THE MARYLAND STATEWIDE TRANSPORTATION MODEL

Desktop Reference

This desktop reference is a supplemental document to the Maryland Statewide Transportation Model (MSTM) User's Guide for version 1.0

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Description:	The Maryland Statewide Transportation Model (MSTM) desktop reference is a supplemental document to the MSTM User's Guide (version 1.0) and is designed to be used as a quick-guide for installing and executing the MSTM.
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The Maryland Statewide Transportation Model (MSTM) desktop reference is a supplemental document to the MSTM Model Documentation (version 1.0). This desktop reference is designed as a "quick-guide" for installing and executing the MSTM. For additional information please refer to the MSTM Model Documentation.

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I.   Hardware/OS Requirements

The MSTM requires a 64-bit Microsoft Windows platform (either Windows Server, or Windows7.   The MSTM is data intensive and requires a large amount of hardware resources. In order to improve model run times, the model is written to take advantage of CUBE Cluster, a product from Citilabs which assigns modeling tasks across several of the CPU's cores.   The model PC used at the Maryland State Highway Administration (SHA) includes multiple Intel i7 processors, allowing the MSTM to run on 12 cores.   The model PC also has 24 GB of RAM. Figure 1 details the specifications of the model PC at the Maryland State Highway Administration (SHA), these specifications will help provide a benchmark when estimating expected model run times on other PCs.

Figure 1: PC Specifications Used to Run the MSTM at SHA
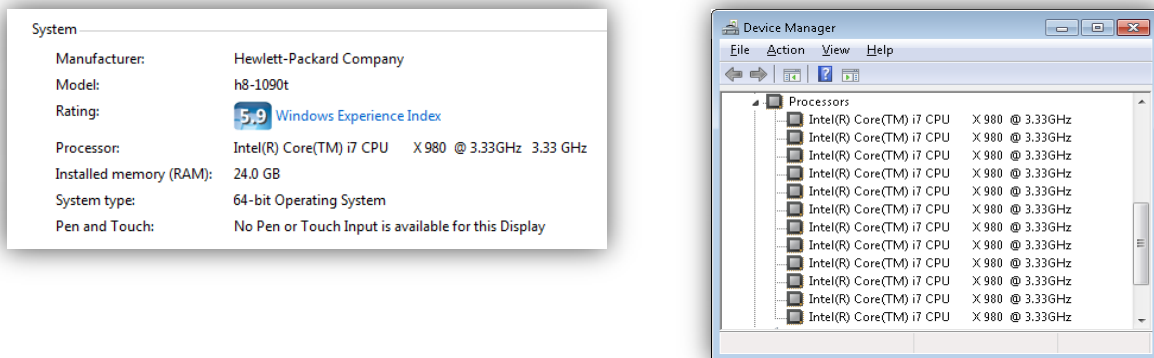
The SHA model PC specifications resulted in model run times of approximately 13.5 hours for a 2007 analysis and approximately 17.5 hours for 2030. Although the model will run successfully on fewer cores, increasing the number of cores (as well as the RAM) significantly improves the model run time. Depending on the specific PC configuration, it may or may not be possible to perform other tasks while the MSTM is running. It is suggested to allow the MSTM to run undisturbed until the model run has completed. Also, with the use of CUBE Cluster, running a single model run at a time is also recommended.

II. Software Requirements

CUBE: The model was developed, scripted and tested using CUBE Voyager. Versions 5.x and 6.x of Voyager have been successfully tested. Additional information on CUBE Voyager can be found at (http://www.citilabs.com/products/cube/cube-voyager). The model also includes code to take advantage of CUBE Cluster, a CUBE add-on that utilizes distributive processing of certain model tasks so they can run simultaneously on numerous cores. CUBE Cluster is *not* required to run the model, but it is highly recommended. Although the model is scripted in CUBE Voyager, these scripts are executed though several DOS batch files. If you are performing a new installation of CUBE, you may need to modify your Windows systems environment settings in order to execute these scripts from a DOS command line. To do this, click on the Windows *Start* button, right-click on *Computer*, then click on *Properties*, then click on *Advanced system settings.* Once in the dialog box, click *Environment Variables*. Under *System variables*, you may need to add the following additions to the path file:

> *C:\Program Files (x86)\Citilabs\TPPlus\;*
> *C:\Program Files (x86)\Citilabs\Cube\;*
> *C:\Program Files (x86)\Citilabs\CubeVoyager*

The path should represent the location of your CUBE installation and each path should be separated by a semicolon. A reboot of your PC will be necessary after making any changes to the path.

Java: The model contains a Regional Model that estimates long distance auto and trucks trips that are not accounted for as part of the regional land activity. These trips include long-haul tractor trailers, visitor trips, tourist trips, etc. The Regional Model in MSTM is scripted in Java, although an understanding of Java is not necessary. If you do not have Java installed, it can be downloaded here: (http://www.oracle.com/technetwork/java/javase/downloads/jdk7-downloads-1880260.html). The installation should be called "Java SE Development Kit 7". The section titled "Demos and Sample Downloads" does not need to be installed.

III. Installing and Executing MSTM

The MSTM is distributed as MSTMv1.0.zip and is 618 Mb in size. The model can be unzipped to any directory, providing the directory structure of the model itself remains intact.   Once unzipped, the model can be executed by simply double-clicking **Run MSTM**.   The model directory structure for MSTM is shown in Figures 2a and 2b.

Figure 2a: General Directory Structure
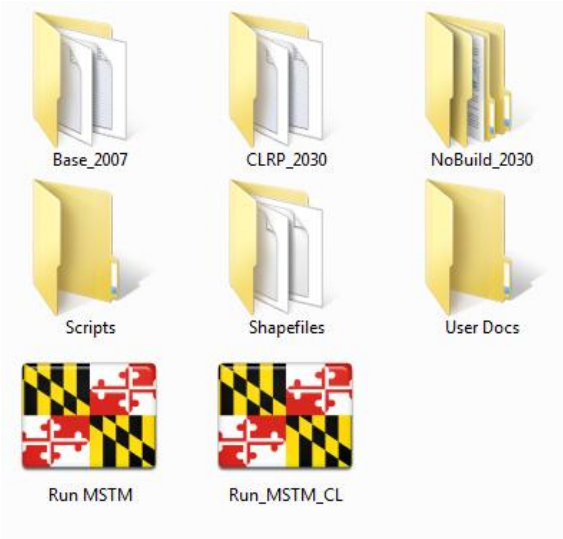
Figure 2b : Detailed Directory Structure
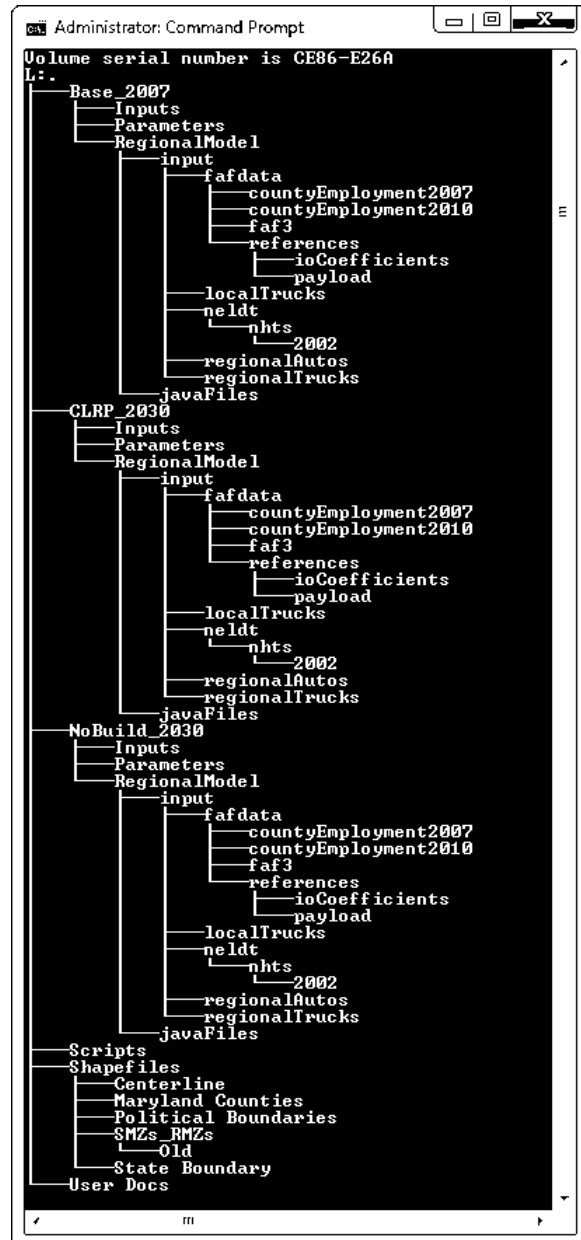
Figure 2a shows the general directory structure of MSTM.   There is one script directory that contains 34 script files. The input files, parameter files and the regional model are all scenario-specific and are located in each of the scenario directories.   The documents folder contains this desktop reference, as well as the full MSTM Documentation.   The shapefiles folder contains shapefiles for the models zone structure, as well as an outline shapefile for the State of Maryland as a reference.   The root directory contains the "Run MSTM" executable as well as the "Run_MSTM_CL" executable that runs fron a DOS command line.

Upon executing **Run MSTM**, a short disclaimer message appears (Figure 3), and the PC's system time is reported on the screen. This should be noted in order to determine the model runtime,

as the system time is also reported following completion of the model. Model run times will vary depending on individual computer specifications. Upon executing "Run MSTM", the MSTM Menu will appear. This is the main menu and consists of 5 options:

(1) Run a MSTM Scenario,

(2) Create a Set-up for a New Scenario,

(3) Clean Directory Structure,

(4) Run Select Link Analysis, and

(5) Run Select Zone Analysis

Figure 3 shows the initial disclaimer screen that appears after double-clicking "Run MSTM"

Figure 3: Maryland State Highway Administration Disclaimer Screen
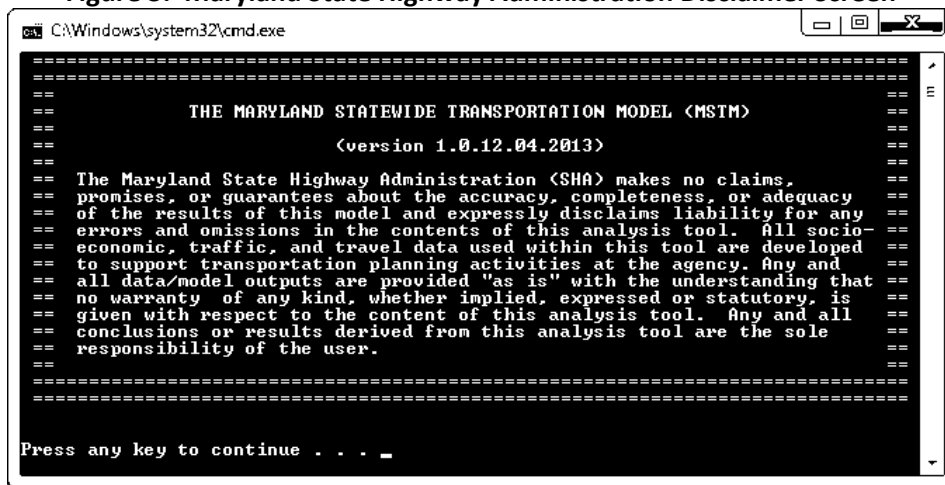
Following the Maryland State Highway Administration's disclaimer, pressing enter will display the MSTM Menu screen (shown in Figure 4).

Figure 4: MSTM Menu Screen
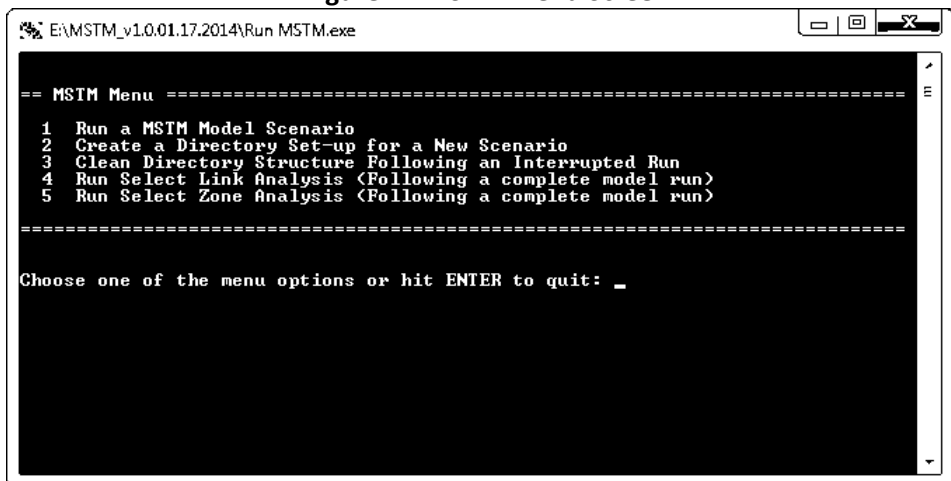
As stated previously, the model is designed to run as a specific scenario. MSTM version 1.0 can currently run scenarios for either a base year (2007) or a forecast year (2030). There are three pre-defined scenarios that are distributed with the model:

- **Base_2007:** This scenario represents 2007 validation year land activity and highway and transit networks.

- **CLRP_2030:** This scenario represents 2030 land activity, along with highway and transit projects that are in the constrained long-range plans (CLRPs) of the Metropolitan Washington Council of Governments (MWCOG) and the Baltimore Metropolitan Council (BMC)

- **NoBuild_2030:** This scenario assumes the forecast year socioeconomic data (2030) and the base year highway and transit networks (2007).

These pre-defined scenarios are also shown in the "Scenario Selection" screen. This screen is shown after Menu Option 1 "Run a MSTM Scenario" is chosen.

Figure 5: MSTM Menu Screen
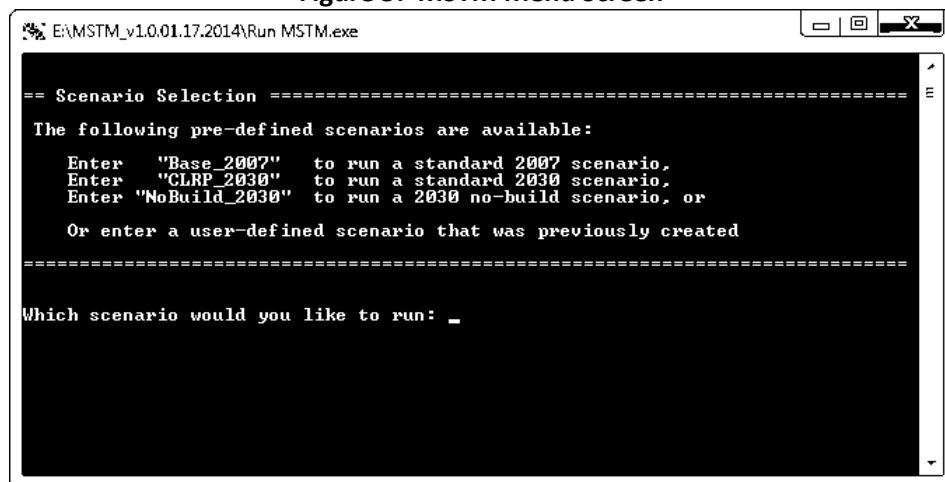
Once a scenario name is entered (either a "pre-packaged" scenario or a user-defined scenario), the user will be presented with several prompts. The default settings are shown and it is recommended to use these settings, however when testing various scenarios model run times could be reduced by reducing these values.

The first of these screens is the Feedback Loop. MSTM incorporates a speed feedback loop where congested speeds are looped back into trip generation and the subsequent model steps. The model was validated using 6 speed feedback loops, and it is recommended that 6 loops be used for non-test scenarios. This option is shown in Figure 6.

Figure 6: MSTM Menu Screen
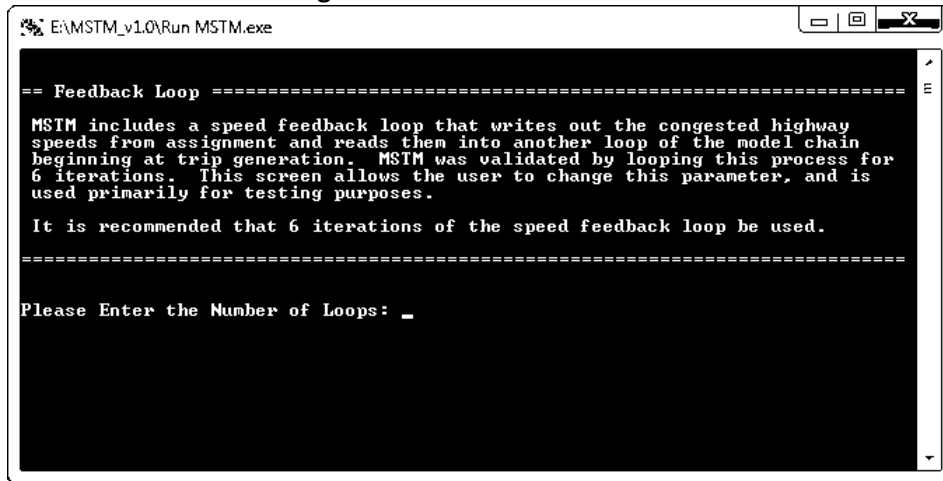
The MSTM deploys a user equilibrium assignment that by default assumes the maximum number of iterations to reach convergence to be 50. It is recommended that users maintain this value, as this is what was assumed during model validation. However, during testing phases of scenarios users may want to reduce this number in order to achieve better model run times.

The MSTM also includes a speed feedback loop where congested speeds from highway assignment are input back into trip generation, and the rest of the model chain. By default, the speed feedback loops 6 times. It is recommended that users maintain this value, as this is what was assumed during model validation. However, during testing phases of scenarios users may want to reduce this number in order to achieve better model run times. The speed feedback interface is shown in Figure 7.

Figure 7: MSTM Menu Screen
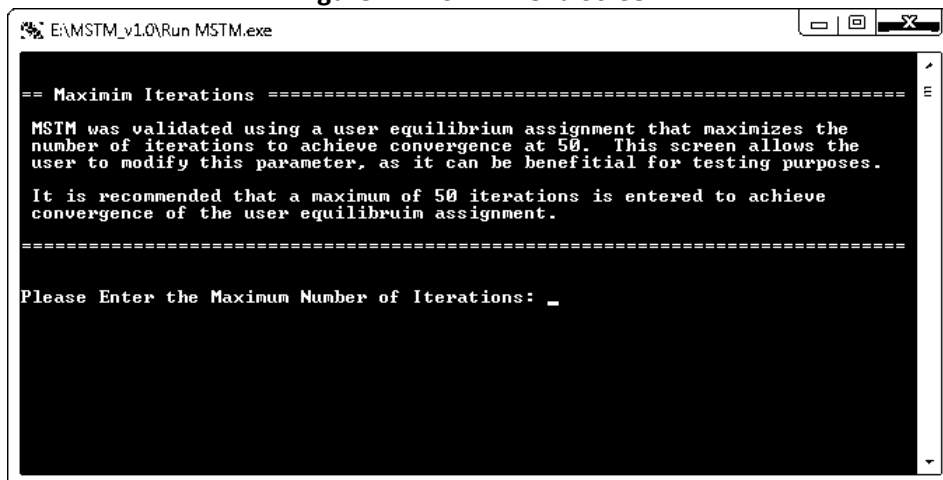
The next screen of the MSTM asks the user to enter the number of cores to use (Figure 8). If the model is being run overnight the total number of cores in the machine should be entered. If other tasks are being done on the PC while the model is running, you may want to reduce the number of cores to improve the PC's performance for those other tasks.

Figure 8: MSTM Menu Screen
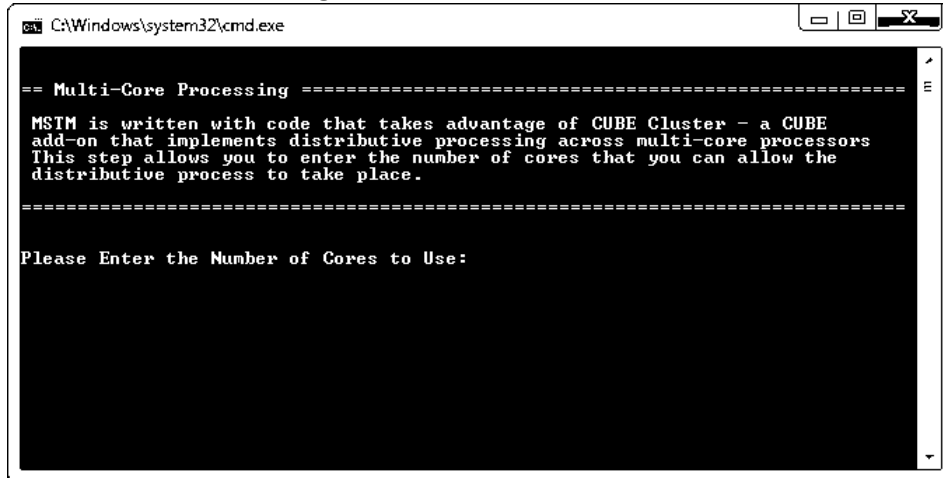
The screen prior to model execution (Figure 9) shows the name of the scenario, the current time which the model will be executed, as well as a summary of the user-defined parameters. Once you have confirmed these inputs are correct, press any key to initiate the model run.

Figure 9: MSTM Menu Screen
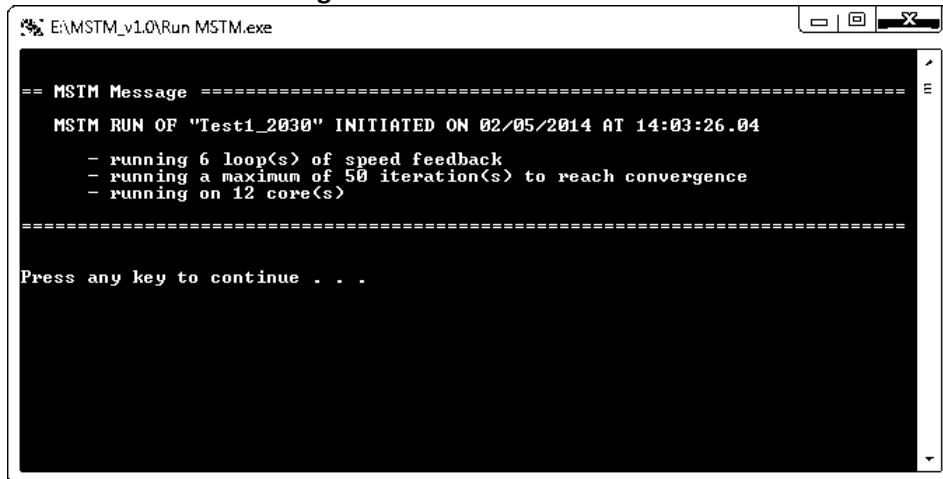
Once the model run is complete, the DOS window will display the date and time that the model finished (Figure 10).

