BMC InSITE Model

Users Guide: DRAFT

draft
report

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1.0   Introduction

This free-standing report provides a User's Guide on how the Population Synthesizer and the 38 components of the Activity Based Model (ABM) Framework developed in TourCast have been combined with the truck model, special generator model and the external model to describe every individual's travel and their activities within detailed time and space constraints.

This report goes into detail on how the InSITE activity based model has been implemented within Cube, a modeling software framework. The report provides a "how to" guide to users in the Baltimore Metropolitan Council and members of the transportation community who will be using this model. This guide should be used along with the Model Estimation and Validation Reports to provide the full background to this model.

To put the activity modeling work in a broad context, we provide a summary of the four major categories of models that exist in the ABM framework:

- **Long-term Models**. This category includes captures decisions with a longer time horizon, including the location of one's regular workplace, school location, vehicle availability, and transit and toll transponder pass ownership.

- **Daily Activity Patterns** simulated through a series of models including:

    o   Daily activity pattern model that determines the number and types of activities in which an individual is expected to participate;

    o   Mandatory tour generation (work, university, and school);

    o   School escorting, which simulates whether children with a school tour are escorted by another family member;

    o   Joint non-mandatory tour participation, which simulates the number of tours undertaken jointly by members of the same household; and

    o   Individual non-mandatory tour generation.

- **Tour Level Models** incorporate interrelationships among trips that are components of a tour which typically departs from home, visits one or more activity locations, and then returns home. Tour-level models provide an improved way to account for mode, time-of-day, and joint travel decisions.

- **Trip/Stop Level Models**. Within each tour, non-primary stops are modeled as intermediate stops. For tours with intermediate stops, separate models that capture the destination of the stop, the mode of travel, and the time-of-day of travel are developed. These models are constrained by the choices already made at the tour-level and therefore, allow for a more realistic decision-making process for every individual trip.

2.0 Installation and Implementation Overview

The Baltimore Metropolitan Council InSITE activity based model (ABM) is powered by TourCast and built to take advantage of multi-core processors within a single machine running the Windows Server or Windows 7 (or higher) operating system.

2.1 Hardware Requirements

Below are the requirements for an efficient ABM operation. The program will work on systems with less RAM and processors, e.g. a laptop with 8GB RAM and 4 cores, but it will perform better on the configuration defined below:

- Hard disk capacity:

    o ~50GB per scenario

- RAM requirements:

    o 16GB

- CPU requirements:

    o 8-16 core processors

    o Processor speed matters nearly as much as number of cores, e.g. a 3.4GHz i7 processor with 4 cores may outperform a 2.4GHz Xeon processor set with 24 cores.

2.2 Software Requirements

These are the minimum requirements to run the ABM with TourCast.

- PopGen2

- Cube 6.4.2 with Cube Cluster

    o Confirm the presence of the license file. Depending on the installation, there may need to be a cubevoyager.lci in the Program Files\Cube\Voyager directory contains the file. If this file is present in the 32 bit program files folder, copy it to the 64 bit folder.

    o Confirm that tpptools.dll, tppdlibx.dll, tputlib.dll are present in the Program Files\Cube\CubeVoyager directory.

- Python 2.7

    o Ensure that Python.exe is included in the PATH variable.

- Microsoft .NET Framework 4.5

- PostgreSQL 9.6 or later

- TourCast binaries and configuration scripts (included as part of model zip file)

2.3 Installation Process

This section describes the steps to install the model.

1. Ensure that the required software is present.

2. Install PostgreSQL, taking note of the root user and root password. Make sure that the values for DatabaseRootUser and DatabaseRootPassword in the TourCast.exe.config file match with what have been selected during the PostgreSQL installation. TourCast ships with both of these values defaulting to 'postgres'.

3.   Choose a location on the computer to unzip the model. The intermediate and final data will be generated within the model folder, so select a location that has sufficient storage (~30GB per speed feedback).

4. NOTE: Do not install the model to a directory (folder) that includes an "@" symbol. This symbol is interpreted by Cube to represent variables and will prevent Cube from following the file path. Note that folders under the "Users" directory, such as My Documents, include an "@" symbol in the file path.

5. Using Cube, open the InSITE_Ver**.cat security catalog file. Click "Yes" when prompted to update the Application structure path.
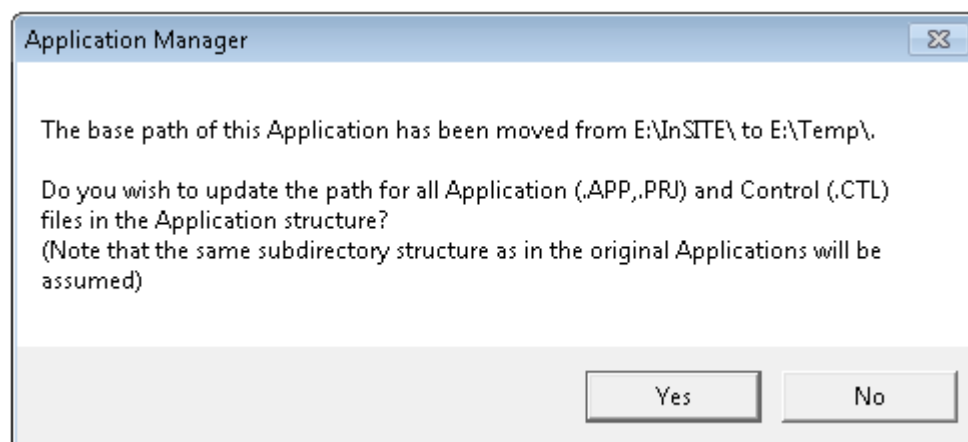
You may also see the following warning message appear several times as the path is updated; they are benign and you can just click "OK" to each one:
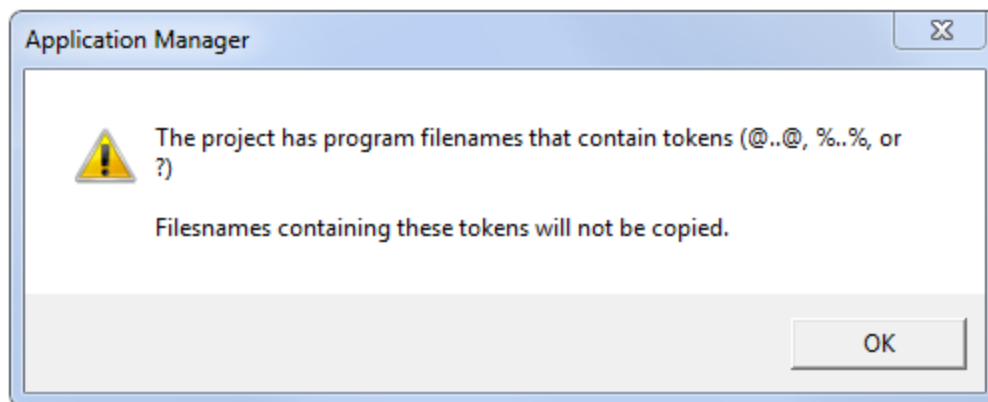
Once the catalog is open, you should see the Root application group. Details of each application group are provided in the following Catalog Overview section.

