYS 250
SATURDAYS 104

23 weekday
4 Saturday

Fixed Route Ridership by Route

	FY 10 Annual	Calculate Daily Ridership	Calculate Daily Ridership	
1 Palmetto/Ellenton	44700	126.3	126.27	
2 East Bradenton	66185	187.0	186.96	
3 Manatee Avenue	161941	457.5	457.46	
4 Wal-Mart at U.S. 301 /Blake Hos.	94409	266.7	266.69	
6 Cortez Road	135225	382.0	381.99	
8 Oneco/Bayshore	70955	200.4	200.44	
9 26th Street West	64138	181.2	181.18	
13 Palmetto Circulator	30223	85.4	85.38	
16 15th St. E./Tallevast	59622	168.4	168.42	
99 Palmetto/Sarasota	294940	833.2	833.16	Route Interlined
TOTAL RIDERSHIP	1022338	2888.0	2887.96	
Avg Fare			**1.00**	

Trolley Ridership by Route

	FY 10 Annual			
Sun. Beach Express Rt. 7	5788			
Anna Maria 51	126373	357.0	free	
Anna Maria 52	135204	381.9	free	
Anna Maria 53	107247	303.0	free	
Longboat/Sarasota 54	39584	111.8	111.82	Route Interlined
TOTAL RIDERSHIP		6929.6		
Avg Fare			**1.00**	
		1.50	0.75	

DAILY

Cash Passengers Regular	Reduced	Txfr	Subtotal	Free Under 6	Passes / Transfers	Total	Dollar Amt
194	73	59	325	0	143	580	$306.97
89	33	27	149	0	65	265	$174.00
175	66	53	293	0	129	522	$330.67
125	47	38	210	0	92	373	$276.70
57	21	17	95	0	42	169	$149.07
127	48	38	212	0	93	378	$302.71
40	15	12	67	0	29	118	$77.71
209	78	63	350	0	154	624	$478.11
29	11	9	49	0	22	87	$42.23
90	34	27	150	0	66	268	$237.46
301	113	91	505	0	222	900	$790.72
130	49	39	219	0	96	390	$345.57
57	21	17	96	0	42	171	$132.67
151	57	46	254	0	111	452	$375.75
1102	414	333	1849	0	811	3293	$2,224.59
75	28	23	125	0	55	223	$259.63
1	0	0	2	0	1	4	$4.11
697	262	210	1169	0	512	2081	$1,348.45
62	23	19	104	0	46	186	$113.19
347	130	105	583	0	255	1038	$690.62
4058	1524	1225	6806	0	2985	12123	$8,661
33%	13%	10%			44%	100%	
$1.25	$1.00	$0.60			$1.00		
$5,072	$1,524	$735	$7,331		$2,985		$10,315
			$1.08				**$0.85**

SCAT MONTHLY PASSENGER STATISTICS
SCAT FY 2010 FIXED ROUTE RIDERSHIP BY INDIVIDUAL ROUTE

Psgrs. Per Day ROUTE	FY 1st Quarter	FY 2nd Quarter	FY 3rd Quarter	FY 4th Quarter	TOTAL				
#1 Fruitville	488	493	494	492	492				
#2 Cocoanut Ave.	294	321	305	301	305				
#3 Pinecraft	187	213	191	191	196				
#4 Lido	116	131	121	116	121				
#5 Osprey-Swift	271	258	263	258	263				
#6 Beneva	1,093	1,097	1,045	1,028	1,066				
#7 Newtown-NE.	362	357	354	364	359				
#8 Newtown-301	352	363	373	357	361				
#9 North Port	257	370	348	337	328				
#11 Siesta Key	400	463	398	402	416				
#12 No. Lockwood	680	670	663	557	672				
#13 Venice	90	93	96	381	112				
#14 Bee Ridge	323	321	330	284	328				
#15 Cattlemen	342	348	353	346	348				
#16 Englewood	163	194	192	231	180		#54	#18	
#17 Trail	1,481	1,505	1,486	1,023	1,480		MCAT	SCAT	TOTAL
#18 Longboat	208	248	221	552	221	Route Interlined	111	221	**332**
#19 Sumter Blvd.	84	0	0	0	84				
#20/29 Toledo/Glenallen	95	77	78	74	81				
#21 Englewood Loop	2	0	0	0	2				
#24/25 ScWdm/Bird	102	0	0	0	102				
#26 Venice Connector	57	51	60	47	55				
#40 Webber Limited	102	94	91	100	97		#99	#99	
#99 Palmetto	888	922	937	905	913	Route Interlined	MCAT	SCAT	TOTAL
#215 Cocoanut-Univ.	108	121	115	111	114		833	913	**1746**
# 1411 LkSara-Siesta K	176	223	240	239	219				
#1713 Trail-Jacaranda	440	542	550	523	514				
# 8517 Tallevast-SMH	82	85	91	87	86				
#9S North Port Sunday	31	41	41	58	43				
TOTAL	7,523	7,456	7,634	7,748	7,612				

23 weekday
4 Saturday

DAILY

Cash Passengers				Free	Passes /		
Regular	Reduced	Txfr	Subtotal	Under 6	Transfers	Total	Dollar Amt
165	62	50	276	0	121	492	
102	38	31	171	0	75	305	
65	25	20	110	0	48	196	
40	15	12	68	0	30	121	
88	33	27	147	0	65	263	
357	134	108	598	0	262	1066	
120	45	36	202	0	89	359	
121	45	36	203	0	89	361	
110	41	33	184	0	81	328	
139	52	42	233	0	102	416	
225	85	68	378	0	166	672	
38	14	11	63	0	28	112	
110	41	33	184	0	81	328	
117	44	35	196	0	86	348	
60	23	18	101	0	44	180	
495	186	150	831	0	364	1480	
74	28	22	124	0	54	221	
28	11	8	47	0	21	84	
27	10	8	45	0	20	81	
1	0	0	1	0	1	2	
34	13	10	57	0	25	102	
19	7	6	31	0	14	55	
32	12	10	54	0	24	97	
306	115	92	512	0	225	913	
38	14	12	64	0	28	114	
73	28	22	123	0	54	219	
172	65	52	288	0	126	514	
29	11	9	48	0	21	86	
15	5	4	24	0	11	43	
3199	1201	966	5366	0	2354	9558	$0
33%	13%	10%			44%	100%	
$1.25	$1.00	$0.60			$1.00		
$3,999	$1,201	$579	$5,780		$2,354		$8,133
			$1.08				**$0.85**

Currently, the Transit and Rail Subcommittee of the Florida Model Task Force (MTF) is reviewing the TRANSITMODEL methodology and changes are expected in the near-term. Nevertheless, the TRANSITMODEL remains as the FSUTMS standard for trip-based models in Florida.