Figure 10: MSTM Menu Screen
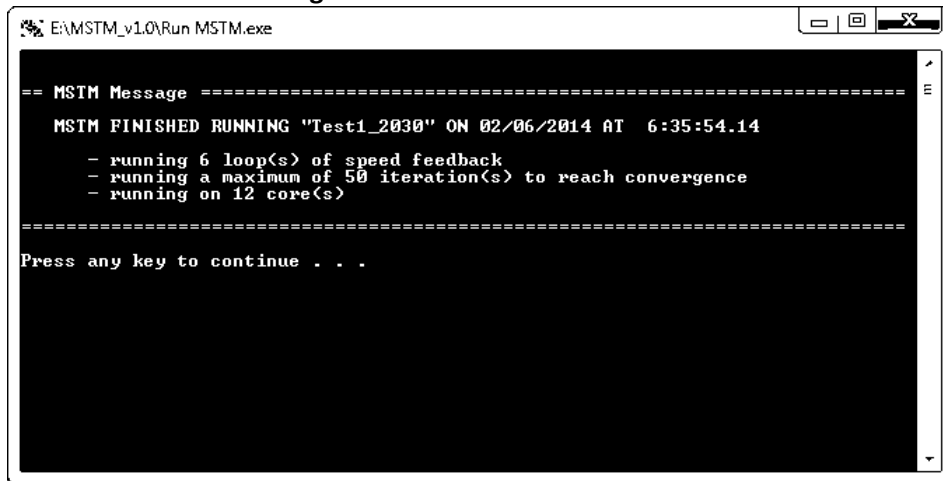
Figures 11a and 11b show a scenario directory before and after a model run. A standard run will create five (5) additional sub-directories: CubePRN, Exports, Outputs, Temp, and Validation. If select link or select zone analysis is performed, these sub-directories will also be created.

Upon completion of a successful run, three reports are created in the root of the scenario directory. These are one-page summaries that highlight the statewide summary statistics for the scenario. The reports are automatically named by joining the scenario name and the analysis year with an underscore " _ ". These standard outputs include a general summary, a VMT summary and a VHT summary.

Figure 11a: Directory Structure Before a Run
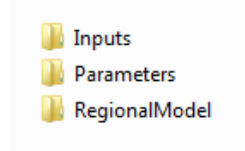
Figure 11b: Directory Structure After a Run
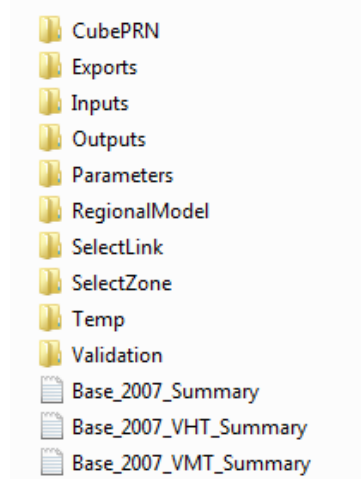
The statewide summary document also includes the system date and time at model execution, as well as the system date and time upon model completion. This is useful, as most modelers

want to be able to track the model run times for various scenarios. The summary reports for the Base_2007 and CLRP_2030 scenarios are available in Appendix A and B respectively. Although results may vary somewhat from what is shown in theses summaries, your results should be within several percentage points of these findings for the same scenario.

A completed model run will also include an "Outputs" sub-directory which will include the loaded network (**MSTM_Veh_Dly_Final.net**). This network includes simulated volumes for an average weekday, as well as volumes for each of the four time periods (AM, Midday, PM, and Nighttime). A complete list of the network link attributes is shown in Appendix C.

The MSTM includes a customized VPR file for the input MSTM.net file, as well as the MSTM_Veh_Dly_Final.net final loaded network that is located in the /Outputs directory. This VPR file is automatically called into CUBE when loading either the input or loaded networks. It includes the zonal layer, as well as color-coding the various facility types and adding roadway shields as a reference. A screen capture of what the loaded network should look like is shown in Figure 9.

Figure 12: MSTM Loaded Network (with custom VPR)
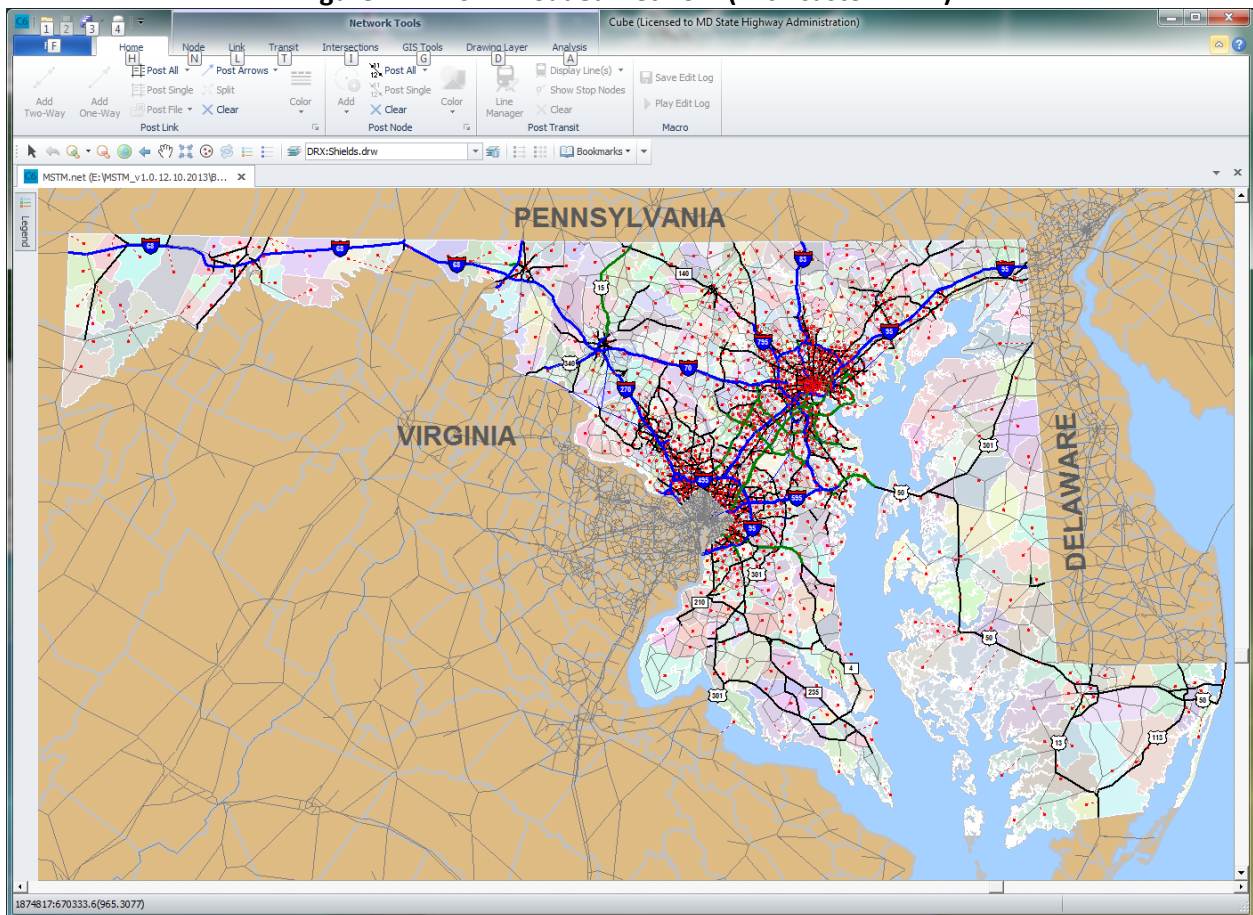
The default file locations of the custom VPR file is "E:\MSTM_1.0\". Depending on where you installed MSTM, you may need to revise the path in order to reference the shapefiles, highway shield layers, etc., properly.

Also, within the scenario directory there is a sub-directory call "Exports", this folder contains the output highway network as a shapefile. The scenario directory also contains a Validation folder. This folder consists of several summaries of model outputs, most of which are in *.csv format. This format allows the data to be easily brought into MS Excel, where it can be further manipulated, graphed, etc.

Figure 11b also illustrates what the directory structure would look like following a select link analysis and a select zone analysis. These analysis tools are part of the model set and once run, these sub-directories will be created. All select zone and select link analysis outputs will be organized in these sub-directories. Select link and select zone analysis is further described in Sections VI and VII.

Running MSTM From a DOS Command Line

The Maryland Statewide Model can also be executed from a DOS command line. This functionality was added to provide an interface that was more supportive of integrating the model with other analysis tools or post processors. The command line interface does not require any user prompts and will rum completely once executed.

Once a scenario is setup, click on the Windows start button and type "cmd" in the search window. This will open up a DOS prompt (Figure 13). Change to the model's root directory, in this example, its "E:\MSTM_v21.0"

Figure 13: Analysis Year for a User-Defined Scenario
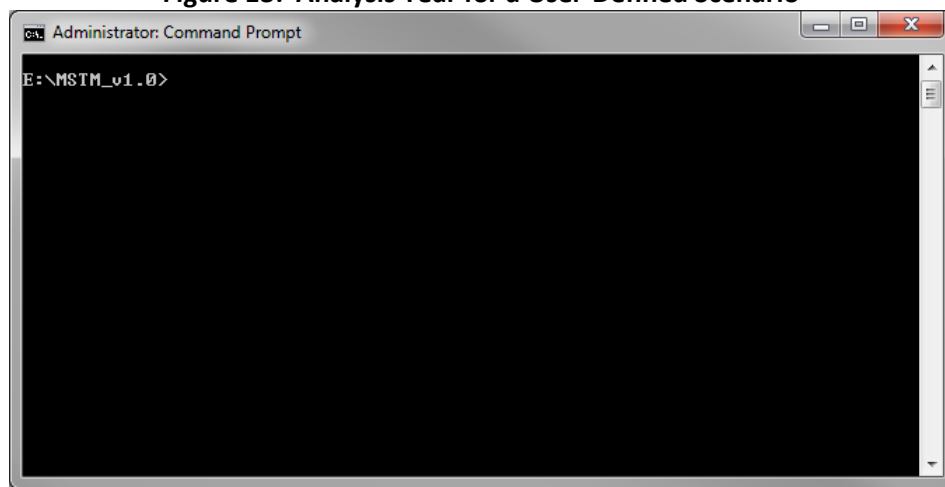
Typing "Run_MSTM_CL" will bring up a help screen that will detail the proper syntax of this command (Figure 14).

Figure 14: Analysis Year for a User-Defined Scenario

```
Administrator: Command Prompt - RUN_MSTM_CL

          *** EXECUTION OF MSTM FROM A DOS COMMAND LINE ***

    SYNTAX:

      Run_MSTM_CL [S] [F] [I] [C]

        [S]   Name of the Scenario (e.g., TEST1_2030)

        [F]   Number of Feedback Loops (cannot be left blank, default is 6)

        [I]   Number of Iterations (cannot be left blank, default is 50)

        [C]   Number of Cores to Use


            EXAMPLE:  Run_MSTM_CL Test_2030 6 50 12



Press any key to continue . . . _
```

This syntax is as follows:

Run_MSTM_CL {scenario} {# of Feedback loops} {# of iterations} {# of cores}

If you created a scenario called "Test_2030", and you wanted to run that scenario using the standard 6 speed beedback lops and the standard 50 maximum iterations to reach convergence of the user-equilibrium assignment, and were running this on a PC with 12 cores – the command like would be:
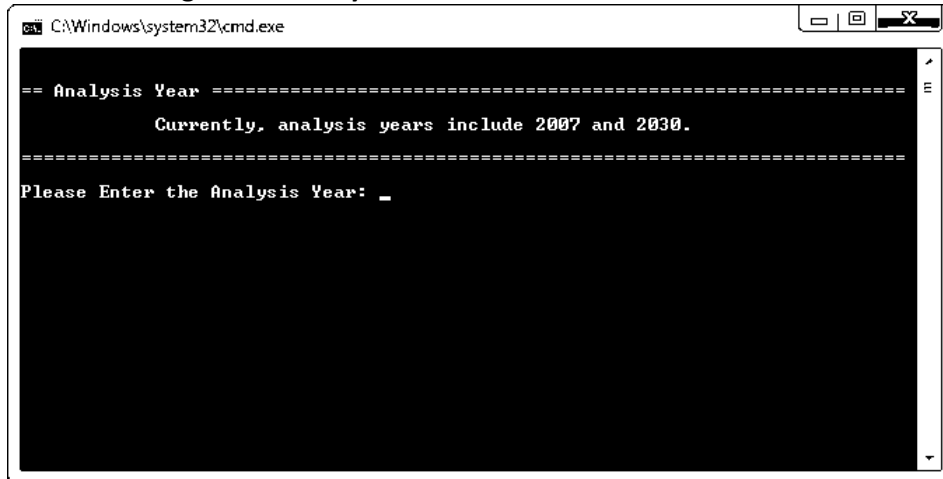
Run_MSTM_CL Test_2030 6 50 12

The model run will still create the same standard reports. The general Summary Report will name this scenario "Test_2030 / 6 / 50". This will retain the number of feedback loops (6) and the number of iterations (50) that were asummed.

IV. Running a User-Defined Scenario

To begin a user-defined scenario, select Option 2: "Create Set-up for a New Scenario" at the main MSTM Menu. The model will then prompt you to select an analysis year (Figure 15). Currently, possible analysis years are 2007 and 2030.

Figure 15: Analysis Year for a User-Defined Scenario
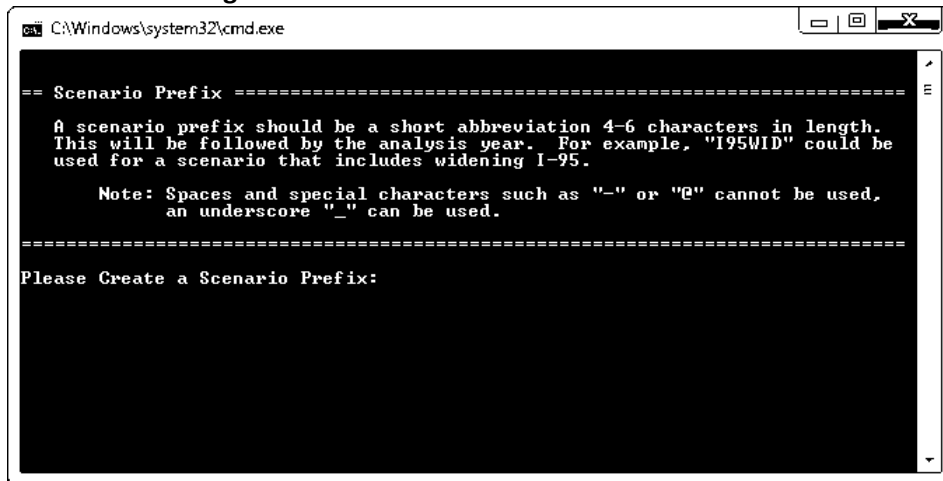
The subsequent screen prompts a scenario prefix (Figure 16). This should be a brief description of the scenario (e.g, "I95wide" could be used to represent a widening along I-95). **Spaces and special characters cannot be used.**

Figure 16:   Prefix for a User-Defined Scenario

The scenario name will combine the prefix with the analysis year, in this example; the scenario would be called "I95wide_2030"

Figure 17:   Creating a User-Defined Scenario

Once you've created a scenario, you can edit any of the files in the scenario directory. However, you cannot change any of the file names. Typical modifications for a user-defined scenario include modification to the land use file (../inputs/Activities.csv), the highway network file (../inputs/MSTM.net) or any of the parameters (../Parameters/parametrs.dat).

V.   Cleaning a Directory Following a Failed Run

During execution of the model, several sub-directories are created, along with temporary files, etc. that can be substantial in size. In the event of an incomplete or cancelled model run, the model directory structure can be restored to its clean state by executing Option 3 (Figure 18).

Figure 18: Cleaning a Scenario Folder
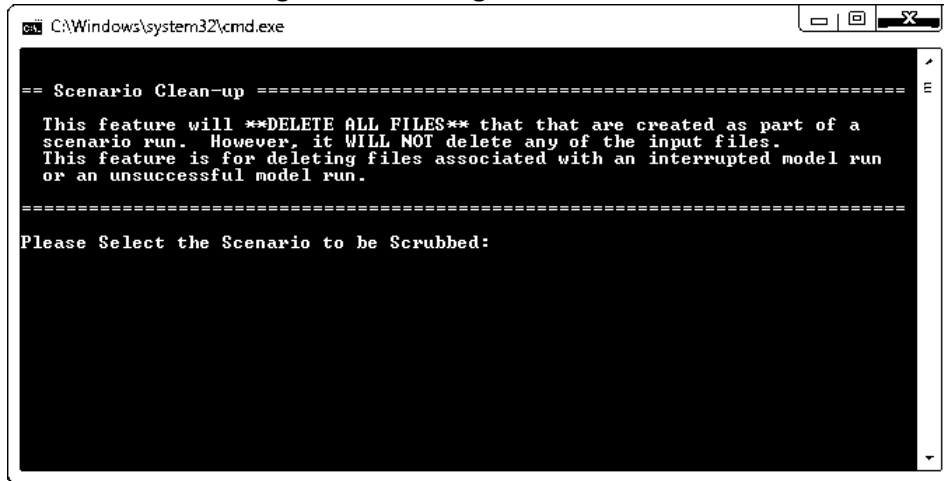
This utility deletes any temporary files, files created by cluster, etc. Once completed, the screen shown in Figure 19 will appear. This utility does not delete any scenario directories, only the files that were created as part of the model run.

Figure 19: MSTM Directory Structure
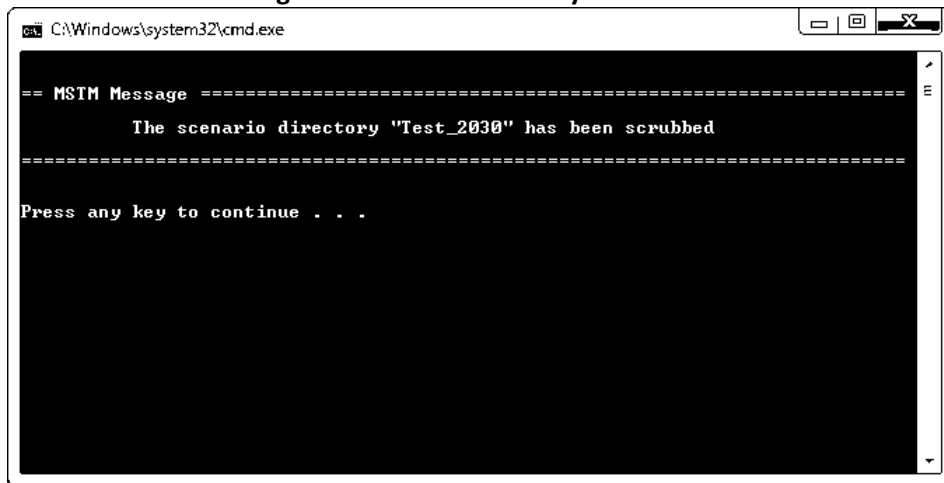
VI.   Performing Select Link Analysis
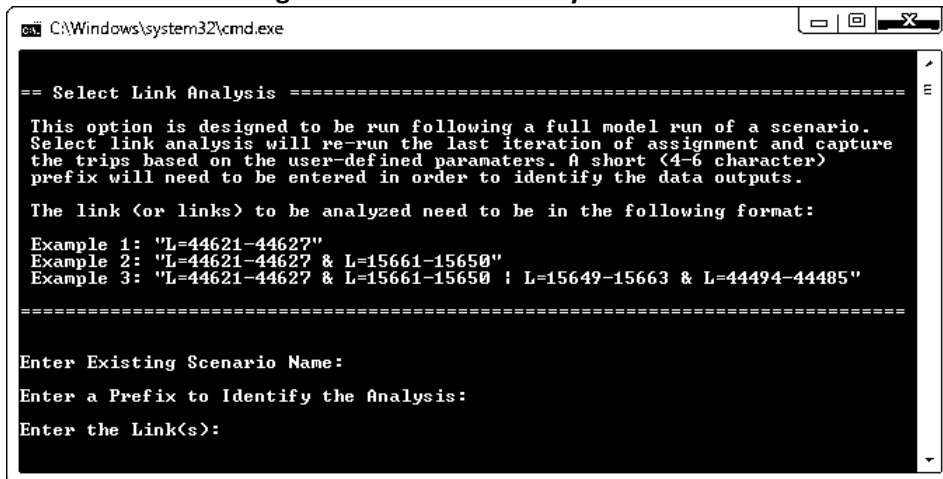
The MSTM menu also includes an option for performing select link analysis. Since this is a common type of analysis, these capabilities are built-into the model executable and require minimal effort. The select link analysis tool is designed to be executed following a complete model run. When the first select link analysis is performed, a sub-directory called "SelectLink" will be created in the scenario directory.

Upon executing option 4 (Run Select Link Analysis), a series of prompts will appear (Figure 20), the first prompt asks the user to "Enter Existing Scenario Name". The user must type the name of an existing scenario exactly. For example, to run select link analysis on the 2030 CLRP network, the user must enter **CLRP_2030**.

The second prompt asks for a prefix for the select link analysis, this should be a short 4 to 6 alpha-numeric character string that identifies the run.

The final prompt is where the user keys the actual code for the select link analysis. This can fro for a single link, a link pair, or a combination of links. The syntax is shown in the user screen and should be entered as shown in the examples (without the quotes).