2.4 Folder Structure

Within the catalog directory that has been expanded there are the following folders:

- **Cube**: Cube application group (*.APP) and script files (*.S)
    - o The Cube files are organized into subdirectories according to the application group.
    - o The Cube script file names are set by the application group name and the program type. For example, a Pilot program in the Root application will have a file name RTPIL***.S
- **Input**: synthesized population, highway factors, and external/special generator parameters
    - o **accessibilities:** accessibility logsum parameters
    - o **network**: preprocessed highway networks
    - o **skims**: loaded highway and transit skims to prime first iteration (optional) – All users will need Full Control permission for this folder, that is, permission to read/write/create files in this folder.
    - o **transit**: transit factor, line, fare, and system files
    - o **Popgen:** preprocessed PopGen outputs
    - o **InputsFromPrevModel**: external, truck, and special generator files from trip based model
    - o **sedata**: zonal and parcel data
- **Doc:** user documentation and validation reports
- **TourCast:**
    - o **bin:** TourCast executables and libraries – Users will also need Full Control permission on this folder for temporary file creation.
    - o **logs:** log output from TourCast
    - o **script:** TourCast model component configuration files
    - o **schema:** sql files for developing schemas in TourCast

Root: Cube scenario directory – All model outputs will be written to subdirectories of this folder.

2.5 Catalog Overview

At a high level, the InSITE ABM catalog is organized with initial skimming and non-ABM components and a speed feedback loop.
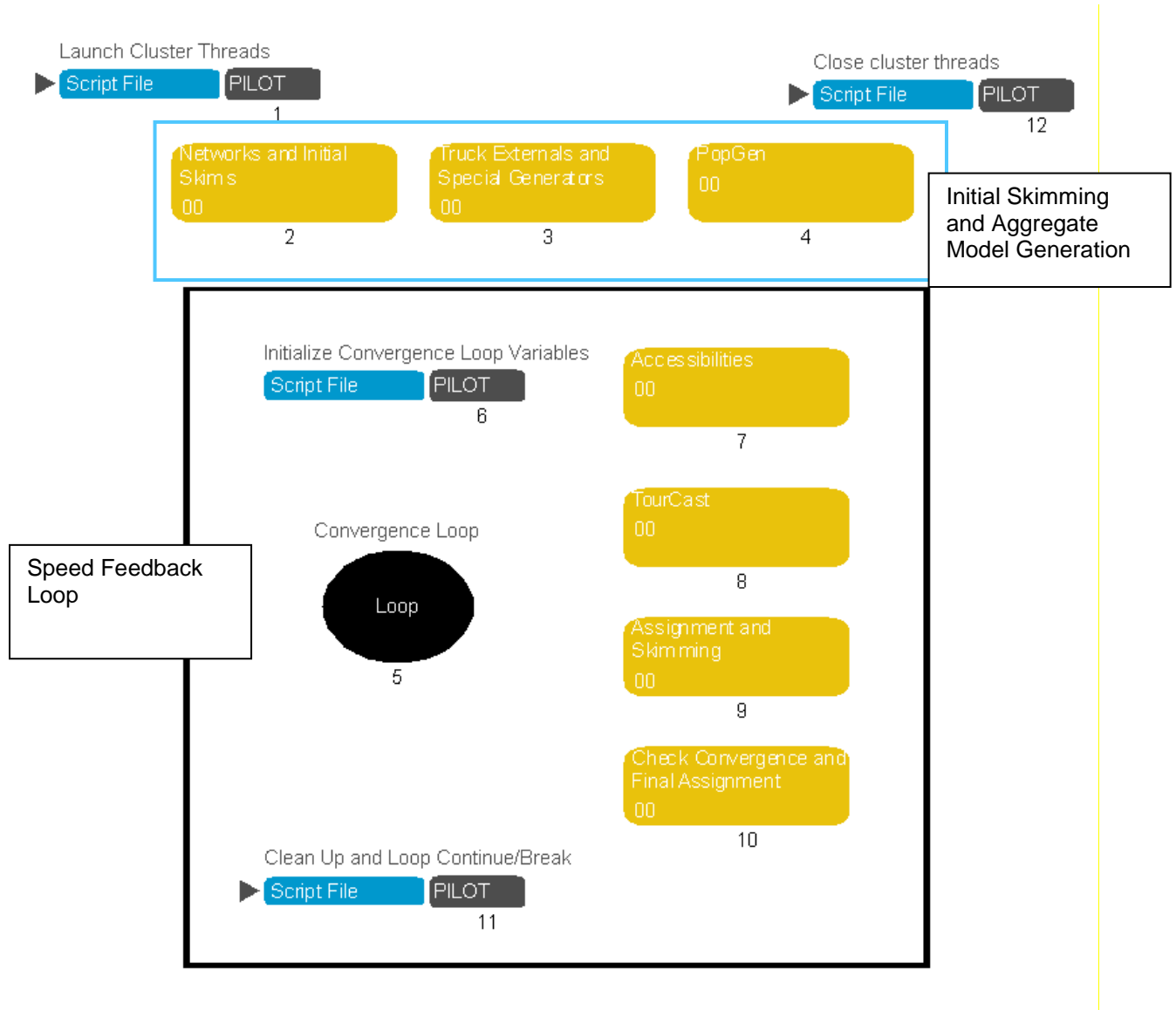
2.5.1 Initial Skimming, Aggregate Model Generation, PopGen

The initial skimming and aggregate model generation includes model operations that do not change across speed feedback iterations, such as the population generator and special generator productions. Also, the skim inputs are prepared in these application groups for the first iteration.

Networks and Initial Skims – Group 2

This group takes as input the highway network with speeds and capacities and the transit line files. Free-flow skims are generated for the non-motorized modes at a daily level, highway for four time periods, and transit for a peak and off-peak time period.

Non-Motorized Networks – Group 2.1
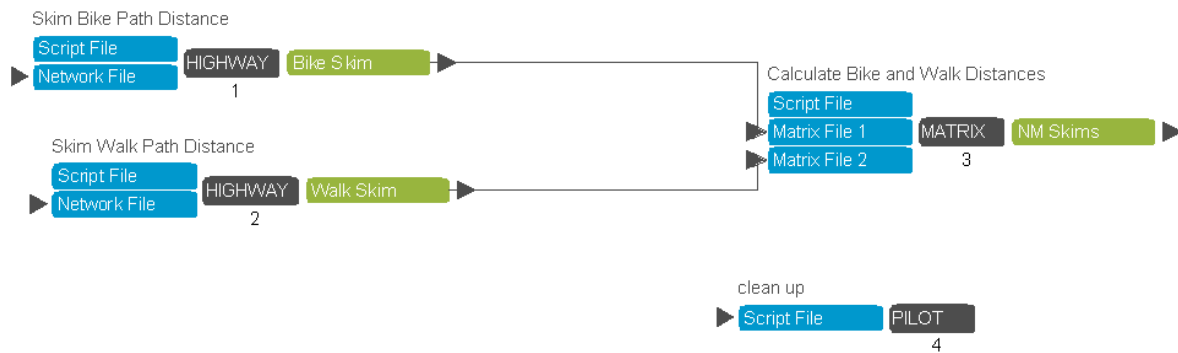
The current model uses the highway distances for both bike and walk skims. A separate structure and process are maintained in the model, should BMC decide to implement a separate skimming process in the future.