Some limitations, are described below:

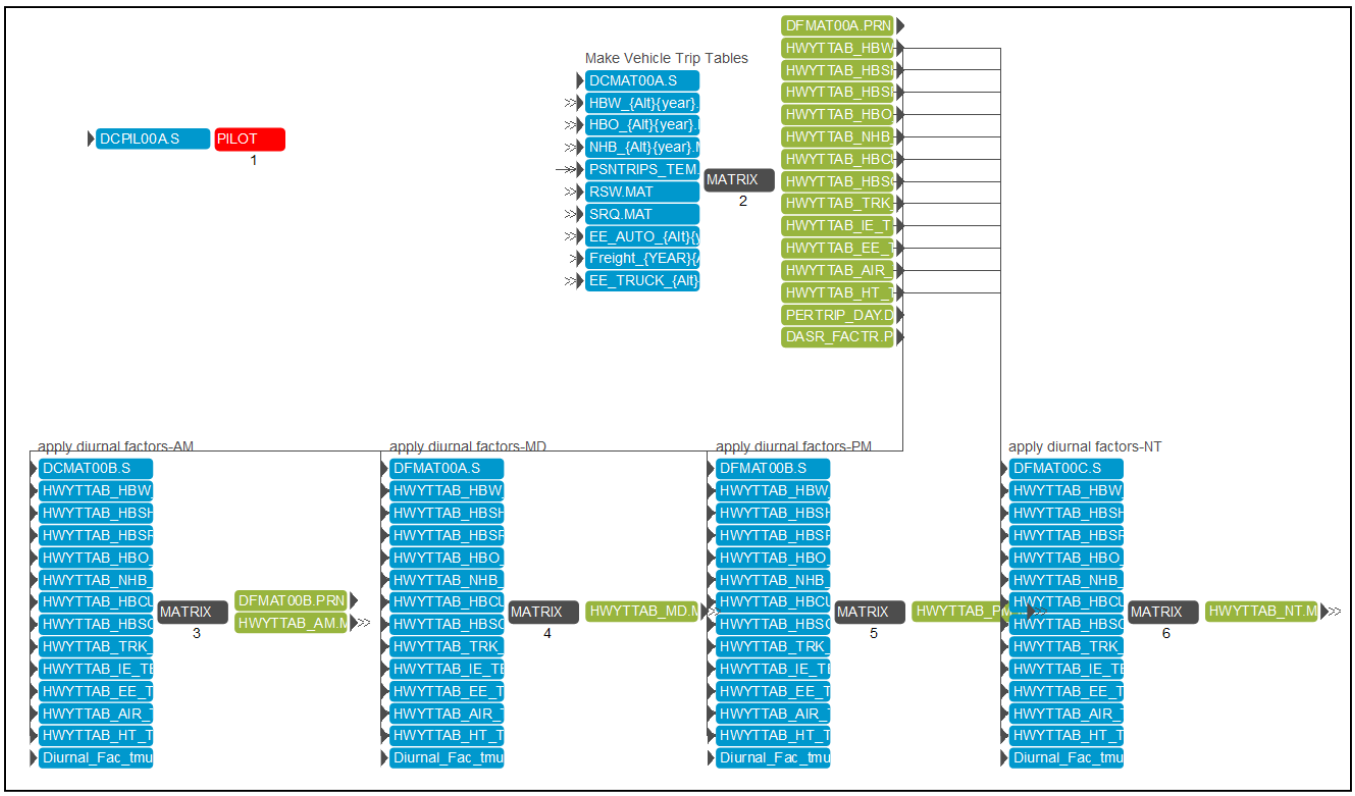
It uses one "average fare" (a problems for areas with a high percentage of senior citizens/students, who ride for half-fare).
There is no ability to calibrate ridership on a route-by-route basis (like TBEST).
Park and ride access is developed as straight-line "as-the-crows-fly" connections between each TAZ and nearby transit stations (not on roadways).
Park and ride egress is not allowed.
Non-motorized modes are not assigned to a network.
Taxi and Ridesource trips are not addressed.

The HIGHWAY ASSIGNMENT Step

SPECIAL NOTICE: These procedures only found in the D1RPM.