Figure 20: MSTM Directory Structure

On the SHA model PC, select link analysis takes approximately 6 hours, but that may vary depending on how many links are being tracked. Figure 21 shows the results of a select link analysis of vehicles traveling along I-95 between the Baltimore and Capital Beltways.

Figure 21: Sample Select Link Output (Chesapeake Bay Bridge)
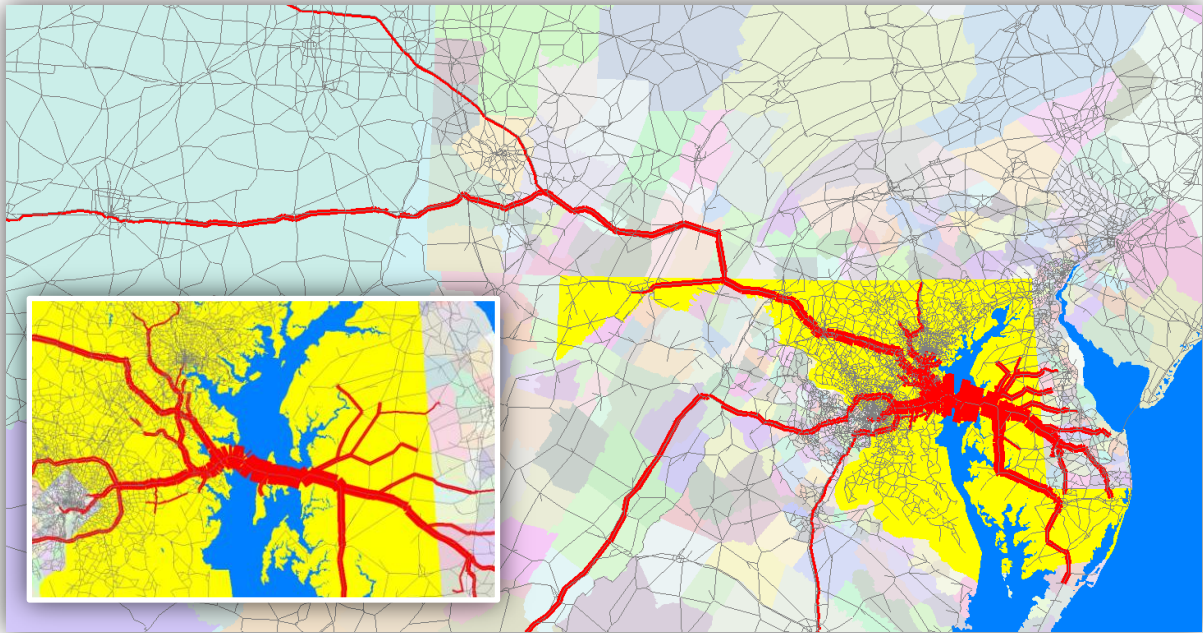
The output network from the select link analysis is located in the "SelectLink" sub-directory of the Scenario. During the select link model run, vehicles are tracked over the course of the day, including the each of the four time periods. Vehicle types are also tracked in order to evaluate trucks versus autos that meet the select link criteria. A listing of the new link attributes that are created during select link analysis is listed in Appendix D.

VII. Performing Select Zone Analysis
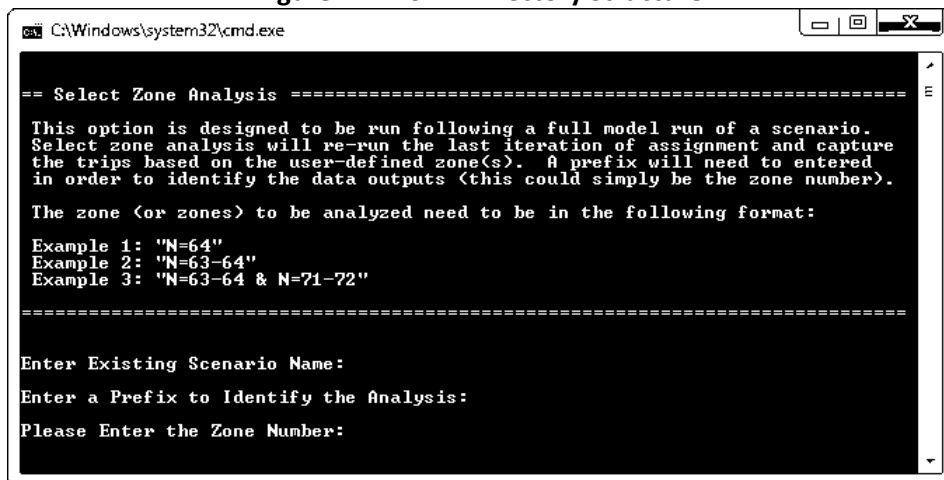
The MSTM menu also includes an option for performing select zone analysis. Since this is a common type of analysis, these capabilities are built-into the model executable and require minimal effort. The select zone analysis tool is designed to be executed following a complete model run. When the first select zone analysis is performed, a sub-directory called "SelectZone" will be created in the scenario directory.

Upon executing option 5 (Run Select Zone Analysis), a series of prompts will appear (Figure 22), the first prompt asks the user to "Enter Existing Scenario Name". The user must type the name of an existing scenario exactly. For example, to run select zone analysis on the 2030 CLRP network, the user must enter **CLRP_2030**.

The second prompt asks for a prefix for the select zone analysis, this should be a short 4 to 6 alpha-numeric character string that identifies the run.

The final prompt is where the user keys the actual code for the select zone analysis. This can fro for a single zone, or a combination of links. The syntax is shown in the user screen and should be entered as shown in the examples (without the quotes).

Figure 22: MSTM Directory Structure

On the SHA model PC, select zone analysis takes approximately 6 hours, but that may vary depending on how many zones are being tracked. Figure 23 shows the results of a select link analysis of vehicles traveling along I-95 between the Baltimore and Capital Beltways.

Figure 23: Sample Select Zone Output
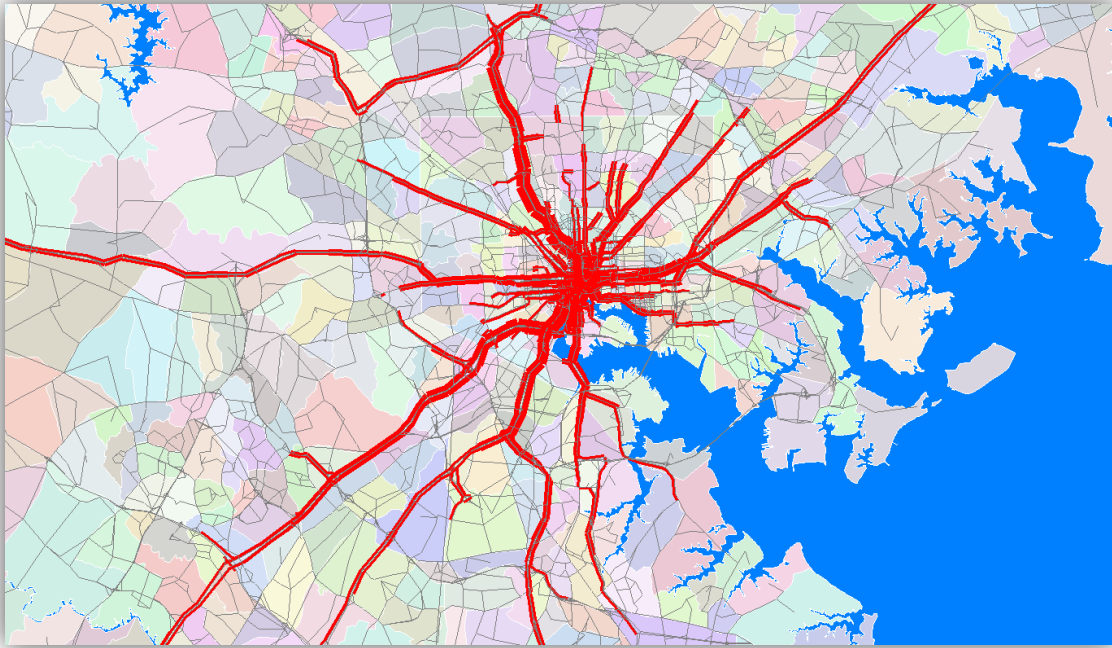
APPENDIX A-1:   Model Summary for 2007

```
========================================================================
==      Maryland Statewide Transportation Model (MSTM) version 1.0    ==
==                   STATEWIDE SUMMARY REPORT                         ==
========================================================================
                        Scenario: Base_2007 / 6 / 50

SOCIOECONOMIC DATA SUMMARY
    Total Households.........................................  2,128,042
    Total Enrollment.........................................    821,028
    Total Employment.........................................  2,774,229
        Retail Employment....................................    493,703
        Office Employment....................................  1,136,685
        Industrial Employment................................    319,902
        Other Employment.....................................    823,939

DAILY PERSON TRIP SUMMARY
    Daily Total Person Trips................................. 21,965,383
        Single-Occupant Auto Persons......................... 11,956,374
        2-Occupant Auto Persons..............................  8,609,929
        3-Occupant Auto Persons..............................    563,241
        Bus Persons..........................................    345,369
        Express Bus Persons..................................      1,006
        Rail Persons.........................................    460,553
        Commuter Rail Persons................................     28,911

DAILY VEHICLE TRIP SUMMARY
    Total Daily Vehicles Assigned ........................... 15,792,384
    Total Daily Autos Assigned .............................. 15,356,983
        Single-Occupant Vehicles............................. 10,449,431
        High-Occupant Vehicles (2)...........................  3,737,375
        High-Occupant Vehicles (3+)..........................    131,641
        Commercial Vehicles..................................  1,003,980
        Regional Autos.......................................     34,556
    Total Daily Trucks Assigned .............................    435,401
        Single-Unit Trucks...................................    229,402
        Multi-Unit Trucks....................................    202,795
        Regional Trucks......................................      3,204

DAILY VEHICLE MILES OF TRAVEL SUMMARY
    Total Daily System VMT ..................................156,752,384
        Auto VMT ............................................146,603,638
        Truck VMT ........................................... 10,148,620
    Daily VMT by Facility Type
        Interstate VMT....................................... 48,367,040
        Freeway VMT..........................................  6,050,078
        Expressway VMT.......................................  6,395,511
        Major Arterial VMT................................... 41,430,041
        Minor Arterial VMT................................... 24,924,634
        Collector VMT........................................ 13,060,387
        Local/Centroid Connector............................ 16,524,693

DAILY VEHICLE HOURS OF TRAVEL SUMMARY
    Total Daily System VHT ..................................  6,116,704
        Auto VHT ............................................  5,752,728
        Truck VHT ...........................................    363,976
    Daily VHT by Facility Type
        Interstate VHT.......................................  1,411,908
        Freeway VHT..........................................    167,566
        Expressway VHT.......................................    212,739
        Major Arterial VHT...................................  1,732,136
        Minor Arterial VHT...................................  1,037,106
        Collector VHT........................................    775,179
        Local/Centroid Connector............................    780,068

== Start: 03:38 PM on 02/10/2014         End: 05:14 AM on 02/11/2014 ==
```

APPENDIX A-2:   Model VMT Summary for 2007

```
Maryland Statewide Transportation Model (MSTM) version 1.0
STATEWIDE AVERAGE WEEKDAY VMT SUMMARY REPORT

                                          Scenario: Base_2007
```

County	Interstate	Freeway/ Expressway	Principal Arterial	Minor Arterial	Collector	Local/ Centroid	TOTAL
Alleghany	659,529	0	535,185	176,602	0	466,549	1,837,863
Anne Arundel	3,698,388	4,764,941	2,356,375	2,578,860	836,815	1,515,411	15,750,799
Baltimore	11,278,024	984,324	3,983,489	3,083,519	2,250,712	1,652,805	23,232,877
Calvert	0	0	1,202,356	501,316	158,408	336,377	2,198,457
Caroline	0	0	50,422	871,812	29,183	213,124	1,164,541
Carroll	116,621	0	1,508,502	1,499,272	1,262,603	594,553	4,981,551
Cecil	2,048,439	0	737,817	1,209,715	502,439	396,751	4,895,164
Charles	0	0	1,688,527	772,149	398,155	568,923	3,427,754
Dorchester	0	0	198,787	564,005	51,492	251,821	1,066,105
Frederick	3,679,041	569,258	1,367,173	1,683,245	590,689	613,683	8,503,081
Garrett	354,806	0	238,287	402,767	0	361,710	1,357,570
Harford	2,542,720	0	1,643,867	1,430,897	1,085,058	824,846	7,527,389
Howard	4,258,189	2,243,110	1,224,938	1,009,139	1,078,114	828,277	10,641,766
Kent	0	0	43,723	494,933	13,589	65,382	617,626
Montgomery	7,471,513	654,529	7,693,842	2,501,750	1,238,256	2,051,138	21,611,022
Prince Georges	7,752,059	2,242,234	7,078,080	1,446,612	1,906,525	2,244,282	22,669,785
Queen Annes	0	0	970,327	602,254	219,020	289,254	1,981,855
St. Marys	0	0	1,401,329	362,245	219,803	816,311	2,799,687
Somerset	0	0	377,630	239,638	23,418	190,837	831,524
Talbot	0	0	497,014	373,460	291,789	206,108	1,368,371
Washington	2,317,043	69,426	786,302	908,479	0	820,424	4,901,673
Wicomico	0	0	1,102,202	581,736	528,000	367,688	2,579,626
Worcester	0	0	794,548	109,201	319,072	256,996	1,479,817
Baltimore City	2,190,671	917,767	3,949,317	1,521,027	156,248	591,443	9,326,480
TOTAL	48,367,040	12,445,589	41,430,041	24,924,634	13,060,387	16,524,693	156,752,384

NOTES: The interstate VMT includes the following ramp VMT: 2,738,896
Collector, Local and Centroid Connector VMT have not been validated

APPENDIX A-3:   Model VHT Summary for 2007

Maryland Statewide Transportation Model (MSTM) version 1.0
STATEWIDE AVERAGE WEEKDAY VHT SUMMARY REPORT

Scenario: Base_2007

County	Interstate	Freeway/ Expressway	Principal Arterial	Minor Arterial	Collector	Local/ Centroid	TOTAL
Alleghany	15,228	0	16,518	5,905	0	18,974	56,625
Anne Arundel	105,786	153,134	95,040	112,725	47,126	72,611	586,419
Baltimore	336,111	23,805	165,410	129,992	132,635	84,713	872,671
Calvert	0	0	37,480	16,783	34,515	12,339	101,117
Caroline	0	0	1,474	30,020	1,057	7,733	40,284
Carroll	2,894	0	55,534	54,629	59,382	24,126	586,419
Cecil	60,524	0	24,050	45,352	25,138	15,594	170,655
Charles	0	0	56,640	27,263	17,696	24,105	125,704
Dorchester	0	0	6,815	18,243	1,720	9,489	36,266
Frederick	85,218	13,474	75,636	73,244	26,603	27,425	301,602
Garrett	7,394	0	7,220	12,760	0	13,271	40,645
Harford	79,027	0	57,775	53,853	48,462	34,888	274,002
Howard	115,152	54,910	45,306	41,728	78,816	41,291	377,200
Kent	0	0	1,510	15,633	454	2,422	20,019
Montgomery	250,472	16,539	347,330	115,105	71,871	110,528	911,846
Prince Georges	241,460	77,404	301,402	63,893	114,999	112,943	912,097
Queen Annes	0	0	35,863	19,938	4,215	11,344	71,361
St. Marys	0	0	43,049	18,565	10,959	33,078	105,651
Somerset	0	0	11,144	7,474	850	7,013	26,481
Talbot	0	0	18,880	17,373	27,128	8,136	71,518
Washington	53,100	1,452	30,476	31,544	0	34,870	151,441
Wicomico	0	0	43,560	24,682	34,386	15,464	118,092
Worcester	0	0	24,546	3,538	13,238	9,907	51,230
Baltimore City	70,113	36,185	198,833	81,640	11,482	35,971	434,213
TOTAL	1,422,463	376,902	1,701,489	1,021,880	762,734	768,235	6,053,703

NOTES: The interstate VHT includes the following ramp VHT: 135,399
Collector, Local and Centroid Connector VHT have not been validated

APPENDIX B-1:   Model Summary for 2030

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============================================================================
==       Maryland Statewide Transportation Model (MSTM) version 1.0     ==
==                      STATEWIDE SUMMARY REPORT                        ==
============================================================================
                         Scenario: CLRP_2030 / 6 / 50

SOCIOECONOMIC DATA SUMMARY
    Total Households........................................ 2,669,061
    Total Enrollment........................................   821,028
    Total Employment........................................ 3,835,248
        Retail Employment...................................   579,688
        Office Employment................................... 1,702,712
        Industrial Employment...............................   400,442
        Other Employment.................................... 1,152,406

DAILY PERSON TRIP SUMMARY
    Daily Total Person Trips................................ 28,312,880
        Single-Occupant Auto Persons........................ 15,619,832
        2-Occupant Auto Persons............................. 10,741,065
        3-Occupant Auto Persons.............................    714,805
        Bus Persons.........................................    249,889
        Express Bus Persons.................................      3,660
        Rail Persons........................................    932,061
        Commuter Rail Persons...............................     51,569

DAILY VEHICLE TRIP SUMMARY
    Total Daily Vehicles Assigned .......................... 20,203,052
    Total Daily Autos Assigned ............................. 19,646,351
        Single-Occupant Vehicles............................ 13,498,647
        High-Occupant Vehicles (2)..........................  4,585,563
        High-Occupant Vehicles (3+).........................    164,507
        Commercial Vehicles................................. 1,351,744
        Regional Autos......................................     45,890
    Total Daily Trucks Assigned ...........................     556,701
        Single-Unit Trucks..................................    294,589
        Multi-Unit Trucks...................................    258,422
        Regional Trucks.....................................      3,690

DAILY VEHICLE MILES OF TRAVEL SUMMARY
    Total Daily System VMT ................................. 206,725,350
        Auto VMT ........................................... 192,510,781
        Truck VMT ..........................................  14,214,378
    Daily VMT by Facility Type
        Interstate VMT......................................  61,878,808
        Freeway VMT.........................................   7,893,275
        Expressway VMT......................................   9,864,413
        Major Arterial VMT..................................  52,201,865
        Minor Arterial VMT..................................  34,441,067
        Collector VMT.......................................  18,478,582
        Local/Centroid Connector............................  21,967,341

DAILY VEHICLE HOURS OF TRAVEL SUMMARY
    Total Daily System VHT .................................  8,791,305
        Auto VHT ...........................................  8,281,896
        Truck VHT ..........................................    509,409
    Daily VHT by Facility Type
        Interstate VHT......................................  1,916,028
        Freeway VHT.........................................    232,904
        Expressway VHT......................................    413,864
        Major Arterial VHT..................................  2,356,734
        Minor Arterial VHT..................................  1,604,877
        Collector VHT.......................................  1,246,031
        Local/Centroid Connector............................  1,020,866

== Start: 04:53 PM on 02/12/2014        End: 09:21 AM on 02/13/2014 ==
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APPENDIX B-2:   Model VMT Summary for 2030

Maryland Statewide Transportation Model (MSTM) version 1.0
STATEWIDE AVERAGE WEEKDAY VMT SUMMARY REPORT

Scenario: CLRP_2030

County	Interstate	Freeway/ Expressway	Principal Arterial	Minor Arterial	Collector	Local/ Centroid	TOTAL
Alleghany	765,222	0	560,798	179,488	0	515,780	2,021,287
Anne Arundel	5,007,171	5,593,269	3,144,282	3,239,494	1,151,648	2,021,599	20,157,467
Baltimore	13,377,950	1,151,404	4,633,907	3,849,569	2,723,213	1,893,649	27,629,675
Calvert	0	0	1,805,056	861,862	201,269	507,679	3,375,867
Caroline	0	0	77,588	1,239,030	43,365	320,915	1,680,898
Carroll	179,689	0	2,087,651	1,996,607	1,953,142	846,607	7,063,696
Cecil	2,707,474	0	1,269,755	1,963,690	831,377	681,916	7,454,210
Charles	0	0	2,775,121	1,213,037	815,130	939,527	5,742,815
Dorchester	0	0	258,700	727,970	64,229	305,584	1,356,483
Frederick	5,375,613	961,741	1,968,469	3,027,549	1,189,860	1,020,340	13,543,565
Garrett	413,420	0	269,141	460,971	0	406,298	1,549,831
Harford	3,601,814	0	2,245,680	1,908,394	1,530,422	1,192,542	10,478,853
Howard	5,493,351	3,401,741	1,630,222	1,405,141	1,524,821	1,196,110	14,651,391
Kent	0	0	63,939	644,137	17,250	81,878	807,205
Montgomery	9,467,095	1,089,137	8,654,755	3,117,567	1,404,423	2,408,051	26,141,017
Prince Georges	9,338,056	4,378,439	7,436,040	2,180,356	2,851,540	2,906,140	29,090,569
Queen Annes	0	0	1,363,001	847,156	179,446	430,441	2,820,044
St. Marys	0	0	1,878,438	451,760	320,117	948,784	3,599,100
Somerset	0	0	794,628	644,892	37,945	529,707	2,007,172
Talbot	0	0	669,126	502,372	359,280	255,553	1,786,331
Washington	3,609,185	86,540	1,131,506	1,218,191	0	1,068,708	7,114,128
Wicomico	0	0	1,604,549	759,200	637,275	470,009	3,471,032
Worcester	0	0	1,154,758	157,300	462,486	350,963	2,125,507
Baltimore City	2,542,795	1,095,416	4,724,754	1,845,332	180,344	668,560	11,057,207
TOTAL	61,878,808	17,757,688	52,201,865	34,441,067	18,478,582	21,967,341	206,725,350

NOTES: The interstate VMT includes the following ramp VMT: 3,391,502
Collector, Local and Centroid Connector VMT have not been validated

APPENDIX B-3:   Model VHT Summary for 2030

Maryland Statewide Transportation Model (MSTM) version 1.0
STATEWIDE AVERAGE WEEKDAY VHT SUMMARY REPORT