Highway Free Flow Skims – Group 2.2

Copy Highway Skims if specified, else
▶ Script File | PILOT
1

▶ Network File | Highway Free Flow Skims 00
2

End else
Script File | PILOT
3
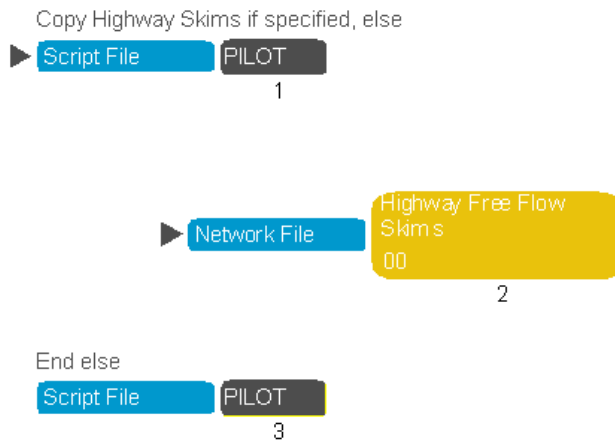
If generating free-flow skims is not specified in the scenario manager, highway skims will be copied from the specified location.

Transit Free Flow Skims – Group 2.3

Extract Nodes File
Script File
>▶ Link/Net. 1 | NETWORK | Node File

Create a sequential id for Transit Stop Lookup
Script File
Database 1 | MATRIX | Record File 1 ▶
2

1

Copy Transit Skims if specified, else
▶ Script File | PILOT
3

▶ Network File | Skim Transit 00
4

End else
Script File | PILOT
5
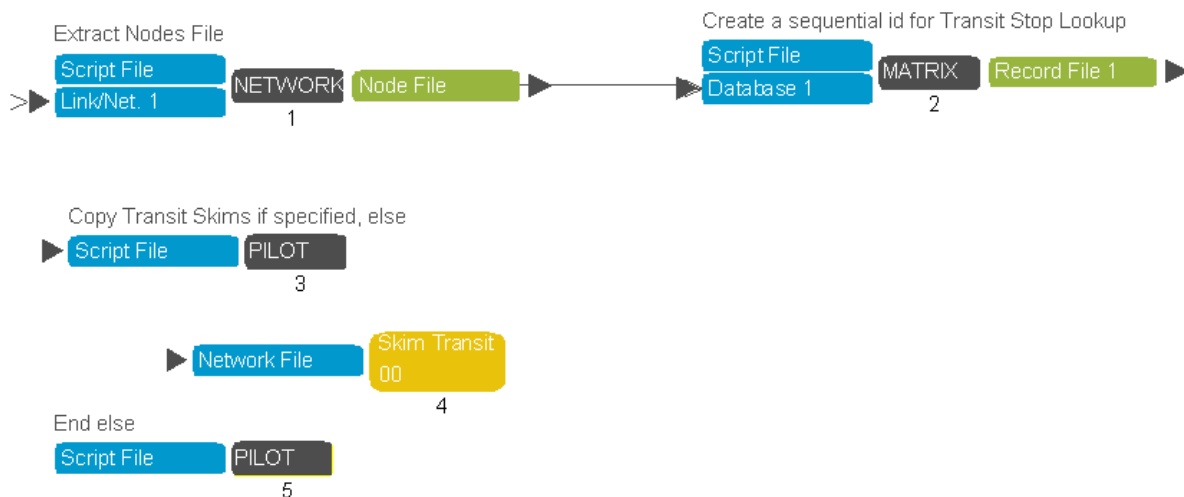
A transit stop lookup file is generated from the network to calculate the parcel-transit stop access and egress times. The transit skimming procedure is identical to that done after highway assignment. Please refer to Group 9.3 for more information.

Truck and Special Generators – Group 3
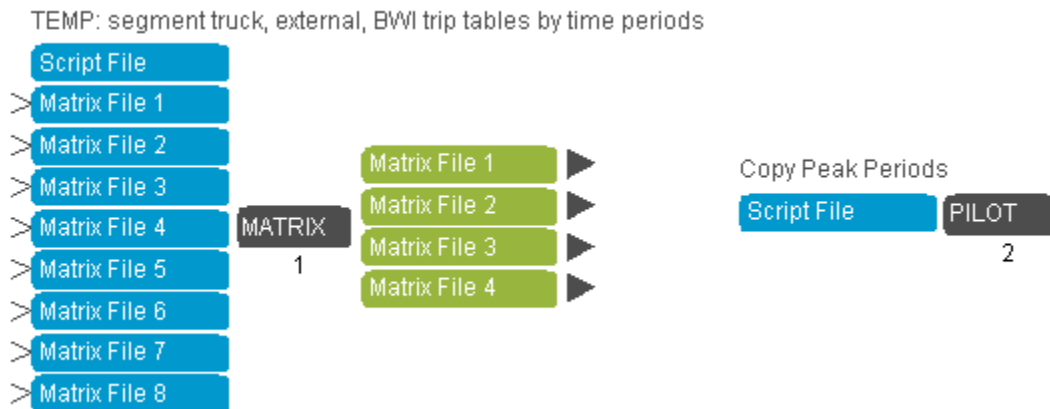
This group models the part of external model components that are constant across speed-feedback iterations.

The current implementation copies the outputs from the trip-based model and will be updated.

Run PopGen – Group 4
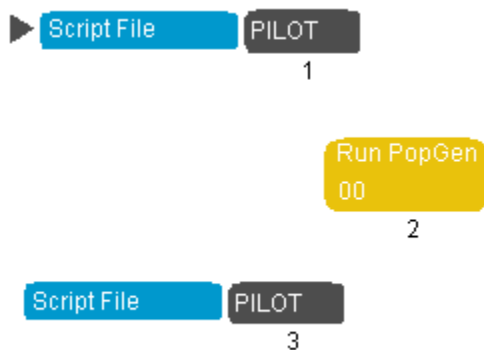
Running PopGen is controlled by a scenario key. If the scenario key is de-selected, the selected households and persons tables are copied to the scenario directory.

The PopGen application group is a placeholder and will eventually be updated to run PopGen natively from Cube.

2.5.2   *Speed Feedback Loop*

Each speed feedback loop begins with calculating the aggregate logsums. Next, the disaggregate demand models powered by TourCast are run. The trip tables from the disaggregate and aggregate models are then combined for highway and transit assignment. After the first iteration, the assigned link volume is compared to the convergence threshold. If the current iteration results are within the

convergence threshold, then a final set of highway assignments and transit assignments are completed and the loop exits.