Diurnal Factors

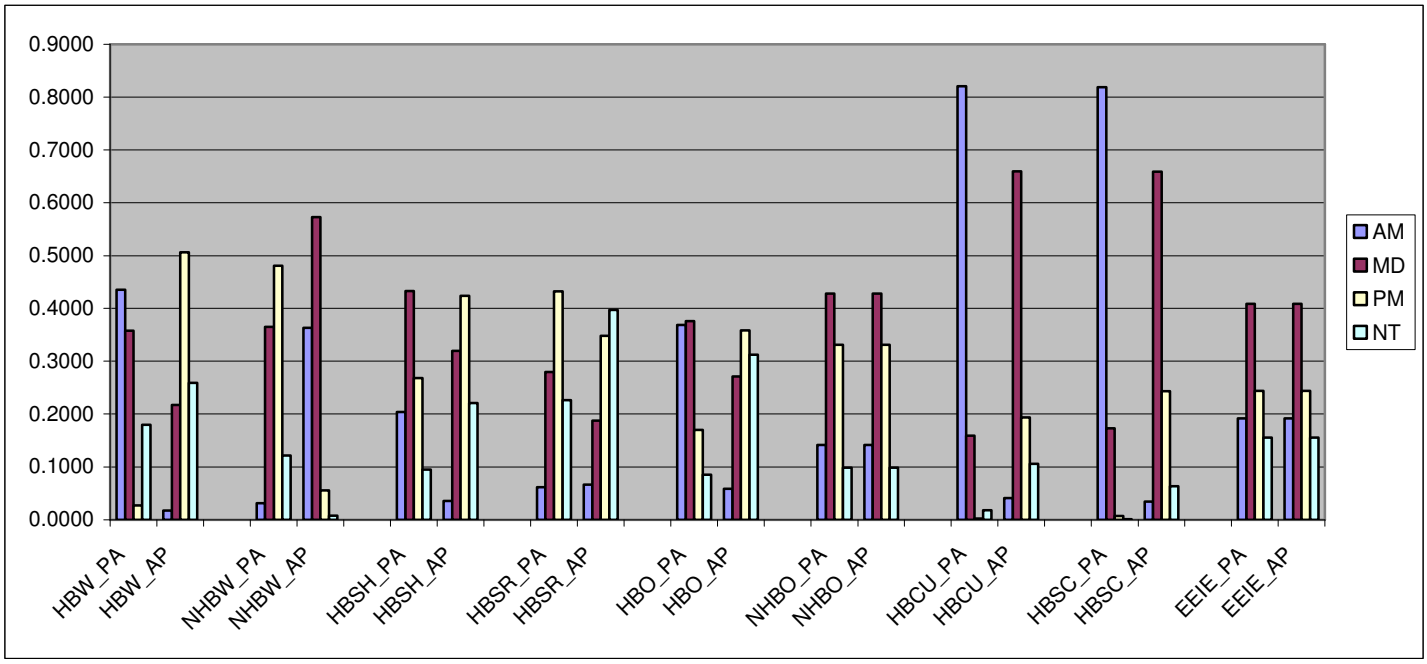
Part of Highway Assignment, "Diurnal Factoring" splits daily automobile trips derived in the Mode Choice model, into trips to be assigned in four time-of-day matrices "AM" (6am-9am), "MD" (9am-3 pm), "PM" (3pm-7pm) and "NT" prior to highway assignment. Peak Periods assignments pave the way for a more precise determination of the effects of directional distribution by time of day, which affect link speeds and travel times. This is also where such things as "peak spreading" may be introduced.



Notes:

1) **Start** ..... puts start-time in runtime file
2) **Make Vehicle Trip Tables** ..... uses percent mode share to split trips by purpose, this is also where auto occupancy is assigned to make DA, SR2 and SR3 vehicle trips.
3) **Apply Diurnal Factors AM** ..... trips, by purpose are factors into highway trip tables by period using the DIURNAL_FAC.DBF table.
4) **Apply Diurnal Factors MD** ..... trips, by purpose are factors into highway trip tables by period using the DIURNAL_FAC.DBF table.
5) **Apply Diurnal Factors PM** ..... trips, by purpose are factors into highway trip tables by period using the DIURNAL_FAC.DBF table.
6) **Apply Diurnal Factors NT** ..... trips, by purpose are factors into highway trip tables by period using the DIURNAL_FAC.DBF table.

Diurnal Factors split vehicle trips into four time-of-day matrices AM (6am-9am), MD (9am-3pm), PM (3pm-6pm) and NT. To explain the application of Diurnal Factors we will look at an example. The first four columns, in the graphic below, show HBW trips leaving from home-going to work. As you would expect, the highest bar is for the AM (6am-9am) period (0.4356% to be exact). So



the daily person trip table would be factored so that 0.4356% of all HBW productions are placed into the AM trip matrix.

Next, looking at the second group of four columns, HBW trips return home-from work, and as you would expect, the lowest bar is for the AM (6am-9am) period (0.0175% to be exact). Again, the daily person trip table would be factored so that 0.0175% of all HBW attractions are placed into the AM trip matrix. Factors are provided for all of the trip purposes shown. The process continues until all trips are apportioned to each of the four time periods.

Next auto occupancy factors are applied. These factors are provided by the Mode Choice, which computes mode shares, for trips, by three classifications: home-based work (HBW), home-based other (HBO)and non-home-based (NHB), as shown in the graphic to the right.

In Step 2 of the Diurnal Model process all of these factors are applied, yielding the four trip purposes matrices for highway assignment: drive-alone (DA), shared-ride (SR2), shared-ride (SR3) and trucks (TRK) for each of the four time periods (AM, MD, PM, NT).

D1RPM model calibration began with the diurnal factors from the TMU project, and these were refined with ACS household travel surveys and FDOT traffic counts.