Scenario: CLRP_2030

County	Interstate	Freeway/Expressway	Principal Arterial	Minor Arterial	Collector	Local/Centroid	TOTAL
Allegany	17,947	0	17,526	6,043	0	21,076	62,592
Anne Arundel	151,296	204,875	146,218	160,246	72,877	96,456	831,974
Baltimore	425,421	29,965	204,099	177,588	141,104	98,077	1,076,249
Calvert	0	0	57,574	32,115	86,120	18,619	194,428
Caroline	0	0	2,264	45,659	1,631	11,609	61,162
Carroll	4,724	0	85,194	81,299	112,078	34,339	317,634
Cecil	96,770	0	42,694	88,967	65,668	26,848	320,948
Charles	0	0	106,685	45,193	41,415	37,804	231,096
Dorchester	0	0	8,949	23,489	2,144	11,434	46,015
Frederick	150,445	23,163	133,860	190,281	84,802	44,976	627,530
Garrett	8,809	0	8,211	14,577	0	14,883	46,478
Harford	102,048	0	84,720	77,651	82,862	50,257	397,539
Howard	156,163	91,722	73,322	62,746	90,457	58,561	532,972
Kent	0	0	2,196	20,323	576	3,023	26,117
Montgomery	334,894	36,901	409,726	158,079	100,204	131,620	1,171,432
Prince Georges	326,253	204,243	345,883	103,928	169,244	145,066	1,294,609
Queen Annes	0	0	53,659	31,479	6,542	16,923	108,602
St. Marys	0	0	58,104	23,928	28,204	36,351	146,587
Somerset	0	0	26,703	21,633	1,419	19,026	68,781
Talbot	0	0	25,520	29,942	50,268	10,000	115,730
Washington	85,285	1,798	45,961	42,164	0	45,166	220,373
Wicomico	0	0	85,358	35,313	52,282	19,101	192,054
Worcester	0	0	35,473	5,041	22,288	13,406	76,208
Baltimore City	89,472	47,012	259,741	105,687	15,253	41,566	558,737
TOTAL	1,949,535	639,678	2,319,639	1,583,370	1,227,437	1,006,190	8,725,848

NOTES: The interstate VHT includes the following ramp VHT: 179,099
Collector, Local and Centroid Connector VHT have not been validated

APPENDIX C: Listing of Link Attributes

Link Attribute	Description
A	A-Node
B	B-Node
SWFT	Statewide Facility Type 1 = Interstate 15 = Rail Links 2 = Freeway 16 = Unused 3 = Expressway 17 = Unused 4 = Major Arterial 18 = unused 5 = Minor Arterial 19 = Drive Access – Intercity Bus 6 = Collector 20 = Drive Access – Intercity Rail 7 = Unused 21 = Park and Ride – Highway Walk Like 8 = Medium Speed Ramps 22 = Unused 9 = High Speed Ramps 23 = Park and Ride – Rail Walk Link 10 = Local Roads 24 = Rail and Highway Walk Links 11 = Centroid Connector 25 = Unused 12 = Unused 26 = AmTrack 13 = Drive Access Link (Park N Ride) 14 = Unused
AREATYPE	Area type (based on Activity Density, where ActDen = (Total Emp + Ret Emp + HH)/acres 1 = ActDen: < 0.3914 6 = ActDen: 5.3649 – 7.7239 2 = ActDen: 0.3915 – 0.9446 7 = ActDen: 7.7240 – 12.0503 3 = ActDen: 0.9447 – 2.7505 8 = ActDen: 12.0504 – 31.2705 4 = ActDen: 2.7508 – 3.6032 9 = ActDen: > 31.27505 5 = ActDen: 3.6033 – 5.3648
RT_ID	Route ID
RT_NAME	Route Name
JUR_NAME	Jurisdiction Name
MODEL	Refers to the model of origin, either the MWCOG or BMC
DISTANCE	Link distance in miles
A_B	Text string of a-node & b-node joined by an underscore (for joining centerline data)
SMZ	Statewide model zone (MD = 1-1179)
AMLIMIT PMLIMIT OPLIMIT	0 = No Restrictions 3 = HOV-3 Only 9 = All Vehicles Prohibited 1 = General Use 4 = No Med/Heavy Trucks 2 = HOV-2 Only 5 = Airport Only
STN_ID	SHA Count Station ID
FIPS	County FIPS Code (State of Maryland = 24001- 24510) 24001 = Allegheny 24021 = Frederick 24039 = Somerset 24003 = Anne Arundel 24023 = Garrett 24041 = Talbot 24005 = Baltimore 24025 = Harford 24043 = Washington 24009 = Calvert 24027 = Howard 24045 = Wicomico 24011 = Caroline 24029 = Kent 24047 = Worcester 24013 = Carroll 24031 = Montgomery 24510 = Baltimore City 24015 = Cecil 24033 = Prince Georges 24017 = Charles 24035 = Queen Anne's 24019 = Dorchester 24037 = St. Mary's
AM_AUTOS	AM Peak Period Autos (6:30 am to 9:30 am)
MD_AUTOS	Midday Period Autos (9:30 am to 3:30 pm)
PM_ AUTOS	PM Peak Period Autos (3:30 pm to 6:30 pm)
NT_AUTOS	Nighttime Period Autos (6:30 pm to 6:30 am)
AM_COMVEH	AM Peak Period Commercial Vehicles (6:30 am to 9:30 am)
MD_ COMVEH	Midday Period Commercial Vehicles (9:30 am to 3:30 pm)
PM_ COMVEH	PM Peak Period Commercial Vehicles (3:30 pm to 6:30 pm)
NT_ COMVEH	Nighttime Period Commercial Vehicles (6:30 pm to 6:30 am)
AM_SDSUT	AM Peak Period Short-Distance Single-Unit Trucks (6:30 am to 9:30 am)
MD_SDSUT	MD Peak Period Short-Distance Single-Unit Trucks (9:30 am to 3:30 pm)

Link Attribute	Description
PM_SDSUT	PM Peak Period Short-Distance Single-Unit Trucks (3:30 pm to 6:30 pm)
NT_SDSUT	NT Peak Period Short-Distance Single-Unit Trucks (6:30 pm to 6:30 am)
AM_SDMUT	AM Peak Period Short-Distance Multi-Unit Trucks (6:30 am to 9:30 am)
MD_SDMUT	MD Peak Period Short-Distance Multi-Unit Trucks (9:30 am to 3:30 pm)
PM_SDMUT	PM Peak Period Short-Distance Multi-Unit Trucks (3:30 pm to 6:30 pm)
NT_SDMUT	NT Peak Period Short-Distance Multi-Unit Trucks (6:30 pm to 6:30 am)
AM_LDTRK	AM Peak Period Long-Distance Trucks (6:30 am to 9:30 am)
MD_LDTRK	MD Peak Period Long-Distance Trucks (9:30 am to 3:30 pm)
PM_LDTRK	PM Peak Period Long-Distance Trucks (3:30 pm to 6:30 pm)
NT_LDTRK	NT Peak Period Long-Distance Trucks (6:30 pm to 6:30 am)
AM_LDAUTO	AM Peak Period Long-Distance Autos (6:30 am to 9:30 am)
MD_LDAUTO	MD Peak Period Long-Distance Autos (9:30 am to 3:30 pm)
PM_LDAUTO	PM Peak Period Long-Distance Autos (3:30 pm to 6:30 pm)
NT_LDAUTO	NT Peak Period Long-Distance Autos (6:30 pm to 6:30 am)
COMVEH24	All Commercial Vehicles During an Average Weekday
LDAUTO24	All Long-Distance Autos During an Average Weekday
LDTRK24	All Long-Distance Trucks During an Average Weekday
SDSUT24	All Short-Distance Single-Unit Trucks During an Average Weekday
SDMUT24	All Short-Distance Multi-Unit Trucks During an Average Weekday
AUTO24	Total Autos During an Average Weekday (includes Commercial Vehicles, and long-Distance Autos)
TRUCK24	Total Trucks During an Average Weekday (includes Short-Distance Single-Unit and Multi-Unit Trucks, as well as Long-Distant Trucks)
VEHS24	**Total Vehicles During an Average Weekday [Auto24 + Truck24]**
AM_VMT	AM Peak Period VMT (6:30 am to 9:30 am)
MD_VMT	MD Peak Period VMT (9:30 am to 3:30 pm)
PM_VMT	PM Peak Period VMT (3:30 pm to 6:30 pm)
NT_VMT	VT Period VMT (6:30 pm to 6:30 am)
VHT24	Vehicle Hours Travelled throughout the entire day
VMT24	Vehicle Miles Travelled throughout the entire day
CONGSPD_AM	Congested speed during the AM period (6:30 am to 9:30 am)
CONGSPD_MD	Congested speed during the MD period (9:30 am to 3:30 pm)
CONGSPD_PM	Congested speed during the PM period (3:30 pm to 6:30 pm)
CONGSPD_NT	Congested speed during the nighttime period (6:30 pm to 6:30 am)
MIN_CONGSPD	Minimal Congested Speed throughout the entire day

APPENDIX D: Select Link Analysis – Link Attributes

The following table describes the main link attributes that result from the select link analysis.

Link Attribute	Description
AM_COMVEH_*SLA*	AM Commercial Vehicles that meet the select link criteria
AM_SDSUT_SLA	AM Medium Heavy-Duty Trucks that meet the select link criteria
AM_SDMUT_SLA	AM Heavy Heavy-Duty Trucks that meet the select link criteria
AM_LDTRKS_SLA	AM Commercial Vehicles that meet the select link criteria
AM_LDAUTO_SLA	AM Regional Autos that meet the select link criteria
AM_AUTOS_SL_SLA	AM Total Autos that meet the select link criteria
AM_TRUCKS_SL_SLA	AM Total Trucks that meet the select link criteria
AM_ALL_VEHS_SL_SLA	AM Total Vehicles (Autos + Trucks) that meet the select link criteria
MD_COMVEH_*SLA*	MD Commercial Vehicles that meet the select link criteria
MD_SDSUT_SLA	MD Medium Heavy-Duty Trucks that meet the select link criteria
MDSDMUT_SLA	MD Heavy Heavy-Duty Trucks that meet the select link criteria
MD_REGTRCKS_SLA	MD Commercial Vehicles that meet the select link criteria
MD_REG_AUTOS_SLA	MD Regional Autos that meet the select link criteria
MD_AUTOS_SL_SLA	MD Total Autos that meet the select link criteria
MD_TRUCKS_SL_SLA	MD Total Trucks that meet the select link criteria
MD_ALL_VEHS_SL_SLA	MD Total Vehicles (Autos + Trucks) that meet the select link criteria
PM_COMVEH_*SLA*	PM Commercial Vehicles that meet the select link criteria
PM_SDSUT_SLA	PM Medium Heavy-Duty Trucks that meet the select link criteria
PMSDMUT_SLA	PM Heavy Heavy-Duty Trucks that meet the select link criteria
PM_REGTRCKS_SLA	PM Commercial Vehicles that meet the select link criteria
PM_REG_AUTOS_SLA	PM Regional Autos that meet the select link criteria
PM_AUTOS_SL_SLA	PM Total Autos that meet the select link criteria
PM_TRUCKS_SL_SLA	PM Total Trucks that meet the select link criteria
PM_ALL_VEHS_SL_SLA	PM Total Vehicles (Autos + Trucks) that meet the select link criteria
NT_COMVEH_*SLA*	NT Commercial Vehicles that meet the select link criteria
NT_SDSUT_SLA	NT Medium Heavy-Duty Trucks that meet the select link criteria
NTSDMUT_SLA	NT Heavy Heavy-Duty Trucks that meet the select link criteria
NT_REGTRCKS_SLA	NT Commercial Vehicles that meet the select link criteria
NT_REG_AUTOS_SLA	NT Regional Autos that meet the select link criteria
NT_AUTOS_SL_SLA	NT Total Autos that meet the select link criteria
NT_TRUCKS_SL_SLA	NT Total Trucks that meet the select link criteria
NT_ALL_VEHS_SL_SLA	NT Total Vehicles (Autos + Trucks) that meet the select link criteria
COMMVEH24_*SLA*	Daily Commercial Vehicles that meet the select link criteria
LDAUTO24_SLA	Daily Regional Autos that meet the select link criteria
SDSUTRK24_SLA	Daily Medium Heavy-Duty Trucks that meet the select link criteria
HDTRK24_SLA	Daily Heavy Heavy-Duty Trucks that meet the select link criteria
AUTO24_SLA	Daily Autos that meet the select link criteria
TRUCK24_SLA	Daily Trucks that meet the select link criteria
VEHS24_SLA	Daily Vehicled that meet the select link criteria

APPENDIX E: Select Zone Analysis – Link Attributes

The following table describes the main link attributes that result from the select zone analysis.

Link Attribute	Description
AM_COMVEH_*SLA*	AM Commercial Vehicles that meet the select link criteria
AM_SDSUT_SLA	AM Short-Distance Single-Unit Trucks that meet the select link criteria
AM_SDMUT_SLA	AM Short-Distance Multi-Unit Trucks that meet the select link criteria
AM_LDTRK_SLA	AM Long-Distance Trucks that meet the select link criteria
AM_LDAUTO_SLA	AM Regional Autos that meet the select link criteria
AM_AUTOS_SLA	AM Total Autos that meet the select link criteria
AM_TRUCKS_SLA	AM Total Trucks that meet the select link criteria
AM_VEHS_SLA	AM Total Vehicles (Autos + Trucks) that meet the select link criteria
MD_COMVEH_*SLA*	MD Commercial Vehicles that meet the select link criteria
MD_SDSUT_SLA	MD Short-Distance Single-Unit Trucks that meet the select link criteria
MD_SDMUT_SLA	MD Short-Distance Multi-Unit Trucks that meet the select link criteria
MD_LDTRK_SLA	MD Long-Distance Trucks that meet the select link criteria
MD_LDAUTO_SLA	MD Regional Autos that meet the select link criteria
MD_AUTOS_SLA	MD Total Autos that meet the select link criteria
MD_TRUCKS_SLA	MD Total Trucks that meet the select link criteria
MD_VEHS_SLA	MD Total Vehicles (Autos + Trucks) that meet the select link criteria
PM_COMVEH_*SLA*	PM Commercial Vehicles that meet the select link criteria
PM_SDSUT_SLA	PM Short-Distance Single-Unit Trucks that meet the select link criteria
PM_SDMUT_SLA	PM Short-Distance Multi-Unit Trucks that meet the select link criteria
PM_LDTRK_SLA	PM Long-Distance Trucks that meet the select link criteria
PM_LDAUTO_SLA	PM Regional Autos that meet the select link criteria
PM_AUTOS_SLA	PM Total Autos that meet the select link criteria
PM_TRUCKS_SLA	PM Total Trucks that meet the select link criteria
PM_VEHS_SLA	PM Total Vehicles (Autos + Trucks) that meet the select link criteria
NT_COMVEH_*SLA*	NT Commercial Vehicles that meet the select link criteria
NT_SDSUT_SLA	NT Short-Distance Single-Unit Trucks that meet the select link criteria
NT_SDMUT_SLA	NT Short-Distance Multi-Unit Trucks that meet the select link criteria
NT_LDTRKS_SLA	NT Long-Distance Trucks that meet the select link criteria
NT_LDAUTO_SLA	NT Long-Distance Autos that meet the select link criteria
NT_AUTOS_SLA	NT Total Autos that meet the select link criteria
NT_TRUCKS_SLA	NT Total Trucks that meet the select link criteria
NT_VEHS_SLA	NT Total Vehicles (Autos + Trucks) that meet the select link criteria
COMVEH24_*SLA*	Daily Commercial Vehicles that meet the select link criteria
LDAUTO24_SLA	Daily Long-Distance Autos that meet the select link criteria
LDTRK24_SLA	Daily Long-Distance Trucks that meet the select link criteria
SDSUT24_SLA	Daily Short-Distance Single-Unit Trucks that meet the select link criteria
SDMUT24_SLA	Daily Short-Distance Multi-Unit Trucks that meet the select link criteria
AUTO24_SLA	Total Daily Autos that meet the select link criteria
TRUCK24_SLA	Total Daily Trucks that meet the select link criteria
VEHS24_SLA	Total Daily Vehicles that meet the select link criteria

Where "SLA" represents the prefix that was entered at model execution

APPENDIX F: Complete Model Directory Listing

Complete MSTM Directory File Listing

```
Q:\MSTM_v1.0
|   Run_MSTM.exe
|   Run_MSTM_CL.exe
|
+---Base_2007
|   +---Inputs
|   |       Activities.csv
|   |       AmtrakLines(OP).lin
|   |       AmtrakLines(PK).lin
|   |       Areatype.dat
|   |       BusLines(OP).lin
|   |       BusLines(PK).lin
|   |       Cen2000Seed_HH_By_SIZ_INC.csv
|   |       Cen2000Seed_HH_By_WRK_INC.csv
|   |       county.txt
|   |       dist.txt
|   |       FareByModes.mtx
|   |       GreyHound(OP).lin
|   |       GreyHound(PK).lin
|   |       hbo_rates.txt
|   |       hbsc_rates.txt
|   |       hbs_rates.txt
|   |       HBWAttrShares.csv
|   |       hbw_rates.txt
|   |       HHbyIncome.csv
|   |       HH_By_SIZ_INC.csv
|   |       HH_By_WRKS_INC.csv
|   |       HH_By_WRK_INC.csv
|   |       INCQShares.dbf
|   |       MotorizedShares.csv
|   |       MSTM.net
|   |       MSTM.vpr
|   |       Networks.ldb
|   |       Networks.mdb
|   |       nhbw_rates.txt
|   |       obo_rates.txt
|   |       ParkCost.dat
|   |       RailLines(OP).lin
|   |       RailLines(PK).lin
|   |       RiverZones.txt
|   |       RMZ.csv
|   |       RMZpopulation.csv
|   |       Seed_HH_By_SIZ_INC.csv
|   |       Seed_HH_By_WRK_INC.csv
|   |       SMZ.csv
|   |       SMZ_WalkShare.csv
|   |       Target_HH_Size_Wrks.dat
|   |       Target_Size_Wrk_Inc.csv
|   |       TOLLLINK.DAT
|   |       TripProductionDampening_NJPAWV.csv
|   |       TRNPEN (MWCOG Metrorail only!).DAT
|   |       turn.pen
|   |       ZonesToRegions.csv
|   |       zoneSystem.csv
|   |
|   +---Parameters
|   |       Areatype.dat
|   |       DBusOP.fac
|   |       DBusPK.fac
|   |       DCRailOP.fac
|   |       DCRailPK.fac
|   |       destchoiceParameters.dat
|   |       DExpBusOP.fac
|   |       DExpBusPK.fac
|   |       DRailOP.fac
|   |       DRailPK.fac
|   |       DTrnOP.fac
|   |       DTrnPK.fac
|   |       Gen.fac
|   |       ModeChoiceCoeff.dat
|   |       parameter.dat
|   |       SMZ_WalkShare.csv
|   |       SYSFILE.PTS
|   |       WBusOP.fac
|   |       WBusPK.fac
|   |       WCRailOP.fac
|   |       WCRailPK.fac
|   |       WExpBusOP.fac
|   |       WExpBusPK.fac
|   |       WRailOP.fac
|   |       WRailPK.fac
|   |       WTrnOP.fac
|   |       WTrnPK.fac
|   |
|   \---RegionalModel
|       |   run_MSTM_Java_models.bat
```

Complete MSTM Directory File Listing

```
|        |
|        +---input
|        |   +---fafdata
|        |   |   +---countyEmployment2007
|        |   |   |       agEmpl2007.csv
|        |   |   |
|        |   |   +---countyEmployment2010
|        |   |   |       coalProduction2010.csv
|        |   |   |       countyEmploymentByIndustry2010.csv
|        |   |   |       source.txt
|        |   |   |
|        |   |   +---faf3
|        |   |   |       faf3regionList.csv
|        |   |   |       faf3_4.csv
|        |   |   |       sctgCommodities.csv
|        |   |   |
|        |   |   \---references
|        |   |       |   countyIDs.csv
|        |   |       |   distanceInMiles_04Oct2012.zmx
|        |   |       |
|        |   |       +---ioCoefficients
|        |   |       |       makeCoefficientsFAF3_wCoal.csv
|        |   |       |       useCoefficientsFAF3_wCoal.csv
|        |   |       |
|        |   |       \---payload
|        |   |               shareTruckTypeByDistance.csv
|        |   |               truckBodyTypeByCommodity_cdt.csv
|        |   |               truckBodyTypeByCommodity_cst.csv
|        |   |               truckBodyTypeByCommodity_sut.csv
|        |   |               truckBodyTypeByCommodity_trt.csv
|        |   |
|        |   +---localTrucks
|        |   |       stwTruckParameters.csv
|        |   |
|        |   +---neldt
|        |   |   |   countyPopulation.csv
|        |   |   |   rowList.csv
|        |   |   |   stateList.csv
|        |   |   |   statesToSynthesizeNHTS.csv
|        |   |   |
|        |   |   \---nhts
|        |   |       \---2002
|        |   |               DAYPUB_ld.csv
|        |   |               LDTPUB.csv
|        |   |               LDTPUBshort.csv
|        |   |               LDTPUBshort.txt
|        |   |               UsersGuide.pdf
|        |   |
|        |   +---regionalAutos
|        |   |       frictionFactorByState.csv
|        |   |
|        |   \---regionalTrucks
|        |           countyScaler.csv
|        |           makeCoefficientsFAF3local.csv
|        |           makeCoefficientsFAF3regional.csv
|        |           natCountiesToZones.csv
|        |           portsOfEntry_airPorts.csv
|        |           portsOfEntry_landBorder.csv
|        |           portsOfEntry_marinePorts.csv
|        |           schema.ini
|        |           useCoefficientsFAF3local.csv
|        |           useCoefficientsFAF3regional.csv
|        |
|        \---javaFiles
|                log4j.xml
|                mstm.jar
|                mstm.properties
|
+---CLRP_2030
|   +---Inputs
|   |   |       Activities.csv
|   |   |       AmtrakLines(OP).lin
|   |   |       AmtrakLines(PK).lin
|   |   |       Areatype.dat
|   |   |       BusLines(OP).BAK
|   |   |       BusLines(OP).lin
|   |   |       BusLines(PK).lin
|   |   |       Cen2000Seed_HH_By_SIZ_INC.csv
|   |   |       Cen2000Seed_HH_By_WRK_INC.csv
|   |   |       county.txt
|   |   |       DEFAULT.VPR
|   |   |       destchoiceParameters.dat
|   |   |       dist.txt
|   |   |       FareByModes.mtx
|   |   |       GreyHound(OP).lin
|   |   |       GreyHound(PK).lin
|   |   |       hbo_rates.txt
|   |   |       hbsc_rates.txt
|   |   |       hbs_rates.txt
|   |   |       HBWAttrShares.csv
|   |   |       hbw_rates.txt
```