Accessibilities – Group 7
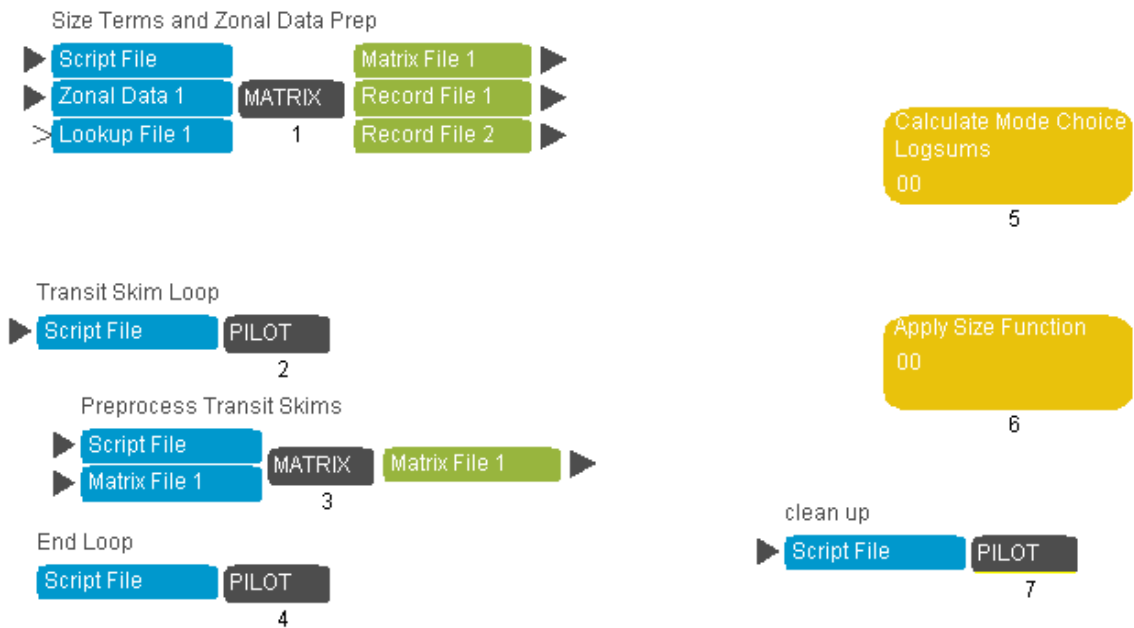
The accessibilities group calculates the aggregate logsums used in the early activity-based model components. The initial steps in the calculation prepare the size terms and process the transit skims. The mode choice logsum is calculated and size terms are applied to the logsum prior to aggregation for across all destination zones for each origin zone.

TourCast – Group 8
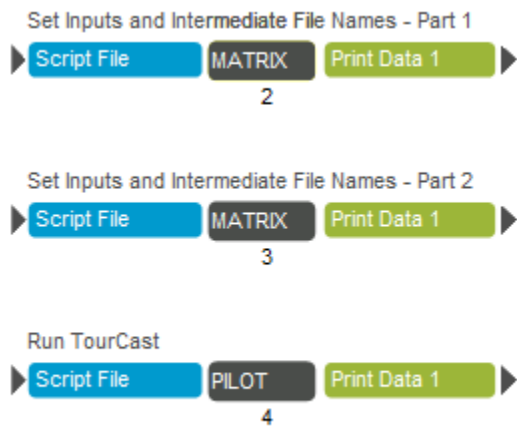
TourCast runs by calling the TourCast.exe file in the TourCast\bin folder of the catalog and passing the component configuration file(s) as arguments. In order to call an external program from within Cube Catalog and capture error codes from the external program, a batch program needs to be dynamically created and called. The first two Matrix programs within this application group set the input and output file names for this speed feedback iteration and the Pilot program assembles the TourCast calls according to the components selected through the scenario manager.

Highway Assignment – Group 9.2

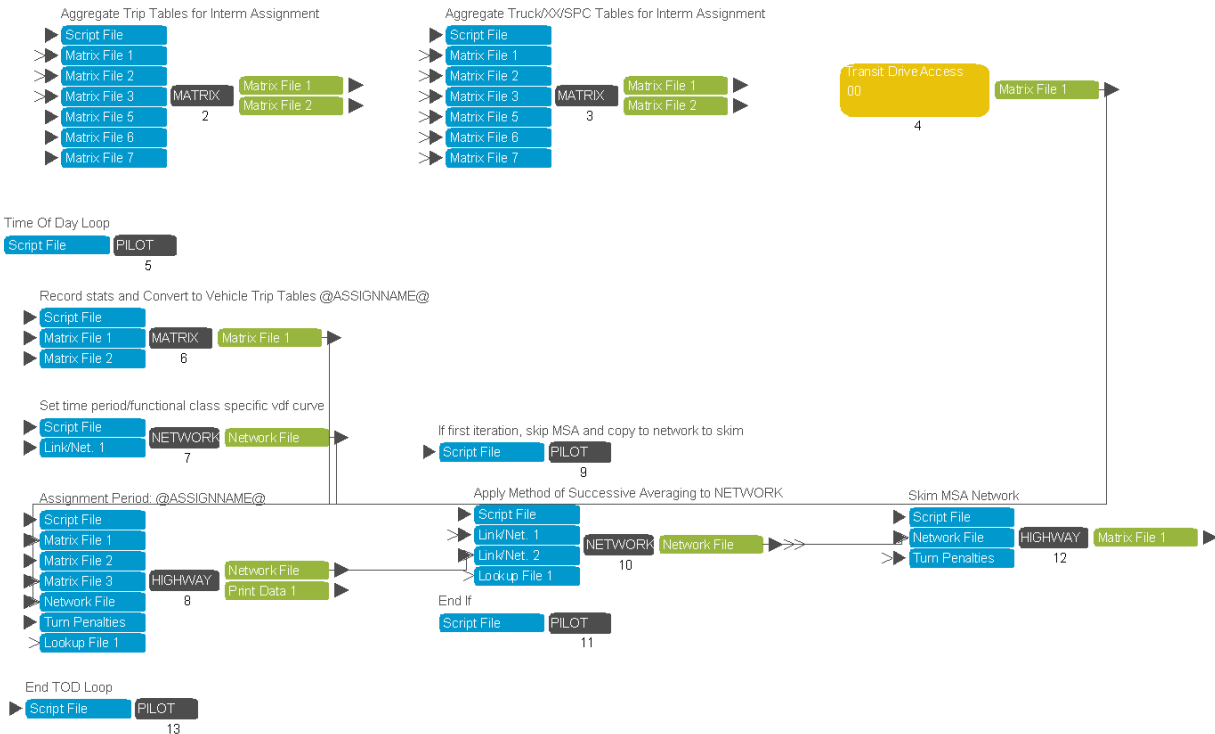This highway assignment is the convergence loop assignment that only assigns four time periods, as opposed to the final highway assignment that assigns eleven time periods. Therefore, the first step in this group is to aggregate the eight time period tables into four time periods (MATRIX 2 – MATRIX 3).

The programs in application group 4 derive the auto trip component from the transit drive-transit person trips for each time period.

The group then loops through each time period, converts from person to vehicle trip tables (MATRIX 6), runs the assignment and conducts a method of successive averages process on the loaded network before collecting skims (HIGHWAY 8 – HIGHWAY 12).

Transit Skims – Group 9.3

Configure Loop Over Region and Periods

Script File | PILOT

1

Walk to Transit Pathbuilding

Script File
Network File
Line File 1
System File 1
NTLegs File 1
NTLegs File 2   PUBLIC
NTLegs File 3   TRANSPORT
NTLegs File 4   2
NTLegs File 5
Fares File
Factor File 1

Network File
Links File 1   Thread End / Restart
Report File   Script File | PILOT
Route File 1   3
Matrix File 1

Drive to Transit Pathbuilding

Script File
Network File
Line File 1
System File 1
NTLegs File 1
NTLegs File 2   PUBLIC
NTLegs File 3   TRANSPORT
NTLegs File 4   4
NTLegs File 5
Fares File
Factor File 1

Network File
Links File 1
Report File
Route File 1
Matrix File 1

End Loop and Wait for Threads to Finish

Script File | PILOT

5

Assemble Transit Skims
00

6

The transit skim group uses the loaded highway network to update the transit speeds and generate a new set of transit skims. The skim loop is done by time period (peak/off-peak), access mode (walk/drive), and region (BMC, COG).