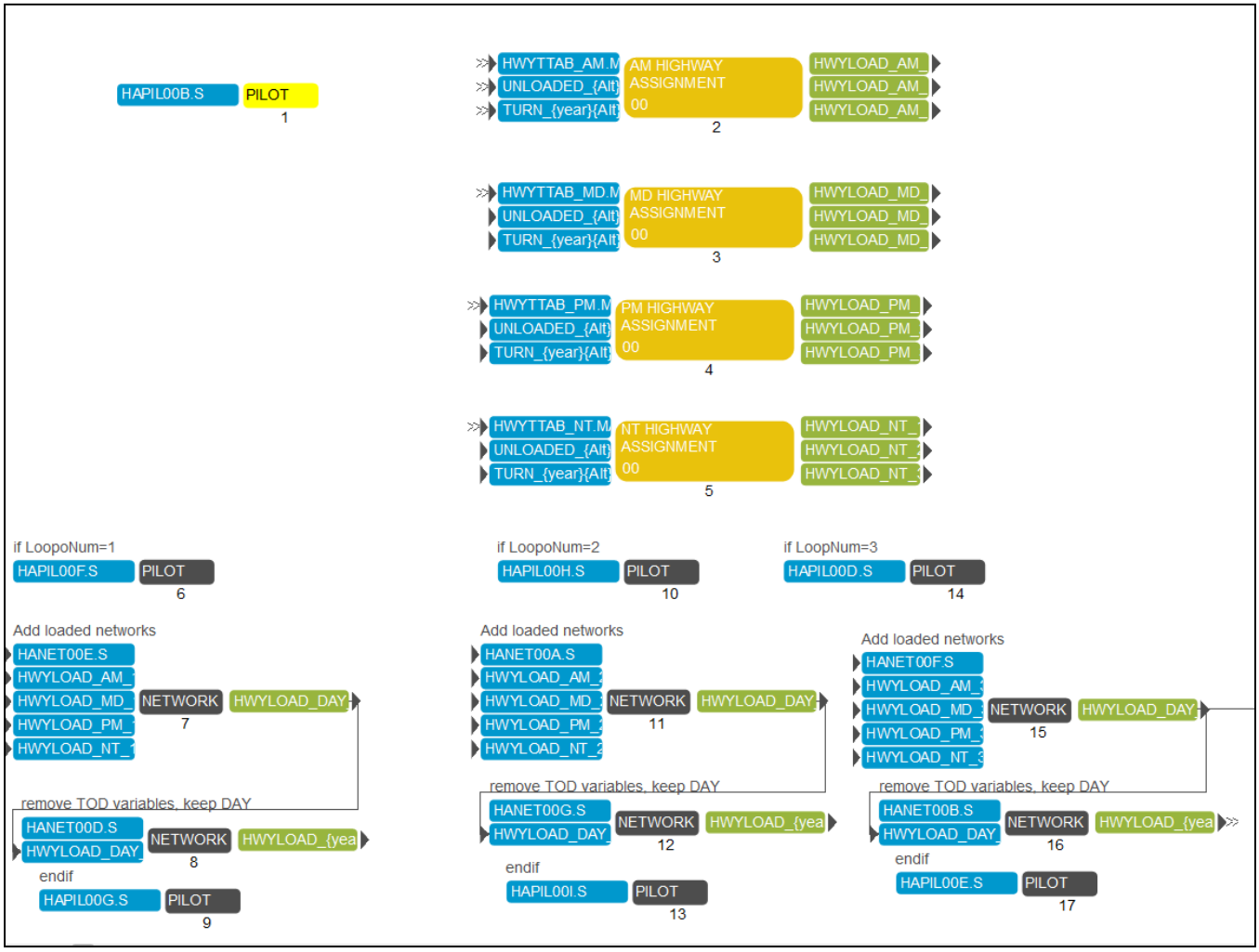
HBW da	1,400,002
HBW sr2	328,303
HBW sr3	167,225
HBW total	1,895,530
%	0.73858062
%	0.17319867
%	0.08822071
HBO DA	989,302
HBO sr2	982,515
HBO sr3	742,514
HBO total	2,714,330
%	0.36447361
%	0.36197315
%	0.27355324
NHB DA	1,377,913
NHB sr2	845,901
NHB sr3	515,681
NHB total	2,739,495
%	0.50298063
%	0.30878004
%	0.18823933

Highway Assignment

The Highway Assignment script in the D1RPM, taken from the Olympus Model, contains the latest toll methodology prescribed by the FDOT Turnpike Enterprise District. The purpose of highway assignment models is to load auto trips onto the highway network. Highway Assignment makes "route choice" decisions for O-D pairs, resulting in traffic estimates on individual links, a simulation general vehicular travel throughout the study area. Validation of the highway assignment involves the adjustment of the speeds, capacities, penalties and other parameters related to travel time.

Trips are loaded onto the highway network by means of an iterative equilibrium highway load program based on an all or nothing capacity restrained assignment. Note that in the D1RPM a feedback-loop is utilized, whereby, congested speeds from the initial

highway assignment are fed back into the next trip distribution-mode-transit & highway processes. This minimize differences in congested speed among all of these modules. Convergence criteria are compared until the differences in travel time and travel distance were minimized. The Highway Assignment flow in the Application are shown below:

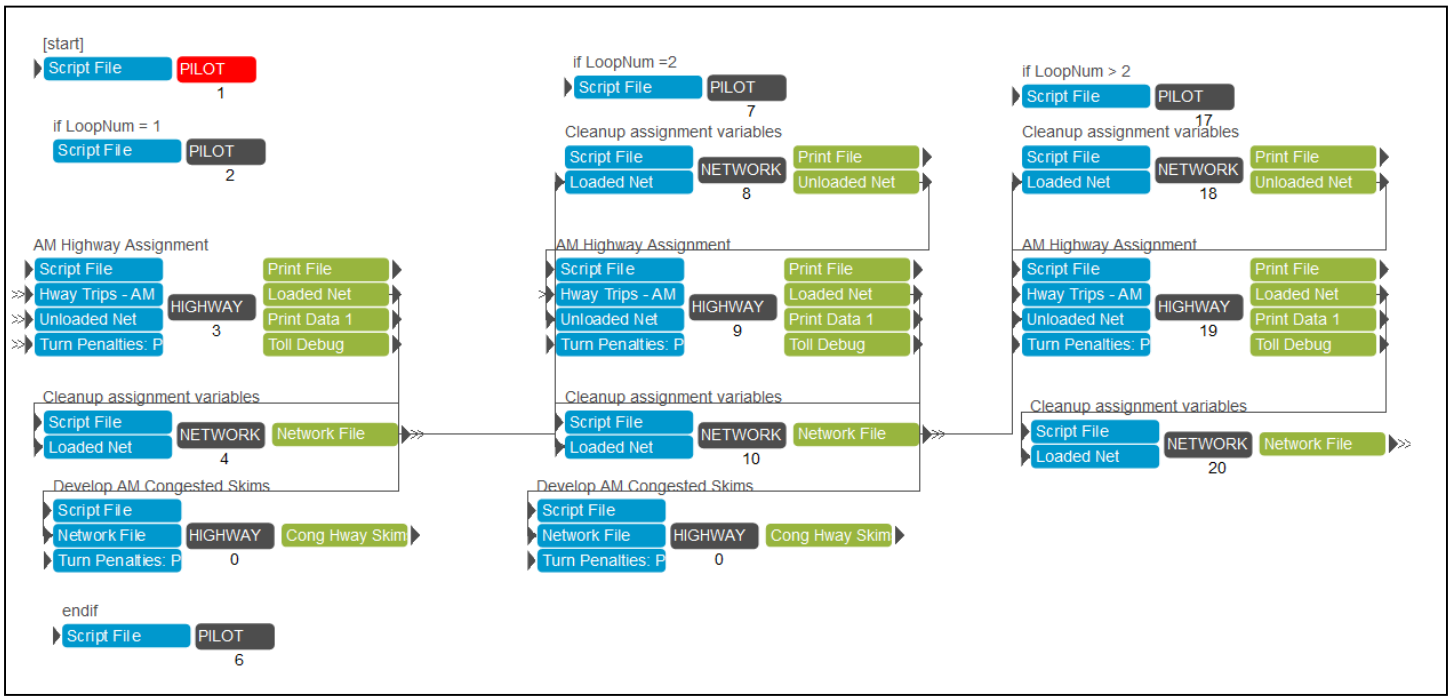


Notes:

1) **[Start]** ..... puts start-time in runtime file
1) **AM HIGHWAY ASSIGNMENT**
2) **MD HIGHWAY ASSIGNMENT**
3) **PM HIGHWAY ASSIGNMENT**
4) **NT HIGHWAY ASSIGNMENT**
5) **IF loop** ..... IF on LoopNum 1
6) **Add loaded networks** ..... self-explanatory
7) **remove TOD variables, keep DAY** ..... self-explanatiory
8) **endif**
9) **IF loop** ..... IF on LoopNum 2
10) **Add loaded networks** ..... self-explanatory
11) **remove TOD variables, keep DAY** ..... self-explanatory
12) **endif**
13) **IF loop** ..... IF on LoopNum 3
14) **Add loaded networks** ..... self-explanatory
15) **remove TOD variables, keep DAY** ..... self-explanatory
16) **endif**

The Highway Assignment flow in the Application for each period is shown below. Note that only the AM Assignment is shown, as the job control for all four periods is identical

AM Assignment



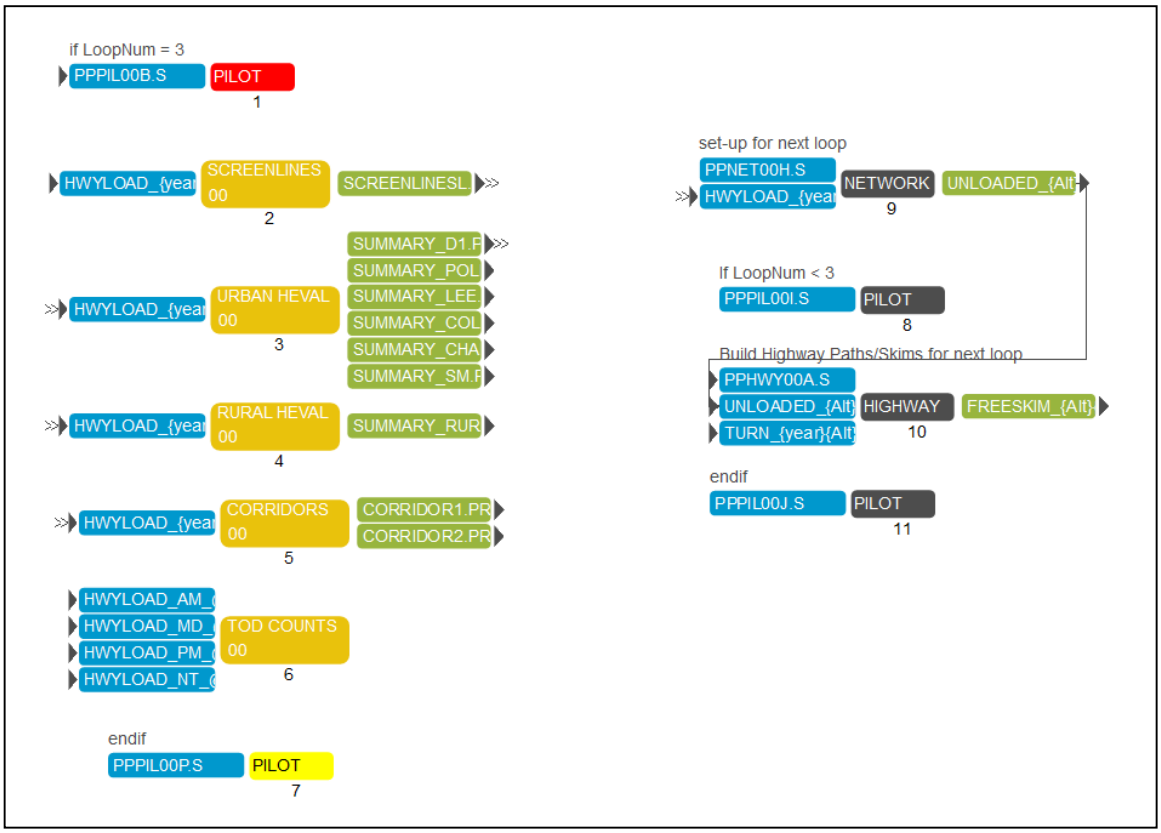
Notes:

1) **[Start]** ..... puts start-time in runtime file
2) **IF loop** ..... IF on LoopNum 1
3) **Add loaded networks** ..... self-explanatory
4) **remove TOD variables, keep DAY** ..... self-explanatiory
5) **endif**
6) **IF loop** ..... IF on LoopNum 2
7) **Add loaded networks** ..... self-explanatory
8) **remove TOD variables, keep DAY** ..... self-explanatory
9) **endif**
10) **IF loop** ..... IF on LoopNum 3
11) **Add loaded networks** ..... self-explanatory
12) **remove TOD variables, keep DAY** ..... self-explanatory
13) **endif**

The POST PROCESS Step

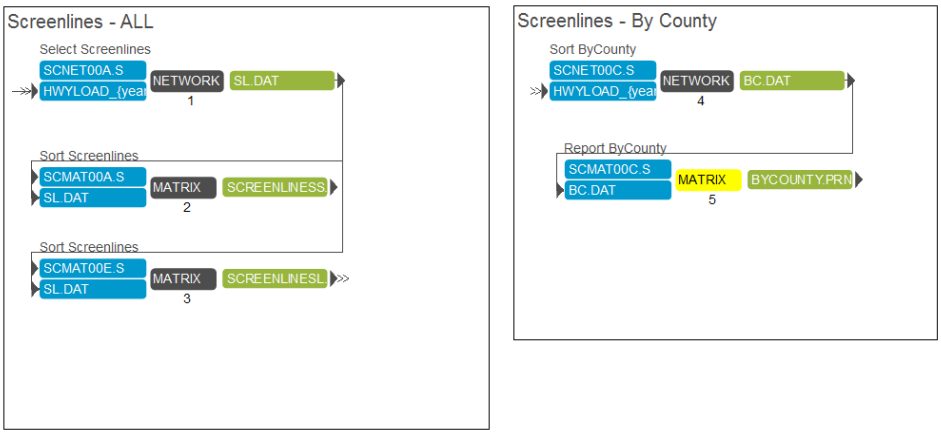
SPECIAL NOTICE: These procedures only found in the D1RPM.