Complete MSTM Directory File Listing

```
|   |       HHbyIncome.csv
|   |       HH_By_SIZ_INC.csv
|   |       HH_By_WRKS_INC.csv
|   |       i95SubareaNetwork.net
|   |       INCQShares.dbf
|   |       MotorizedShares.csv
|   |       MSTM (without FIPS).NET
|   |       MSTM.BAK
|   |       MSTM.NET
|   |       MSTM.NET backup
|   |       MSTM.vpr
|   |       Networks.mdb
|   |       nhbw_rates.txt
|   |       obo_rates.txt
|   |       ParkCost.dat
|   |       RailLines(OP).lin
|   |       RailLines(PK).lin
|   |       RiverZones.txt
|   |       RMZ.csv
|   |       RMZpopulation.csv
|   |       Seed_HH_By_SIZ_INC.csv
|   |       Seed_HH_By_WRK_INC.csv
|   |       Shields.drw
|   |       SMZ.csv
|   |       SMZ_WalkShare.csv
|   |       stamp.log
|   |       Target_HH_Size_Wrks.dat
|   |       Target_Size_Wrk_Inc.csv
|   |       TOLLLINK.DAT
|   |       TripProductionDampening_NJPAWV.csv
|   |       TRNPEN (MWCOG Metrorail only!).DAT
|   |       turn.pen
|   |       ZonesToRegions.csv
|   |       zoneSystem.csv
|   |
|   +---NoBuild_2007
|   |   +---Inputs
|   |   |   |       BING.mxd
|   |   |   |       Case Studies for MSTM 2.pptx
|   |   |   |       Case Studies for MSTM.pptx
|   |   |   |       E Drive.lnk
|   |   |   |       hqprograms (shahqfs1) (P) - Shortcut.lnk
|   |   |   |       modelsummary.job
|   |   |   |       MSTM Challenges and Opportunities.docx
|   |   |   |       run_Model_Ver2.3.37_2040_base.bat
|   |   |   |       Simulated Distribution Patterns on York Road.docx
|   |   |   |       Simulated Distribution Patterns on York Road.pdf
|   |   |   |       Tee.exe
|   |   |   |       TIMETHIS.EXE
|   |   |   |       view_from_space_v2.3.52_3722taz.s
|   |   |   |
|   |   +---Parameters
|   |   |   |       BING.mxd
|   |   |   |       Case Studies for MSTM 2.pptx
|   |   |   |       Case Studies for MSTM.pptx
|   |   |   |       E Drive.lnk
|   |   |   |       hqprograms (shahqfs1) (P) - Shortcut.lnk
|   |   |   |       modelsummary.job
|   |   |   |       MSTM Challenges and Opportunities.docx
|   |   |   |       run_Model_Ver2.3.37_2040_base.bat
|   |   |   |       Simulated Distribution Patterns on York Road.docx
|   |   |   |       Simulated Distribution Patterns on York Road.pdf
|   |   |   |       Tee.exe
|   |   |   |       TIMETHIS.EXE
|   |   |   |       view_from_space_v2.3.52_3722taz.s
|   |   |   |
|   |   \---RegionalModel
|   |       +---input
|   |       |   +---fafdata
|   |       |   |   |       BING.mxd
|   |       |   |   |       Case Studies for MSTM 2.pptx
|   |       |   |   |       Case Studies for MSTM.pptx
|   |       |   |   |       E Drive.lnk
|   |       |   |   |       hqprograms (shahqfs1) (P) - Shortcut.lnk
|   |       |   |   |       modelsummary.job
|   |       |   |   |       MSTM Challenges and Opportunities.docx
|   |       |   |   |       run_Model_Ver2.3.37_2040_base.bat
|   |       |   |   |       Simulated Distribution Patterns on York Road.docx
|   |       |   |   |       Simulated Distribution Patterns on York Road.pdf
|   |       |   |   |       Tee.exe
|   |       |   |   |       TIMETHIS.EXE
|   |       |   |   |       view_from_space_v2.3.52_3722taz.s
|   |       |   |   |
|   |       |   +---localTrucks
|   |       |   |   |       BING.mxd
|   |       |   |   |       Case Studies for MSTM 2.pptx
|   |       |   |   |       Case Studies for MSTM.pptx
|   |       |   |   |       E Drive.lnk
|   |       |   |   |       hqprograms (shahqfs1) (P) - Shortcut.lnk
|   |       |   |   |       modelsummary.job
|   |       |   |   |       MSTM Challenges and Opportunities.docx
```

Complete MSTM Directory File Listing

```
|   |       |   |       run_Model_Ver2.3.37_2040_base.bat
|   |       |   |       Simulated Distribution Patterns on York Road.docx
|   |       |   |       Simulated Distribution Patterns on York Road.pdf
|   |       |   |       Tee.exe
|   |       |   |       TIMETHIS.EXE
|   |       |   |       view_from_space_v2.3.52_3722taz.s
|   |       |   |
|   |       |   +---neldt
|   |       |   |       BING.mxd
|   |       |   |       Case Studies for MSTM 2.pptx
|   |       |   |       Case Studies for MSTM.pptx
|   |       |   |       E Drive.lnk
|   |       |   |       hqprograms (shahqfs1) (P) - Shortcut.lnk
|   |       |   |       modelsummary.job
|   |       |   |       MSTM Challenges and Opportunities.docx
|   |       |   |       run_Model_Ver2.3.37_2040_base.bat
|   |       |   |       Simulated Distribution Patterns on York Road.docx
|   |       |   |       Simulated Distribution Patterns on York Road.pdf
|   |       |   |       Tee.exe
|   |       |   |       TIMETHIS.EXE
|   |       |   |       view_from_space_v2.3.52_3722taz.s
|   |       |   |
|   |       |   +---regionalAutos
|   |       |   |       BING.mxd
|   |       |   |       Case Studies for MSTM 2.pptx
|   |       |   |       Case Studies for MSTM.pptx
|   |       |   |       E Drive.lnk
|   |       |   |       hqprograms (shahqfs1) (P) - Shortcut.lnk
|   |       |   |       modelsummary.job
|   |       |   |       MSTM Challenges and Opportunities.docx
|   |       |   |       run_Model_Ver2.3.37_2040_base.bat
|   |       |   |       Simulated Distribution Patterns on York Road.docx
|   |       |   |       Simulated Distribution Patterns on York Road.pdf
|   |       |   |       Tee.exe
|   |       |   |       TIMETHIS.EXE
|   |       |   |       view_from_space_v2.3.52_3722taz.s
|   |       |   |
|   |       |   \---regionalTrucks
|   |       |           BING.mxd
|   |       |           Case Studies for MSTM 2.pptx
|   |       |           Case Studies for MSTM.pptx
|   |       |           E Drive.lnk
|   |       |           hqprograms (shahqfs1) (P) - Shortcut.lnk
|   |       |           modelsummary.job
|   |       |           MSTM Challenges and Opportunities.docx
|   |       |           run_Model_Ver2.3.37_2040_base.bat
|   |       |           Simulated Distribution Patterns on York Road.docx
|   |       |           Simulated Distribution Patterns on York Road.pdf
|   |       |           Tee.exe
|   |       |           TIMETHIS.EXE
|   |       |           view_from_space_v2.3.52_3722taz.s
|   |       |
|   |       \---javaFiles
|   |               BING.mxd
|   |               Case Studies for MSTM 2.pptx
|   |               Case Studies for MSTM.pptx
|   |               E Drive.lnk
|   |               hqprograms (shahqfs1) (P) - Shortcut.lnk
|   |               modelsummary.job
|   |               MSTM Challenges and Opportunities.docx
|   |               run_Model_Ver2.3.37_2040_base.bat
|   |               Simulated Distribution Patterns on York Road.docx
|   |               Simulated Distribution Patterns on York Road.pdf
|   |               Tee.exe
|   |               TIMETHIS.EXE
|   |               view_from_space_v2.3.52_3722taz.s
|   |
|   +---Parameters
|   |       Areatype.dat
|   |       DBusOP.fac
|   |       DBusPK.fac
|   |       DCRailOP.fac
|   |       DCRailPK.fac
|   |       DELETE.BAT
|   |       destchoiceParameters.dat
|   |       DExpBusOP.fac
|   |       DExpBusPK.fac
|   |       DRailOP.fac
|   |       DRailPK.fac
|   |       DTrnOP.fac
|   |       DTrnPK.fac
|   |       Gen.fac
|   |       ModeChoiceCoeff.dat
|   |       parameter.dat
|   |       selectlink.dat
|   |       SMZ_WalkShare.csv
|   |       SYSFILE.PTS
|   |       WBusOP.fac
|   |       WBusPK.fac
|   |       WCRailOP.fac
|   |       WCRailPK.fac
```

Complete MSTM Directory File Listing

```
|   |           WExpBusOP.fac
|   |           WExpBusPK.fac
|   |           WRailOP.fac
|   |           WRailPK.fac
|   |           WTrnOP.fac
|   |           WTrnPK.fac
|   |
|   +---RegionalModel
|   |   |   run_MSTM_Java_models.bat
|   |   |
|   |   +---input
|   |   |   +---fafdata
|   |   |   |   +---countyEmployment2007
|   |   |   |   |       agEmpl2007.csv
|   |   |   |   |
|   |   |   |   +---countyEmployment2010
|   |   |   |   |       coalProduction2010.csv
|   |   |   |   |       countyEmploymentByIndustry2010.csv
|   |   |   |   |       source.txt
|   |   |   |   |
|   |   |   |   +---faf3
|   |   |   |   |       faf3regionList.csv
|   |   |   |   |       faf3_4.csv
|   |   |   |   |       sctgCommodities.csv
|   |   |   |   |
|   |   |   |   \---references
|   |   |   |       |   countyIDs.csv
|   |   |   |       |   distanceInMiles_04Oct2012.zmx
|   |   |   |       |
|   |   |   |       +---ioCoefficients
|   |   |   |       |       makeCoefficientsFAF3_wCoal.csv
|   |   |   |       |       useCoefficientsFAF3_wCoal.csv
|   |   |   |       |
|   |   |   |       \---payload
|   |   |   |               shareTruckTypeByDistance.csv
|   |   |   |               truckBodyTypeByCommodity_cdt.csv
|   |   |   |               truckBodyTypeByCommodity_cst.csv
|   |   |   |               truckBodyTypeByCommodity_sut.csv
|   |   |   |               truckBodyTypeByCommodity_trt.csv
|   |   |   |
|   |   |   +---localTrucks
|   |   |   |       stwTruckParameters.csv
|   |   |   |
|   |   |   +---neldt
|   |   |   |   |   countyPopulation.csv
|   |   |   |   |   rowList.csv
|   |   |   |   |   stateList.csv
|   |   |   |   |   statesToSynthesizeNHTS.csv
|   |   |   |   |
|   |   |   |   \---nhts
|   |   |   |       \---2002
|   |   |   |               DAYPUB_ld.csv
|   |   |   |               LDTPUB.csv
|   |   |   |               LDTPUBshort.csv
|   |   |   |               LDTPUBshort.txt
|   |   |   |               UsersGuide.pdf
|   |   |   |
|   |   |   +---regionalAutos
|   |   |   |       frictionFactorByState.csv
|   |   |   |
|   |   |   \---regionalTrucks
|   |   |           countyScaler.csv
|   |   |           makeCoefficientsFAF3local.csv
|   |   |           makeCoefficientsFAF3regional.csv
|   |   |           natCountiesToZones.csv
|   |   |           portsOfEntry_airPorts.csv
|   |   |           portsOfEntry_landBorder.csv
|   |   |           portsOfEntry_marinePorts.csv
|   |   |           schema.ini
|   |   |           useCoefficientsFAF3local.csv
|   |   |           useCoefficientsFAF3regional.csv
|   |   |
|   |   \---javaFiles
|   |           log4j.xml
|   |           mstm.jar
|   |           mstm.properties
|   |
|   \---Test_2007
|       +---Inputs
|       |       BING.mxd
|       |       Case Studies for MSTM 2.pptx
|       |       Case Studies for MSTM.pptx
|       |       E Drive.lnk
|       |       hqprograms (shahqfs1) (P) - Shortcut.lnk
|       |       modelsummary.job
|       |       MSTM Challenges and Opportunities.docx
|       |       run_Model_Ver2.3.37_2040_base.bat
|       |       Simulated Distribution Patterns on York Road.docx
|       |       Simulated Distribution Patterns on York Road.pdf
|       |       Tee.exe
|       |       TIMETHIS.EXE
```

Complete MSTM Directory File Listing

```
|     |          view_from_space_v2.3.52_3722taz.s
|     |
|     +---Parameters
|     |          BING.mxd
|     |          Case Studies for MSTM 2.pptx
|     |          Case Studies for MSTM.pptx
|     |          E Drive.lnk
|     |          hqprograms (shahqfs1) (P) - Shortcut.lnk
|     |          modelsummary.job
|     |          MSTM Challenges and Opportunities.docx
|     |          run_Model_Ver2.3.37_2040_base.bat
|     |          Simulated Distribution Patterns on York Road.docx
|     |          Simulated Distribution Patterns on York Road.pdf
|     |          Tee.exe
|     |          TIMETHIS.EXE
|     |          view_from_space_v2.3.52_3722taz.s
|     |
|     \---RegionalModel
|         +---input
|         |   +---fafdata
|         |   |   |      BING.mxd
|         |   |   |      Case Studies for MSTM 2.pptx
|         |   |   |      Case Studies for MSTM.pptx
|         |   |   |      E Drive.lnk
|         |   |   |      hqprograms (shahqfs1) (P) - Shortcut.lnk
|         |   |   |      modelsummary.job
|         |   |   |      MSTM Challenges and Opportunities.docx
|         |   |   |      run_Model_Ver2.3.37_2040_base.bat
|         |   |   |      Simulated Distribution Patterns on York Road.docx
|         |   |   |      Simulated Distribution Patterns on York Road.pdf
|         |   |   |      Tee.exe
|         |   |   |      TIMETHIS.EXE
|         |   |   |      view_from_space_v2.3.52_3722taz.s
|         |   |   |
|         |   +---localTrucks
|         |   |   |      BING.mxd
|         |   |   |      Case Studies for MSTM 2.pptx
|         |   |   |      Case Studies for MSTM.pptx
|         |   |   |      E Drive.lnk
|         |   |   |      hqprograms (shahqfs1) (P) - Shortcut.lnk
|         |   |   |      modelsummary.job
|         |   |   |      MSTM Challenges and Opportunities.docx
|         |   |   |      run_Model_Ver2.3.37_2040_base.bat
|         |   |   |      Simulated Distribution Patterns on York Road.docx
|         |   |   |      Simulated Distribution Patterns on York Road.pdf
|         |   |   |      Tee.exe
|         |   |   |      TIMETHIS.EXE
|         |   |   |      view_from_space_v2.3.52_3722taz.s
|         |   |   |
|         |   +---neldt
|         |   |   |      BING.mxd
|         |   |   |      Case Studies for MSTM 2.pptx
|         |   |   |      Case Studies for MSTM.pptx
|         |   |   |      E Drive.lnk
|         |   |   |      hqprograms (shahqfs1) (P) - Shortcut.lnk
|         |   |   |      modelsummary.job
|         |   |   |      MSTM Challenges and Opportunities.docx
|         |   |   |      run_Model_Ver2.3.37_2040_base.bat
|         |   |   |      Simulated Distribution Patterns on York Road.docx
|         |   |   |      Simulated Distribution Patterns on York Road.pdf
|         |   |   |      Tee.exe
|         |   |   |      TIMETHIS.EXE
|         |   |   |      view_from_space_v2.3.52_3722taz.s
|         |   |   |
|         |   +---regionalAutos
|         |   |   |      BING.mxd
|         |   |   |      Case Studies for MSTM 2.pptx
|         |   |   |      Case Studies for MSTM.pptx
|         |   |   |      E Drive.lnk
|         |   |   |      hqprograms (shahqfs1) (P) - Shortcut.lnk
|         |   |   |      modelsummary.job
|         |   |   |      MSTM Challenges and Opportunities.docx
|         |   |   |      run_Model_Ver2.3.37_2040_base.bat
|         |   |   |      Simulated Distribution Patterns on York Road.docx
|         |   |   |      Simulated Distribution Patterns on York Road.pdf
|         |   |   |      Tee.exe
|         |   |   |      TIMETHIS.EXE
|         |   |   |      view_from_space_v2.3.52_3722taz.s
|         |   |   |
|         |   \---regionalTrucks
|         |   |          BING.mxd
|         |   |          Case Studies for MSTM 2.pptx
|         |   |          Case Studies for MSTM.pptx
|         |   |          E Drive.lnk
|         |   |          hqprograms (shahqfs1) (P) - Shortcut.lnk
|         |   |          modelsummary.job
|         |   |          MSTM Challenges and Opportunities.docx
|         |   |          run_Model_Ver2.3.37_2040_base.bat
|         |   |          Simulated Distribution Patterns on York Road.docx
|         |   |          Simulated Distribution Patterns on York Road.pdf
|         |   |          Tee.exe
```

Complete MSTM Directory File Listing

```
|       |           TIMETHIS.EXE
|       |           view_from_space_v2.3.52_3722taz.s
|       |
|       \---javaFiles
|               BING.mxd
|               Case Studies for MSTM 2.pptx
|               Case Studies for MSTM.pptx
|               E Drive.lnk
|               hqprograms (shahqfs1) (P) - Shortcut.lnk
|               modelsummary.job
|               MSTM Challenges and Opportunities.docx
|               run_Model_Ver2.3.37_2040_base.bat
|               Simulated Distribution Patterns on York Road.docx
|               Simulated Distribution Patterns on York Road.pdf
|               Tee.exe
|               TIMETHIS.EXE
|               view_from_space_v2.3.52_3722taz.s
|
+---NoBuild_2030
|   +---Inputs
|   |       Activities.csv
|   |       AmtrakLines(OP).lin
|   |       AmtrakLines(PK).lin
|   |       Areatype.dat
|   |       BusLines(OP).lin
|   |       BusLines(PK).lin
|   |       Cen2000Seed_HH_By_SIZ_INC.csv
|   |       Cen2000Seed_HH_By_WRK_INC.csv
|   |       county.txt
|   |       dist.txt
|   |       FareByModes.mtx
|   |       GreyHound(OP).lin
|   |       GreyHound(PK).lin
|   |       hbo_rates.txt
|   |       hbsc_rates.txt
|   |       hbs_rates.txt
|   |       HBWAttrShares.csv
|   |       hbw_rates.txt
|   |       HHbyIncome.csv
|   |       HH_By_SIZ_INC.csv
|   |       HH_By_WRKS_INC.csv
|   |       HH_By_WRK_INC.csv
|   |       INCQShares.dbf
|   |       MotorizedShares.csv
|   |       MSTM.net
|   |       MSTM.vpr
|   |       Networks.ldb
|   |       Networks.mdb
|   |       nhbw_rates.txt
|   |       obo_rates.txt
|   |       ParkCost.dat
|   |       RailLines(OP).lin
|   |       RailLines(PK).lin
|   |       RiverZones.txt
|   |       RMZ.csv
|   |       RMZpopulation.csv
|   |       Seed_HH_By_SIZ_INC.csv
|   |       Seed_HH_By_WRK_INC.csv
|   |       SMZ.csv
|   |       SMZ_WalkShare.csv
|   |       Target_HH_Size_Wrks.dat
|   |       Target_Size_Wrk_Inc.csv
|   |       TOLLLINK.DAT
|   |       TripProductionDampening_NJPAWV.csv
|   |       TRNPEN (MWCOG Metrorail only!).DAT
|   |       turn.pen
|   |       ZonesToRegions.csv
|   |       zoneSystem.csv
|   |
|   +---Parameters
|   |       Areatype.dat
|   |       DBusOP.fac
|   |       DBusPK.fac
|   |       DCRailOP.fac
|   |       DCRailPK.fac
|   |       destchoiceParameters.dat
|   |       DExpBusOP.fac
|   |       DExpBusPK.fac
|   |       DRailOP.fac
|   |       DRailPK.fac
|   |       DTrnOP.fac
|   |       DTrnPK.fac
|   |       Gen.fac
|   |       ModeChoiceCoeff.dat
|   |       parameter.dat
|   |       SMZ_WalkShare.csv
|   |       SYSFILE.PTS
|   |       WBusOP.fac
|   |       WBusPK.fac
|   |       WCRailOP.fac
|   |       WCRailPK.fac
```