Transit Skims Assembly – Group 9.3.6

Region / Period / Access Loop

Script File | PILOT
1

Script File
Network File
Route File 1 → PUBLIC TRANSPORT → Stop2StopFile1 / Report File
Matrix File 1
2

If PnR

Script File | PILOT
5

Export PnR for Drive-Access Derivation

Script File
Database 1 → MATRIX → Record File 1
Lookup File 1
6

Script File
Record File → MATRIX → Record File 1
3

Script File
Matrix File 1 → MATRIX → Matrix File 1
4

End Loop

Script File | PILOT
7

Attach First/Last Stop To Peak Skims

Script File
Matrix File 1
Matrix File 2
Matrix File 3
Matrix File 4 → MATRIX → Matrix File 1 / Matrix File 2 / Matrix File 3 / Matrix File 4
Matrix File 5   8
Matrix File 6
Matrix File 7
Matrix File 8

Attach First/Last Stop To OffPeak Skims

Script File
Matrix File 1
Matrix File 2
Matrix File 3
Matrix File 4 → MATRIX → Matrix File 1 / Matrix File 2 / Matrix File 3 / Matrix File 4
Matrix File 5   9
Matrix File 6
Matrix File 7
Matrix File 8

Combine BMC and WashCOG Regions

Script File
Matrix File 1
Matrix File 2
Matrix File 3
Matrix File 4 → MATRIX → Matrix File 1 / Matrix File 2 / Matrix File 3 / Matrix File 4
Matrix File 5   10
Matrix File 6
Matrix File 7
Matrix File 8

Script File | PILOT
11

Simplify skims for TourCast

Script File
Matrix File 1 → MATRIX → Matrix File 1
Lookup File 1   12

Script File | PILOT
13

The transit skim assembly combines the transit skims between the two regions (MWCOG and BMC) and converts the skims into the necessary cores for TourCast.

Convergence Check – Group 10.2
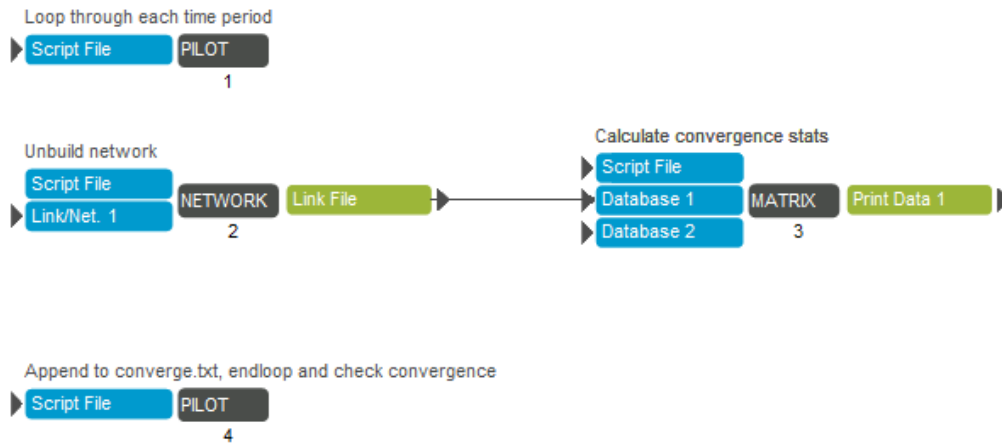
After the second iteration, the highway assignments are compared to the previous iteration to see if the highway volume has changed in a manner greater than the convergence thresholds. Convergence is checked for each time period and the speed feedback loop continues if convergence is not reached for all time periods. The convergence status is appended to the **converge.txt** file in the scenario directory.

Assign Highway and Transit – Group 10.4
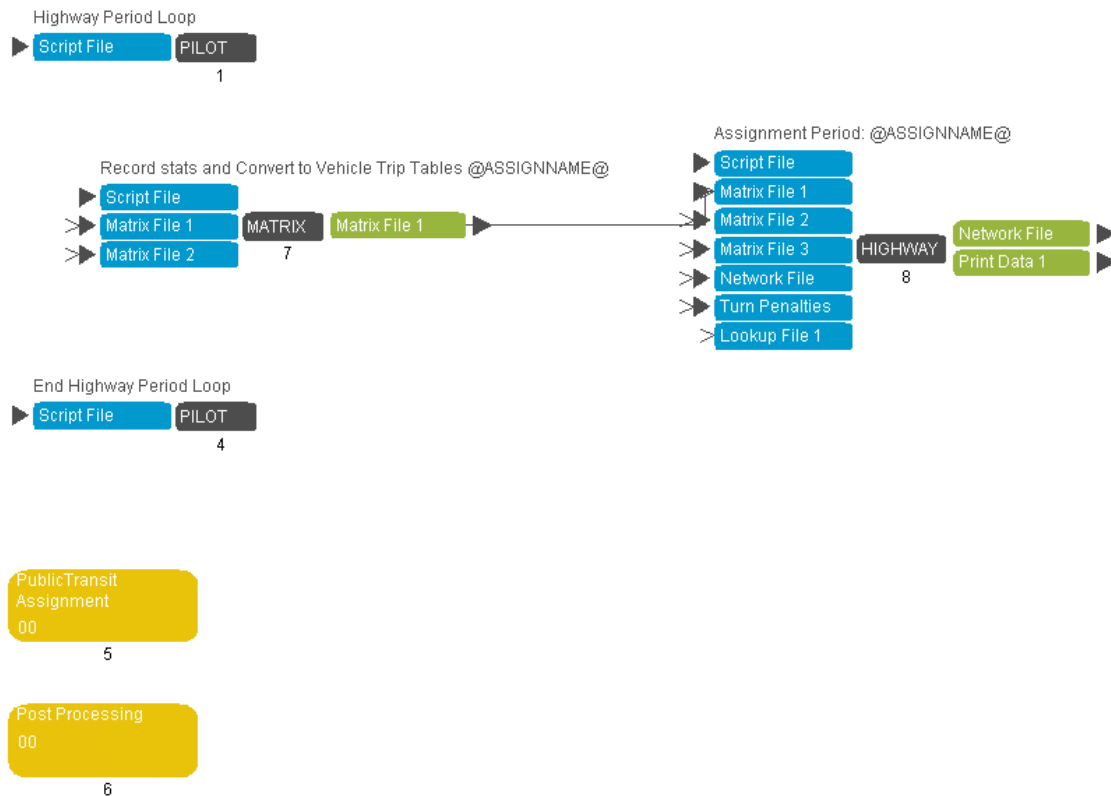
If convergence has been reached, then the eight time period highway assignment and the transit assignment are run. The post processing step at the end of the eight time period assignment combines

the results of each time period as well as the results from the four time period assignment into a single network for analysis.