Post Processing procedures are included to provide overall model performance such as screenline and corridor reports as well as volume to capacity evaluation.



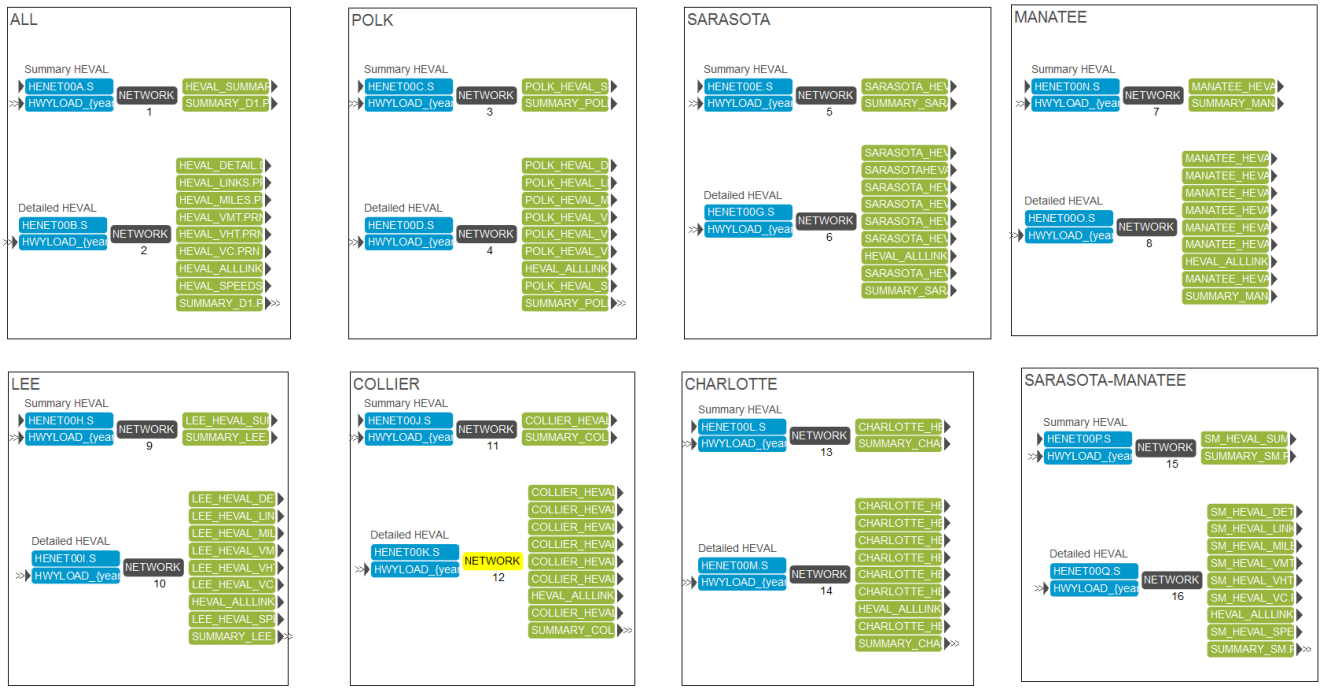
Notes:

1) If LoopNum=3 .....IF on LoopNum 3 i.e. don't make reports until the last loop of assignment
2) SCREENLINES
3) URBAN HEVAL
4) RURAL HEVAL
5) CORRIDORS
6) TOD COUNTS
7) endif .....self-explanatory
8) Set up for next loop .....removes variables so output network is identical to an unloaded network (except congested speeds and times are retained)
9) If LoopNum=3 .....self-explanatory
10) Build Highway Paths/Skims for next loop.....since the next step in the feedback process is to re-run Trip Distribution, a new set of skims (using congested speeds and times from the prevous assignment is needed
11) endif .....self-explanatory



Notes:

1) Select Screenlines .....report only on links with counts which are in the D1RPM model area.
2) Sort Screenlines .....print screenline report (summary version)
3) Sort Screenlines .....print screenline report (long version)
4) Sort by County .....self-explanatory
5) Report by County .....print screenline report (county summary)