Complete MSTM Directory File Listing

```
|   |       WExpBusOP.fac
|   |       WExpBusPK.fac
|   |       WRailOP.fac
|   |       WRailPK.fac
|   |       WTrnOP.fac
|   |       WTrnPK.fac
|   |
|   \---RegionalModel
|       |   run_MSTM_Java_models.bat
|       |
|       +---input
|       |   +---fafdata
|       |   +---localTrucks
|       |   |   |   stwTruckParameters.csv
|       |   |   |
|       |   |   +---neldt
|       |   |   |       countyPopulation.csv
|       |   |   |       rowList.csv
|       |   |   |       stateList.csv
|       |   |   |       statesToSynthesizeNHTS.csv
|       |   |   |
|       |   |   +---regionalAutos
|       |   |   |       frictionFactorByState.csv
|       |   |   |
|       |   |   \---regionalTrucks
|       |   |           countyScaler.csv
|       |   |           makeCoefficientsFAF3local.csv
|       |   |           makeCoefficientsFAF3regional.csv
|       |   |           natCountiesToZones.csv
|       |   |           portsOfEntry_airPorts.csv
|       |   |           portsOfEntry_landBorder.csv
|       |   |           portsOfEntry_marinePorts.csv
|       |   |           schema.ini
|       |   |           useCoefficientsFAF3local.csv
|       |   |           useCoefficientsFAF3regional.csv
|       |   |
|       |   \---javaFiles
|       |           log4j.xml
|       |           mstm.jar
|       |           mstm.properties
|       |
+---Scripts
|       ComVeh_Truck_TLFD.s
|       County_VHT_Summary.s
|       County_VMT_Summary.s
|       DCModel.s
|       ExportNET2DBF.s
|       ExportSkm2Csv.s
|       HwyAssign.s
|       HwyAssign_SL.s
|       HwyAssign_SZ.s
|       HwySkm.s
|       IPF.s
|       IPF_Preprocessor1.s
|       IPF_Preprocessor2.s
|       Maryland_Summary.s
|       ModeChoice.s
|       msAverage.s
|       Nettoshape.s
|       Shapetonet.s
|       TOD.s
|       TransitAssign.s
|       TripDistribution.s
|       TripGeneration.s
|       TrnSkms.s
|       Validation_DCModel.s
|       Validation_DCModel_All.s
|       Validation_MCMODEL.s
|       Validation_MCMODEL_SurveyReg.s
|       Validation_TOD(trips).s
|       Validation_TOD(trips)_SurveyRegion.s
|       Validation_TOD-Survey.s
|       Validation_TOD.s
|       Validation_TripGen(after).s
|       Validation_TripGen(before).s
|       Validation_TripGeneration.s
|       VMT_By_SWFT.s
|       VMT_VHT_ByCountyOnly.s
|
+---Shapefiles
|   |   Shields.drw
|   |   Shields2.drw
|   |
|   +---Centerline
|   |       routes.dbf
|   |       routes.prj
|   |       routes.sbn
|   |       routes.sbx
|   |       routes.shp
|   |       routes.shp.xml
|   |       routes.shx
```

Complete MSTM Directory File Listing

```
|  |        routes.vpr
|  |
|  +---Maryland Counties
|  |        All_Counties.dbf
|  |        All_Counties.prj
|  |        All_Counties.sbn
|  |        All_Counties.sbx
|  |        All_Counties.shp
|  |        All_Counties.shp.xml
|  |        All_Counties.shx
|  |
|  +---Political Boundaries
|  |        SHA_POLY_POLBOUNDSW_MD_2012.dbf
|  |        SHA_POLY_POLBOUNDSW_MD_2012.prj
|  |        SHA_POLY_POLBOUNDSW_MD_2012.sbn
|  |        SHA_POLY_POLBOUNDSW_MD_2012.sbx
|  |        SHA_POLY_POLBOUNDSW_MD_2012.shp
|  |        SHA_POLY_POLBOUNDSW_MD_2012.shp.xml
|  |        SHA_POLY_POLBOUNDSW_MD_2012.shx
|  |        SHA_POLY_POLBOUNDSW_MD_2012.xml
|  |
|  +---SMZs_RMZs
|  |  |     MD_SMZ_refined.dbf
|  |  |     MD_SMZ_refined.prj
|  |  |     MD_SMZ_refined.sbn
|  |  |     MD_SMZ_refined.sbx
|  |  |     MD_SMZ_refined.shp
|  |  |     MD_SMZ_refined.shp.xml
|  |  |     MD_SMZ_refined.shx
|  |  |     MSTM_SMZ_RMZ.dbf
|  |  |     MSTM_SMZ_RMZ.prj
|  |  |     MSTM_SMZ_RMZ.sbn
|  |  |     MSTM_SMZ_RMZ.sbx
|  |  |     MSTM_SMZ_RMZ.shp
|  |  |     MSTM_SMZ_RMZ.shp.xml
|  |  |     MSTM_SMZ_RMZ.shx
|  |  |
|  |  \---Old
|  |           SMZ_RMZ_02152011.dbf
|  |           SMZ_RMZ_02152011.prj
|  |           SMZ_RMZ_02152011.sbn
|  |           SMZ_RMZ_02152011.sbx
|  |           SMZ_RMZ_02152011.shp
|  |           SMZ_RMZ_02152011.shx
|  |
|  \---State Boundary
|           Maryland_Outline.dbf
|           Maryland_Outline.prj
|           Maryland_Outline.sbn
|           Maryland_Outline.sbx
|           Maryland_Outline.shp
|           Maryland_Outline.shp.xml
|           Maryland_Outline.shx
|           Maryland_Outline.vpr
|           MD_Outline.dbf
|           MD_Outline.prj
|           MD_Outline.sbn
|           MD_Outline.sbx
|           MD_Outline.shp
|           MD_Outline.shp.xml
|           MD_Outline.shx
|
\---User Docs
         MSTM Quick Guide.pdf
         Validation Report and Users Guide.pdf
```

APPENDIX G: Model Executable (Run MSTM.exe)

Contents of MSTM.exe

```
::  version 1.12.04.2013
::  modifications by M Radovic
::  enabling a scenario-specific directory structure
::
@echo off
::COLOR 1A
COLOR 0A
echo  =============================================================================
echo  =============================================================================
echo  ==                                                                         ==
echo  ==             THE MARYLAND STATEWIDE TRANSPORTATION MODEL (MSTM)           ==
echo  ==                                                                         ==
echo  ==                         (version 1.0.01.26.2014)                        ==
echo  ==                                                                         ==
echo  ==  The Maryland State Highway Administration (SHA) makes no claims,        ==
echo  ==  promises, or guarantees about the accuracy, completeness, or adequacy   ==
echo  ==  of the results of this model and expressly disclaims liability for any  ==
echo  ==  errors and omissions in the contents of this analysis tool.  All socio  ==
echo  ==  economic, traffic, and travel data used within this tool are developed  ==
echo  ==  to support transportation planning activities at the agency. Any and    ==
echo  ==  all data/model outputs are provided "as is" with the understanding that ==
echo  ==  no warranty  of any kind, whether implied, expressed or statutory, is   ==
echo  ==  given with respect to the content of this analysis tool.  Any and all   ==
echo  ==  conclusions or results derived from this analysis tool are the sole     ==
echo  ==  responsibility of the user.                                             ==
echo  ==                                                                         ==
echo  =============================================================================
echo  =============================================================================
echo+
echo+
pause
cls
:: ----------------------------------------------------------------------
:menuLOOP
echo+
echo+
echo.== MSTM Menu ================================================================
echo.
for /f "tokens=1,2,* delims=_ " %%A in ('"findstr /b /c:":menu_" "%~f0""') do echo.  %%B  %%C
echo+
echo.=============================================================================
echo+
set choice=
echo.&set /p choice=Choose one of the menu options or hit ENTER to quit: ||GOTO:EOF
echo.&call:menu_%choice%
GOTO:menuLOOP
::///////////////////////////////////////////////////////////////////////////
:menu_1     Run a MSTM Model Scenario
::\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
::
 set runpath=%CD%
 cd "%runpath%"\
 ECHO OFF
 cls
echo+
echo+
echo.== Scenario Selection =======================================================
echo+
echo  The following pre-defined scenarios are available:
echo+
echo     Enter   "Base_2007"   to run a standard 2007 scenario,
echo     Enter   "CLRP_2030"   to run a standard 2030 scenario,
echo     Enter  "NoBuild_2030" to run a 2030 no-build scenario, or
echo+
echo     Or enter a user-defined scenario that was previously created
echo+
echo.=============================================================================
echo+
echo+
set /p scenario=Which scenario would you like to run:
set runpath=%CD%
cd "%runpath%"\
cd "%runpath%"\%scenario%\
 cls
echo+
echo+
echo.== Feedback Loop ============================================================
echo+
echo  MSTM includes a speed feedback loop that writes out the congested highway
echo  speeds from assignment and reads them into another loop of the model chain
echo  beginning at trip generation.  MSTM was validated by looping this process for
echo  6 iterations.  This screen allows the user to change this parameter, and is
echo  used primarily for testing purposes.
echo+
echo  It is recommended that 6 iterations of the speed feedback loop be used.
echo+
echo.=============================================================================
```

Contents of MSTM.exe

```
echo+
echo+
 set /p iters= Please Enter the Number of Loops:
cls
echo+
echo+
echo.== Maximim Iterations ========================================================
echo+
echo  MSTM was validated using a user equilibrium assignment that maximizes the
echo  number of iterations to achieve convergence at 50.  This screen allows the
echo  user to modify this parameter, as it can be benefitial for testing purposes.
echo+
echo  It is recommended that a maximum of 50 iterations is entered to achieve
echo  convergence of the user equilibruim assignment.
echo+
echo.==========================================================================
echo+
echo+
 set /p MaxIterns= Please Enter the Maximum Number of Iterations:
cls
echo+
echo+
echo.== Multi-Core Processing ======================================================
echo+
echo  MSTM is written with code that takes advantage of CUBE Cluster - a CUBE
echo  add-on that implements distributive processing across multi-core processors
echo  This step allows you to enter the number of cores that you can allow the
echo  distributive process to take place.
echo+
echo.==========================================================================
echo+
echo+
 set /p maxcores= Please Enter the Number of Cores to Use:
cls
echo+
echo+
echo.== MSTM Message ===============================================================
echo+
echo    MSTM RUN OF "%scenario%" INITIATED ON %DATE% AT %TIME%
echo+
echo      - running %iters% loop(s) of speed feedback
echo      - running a maximum of %MaxIterns% iteration(s) to reach convergence
echo      - running on %maxcores% core(s)
echo+
echo.==========================================================================
echo+
echo+
PAUSE
cls
:: --------------------------------------------------------------------------
:: ---------------------------- EXECUTE MODEL RUN -----------------------------
:: --------------------------------------------------------------------------
echo+
 ECHO Create Stamp For Printing Summary...
 set runpath=%CD%
 cd "%runpath%"\
 cd..
::
del stamp.log
echo ;USER-DEFINED PARAMETERS ENTERED AT MODEL EXECUTION >> stamp.log
echo ; >> stamp.log
@echo %%time%% = %time%
@FOR /f "tokens=1-2" %%i in ('time /t') do @(
SET HrMin=%%i
SET ampm=%%j
)
echo START_TIME = '%TIME%' >> stamp.log
echo START_DATE = '%DATE%' >> stamp.log
echo SCENARIO   = '%SCENARIO%' >> stamp.log
echo ITERS      = %iters%  >> stamp.log
echo MAXCORES   = %maxcores%  >> stamp.log
echo MaxIterns  = %MaxIterns% >> stamp.log
echo ;----- END OF USER-DEFINED PARAMETERS ----- >> stamp.log
::
:: Append stamp log with parameter.txt file
::
 set runpath=%CD%
 cd "%runpath%\
Copy /b stamp.log + %scenario%\Parameters\parameter.dat
echo+
::
echo+
 ECHO Create Scenario-Specific Folders...
 set runpath=%CD%
 cd "%runpath%"\
 cd "%runpath%"\%scenario%
 md "%runpath%"\%scenario%\Exports
 md "%runpath%"\%scenario%\Outputs
 md "%runpath%"\%scenario%\Outputs\Final_Iteration
 md "%runpath%"\%scenario%\Validation
 md "%runpath%"\%scenario%\CubePRN
```

Contents of MSTM.exe

```
 md "%runpath%"\%scenario%\Temp
 ::
 cd "%runpath%"\%scenario%\Inputs\
    copy MSTM.vpr "%runpath%"\%scenario%\Outputs
 cd "%runpath%"\%scenario%\Outputs\
    rename  MSTM.vpr MSTM_Veh_Dly_Final.vpr
 ::
 cd "%runpath%"\%scenario%\Inputs\
    copy MSTM.vpr "%runpath%"\%scenario%\Outputs
 cd "%runpath%"\%scenario%\Outputs\
    rename  MSTM.vpr MSTM_Veh_Dly.vpr
 cd..
 cd..
 ::
 set runpath=%CD%
 cd "%runpath%"\
 cd "%runpath%"\%scenario%\RegionalModel\
 md "%runpath%"\%scenario%\RegionalModel\output
 cd "%runpath%"\%scenario%\RegionalModel\output\
 md "%runpath%"\%scenario%\RegionalModel\output\temp
 cd..
 cd..
 cd..
 set runpath=%CD%
 cd "%runpath%"\
 cd "%runpath%"\%scenario%\RegionalModel\input\
 md "%runpath%"\%scenario%\RegionalModel\input\skims
 ::
 cd "%runpath%"\%scenario%\Inputs\
    copy Activities.csv "%runpath%"\%scenario%\RegionalModel\input
    copy RMZ.csv "%runpath%"\%scenario%\RegionalModel\input
    copy RMZpopulation.csv "%runpath%"\%scenario%\RegionalModel\input
    copy SMZ.csv "%runpath%"\%scenario%\RegionalModel\input
    copy zoneSystem.csv "%runpath%"\%scenario%\RegionalModel\input
         copy run_MSTM_Java_models.bat "%runpath%"\%scenario%\RegionalModel
 ::
 echo+
 echo+
 echo.================================================================================
 ECHO                          BEGIN MSTM MODEL RUN
 echo.================================================================================
 echo+
 echo+
 echo.================================================================================
 ECHO  STEP 1: Running Transit Skims
 echo.================================================================================
 echo+
 echo+
 cd "%runpath%"\Scripts\
    cluster MSTM 1-%maxcores% START EXIT
    runtpp TrnSkms.s
    cluster MSTM 1-%maxcores% CLOSE EXIT
  if ERRORLEVEL 2 goto done
 echo+
 echo+
 :: Start Feedback Loop
 FOR /L %%G IN (1,1,%iters%) DO (
 echo+
 ECHO ---  Looping through iteration %%G  ---
 echo+
 ECHO ITERATION=%%G>"%runpath%"\iteration.txt
 ::
 echo+
 echo+
 echo.================================================================================
 ECHO  STEP 2: Running Highway Skims   [Loop %%G of %iters%]
 echo.================================================================================
 echo+
 echo+
 cd "%runpath%"\Scripts\
 runtpp HwySkm.s
 if ERRORLEVEL 2 goto done
 ::
 echo+
 echo+
 echo.================================================================================
 ECHO  STEP 3: Calculating MSA   [Loop %%G of %iters%]
 echo.================================================================================
 echo+
 echo+
 cd "%runpath%"\Scripts\
 runtpp msAverage.s
 runtpp ExportSkm2Csv.s
 if ERRORLEVEL 2 goto done
 ::
 echo+
 echo+
 echo.================================================================================
 ECHO STEP 4: Running IPF   [Loop %%G of %iters%]
 echo.================================================================================
 echo+
```

Contents of MSTM.exe

```
echo+
cd "%runpath%"\Scripts\
runtpp IPF.s
if ERRORLEVEL 2 goto done
::
echo+
echo+
echo.===============================================================================
ECHO STEP 5: Running Trip Generation    [Loop %%G of %iters%]
echo.===============================================================================
echo+
echo+
cd "%runpath%"\Scripts\
runtpp TripGeneration.s
if ERRORLEVEL 2 goto done
::
echo+
echo+
echo.===============================================================================
ECHO STEP 6: Running Trip Distribution    [Loop %%G of %iters%]
echo.===============================================================================
echo+
cd "%runpath%"\Scripts\
runtpp TripDistribution.s
if ERRORLEVEL 2 goto done
::
echo+
echo+
echo.===============================================================================
ECHO STEP 7: Running Regional Auto and Truck Model    [Loop %%G of %iters%]
echo.===============================================================================
echo+
echo+
cd "%runpath%"\%scenario%\RegionalModel
call run_MSTM_Java_models.bat
::
echo+
echo+
echo.===============================================================================
ECHO STEP 8: Running Destination Choice Model    [Loop %%G of %iters%]
echo.===============================================================================
echo+
echo+
cd "%runpath%"\Scripts\
runtpp DCModel.s
if ERRORLEVEL 2 goto done
::
echo+
echo+
echo.===============================================================================
ECHO STEP 9: Running Mode Choice    [Loop %%G of %iters%]
echo.===============================================================================
cluster MSTM 1-%maxcores% START EXIT
runtpp ModeChoice.s
cluster MSTM 1-%maxcores% CLOSE EXIT

rename HBW5ModeChoiceModel.PRN HBW5ModeChoiceModel_%%G.PRN

if ERRORLEVEL 2 goto done
::
echo+
echo+
echo.===============================================================================
ECHO STEP 10: Running Time of Day    [Loop %%G of %iters%]
echo.===============================================================================
echo+
echo+
runtpp TOD.s
if ERRORLEVEL 2 goto done
::
echo+
echo+
echo.===============================================================================
ECHO STEP 11: Running Highway Assignment    [Loop %%G of %iters%]
echo.===============================================================================
echo+
echo+
cd "%runpath%"\Scripts\
cluster HwyAssignIDP 1-%maxcores% START EXIT
runtpp "HwyAssign.s"
cluster HwyAssignIDP 1-%maxcores% CLOSE EXIT
) if ERRORLEVEL 2 goto done
::
echo+
echo+
echo.===============================================================================
ECHO STEP 12: Running Transit Assignment
echo.===============================================================================
echo+
echo+
```

Contents of MSTM.exe

```
 cluster TransitAssignment 1-%maxcores% START EXIT
 runtpp TransitAssign.s
 cluster TransitAssignment 1-%maxcores% CLOSE EXIT
 if ERRORLEVEL 2 goto done
 ::
echo+
echo+
echo.===============================================================================
 ECHO STEP 13: Running Valdation Summary Utilities
echo.===============================================================================
 echo+
echo+
 cd "%runpath%"\Scripts\
 runtpp VMT_VHT_ByCountyOnly.s
 runtpp VMT_By_SWFT.s
 runtpp ComVeh_Truck_TLFD.s
 if ERRORLEVEL 2 goto done
::
::Export DBF files
 cd "%runpath%"\Scripts\
 runtpp ExportNET2DBF.s
 if ERRORLEVEL 2 goto done
::
echo+
echo.-------------------------------------------------------------------------------
 ECHO STEP 13a: Running Trip Generation Validation Summary
echo.-------------------------------------------------------------------------------
echo+
 cd "%runpath%"\Scripts\
 runtpp Validation_TripGeneration.s
 runtpp Validation_TripGen(after).s
 if ERRORLEVEL 2 goto done
::
echo+
echo.-------------------------------------------------------------------------------
 ECHO STEP 13b: Running Destination Choice Validation Summary
echo.-------------------------------------------------------------------------------
echo+
 cd "%runpath%"\Scripts\
 runtpp Validation_DCModel.s
 runtpp Validation_DCModel_All.s
 if ERRORLEVEL 2 goto done
::
echo+
echo.-------------------------------------------------------------------------------
 ECHO STEP 13c: Running Mode Choice Validation Summary
echo.-------------------------------------------------------------------------------
echo+
 cd "%runpath%"\Scripts\
 runtpp Validation_MCModel.s
 runtpp Validation_MCMODEL_SurveyReg.s
 if ERRORLEVEL 2 goto done
::
echo+
echo.-------------------------------------------------------------------------------
ECHO STEP 13d: Running Time of Day Validation Summary
echo.-------------------------------------------------------------------------------
echo+
 cd "%runpath%"\Scripts\
 runtpp Validation_TOD.s
 runtpp Validation_TOD-Survey.s
 if ERRORLEVEL 2 goto done
::
echo+
echo+
echo.===============================================================================
ECHO STEP 14: Convert Network to Shapefile
echo.===============================================================================
echo+
echo+
 cd "%runpath%"\Scripts\
 runtpp Nettoshape.s
 if ERRORLEVEL 2 goto done
::
echo+
:: Create Stamp For Printing Summary...
 cd "%runpath%"\
@echo %%time%% = %time%
@FOR /f "tokens=1-2" %%i in ('time /t') do @(
SET HrMin=%%i
SET ampm=%%j
)
echo END_TIME  = '%TIME%' >> stamp.log
echo END_DATE  = '%DATE%' >> stamp.log
echo+
::
echo+
echo.===============================================================================
ECHO STEP 15: Running Model Summary Reports
echo.===============================================================================
 cd "%runpath%"\Scripts\
```

Contents of MSTM.exe

```
 runtpp Maryland_Summary.s
 if ERRORLEVEL 2 goto done
::
:: Running VMT Summary Report...
 cd "%runpath%"\Scripts\
 runtpp County_VMT_Summary.s
 if ERRORLEVEL 2 goto done
::
:: Running VHT Summary Report...
 cd "%runpath%"\Scripts\
 runtpp County_VHT_Summary.s
 if ERRORLEVEL 2 goto done
::
echo+
echo+
echo.=============================================================================
ECHO                            MSTM MODEL RUN COMPLETE
echo.=============================================================================
echo+
echo+
echo.=============================================================================
ECHO                          Running Model Clean-up Utilities
echo.=============================================================================
echo+
echo+
:: Run Cleaning of Script Directory...
 cd "%runpath%"\Scripts\
DEL *.0??
DEL *.PRN
DEL *.BAK
del *.vpr
del *.var
del *.script
del *.script.var
del *.script.end
del *.script.message
del *.PRJ
del *.COMMAND
del *.cmdstart
del *.TXT
del *.lOG
del *.RPT
::
::Run Cleaning of Outputs Directory...
 cd "%runpath%"\%scenario%\Outputs\
 xcopy *_iter%iters%.NET "%runpath%"\%scenario%\Outputs\Final_Iteration
 xcopy *_iter%iters%.TMP "%runpath%"\%scenario%\Outputs\Final_Iteration
 xcopy *_iter%iters%.SKM "%runpath%"\%scenario%\Outputs\Final_Iteration
 xcopy *.PRN "%runpath%"\%scenario%\CubePRN
 xcopy *.TXT "%runpath%"\%scenario%\CubePRN

cd "%runpath%"\%scenario%\Outputs\
del *_iter*.TMP
del *_iter*.NET
del *_iter*.SKM
del *.TMP
cd..
::
:: Move Log files...
 cd "%runpath%"\
 copy stamp.log "%runpath%"\%scenario%\Temp
 cd "%runpath%"\
 del *.log /q
 del *.txt /q
cls
::
echo+
echo+
echo.== MSTM Message ============================================================
echo+
echo    MSTM FINISHED RUNNING "%scenario%" ON %DATE% AT %TIME%
echo+
echo      - running %iters% loop(s) of speed feedback
echo      - running a maximum of %MaxIterns% iteration(s) to reach convergence
echo      - running on %maxcores% core(s)
echo+
echo.=============================================================================
echo+
 :done
 PAUSE
cls
GOTO:EOF
::
::////////////////////////////////////////////////////////////////////////////
:menu_2    Create a Directory Set-up for a New Scenario
::\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
cls
echo+
echo+
echo.== Analysis Year ============================================================
echo+
```