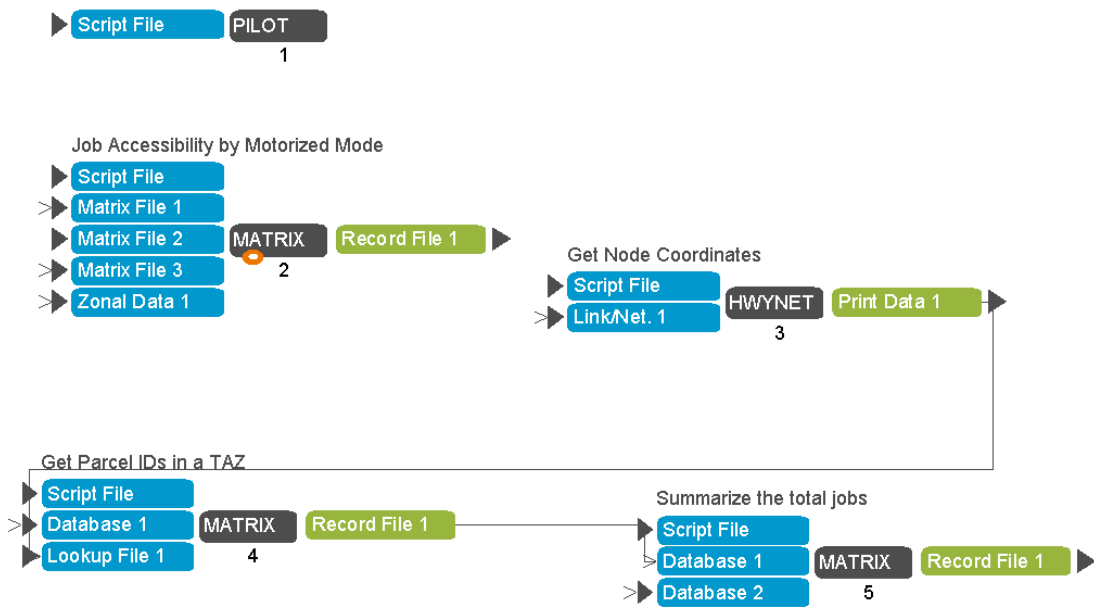## Transit Assignment – Group 10.4.5

Time period / transit access loop

Script File	PILOT
	2

Script File		
Network File	PUBLIC	Links File 1
Route File 1	TRANSPORT	Report File
Matrix File 1	3	

End Loop

Script File	PILOT
	4

This group assigns the walk-transit and drive-transit trip tables for peak and off-peak periods.

Job Accessibility – Group 12.1

Script File PILOT
1

Job Accessibility by Motorized Mode

Script File
Matrix File 1
Matrix File 2 MATRIX Record File 1
Matrix File 3 2
Zonal Data 1

Get Node Coordinates

Script File
Link/Net. 1 HWYNET Print Data 1
3

Get Parcel IDs in a TAZ

Script File
Database 1 MATRIX Record File 1
Lookup File 1 4

Summarize the total jobs

Script File
Database 1 MATRIX Record File 1
Database 2 5

This group calculates job accessibility by different modes for each TAZ.

3.0   Preparing a Model Run

3.1 Input Data and Parameter Files

3.1.1   TourCast component configuration files

Each disaggregate demand model includes a main configuration file and may require several other configuration files to be fully defined. The configuration files define the following for each model component:

- Component type
- Alternatives
- Variables and coefficients
- Nest structure (if the model is nested)
- Model parameters
- Segmentation

The configuration files associated with each component are defined in **Appendix A**.

3.2   Cube Catalog Scenario Manager

The scenario manager has a set of user-defined keys. The purpose and default value of each key is described in this section.

The catalog scenario manager can be used to specify the scenario input files and parameters. To access the scenario manager, open the InSITE_Ver**.cat security catalog file in Cube and double click the desired scenario in the Scenario window.
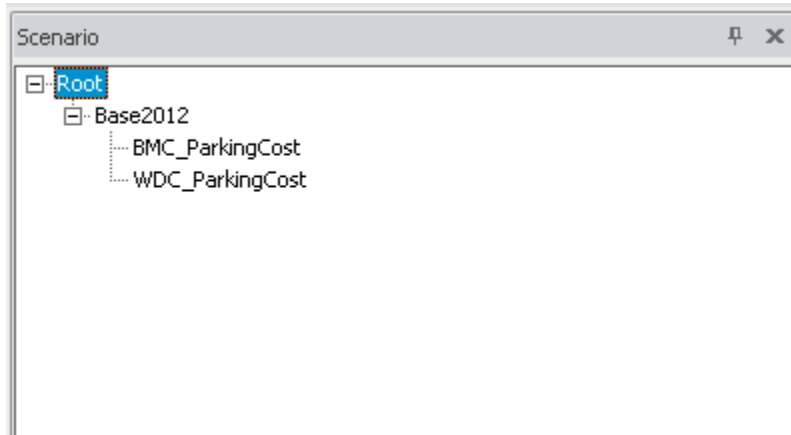
The scenario manager contains four pages, organized by:

- Major Inputs and Run Parameters;
- TourCast Operational Control;
- Highway and Non-Motorized Parameters; and
- Public Transit

3.2.1   Major Inputs and Run Parameters

Scen_Name	Base2012
DatabaseName	BMC_ScenRun_03292018

BMC InSITE Activity Based Model with TourCast

Major Inputs

Number of zones	2976
Highway Network File	C:\InSITE_BMC_DBV\Input\network\spdcap12.net
Zonal attributes file	C:\InSITE_BMC_DBV\Input\sedata\2012\zone_highDCPRk_EmpDensity.dbf
Parcel data file	C:\InSITE_BMC_DBV\Input\sedata\2012\Parcels.dbf
Synthesized households file	C:\InSITE_BMC_DBV\Input\popgen\hh_popgen.DBF
Synthesized persons file	C:\InSITE_BMC_DBV\Input\popgen\person_popgen.DBF

Catalog Run Parameters

Maximum Number of Cluster Sessions	16
Maximum Full Feedback Iterations	4
Previous iteration assignment weight	0.5
Convergence Link Volume Error Percentage Threshold	10
Convergence: allowable percentage of links exceeding link volume threshold	1
☑ Remove temporary files	
☐ Generate Free-Flow Skims - OR select seed skims below	
Initial Highway AM Skims (optional)	C:\InSITE_BMC_DBV\Input\skims\2012\HWY_AM_0.skm
Initial Highway MD skims (Optional)	C:\InSITE_BMC_DBV\Input\skims\2012\HWY_MD_0.skm
Initial Highway PM Skims (Optional)	C:\InSITE_BMC_DBV\Input\skims\2012\HWY_PM_0.skm
Initial Highway NT Skims (Optional)	C:\InSITE_BMC_DBV\Input\skims\2012\HWY_NT_0.skm
☐ Reskim transit networks - OR select seed skims below	
Congested Walk-Transit Peak Skims	C:\InSITE_BMC_DBV\Input\skims\2012\TRN_wk_pk_0.SKM
Congested Walk-Transit OffPeak Skims	C:\InSITE_BMC_DBV\Input\skims\2012\TRN_wk_op_0.SKM
Congested Drive-Transit Peak Skims	C:\InSITE_BMC_DBV\Input\skims\2012\TRN_dr_pk_0.SKM
Congested Drive-Transit OffPeak Skims	C:\InSITE_BMC_DBV\Input\skims\2012\TRN_dr_op_0.SKM
BMC Peak PnR Lot Connections	C:\InSITE_BMC_DBV\Input\skims\2012\TRN_FIRSTLAST_DR_PK_BMC_0.DBF
BMC OffPeak PnR Lot Connections	C:\InSITE_BMC_DBV\Input\skims\2012\TRN_FIRSTLAST_DR_OP_BMC_0.DBF

COG Peak PnR Lot Connections	C:\InSITE_BMC_DBV\Input\skims\2012\TRN_FIRSTLAST_DR_PK_COG_0.DBF
COG OffPeak PnR Lot Connections	C:\InSITE_BMC_DBV\Input\skims\2012\TRN_FIRSTLAST_DR_OP_COG_0.DBF

The Major Inputs include the highway network file, zonal data file, parcel data file, and the synthesized population files.