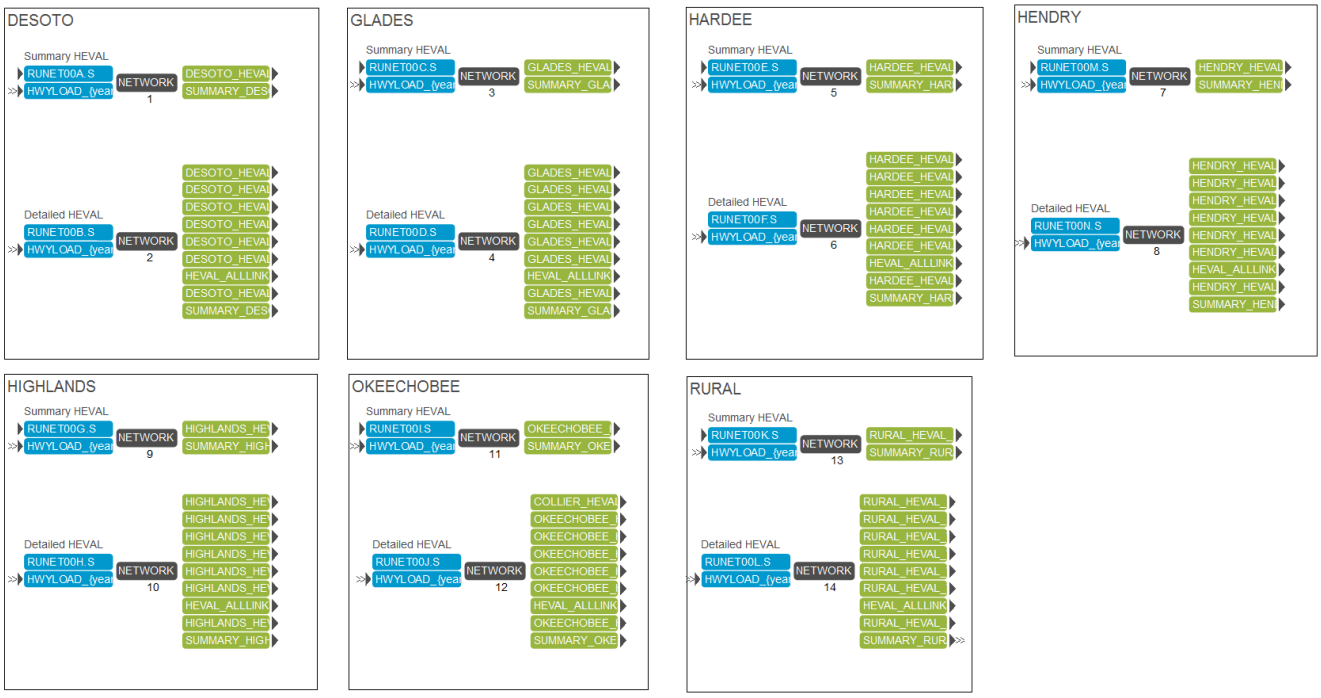


Only one process is described, below, for the entire D1RPM model area. Seven identical reports, except for the sort/exclusion are produced for the urban areas: Polk, Sarasota, Manatee, Sarasota-Manatee, Lee, Collier and Charlotte County.

Notes:

6) **Summary HEVAL** .....report summary statistics only.

7) **Detailed HEVAL** .....report all statistics, a cross-classification stratified by Links, Miles, VMT, VHT, VC, SPEED

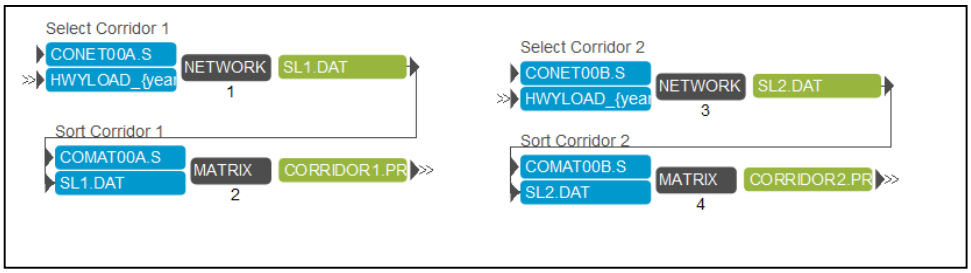


Only one process is described, below, for the entire D1RPM RURAL model area. Seven identical reports, except for the sort/exclusion are produced for the urban areas: Desoto, Glades, Hardee, Hendry, Highlands, Okeechobee and Rural.

Notes:

8) **Summary HEVAL** .....report summary statistics only.

9) **Detailed HEVAL** .....report all statistics, a cross-classification stratified by Links, Miles, VMT, VHT, VC, SPEED



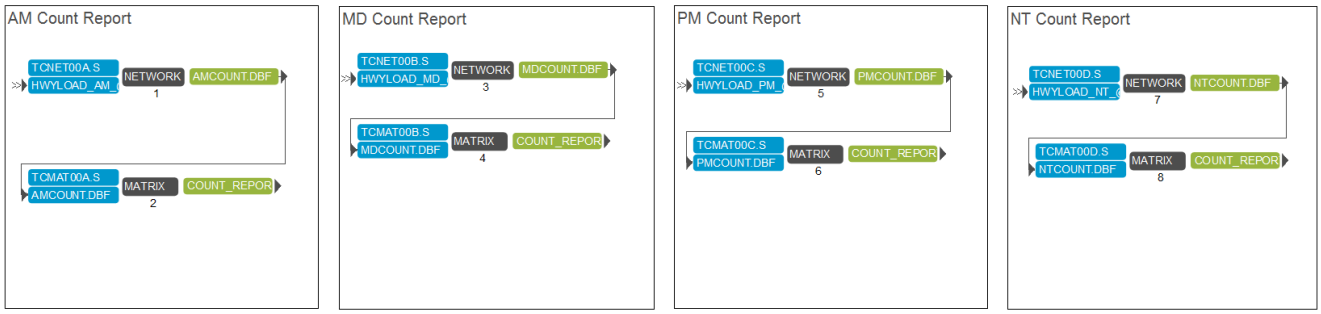
Notes:

10) **Select Corridor 1** .....select all roadways matching the CORRIDOR1 key variable (user selected).

11) **Sort Corridor 1** .....report statistics on Corridor 1

12) **Select Corridor 2** .....select all roadways matching the CORRIDOR2 key variable (user selected).

13) **Sort Corridor 2** .....report statistics on Corridor 2



Only one process is described, below, for the AM period. All reports are identical, except for the sort/exclusion are produced for the urban areas: Polk, Sarasota, Manatee, Sarasota-Manatee, Lee, Collier and Charlotte County.

Notes:

1) .....select all counts > 0 in the AM period.

2) .....report statistics on Counts

It should be noted, here, that post processing procedures are continually evolving, depending upon the needs of the users. For example, the FDOT "FITS_EVAL" reporting for ITS evaluations is currently being tested and may be included within the model at a later

Also, as the model runs through its procedures, a number of other reports are generated (and placed in the scenario folder) which may be helpful to the user. Examples include:

Trip Generation Report (TG_REPORT.PRN), person trips, by purpose, before and after trip-balancing.
Travel Length Frequency Report (DISTRIB.PRN) , trip length, by trip purpose.
Mode Split (MODESUM.TXT) trips by trip purpose.
Transit Assignment (TASUM.PRN), trip by transit route, mode, system.
Screenline Reports by system and by county in (SCREENLINES.PRN).
Model Performance to Calibration Standards, by system and county in (SUMMARY_D1.PRN).
'runtime.prn' which documents model performance.
'keys.prn' which documents model parameters used during the run.