Contents of MSTM.exe

```
echo              Currently, analysis years include 2007 and 2030.
echo+
echo.===============================================================================
echo+
 set /p scenyear= Please Enter the Analysis Year:
 cls
echo+
echo+
echo.== Scenario Prefix ============================================================
echo+
echo    A scenario prefix should be a short abbreviation 4-6 characters in length.
echo    This will be followed by the analysis year.  For example, "I95WID" could be
echo    used for a scenario that includes widening I-95.
echo+
echo        Note: Spaces and special characters such as "-" or "@" cannot be used,
echo              an underscore "_" can be used.
echo+
echo.===============================================================================
echo+
 set /p scen= Please Create a Scenario Prefix:
 cls
echo+
echo+
::
 if %scenyear%==2007 goto 2007
 if %scenyear%=2030 goto 2030
::
:2007
::
echo+
echo+
echo.===============================================================================
echo Preparing Scenario-Specific Directory
echo.===============================================================================
echo+
echo+
 set runpath=%CD%
 cd "%runpath%"\
 md "%runpath%"\%scen%_%scenyear%
 md "%runpath%"\%scen%_%scenyear%\Inputs
 md "%runpath%"\%scen%_%scenyear%\Parameters
 md "%runpath%"\%scen%_%scenyear%\RegionalModel
 md "%runpath%"\%scen%_%scenyear%\RegionalModel\input
 md "%runpath%"\%scen%_%scenyear%\RegionalModel\input\fafdata
 md "%runpath%"\%scen%_%scenyear%\RegionalModel\input\localTrucks
 md "%runpath%"\%scen%_%scenyear%\RegionalModel\input\neldt
 md "%runpath%"\%scen%_%scenyear%\RegionalModel\input\regionalAutos
 md "%runpath%"\%scen%_%scenyear%\RegionalModel\input\regionalTrucks
 md "%runpath%"\%scen%_%scenyear%\RegionalModel\javaFiles
 cd..
 cd..
 cd..
xcopy "%runpath%"\BASE_2007\RegionalModel\input\fafdata  "%runpath%"\%scen%_%scenyear%\RegionalModel\input\fafdata /e
xcopy "%runpath%"\BASE_2007\RegionalModel\input\neldt "%runpath%"\%scen%_%scenyear%\RegionalModel\input\neldt /e
xcopy "%runpath%"\BASE_2007\RegionalModel\input\localTrucks  "%runpath%"\%scen%_%scenyear%\RegionalModel\input\localTrucks /e
xcopy "%runpath%"\BASE_2007\RegionalModel\input\regionalAutos "%runpath%"\%scen%_%scenyear%\RegionalModel\input\regionalAutos /e
xcopy "%runpath%"\BASE_2007\RegionalModel\input\regionalTrucks   "%runpath%"\%scen%_%scenyear%\RegionalModel\input\regionalTrucks
/e

 cd "%runpath%"\BASE_2007\Inputs\
 copy *.* "%runpath%"\%scen%_%scenyear%\Inputs
 cd..
   cd "%runpath%"\BASE_2007\Parameters\
 copy *.* "%runpath%"\%scen%_%scenyear%\Parameters
 cd..
 cd "%runpath%"\BASE_2007\RegionalModel\
 copy run_MSTM_Java_models.bat "%runpath%"\%scen%_%scenyear%\RegionalModel

 cd "%runpath%"\BASE_2007\RegionalModel\javaFiles
 copy *.* "%runpath%"\%scen%_%scenyear%\RegionalModel\javaFiles

 cd "%runpath%"\%scen%_%scenyear%
 cls
echo+
echo+
echo.== MSTM Message ===============================================================
echo+
echo        Your Scenario Directory "%scen%_%scenyear%" has been created!
echo        Please make the necessary file modifications in that directory.
echo        Once completed, select Option 1 at the menu to execute the run.
echo+
echo.===============================================================================
echo+
echo+
cd..
pause
cls
GOTO:EOF
::
:2030
::
```

Contents of MSTM.exe

```
echo+
echo+
echo.================================================================================
echo Preparing Scenario-Specific Directory
echo.================================================================================
echo+
echo+
 set runpath=%CD%
 cd "%runpath%"\
 md "%runpath%"\%scen%_%scenyear%
 md "%runpath%"\%scen%_%scenyear%\Inputs
 md "%runpath%"\%scen%_%scenyear%\Parameters
 md "%runpath%"\%scen%_%scenyear%\RegionalModel
 md "%runpath%"\%scen%_%scenyear%\RegionalModel\input
 md "%runpath%"\%scen%_%scenyear%\RegionalModel\input\fafdata
 md "%runpath%"\%scen%_%scenyear%\RegionalModel\input\localTrucks
 md "%runpath%"\%scen%_%scenyear%\RegionalModel\input\neldt
 md "%runpath%"\%scen%_%scenyear%\RegionalModel\input\regionalAutos
 md "%runpath%"\%scen%_%scenyear%\RegionalModel\input\regionalTrucks
 md "%runpath%"\%scen%_%scenyear%\RegionalModel\javaFiles
 cd..
 cd..
 cd..
xcopy "%runpath%"\CLRP_2030\RegionalModel\input\fafdata   "%runpath%"\%scen%_%scenyear%\RegionalModel\input\fafdata /e
xcopy "%runpath%"\CLRP_2030\RegionalModel\input\neldt "%runpath%"\%scen%_%scenyear%\RegionalModel\input\neldt /e
xcopy "%runpath%"\CLRP_2030\RegionalModel\input\localTrucks   "%runpath%"\%scen%_%scenyear%\RegionalModel\input\localTrucks /e
xcopy "%runpath%"\CLRP_2030\RegionalModel\input\regionalAutos "%runpath%"\%scen%_%scenyear%\RegionalModel\input\regionalAutos /e
xcopy  "%runpath%"\CLRP_2030\RegionalModel\input\regionalTrucks    "%runpath%"\%scen%_%scenyear%\RegionalModel\input\regionalTrucks
/e

 cd "%runpath%"\CLRP_2030\Inputs\
 copy *.* "%runpath%"\%scen%_%scenyear%\Inputs
 cd..
   cd "%runpath%"\CLRP_2030\Parameters\
 copy *.* "%runpath%"\%scen%_%scenyear%\Parameters
 cd..
 cd "%runpath%"\CLRP_2030\RegionalModel\
 copy run_MSTM_Java_models.bat "%runpath%"\%scen%_%scenyear%\RegionalModel

 cd "%runpath%"\CLRP_2030\RegionalModel\javaFiles
 copy *.* "%runpath%"\%scen%_%scenyear%\RegionalModel\javaFiles

 cd "%runpath%"\%scen%_%scenyear%
cls
echo+
echo+
echo.== MSTM Message ================================================================
echo+
echo        Your Scenario Directory "%scen%_%scenyear%" has been created!
echo        Please make the necessary file modifications in that directory.
echo        Once completed, select Option 1 at the menu to execute the run.
echo+
echo.================================================================================
echo+
echo+
cd..
pause
cls
GOTO:EOF
::
::
::////////////////////////////////////////////////////////////////////////////
:menu_3     Clean Directory Structure Following an Interrupted Run
::\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
cls
echo+
echo+
echo.== Scenario Clean-up ===========================================================
echo+
echo   This feature will **DELETE ALL FILES** that that are created as part of a
echo   scenario run.  However, it WILL NOT delete any of the input files.
echo   This feature is for deleting files associated with an interrupted model run
echo   or an unsuccessful model run.
echo+
echo.================================================================================
echo+
set /p scrub=Please Select the Scenario to be Scrubbed:
cls
echo+
echo+
echo Cleaning model from interrupted or unsuccessful run...
::
set runpath=%CD%
 cd "%runpath%
 del *.log /q
 del *.txt /q
::
 cd "%runpath%"\%scrub%\
 rd "%runpath%"\%scrub%\Validation /s/q
 rd "%runpath%"\%scrub%\Exports /s/q
```

Contents of MSTM.exe

```
 rd "%runpath%"\%scrub%\Outputs /s/q
 rd "%runpath%"\%scrub%\Temp /s/q
 rd "%runpath%"\%scrub%\CubePRN /s/q
 rd "%runpath%"\%scrub%\RegionalModel\output /s/q
 rd "%runpath%"\%scrub%\RegionalModel\input\skims /s/q
 ::
 cd "%runpath%"\Scripts\
DEL *.0??
DEL *.PRN
DEL *.BAK
del *.vpr
del *.var
del *.script
del *.script.var
del *.script.end
del *.script.message
del *.PRJ
del *.COMMAND
del *.cmdstart
del *.TXT
del *.lOG
del *.RPT
cls
 cd "%runpath%"\
DEL iteration.txt
DEL stamp.log
cls
 cd "%runpath%"\%scrub%\RegionalModel\
del *.* /q
 cd "%runpath%"\%scrub%\RegionalModel\input\
del *.* /q
cls
 cd..
 cd..
 cd..
cls
::
echo+
echo+
echo.== MSTM Message ================================================
echo+
echo           The scenario directory "%scrub%" has been scrubbed
echo+
echo.================================================================
echo+
echo+
pause
cls
GOTO:EOF
::///////////////////////////////////////////////////////////////////
:menu_4      Run Select Link Analysis (Following a complete model run)
::\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
 cls
 set runpath=%CD%
 cd "%runpath%"\
 ECHO OFF
echo+
echo+
echo.== Select Link Analysis ========================================
echo+
echo  This option is designed to be run following a full model run of a scenario.
echo  Select link analysis will re-run the last iteration of assignment and capture
echo  the trips based on the user-defined paramaters. A short (4-6 character)
echo  prefix will need to be entered in order to identify the data outputs.
echo+
echo  The link (or links) to be analyzed need to be in the following format:
echo+
echo  Example 1: "L=44621-44627"
echo  Example 2: "L=44621-44627 & L=15661-15650"
echo  Example 3: "L=44621-44627 & L=15661-15650 | L=15649-15663 & L=44494-44485"
echo+
echo.================================================================
echo+
echo+
 set /p scenario= Enter the Existing Scenario Name:
echo+
 set /p prefix= Enter a Prefix to Identify the Analysis:
echo+
 set /p links= Enter the Code for the Link(s):
echo
echo   SCENARIO = '%SCENARIO%' >> stamp.log
echo     SL_ID = '%prefix%' >> stamp.log
echo        SL = '%links%' >> stamp.log
::
 cd "%runpath%"\%scenario%\
 ::cd %scenario%
 MD SelectLink
 CD SelectLink
 MD %prefix%
 CD %prefix%
 MD Outputs
```

Contents of MSTM.exe

```
 cd..
 cd..
 cd..
 cd "%runpath%"\%scenario%\Inputs\
     copy MSTM.vpr "%runpath%"\%scenario%\SelectLink\%prefix%
        rename "%runpath%"\%scenario%\SelectLink\%prefix%\MSTM.vpr MSTM_Veh_SL_%prefix%.vpr
cd..
cd..
cls
echo+
echo+
echo.== Maximim Iterations ============================================================
echo+
echo  MSTM was validated using a user equilibrium assignment that maximizes the
echo  number of iterations to achieve convergence at 50.  This screen allows the
echo  user to modify this parameter, as it can be benefitial for testing purposes.
echo+
echo  It is recommended that a maximum of 50 iterations is entered to achieve
echo  convergence of the user equilibruim assignment.
echo+
echo.============================================================================
echo+
echo+
 set /p MaxIterns= Please Enter the Maximum Number of Iterations:
cls
echo+
echo+
echo.== Multi-Core Processing ============================================================
echo+
echo  MSTM is written with code that takes advantage of CUBE Cluster - a CUBE
echo  add-on that implements distributive processing across multi-core processors
echo  This step allows you to enter the number of cores that you can allow the
echo  distributive process to take place.
echo+
echo.============================================================================
echo+
echo+
 set /p maxcores= Please Enter the Number of Cores to Use:
cls
echo+
echo+
::
echo+
 ECHO Create Stamp For Printing Summary...
 set runpath=%CD%
 cd "%runpath%"\
::
echo START_TIME = '%TIME%' >> stamp.log
echo START_DATE = '%DATE%' >> stamp.log
echo MAXCORES   = %maxcores%  >> stamp.log
echo MaxIterns  = %MaxIterns% >> stamp.log
::
:: Append stamp log with parameter.txt file
::
 set runpath=%CD%
 cd "%runpath%"\
Copy /b stamp.log + %scenario%\Parameters\parameter.dat
cd..
cd..
echo+
::
     cd "%runpath%"\Scripts\
     copy HwyAssign_SL.s "%runpath%"\%scenario%\SelectLink\%prefix%
:: ----------------------------------------------------------------------
cls
echo+
echo+
echo.== MSTM Message ============================================================
echo+
ECHO   RUNNING HWY ASSIGNMENT FOR SELECT LINK ANALYSIS ON %DATE% AT %TIME%
echo+
echo                      Select Link Scenario: "%prefix%"
echo      Max iterations to reach convergence: %MaxIterns%
echo                      Number of cores to use: %maxcores%
echo+
echo.============================================================================
echo+
pause
echo+
     cd "%runpath%"\%scenario%\SelectLink\Link_%prefix%
     cluster HwyAssignIDP 1-%maxcores% START EXIT
     runtpp "HwyAssign_SL.s"
     cluster HwyAssignIDP 1-%maxcores% CLOSE EXIT
     if ERRORLEVEL 2 goto done
::
     ECHO Running Cleanup...
     cd "%runpath%"\%scenario%\SelectLink\%prefix%
        del *.SKM
        del *.TMP
        del *.PRN
        del *.VAR
```

Contents of MSTM.exe

```
        del *.S
        del *.PRJ

 cd "%runpath%"\
 del *.log /q
::
cls
echo+
echo+
echo.== MSTM Message ==============================================================
echo+
echo    COMPLETED SELECT LINK ANALYSIS OF "%prefix%" ON %DATE% AT %TIME%
echo+
echo        - running a maximum of %MaxIterns% iteration(s) to reach convergence
echo        - running on %maxcores% core(s)
echo+
echo.==============================================================================
echo+
 :done
PAUSE
cls
GOTO:EOF
::////////////////////////////////////////////////////////////////////////////
:menu_5     Run Select Zone Analysis (Following a complete model run)
::\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
 cls
 set runpath=%CD%
 cd "%runpath%"\
 ECHO OFF
echo+
echo+
echo.== Select Zone Analysis ======================================================
echo+
echo  This option is designed to be run following a *full model run* of a scenario.
echo  This means (6) speed feedback loops are required from the completed run that
echo  this analysis is pivoting from.  Select zone analysis will run an additional
echo  iteration of assignment and capture the trips based on the users definition.
echo  A prefix will need to entered in order to identify the data outputs (this
echo  could simply be the zone number).
echo+
echo  The zone (or zones) to be analyzed need to be in the following format:
echo+
echo  Example 1: "N=64"
echo  Example 2: "N=63-64"
echo  Example 3: "N=63-64 && N=67"
echo+
echo.==============================================================================
echo+
echo+
 set /p scenario= Enter the Existing Scenario Name:
echo+
 set /p zprefix= Enter a Short Prefix to Identify the Analysis:
echo+
 set /p SZ= Enter the Code for the Zone Analysis:
echo+
echo+
echo    SCENARIO = '%SCENARIO%' >> stamp.log
echo          SZ = '%SZ%'       >> stamp.log
echo    SZPREFIX = '%zprefix%'  >> stamp.log
echo       SZ_ID = '%zprefix%'  >> stamp.log
::
 cd "%runpath%"\%scenario%\
:: cd %scenario%
 MD SelectZone
 CD SelectZone
 MD %zprefix%
 CD %zprefix%
 MD Outputs
 cd..
 cd..
 cd..
 cd "%runpath%"\%scenario%\Inputs\
    copy MSTM.vpr "%runpath%"\%scenario%\SelectZone\%zprefix%
  rename "%runpath%"\%scenario%\SelectZone\%zprefix%\MSTM.vpr MSTM_Veh_SZ_%zprefix%.vpr
cd..
cd..
cls
echo+
echo+
echo.== Maximim Iterations ========================================================
echo+
echo  MSTM was validated using a user equilibrium assignment that maximizes the
echo  number of iterations to achieve convergence at 50.  This screen allows the
echo  user to modify this parameter, as it can be benefitial for testing purposes.
echo+
echo  It is recommended that a maximum of 50 iterations is entered to achieve
echo  convergence of the user equilibruim assignment.
echo+
echo.==============================================================================
echo+
echo+
```

Contents of MSTM.exe

```
 set /p MaxIterns= Please Enter the Maximum Number of Iterations:
cls
echo+
echo+
echo.== Multi-Core Processing ======================================================
echo+
echo  MSTM is written with code that takes advantage of CUBE Cluster - a CUBE
echo  add-on that implements distributive processing across multi-core processors
echo  This step allows you to enter the number of cores that you can allow the
echo  distributive process to take place.
echo+
echo.==============================================================================
echo+
echo+
 set /p maxcores= Please Enter the Number of Cores to Use:
cls
echo+
echo+
::
echo+
 ECHO Create Stamp For Printing Summary...
 set runpath=%CD%
 cd "%runpath%"\
::
echo START_TIME = '%TIME%' >> stamp.log
echo START_DATE = '%DATE%' >> stamp.log
echo MAXCORES   = %maxcores%  >> stamp.log
echo MaxIterns  = %MaxIterns% >> stamp.log
::
:: Append stamp log with parameter.txt file
::
 set runpath=%CD%
 cd "%runpath%"\
Copy /b stamp.log + %scenario%\Parameters\parameter.dat
cd..
cd..
echo+
::
    cd "%runpath%"\Scripts\
    copy HwyAssign_SZ.s "%runpath%"\%scenario%\SelectZone\%zprefix%
::
cls
echo+
echo+
echo.== MSTM Message =================================================================
echo+
ECHO   RUNNING HWY ASSIGNMENT FOR SELECT ZONE ANALYSIS ON %DATE% AT %TIME%
echo+
echo                    Select Zone Scenario: "%zprefix%"
echo       Max iterations to reach convergence: %MaxIterns%
echo                    Number of cores to use: %maxcores%
echo+
echo.==============================================================================
echo+
pause
echo+
    cd "%runpath%"\%scenario%\SelectZone\%zprefix%\
    cluster HwyAssignIDP 1-%maxcores% START EXIT
    runtpp "HwyAssign_SZ.s"
    cluster HwyAssignIDP 1-%maxcores% CLOSE EXIT
    if ERRORLEVEL 2 goto done
::
    ECHO Running Cleanup...
    cd "%runpath%"\%scenario%\SelectZone\%zprefix%\
      del *.SKM
      del *.TMP
      del *.PRN
      del *.VAR
      del *.S
      del *.PRJ

 cd "%runpath%"\
 del *.log /q
cls
::
echo+
echo+
echo.== MSTM Message =================================================================
echo+
echo    COMPLETED SELECT ZONE ANALYSIS OF "%zprefix%" ON %DATE% AT %TIME%
echo+
echo       - running a maximum of %MaxIterns% iteration(s) to reach convergence
echo       - running on %maxcores% core(s)
echo+
echo.==============================================================================
echo+
 :done
PAUSE
cls
GOTO:EOF
```

APPENDIX H: CUBE Voyager Scripts

TrnSkms.s

```
; Maryland Statewide Travel Demand Model (MSTM)
;
; Script: Transit Skimming
;
; About:
; This script computes the transit skims by 4 transit modes: 1)Commuter rail, 2)urban rail, 3)express bus
; and 4)local bus; two time periods: 1) peak and 2) off-peak; and by 2 access modes: 1)walk and 2) drive
; includes both park-n-ride and kiss-n-ride.

; Description:
; STEP 1: First calculates the time values to be used in computing the run time of the transit line.
;         These are based on the Facility Type of the Links on which the line runs.
; STEP 2: Creates transit access and egress links:
;         1) Zonal Walk acess and egress legs,
;         2) Zonal drive access legs for Intercity
;         3) Zonal auto access legs to : a)BMC PNR Stations, b) MWCOG Rail PNR Stations and c) MWCOG Bus only PNR Stations
;         4) Computes peak and off-peak transit skims based on the best path

; Input Files
;  AmtrakLines<OP/PK>.lin - peak and off-peak transit line files by transit mode
;  BusLines<OP/PK>.lin
;  GreyHound<OP/PK>.lin
;  RailLines<OP/PK>.lin

; Output skims
; 1) Writes out transit skims by mode, access and timeperiod combinations with the following tables
;     InitialWaitTime - Initial wait time
;     XferWaitTime    - Transfer wait time
;     WALKTIME        - Walk access time - max time it can take people to walk a mile is 20 mins
;     AUTOTIME        - Auto access time
;     AUTODIST        - Auto access distance
;     FARE            - Transit fare
;     NUMXFERS        - Number of transfers
;     BUSTIME         - Local bus in-vehicle travel time
;     RAILTIME        - Urban rail in-vehcile travel time
;     TModesTimeA     - Actual time all Transit modes
;     BestJrnyTime    - Best Journey Time
;     CheapJrnyTime   - Cheapest Journey Time
;     LocalBusTime    - Local Bus Time
;     ExpBusTime      - Express Bus Time + Premium Bus Time
;     RailTime;       - Metro Rail in-vehcile travel time+ Light in-vehcile travel time
;     ComRailTime     - Commuter rail in-vehcile travel time
;     XFERPEN         - Transfer penalties actual
;     BRDPEN          - Boarding penalties perceived
;     AmtrakTimeA     - Amtrak TimeA
;     GreyTimeA       - Greyhound TimeA
;     AmtrakDist      - Amtrak Dist
;     GreyDist        - Greyhound Dist
; 2) MSTM_<access-transit mode><PK/OP>.NET - Save transit networks for each access and transit mode combiantions by timeperiod
; Authors:
; Mayank Prakash Jain - jainm@pbworld.com - 09/16/2008
; Amar Sarvepalli - sarvepalli@pbworld.com - 12/10/2010
; Version 1.0

MULTISTEP1 = 1
DISTRIBUTE multistep = 1

READ File = '..\stamp.log'
```