The Catalog Run Parameters specify the catalog parameters and initial skim inputs:

- The scenario name and database name: The two names will be combined to be used as the database name in PostgreSql database.

- Maximum Number of Cluster Sessions: This should be set to a value less than or equal to the number of CPU cores in the computer.

- Maximum Full Feedback Iterations: If convergence is not reached within this number of iterations, the model will complete and run the final assignment as if convergence was reached.

- Previous iteration assignment weight: This factor is applied to the previous weighted assignment results and combines them with one minus this factor applied to the current assignment results. A factor of 0 would use only the current assignment results and a factor of 1 would use only the previous results.

- Convergence Criteria: The catalog will run speed feedback iterations until either the convergence thresholds are reached or the Maximum Full Feedback Iterations is met. The convergence criteria are applied by time period and is met if fewer than 1% of links differ in volume by more than 10% (numbers from configuration shown in figure above).

- Remove temporary files: When selected, intermediate group files are deleted.

- Convergence can be hastened by using initial highway skim inputs from a previous model run. These skim files are specified in the 4 lines under the highway skim checkbox. These files will be used as the initial skim inputs unless the **Generate Free-Flow Skims** box is checked.

- Model computational time can be reduced by using initial transit skim inputs from a previous model run. These skim files are specified in the 8 lines under the transit skim checkbox. These files will be used as the initial skim inputs unless the **Reskim transit networks** box is checked.

- Select to run PopGen: Once PopGen is integrated into the catalog, its operation will be controlled through this checkbox.

3.2.2   TourCast Operational Control

TourCast Operational Control

☑ Parcel, zone, and transit stop database loader
☑ Run TourCast Post-PopGen component
☑ School Location
☑ Usual Work Location
☑ Vehicle Availability
☑ Pass Ownership Model
☑ Household classification
☑ Daily Activity Pattern
☑ Tourcast mandatory tour generation
☑ Work tour Detsination choice
☑ University tour destination choice
☑ School Escort
☑ Mandatory Tour Destination
☑ Mandatory Tour Time Of Day
☑ Fully Joint
☑ Fully joint tour destination choice
☑ Fully joint tour time of day
☑ Individual Non-Mandatory
☑ Individual non mandatory tour destination choice
☑ Individual non mandatory escort tour destination choice
☑ Individual non mandatory non escort tour time of day
☑ Individual non mandatory escort tour time of day
☑ Home-Based Tour Stop Generation
☑ Home-Based Tour Mode Choice
☑ Work based tour generation

☑ Work based tour destination choice
☑ work based tour time of day
☑ Work based tour stop generation
☑ Work based tour mode choice
☑ Stop destination choice
☑ stop time of day
☑ Trip Mode Choice
☑ DTA Roster Post processor

The third and fourth tabs of the Scenario Manager interface contain a series of check-boxes that are associated with the TourCast component groups in their order of execution. By default, all TourCast components are selected. NOTE: The TourCast components are loosely coupled, but deselecting component(s) means that some input data to downstream components will not be generated and must be made available in the scenario directory manually.

3.2.3 Highway Parameters

Highway Parameters

HOV2 Average Occupancy	2
HOV3 Average Occupancy	3.2
Commercial Vehicle PCE	1
Medium Truck PCE	1.5
Heavy Truck PCE	2
Highway Turn Penalty File	C:\InSITE_BMC_DBV\Input\network\turn.pen
AM Period Capacity Factor	2.34
MD Period Capacity Factor	4.965
PM Period Capacity Factor	3.65
NT Period Capacity Factor	3.111
Maximum Highway Assignment Iterations	200

This section contains:

- Average occupancy for HOV2 and HOV3+ modes, which is used to convert from TourCast person trip outputs to vehicle trips for assignment;

- Truck PCE: passenger car equivalents of each truck by truck category;

- Turn penalty file;

- AM, MD, PM and NT capacity factor and

- Maximum iterations to run for the highway static assignment.

3.2.4   Public Transit

Public Transit

Transit system file	C:\InSITE_BMC_DBV\Input\transit\2012\system.dat
Transit fare file	C:\InSITE_BMC_DBV\Input\transit\2012\fare12.dat
BMC transit lines	C:\InSITE_BMC_DBV\Input\transit\2012\LINE12BR.dat
MARC transit lines	C:\InSITE_BMC_DBV\Input\transit\2012\MARC.dat
Metro transit lines - peak	C:\InSITE_BMC_DBV\Input\transit\2012\LINE12MRPK.dat
Metro transit lines - offpeak	C:\InSITE_BMC_DBV\Input\transit\2012\LINE12MROP.dat
WashCOG transit lines	C:\InSITE_BMC_DBV\Input\transit\2012\LINE12WR.DAT
Commuter Rail IVTT Discount	0.8
BMC Peak Walk Transit Factor file	C:\InSITE_BMC_DBV\Input\transit\2012\factorspk_Wk_BMC.dat
BMC Peak Drive Transit Factor file	C:\InSITE_BMC_DBV\Input\transit\2012\factorspk_Dr_BMC.dat
BMC OffPeak Walk Transit Factor file	C:\InSITE_BMC_DBV\Input\transit\2012\factorsop_Wk_BMC.dat
BMC OffPeak Drive Transit Factor file	C:\InSITE_BMC_DBV\Input\transit\2012\factorsop_Dr_BMC.dat
WashCOG Peak Walk Transit Factor file	C:\InSITE_BMC_DBV\Input\transit\2012\factorspk_Wk_COG.dat
WashCOG Peak Drive Transit Factor file	C:\InSITE_BMC_DBV\Input\transit\2012\factorspk_Dr_COG.dat
WashCOG OffPeak Walk Transit Factor File	C:\InSITE_BMC_DBV\Input\transit\2012\factorsop_Wk_COG.dat
WashCOG OffPeak Drive Transit Factor file	C:\InSITE_BMC_DBV\Input\transit\2012\factorsop_Dr_COG.dat
Peak Transit Transfer Leg file	C:\InSITE_BMC_DBV\Input\transit\2012\NTLEGSPK.DAT
OffPeak Transit Transfer Leg file	C:\InSITE_BMC_DBV\Input\transit\2012\NTLEGSOP.DAT
Peak Transit Walk Access Leg file	C:\InSITE_BMC_DBV\Input\transit\2012\WLKACCPK.DAT
OffPeak Transit Walk Access Leg file	C:\InSITE_BMC_DBV\Input\transit\2012\WLKACCOP.DAT
Peak Transit Drive Access Leg file	C:\InSITE_BMC_DBV\Input\transit\2012\DRVACCPK.DAT
OffPeak Transit Drive Access Leg file	C:\InSITE_BMC_DBV\Input\transit\2012\DRVACCOP.DAT
Peak Transit Walk Egress Leg file	C:\InSITE_BMC_DBV\Input\transit\2012\WLKEGRPK.DAT
OffPeak Walk Egress Transit Leg file	C:\InSITE_BMC_DBV\Input\transit\2012\WLKEGROP.DAT
WashCOG Peak Transit Walk Leg file	C:\InSITE_BMC_DBV\Input\transit\2012\XFERACCEGRPK.NTL
WashCOG OffPeak Transit Walk Leg file	C:\InSITE_BMC_DBV\Input\transit\2012\XFERACCEGROP.NTL
Sidewalk Leg file	C:\InSITE_BMC_DBV\Input\transit\2012\sidewalk.dat
Peak Transit PR Access Link	C:\InSITE_BMC_DBV\Input\transit\2012\PNRPKALL.dbf
Off-Peak transit PnR Access Links	C:\InSITE_BMC_DBV\Input\transit\2012\PNROPALL.dbf