Link Data Description

Structure for database: G:\LINKS_40A.DBF
Number of data records: 66293
Date of last update : 12/28/15

Field	Field Name	Type	Width	Dec	Index	
1	A	Numeric	5		N	
2	B	Numeric	5		N	
3	COUNTY	Character	10		N	county name
4	CC	Numeric	2		N	county code (1-12)
5	EC_KEY	Numeric	3		N	project # (by county)
6	NEEDS_KEY	Numeric	3		N	zero or 1
7	LRTP_KEY	Numeric	2		N	99 = not cost feasible
8	ATYPE	Numeric	2		N	area type
9	FTYPE	Numeric	3		N	facility type
10	LANES	Numeric	1		N	directional lanes
11	FID	Numeric	2		N	florida ID
12	DIR	Character	2		N	cardinal direction (N,S,E,W)
13	ONEWAY	Numeric	1		N	if link is 1-way
14	LRTP_KEY1	Numeric	1		N	project # +inserted / -deleted
15	LRTP_KEY2	Numeric	2		N	project # +inserted / -deleted
16	LRTP_KEY3	Numeric	2		N	project # +inserted / -deleted
17	LRTP_KEY4	Numeric	2		N	project # +inserted / -deleted
18	LRTP_KEY5	Numeric	2		N	project # +inserted / -deleted
19	LRTP_KEY6	Numeric	2		N	project # +inserted / -deleted
20	LRTP_KEY7	Numeric	1		N	project # +inserted / -deleted
21	CONST	Numeric	2		N	"constrained"
22	TRK_RT	Numeric	1		N	"truck route"
23	TOLL	Numeric	2		N	
24	CTOLL	Numeric	9	3	N	
25	TOLLTYPE	Numeric	1		N	
26	PLZADESC	Character	16		N	
27	PLZALNSMAX	Numeric	1		N	
28	CARTOLL	Numeric	7	2	N	
29	SVCMINUTES	Numeric	1		N	
30	SVCSECONDS	Numeric	1		N	
31	TOLL_DEC	Numeric	1		N	
32	TOLL_ACC	Numeric	1		N	
33	SCREENLINE	Numeric	2		N	
34	SL_NAME	Character	15		N	
35	SOURCE	Character	9		N	
36	STATION_N	Numeric	4		N	
37	STATION_C	Character	6		N	
38	DESC	Character	81		N	
39	AADT2006	Numeric	5		N	
40	AADT2007	Numeric	1		N	
41	AADT2008	Numeric	5		N	
42	AADT2009	Numeric	5		N	
43	AADT2010	Numeric	6		N	
44	AADT2011	Numeric	5		N	
45	AADT2012	Numeric	5		N	
46	AADT_1W	Numeric	5		N	
47	MOCF	Numeric	7	2	N	
48	DIR_COUNT	Numeric	6		N	
49	TRK_COUNT	Numeric	5		N	
50	HT_COUNT	Numeric	4		N	
51	COUNT_AM	Numeric	4		N	
52	COUNT_MD	Numeric	4		N	
53	COUNT_PM	Numeric	4		N	
54	COUNT_NT	Numeric	4		N	
55	UAB	Character	1		N	urban area boundary code
56	FUNCLASS	Numeric	1		N	functional classification
57	SV_LOSSTD	Numeric	6		N	service volume, LOS D

58	ROADWAY	Character	40		N	
59	US	Character	40		N	US Highway #
60	SR	Character	40		N	State Route #
61	CR	Character	40		N	County Route #
62	LOCAL	Character	40		N	Local Name
63	BLANK	Character	1		N	

Fields after "BLANK" are added during Assignment

48	DISTANCE	Numeric	8	5	N	
49	DISTANCEFT	Numeric	11	5	N	
50	UROADFAC	Numeric	4	2	N	
51	CONFAC	Numeric	4	2	N	
52	BPRCOEFF	Numeric	4	2	N	
53	BPREXPO	Numeric	3	1	N	
54	CAPACITY	Numeric	7	1	N	
55	SPEED	Numeric	10	5	N	
56	TIME	Numeric	8	5	N	
57	WALKTIME	Numeric	6	2	N	
58	SPEED0	Numeric	2		N	
59	NTCSPEED1	Numeric	10	5	N	
60	NTCSPEED2	Numeric	10	5	N	
61	NTCSPEED3	Numeric	10	5	N	
62	C_NT	Numeric	12	5	N	
63	PMCSPEED1	Numeric	10	5	N	
64	PMCSPEED2	Numeric	10	5	N	
65	PMCSPEED3	Numeric	10	5	N	
66	C_PM	Numeric	12	5	N	
67	MDCSPEED1	Numeric	10	5	N	
68	MDCSPEED2	Numeric	10	5	N	
69	MDCSPEED3	Numeric	10	5	N	
70	C_MD	Numeric	12	5	N	
71	AMCSPEED1	Numeric	10	5	N	
72	AMCSPEED2	Numeric	10	5	N	
73	AMCSPEED3	Numeric	10	5	N	
74	C_AM	Numeric	12	5	N	
75	DIRV_DAY	Numeric	5		N	Directional Volume
76	DA_DAY	Numeric	5		N	Drive-Alone Vollume
77	SR_DAY	Numeric	5		N	Shared-Ride Volume
78	TRK_DAY	Numeric	4		N	Truck Volume
79	TOTV_DAY	Numeric	6		N	Total 2-way Volume
80	CAP_DAY	Numeric	6		N	Capacity
81	VOLCAP_DAY	Numeric	7	5	N	Volume to Capacity
82	VC_FDOT	Numeric	7	5	N	VC to SV_LOSSTD
83	VOLCNT_DAY	Numeric	7	5	N	Volume to Count
84	VMT_DAY	Numeric	6		N	
85	VHT_DAY	Numeric	4		N	
86	CSPD_DAY	Numeric	10	5	N	
87	CTIME_DAY	Numeric	8	5	N	