This section specifies the public transit inputs. The transit input files are stored in the Inputs\Transit folder. The scenario keys specify:

- Transit line file that describes the path, operating time, and headway of each route;
- Access/Egress links;
- Transit fare and system files that describe parameters for each transit mode; and
- Factor files by time of day and region.

4.0 Running the Entire Model

Once all of the input files are created and mapped using the scenario manager, running the entire model is as simple as clicking "Run" from the scenario manager.

4.1.1 Task Monitor Window

While the catalog is running, the progress can be monitored through the Task Monitor window, which will display the current application group being executed. Even when Cube Cluster is in operation, the Task Monitor window will still be present.
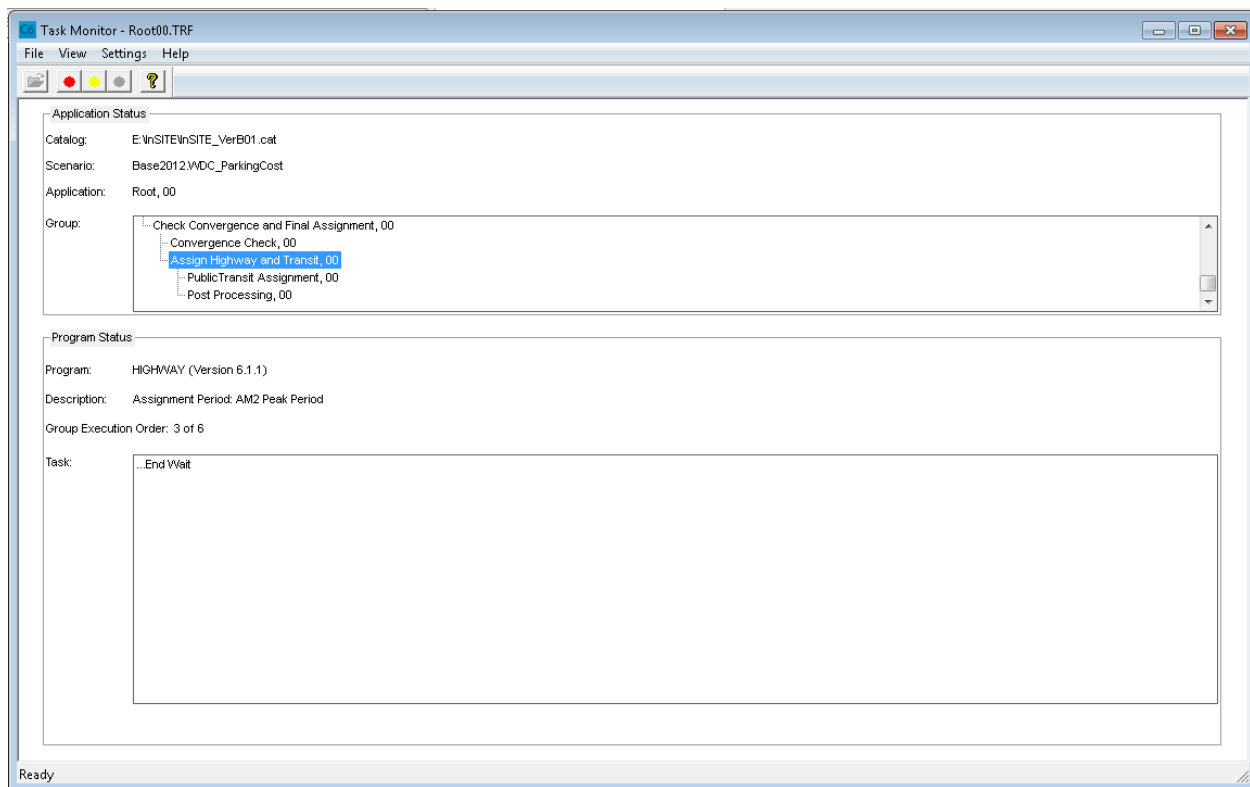
4.1.2 TourCast Operating Window

TourCast is executed through a dynamically built batch command **TourCastRun.bat** in the Cube folder. When TourCast is called, the Task Monitor will display:

Executing: "start /wait TourCastRun.bat"

and two command prompt windows will open. One window is present to carry error codes back to Cube and will not display any output. The other window shows the status of each component execution. Once the TourCast components are complete, control will return to Cube to run the next set of components.

The call to each component is indicated by a new TourCast.exe call. Each component will be running with the program number and status updated on the command window.

If a new database name is given, the new database will be created directly without asking the user any question. If the database name is same as an existing database, the user will be asked whether to overwrite the existing database.

If there is an error, this window will be paused. It is good practice to copy the full text of this window if there is an error to assist in debugging. Once the text is copied, press any key and close the windows. This will return control to Cube and the catalog run will end with an error.

4.1.3   Running the Model for a Subset of the Full Population

A user may wish to make a model run with a subset of the full population, for example to quickly discover any installation issues. To do this, edit the file *scripts\ PopSynthPostProcessor.py* and change the value in the line:

> "Subset": 1 # subset of population to run

The default value of 1 indicates the full population. To run, for example, a 0.1% sample set this value to 0.001.

4.2 Model outputs

A reliable way to monitor the model status is to examine the output files. Each file has the speed feedback iteration number included.

Catalog outputs files are defined in Appendix A.

TourCast output files are defined in Appendix A.

4.3 Running a single application group

A single application group can be run in the catalog as long as all variables are defined. Within the speed feedback loop, at least the iteration variable ITER needs to be defined. This can be done by creating a Pilot program in the application group with the following text (for example, to run iteration 1):

ITER = 1

4.3.1 Running TourCast only

TourCast can be run individually by running within the TourCast application group. Note that the scenario manager configuration settings are active if TourCast is run using the Run Application control. Alternatively, TourCast can be run by calling TourCast.exe directly with the desired component configuration file. Please see the TourCastRun.bat file in the Cube folder for examples.

5.0 Preparing a New Scenario

To build a new scenario, the following inputs potentially need to be updated:

- Highway Network

- Transit Line File

- Zonal data (sociodemographics)

- External station volumes

- Synthesized population

6.0 List of Appendices

Appendix A. IO File and TourCast Component Map