TrnSkms.s

```
;cluster MSTM 1-20 START EXIT

; Calculate transit time from highway network
RUN PGM=NETWORK  PRNFILE='..\@scenario@\Outputs\Transit Network.PRN' MSG='Transit Network'

  ID = "Calculate transit time from highway network"
  NETI = ..\@scenario@\Inputs\MSTM.net              ;Input Network
  NETO = ..\@scenario@\Outputs\MSTM_TrnSpd.tmp

  ; First step is to calculate the time values to be used in calculating the run time of the transit line.
  ; These are based on the Facility Type of the Links on which the line runs.

  PHASE =LINKMERGE
    IF (LI.1.SWFT=1)                                    ;interstate
        TRNTMPK= 60* (LI.1.DISTANCE/CONGSPD)
        TRNTMOP= 60* (LI.1.DISTANCE/(5.0*FFSPD/6.0))

    ELSEIF (LI.1.SWFT=2)                                ;freeway
        TRNTMPK= 60* (LI.1.DISTANCE/CONGSPD)
        TRNTMOP= 60* (LI.1.DISTANCE/(5.0*FFSPD/6.0))

    ELSEIF ( LI.1.SWFT=4)                              ;principle arterial
        TRNTMPK= 60* (LI.1.DISTANCE/ (0.003* CONGSPD^2+ 0.35*CONGSPD))
        TRNTMOP= 60* (LI.1.DISTANCE/ (0.003* FFSPD^2+ 0.28*FFSPD))

    ELSEIF ( LI.1.SWFT=5)                              ;minor arterial
        TRNTMPK= 60* (LI.1.DISTANCE/ (0.003* CONGSPD^2+ 0.35*CONGSPD))
        TRNTMOP= 60* (LI.1.DISTANCE/ (0.003* FFSPD^2+ 0.28*FFSPD))

    ELSEIF ( LI.1.SWFT=6)                              ;collector
        TRNTMPK= 60*  (LI.1.DISTANCE/ (0.003* CONGSPD^2+ 0.34*CONGSPD))
        TRNTMOP= 60*  (LI.1.DISTANCE/ (0.003* FFSPD^2+ 0.28*FFSPD))

    ELSEIF ( LI.1.SWFT=7-9)                            ;ramp
        TRNTMPK= 60* (LI.1.DISTANCE/CONGSPD)
        TRNTMOP= 60* (LI.1.DISTANCE/(5.0*FFSPD/6.0))

    ELSEIF (LI.1.SWFT=15)                              ; Rail Tracks
        TRNTMPK= 60* (LI.1.DISTANCE/PSTSPD)
        TRNTMOP= 60* (LI.1.DISTANCE/PSTSPD)
    ELSE                                              ; Rest of the Facilities
        TRNTMPK= 60* (LI.1.DISTANCE/CONGSPD)
        TRNTMOP= 60* (LI.1.DISTANCE/(5.0*FFSPD/6.0))
    ENDIF

  ENDPHASE
ENDRUN


LOOP PKSkim = 1,10      ; Peak Skim Loop
  prd = 'PK'
  IF (PKSkim=1)   ST='WBus'     ; ST = Skim Type
  IF (PKSkim=2)   ST='WCRail'
  IF (PKSkim=3)   ST='WExpBus'
  IF (PKSkim=4)   ST='WRail'
  IF (PKSkim=5)   ST='DBus'
  IF (PKSkim=6)   ST='DCRail'
  IF (PKSkim=7)   ST='DExpBus'
  IF (PKSkim=8)   ST='DRail'
  IF (PkSkim=9)   ST='WTrn'
  IF (PkSkim=10)  ST='DTrn'

  IF (PKSkim=8)
  IF (MULTISTEP1=1) Wait4Files Files= MSTM1.script.end, MSTM2.script.end, MSTM3.script.end,
    MSTM4.script.end, MSTM5.script.end, MSTM6.script.end,
```

TrnSkms.s

```
     MSTM7.script.end, CheckReturnCode=T, printfiles=MERGE
  ENDIF

DISTRIBUTEMULTISTEP ProcessID='MSTM', ProcessNum=PKSkim


RUN PGM=PT PRNFILE='..\@scenario@\Outputs\@ST@ Peak Transit Skims.PRN'    MSG='@ST@ Peak Transit Skims'           ; Peak Paths/Skims
  ID = "Peak @ST@ Paths/Skims"

  NETI    = ..\@scenario@\Outputs\MSTM_TrnSpd.tmp                              ;The Highway network with the transit time calculated
  SYSTEMI  = '..\@scenario@\Parameters\SYSFILE.PTS'
  FACTORI = '..\@scenario@\Parameters\@ST@@prd@.fac'
  LINEI[1] = ..\@scenario@\Inputs\RailLines(PK).lin, LIST=T
  LINEI[2] = ..\@scenario@\Inputs\BusLines(PK).lin, LIST=T
  LINEI[3] = ..\@scenario@\Inputs\AmtrakLines(PK).lin, LIST=T
  LINEI[4] = ..\@scenario@\Inputs\GreyHound(PK).lin, LIST=T

    NETO = ..\@scenario@\Outputs\MSTM_@ST@@prd@.net
    FILEO MATO[1]=..\@scenario@\Outputs\@ST@@prd@.skm, MO=1-22, DEC=1*2,
                NAME= InitialWaitTime, XferWaitTime, WALKTIME, AUTOTIME, AUTODIST,      ; 1-5
                      FARE, NUMXFERS, BUSTIME, RAILTIME, TModesTimeA,                   ; 6-10
                      BestJrnyTime, CheapJrnyTime, LocalBusTime, ExpBusTime, RailTime,  ; 11-15
                      ComRailTime, XFERPEN, BRDPEN, AmtrakTimeA, GreyTimeA,             ; 16-20
                      AmtrakDist, GreyDist                                              ; 21-25

    FILEO ROUTEO[1]  = ..\@scenario@\Outputs\ROUTE_@ST@@prd@.RTE, REPORTI=1194,1314,1054,1028,1515,1556,1155,1671,1656,64,934,707,15,
                                    REPORTJ=1194,1314,1054,1028,1515,1556,1155,1671,1656,64,934,707,15,
                                    TRACEI=1194,1314,1054,1028,1515,1556,1155,1671,1656,64,934,707,15,
                                    TRACEJ=1194,1314,1054,1028,1515,1556,1155,1671,1656,64,934,707,15
    FILEO REPORTO    = ..\@scenario@\Outputs\REPORT_@ST@@prd@.txt

; Global Parameters
  PARAMETERS TRANTIME=LI.TRNTMPK,
            FARE=N,             ; FARE=T: Specifies that fares are to be included as a component of Generalized cost in Route Evaluation
            HDWAYPERIOD=1,
            EXTENDREPORT=T      ; The program prints messages whenever a line�s calculated travel times exceed
                                 ; the values specified by RUNTIME/RT/NNTIME.

  PHASE=DATAPREP
; !!!!!!!!!!!!! IMPORTANT NOTE: CHANGE THE NUMBER OF MODES IF YOU ADD OR DELETE A MODE FROM THE SYSTEM IN THE GENERATE STATEMENTS BELOW, EG.
; IF YOU ADD MODE 7 AND 8 AND TO ALREADY EXISTING 6 MODES THEN YOU SHOULD CHANGE MAXCOST = 6*99 TO MAXCOST=8*99, SAME FOR MAXNTLEGS etc.

    GENERATE,             ; Zonal WALK Access and Egress Legs
      NTLEGMODE=13, COST=LI.DISTANCE, MAXCOST=8*1.0,
      FROMNODE=1-1832, TONODE=1833-120000, DIRECTION=3,
      INCLUDELINK=(LI.SWFT=4-6,10-13,21-26), MAXNTLEGS=8*4,
      ONEWAY=FALSE, EXTRACTCOST=(60*(LI.DISTANCE/2.5))

    GENERATE,             ; WALK TRANSFER LEGS (From all nodes to all nodes!)
      NTLEGMODE=12, COST=LI.DISTANCE, MAXCOST=8*0.5,
      FROMNODE=1833-120000, TONODE=1833-120000, DIRECTION=3,
      INCLUDELINK=(LI.SWFT=4-6,10-13,21-26), MAXNTLEGS=8*4,
      ONEWAY=FALSE, EXTRACTCOST= (60*(LI.DISTANCE/2.5))

; Zonal Drive Access Legs for Intercity. It is assumed that people can be picked up or drive away from the destination Transit Station.
    GENERATE,             ; Zonal Drive Access Legs for Intercity
      NTLEGMODE=11, COST=LI.DISTANCE, MAXCOST=8*10,
      FROMNODE=1-1832, DIRECTION=3,
      INCLUDELINK=(LI.SWFT=1-13), MAXNTLEGS=8*2,
      EXTRACTCOST=60*((LI.DISTANCE/LI.FFSPD)+(LI.TOLLOP/1400)),
    ACCESSLINK =
        4801-4501,,,
        4802-4502,,,
        4803-4503,,,
        4804-4504,,,
```

TrnSkms.s

```
4805-4505,,,
4806-4506,,,
4807-4507,,,
4808-4508,,,
4809-4509,,,
4810-4510,,,
4811-4511,,,
4812-4512,,,
4813-4513,,,
4814-4514,,,
4815-4515,,,
4816-4516,,,
4817-4517,,,
4818-4518,,,
4819-4519,,,
4820-4520,,,
4821-4521,,,
4822-4522,,,
4823-4523,,,
4824-4524,,,
4825-4525,,,
4826-4526,,,
4827-4527,,,
4828-4528,,,
4829-4529,,,
4830-4530,,,
4831-4531,,,
4832-4532,,,
4833-4533,,,
4834-4534,,,
4835-4535,,,
4836-4536,,,
4837-4537,,,
4838-4538,,,
4839-4539,,,
4840-4540,,,
4841-4541,,,
4841-4541,,,
4842-4542,,,
4843-4543,,,
4844-4544,,,
4845-4545,,,
4845-4545,,,
4846-4546,,,
4847-4547,,,
4848-4548,,,
4849-4549,,,
4850-4550,,,
4851-4551,,,
4852-4552,,,
4853-4553,,,
4854-4554,,,
4855-4555,,,
4856-4556,,,
4857-4557,,,
4501-4801,,,
4502-4802,,,
4503-4803,,,
4504-4804,,,
4505-4805,,,
4506-4806,,,
4507-4807,,,
4508-4808,,,
4509-4809,,,
4510-4810,,,
```

TrnSkms.s

```
                 4511-4811,,,
                 4512-4812,,,
                 4513-4813,,,
                 4514-4814,,,
                 4515-4815,,,
                 4516-4816,,,
                 4517-4817,,,
                 4518-4818,,,
                 4519-4819,,,
                 4520-4820,,,
                 4521-4821,,,
                 4522-4822,,,
                 4523-4823,,,
                 4524-4824,,,
                 4525-4825,,,
                 4526-4826,,,
                 4527-4827,,,
                 4528-4828,,,
                 4529-4829,,,
                 4530-4830,,,
                 4531-4831,,,
                 4532-4832,,,
                 4533-4833,,,
                 4534-4834,,,
                 4535-4835,,,
                 4536-4836,,,
                 4537-4837,,,
                 4538-4838,,,
                 4539-4839,,,
                 4540-4840,,,
                 4541-4841,,,
                 4541-4841,,,
                 4542-4842,,,
                 4543-4843,,,
                 4544-4844,,,
                 4545-4845,,,
                 4545-4845,,,
                 4546-4846,,,
                 4547-4847,,,
                 4548-4848,,,
                 4549-4849,,,
                 4550-4850,,,
                 4551-4851,,,
                 4552-4852,,,
                 4553-4853,,,
                 4554-4854,,,
                 4555-4855,,,
                 4556-4856,,,
                 4557-4857,,  ONEWAY=TRUE

        GENERATE,                ; ZONAL AUTO ACCESS LEGS (BMC PNR Stations)
          NTLEGMODE=11, COST=LI.DISTANCE, MAXCOST=8*10,
          FROMNODE=1-1832, DIRECTION=1,
          INCLUDELINK=(LI.SWFT=1-13), MAXNTLEGS=8*2,
          EXTRACTCOST=60*((LI.DISTANCE/LI.FFSPD)+(LI.TOLLOP/1400)),
        ACCESSLINK=
          3002-4002,,,  ; Explanation:
          3003-4003,,,  ; 3002 -      4002           ,          ,
          3005-4005,,,  ; PNR  - STATION SERVED   ,  COST    ,    DISTANCE ,
          3014-4014,,,  ; (WHERE THESE WILL BE ADDED TO THE CORROSPONDING VALUES OBTAINED FROM THE ROUTE FROM fROMNODES TO THE PNRs.)
          3016-4016,,,
          3017-4017,,,
          3018-4018,,,
          3019-4019,,,
          3059-4059,,,
```

TrnSkms.s

```
          3062-4062,,,
          3063-4063,,,
          3064-4064,,,
          3065-4065,,,
          3066-4066,,,
          3067-7635,,,
          3068-4068,,,
          3097-14710,,,
          3105-4105,,,
          3107-4107,,,
          3108-4108,,,
          3109-4109,,,
          3110-4110,,,
          3111-4111,,,
          3112-4112,,,
          3205-4205,,,
          3209-4209,,,
          3211-4211,,,
          3213-4213,,,
          3236-4236,,,
          3237-4237,,,
          3241-4241,,,
          3252-4252,,,
          3253-4253,,,
          3254-4254,,,
          3255-4255,,,
          3258-4258,,,
          3267-26787,,,
          3501-5401,,,
          3502-5521,,,
          3503-5610,,,
          3504-6791,,,
          3511-10277,,,
          3512-10578,,,
          3513-10594,,,
          3514-10818,,,
          3515-11027,,,
          3516-10883,,,
          3521-14603,,,
          3522-14624,,,
          3523-14827,,,
          3524-14836,,,
          3525-15134,,,
          3526-15148,,,
          3527-15330,,,
          3528-15549,,,
          3529-15580,,,
          3530-15816,,,
          3541-23065,,,
          3542-23091,,,
          3543-23094,,,
          3544-23135,,,
          3545-23130,,,
          3546-23283,,,
          3551-26056,,,
          3553-26646,,,
          3554-26380,,,
          3555-26486,,,
          3561-44265,,,
          3562-43546,,,
          3563-33963,,,
          3564-36473,, ONEWAY=TRUE

  GENERATE,                ; ZONAL AUTO ACCESS LEGS (MWCOG Rail PNR Stations)
    NTLEGMODE=11, COST=LI.DISTANCE, MAXCOST=8*10,
```

TrnSkms.s

```
     FROMNODE=1-1832, DIRECTION=1,
     INCLUDELINK=(LI.SWFT=1-13), MAXNTLEGS=8*2,
     EXTRACTCOST=60*((LI.DISTANCE/LI.FFSPD)+(LI.TOLLOP/1400)),
  ACCESSLINK= 7501-59019 ,  ,  ,
              7502-59017 ,  ,  ,
              7503-59013 ,  ,  ,
              7504-59016 ,  ,  ,
              7505-59012 ,  ,  ,
              7507-43048 ,  ,  ,
              7519-49422 ,  ,  ,
              7521-59043 ,  ,  ,
              7523-59063 ,  ,  ,
              7524-59026 ,  ,  ,
              7525-59024 ,  ,  ,
              7526-59022 ,  ,  ,
              7527-59033 ,  ,  ,
              7528-59034 ,  ,  ,
              7529-59038 ,  ,  ,
              7530-59040 ,  ,  ,
              7540-49130 ,  ,  ,
              7542-59059 ,  ,  ,
              7543-59058 ,  ,  ,
              7544-59057 ,  ,  ,
              7545-59056 ,  ,  ,
              7546-59001 ,  ,  ,
              7547-59002 ,  ,  ,
              7548-59003 ,  ,  ,
              7557-59006 ,  ,  ,
              7558-59009 ,  ,  ,
              7559-59010 ,  ,  ,
              7560-59011 ,  ,  ,
              7561-45105 ,  ,  ,
              7575-49731 ,  ,  ,
              7576-59050 ,  ,  ,
              7577-59049 ,  ,  ,
              7578-59047 ,  ,  ,
              7579-59046 ,  ,  ,
              7580-59044 ,  ,  ,
              7582-59053 ,  ,  ,
              7583-59052 ,  ,  ,
              7585-45506 ,  ,  ,
              7586-44183 ,  ,  ,
              7587-44414 ,  ,  ,
              7592-55808 ,  ,  ,
              7593-55802 ,  ,  ,
              7594-55806 ,  ,  ,
              7595-55810 ,  ,  ,
              7597-55648 ,  ,  ,
              7598-55647 ,  ,  ,
              7802-43178 ,  ,  ,
              7803-43647 ,  ,  ,
              7804-7604 ,  ,  ,
              7805-43358 ,  ,  ,
              7806-43425 ,  ,  ,
              7807-43423 ,  ,  ,
              7808-43163 ,  ,  ,
              7809-43150 ,  ,  ,
              7810-43432 ,  ,  ,
              7811-7611 ,  ,  ,
              7812-7612 ,  ,  ,
              7813-53262 ,  ,  ,
              7814-53368 ,  ,  ,
              7815-54966 ,  ,  ,
              7816-7616 ,  ,  ,
              7817-53375 ,  ,  ,
```

TrnSkms.s

```
7826-44070 ,   ,   ,
7827-44082 ,   ,   ,
7828-44095 ,   ,   ,
7829-44293 ,   ,   ,
7830-53918 ,   ,   ,
7831-53980 ,   ,   ,
7527-59033 ,   ,   ,
7834-53979 ,   ,   ,
7835-44273 ,   ,   ,
7836-53625 ,   ,   ,
7851-44147 ,   ,   ,
7852-44362 ,   ,   ,
7853-44329 ,   ,   ,
7854-53906 ,   ,   ,
7855-53927 ,   ,   ,
7905-46362 ,   ,   ,
7906-46229 ,   ,   ,
7907-46283 ,   ,   ,
7909-46467 ,   ,   ,
7910-46471 ,   ,   ,
7911-50186 ,   ,   ,
7547-59002 ,   ,   ,
7927-46191 ,   ,   ,
7928-46411 ,   ,   ,
7929-50438 ,   ,   ,
7930-50442 ,   ,   ,
7931-54554 ,   ,   ,
7932-54556 ,   ,   ,
7933-54594 ,   ,   ,
7934-50446 ,   ,   ,
7870-45748 ,   ,   ,
7501-59020 ,   ,   ,
7502-43358 ,   ,   ,
7503-59014 ,   ,   ,
7504-43339 ,   ,   ,
7505-43334 ,   ,   ,
7521-49544 ,   ,   ,
7523-43178 ,   ,   ,
7524-43605 ,   ,   ,
7525-43607 ,   ,   ,
7526-43592 ,   ,   ,
7527-44094 ,   ,   ,
7528-59035 ,   ,   ,
7529-44036 ,   ,   ,
7530-44042 ,   ,   ,
7540-49845 ,   ,   ,
7542-44561 ,   ,   ,
7543-44557 ,   ,   ,
7544-44539 ,   ,   ,
7545-44515 ,   ,   ,
7546-45643 ,   ,   ,
7547-46151 ,   ,   ,
7548-59005 ,   ,   ,
7557-59007 ,   ,   ,
7558-46698 ,   ,   ,
7559-50507 ,   ,   ,
7560-45051 ,   ,   ,
7576-49667 ,   ,   ,
7577-49673 ,   ,   ,
7578-44148 ,   ,   ,
7579-44153 ,   ,   ,
7580-59045 ,   ,   ,
7582-49645 ,   ,   ,
7583-44189 ,   ,   ,
7585-45545 ,   ,   ,
```

TrnSkms.s

```
            7586-44963 ,  ,  ,
            7587-44318 ,  ,  ,
            7592-55809 ,  ,  ,
            7593-55807 ,  ,  ,
            7594-55805 ,  ,  ,
            7802-47323 ,  ,  ,
            7827-44083 ,  ,  ,
            7828-44098 ,  ,  ,
            7851-44181 ,  ,  ,
            7905-50552 ,  ,  ,
            7907-46337 ,  ,  ,
            7910-46473 ,  ,  ,
            7547-46151 ,  ,  ,
            7929-50448 ,  ,  ,
            7502-47605 ,  ,  ,
            7503-43351 ,  ,  ,
            7504-43682 ,  ,  ,
            7523-47602 ,  ,  ,
            7527-44100 ,  ,  ,
            7528-44082 ,  ,  ,
            7530-44043 ,  ,  ,
            7542-49858 ,  ,  ,
            7543-44560 ,  ,  ,
            7544-44558 ,  ,  ,
            7545-44554 ,  ,  ,
            7546-45653 ,  ,  ,
            7547-50821 ,  ,  ,
            7548-46121 ,  ,  ,
            7557-50630 ,  ,  ,
            7559-50509 ,  ,  ,
            7580-44181 ,  ,  ,
            7585-47703 ,  ,  ,
            7802-47673 ,  ,  ,
            7907-46377 ,  ,  ,
            7910-47024 ,  ,  ,
            7502-43377 ,  ,  ,
            7503-43684 ,  ,  ,
            7527-47633 ,  ,  ,
            7528-47627 ,  ,  ,
            7543-49855 ,  ,  ,
            7547-47726 ,  ,  ,
            7580-47651 ,  ,  ,
            ONEWAY=TRUE

    GENERATE,                ; ZONAL AUTO ACCESS LEGS (MWCOG Bus only PNR Stations)
      NTLEGMODE=11, COST=LI.DISTANCE, MAXCOST=8*10,
      FROMNODE=1-1832, DIRECTION=1,
      INCLUDELINK=(LI.SWFT=1-13), MAXNTLEGS=8*2,
      EXTRACTCOST=60*((LI.DISTANCE/LI.FFSPD)+(LI.TOLLOP/1400)),
    ACCESSLINK= 8000-44781 ,  ,  ,
            8002-44376 ,  ,  ,
            8003-44373 ,  ,  ,
            8004-43514 ,  ,  ,
            8005-53814 ,  ,  ,
            8006-53733 ,  ,  ,
            8007-43546 ,  ,  ,
            8008-44118 ,  ,  ,
            8009-49211 ,  ,  ,
            8010-54155 ,  ,  ,
            8011-56734 ,  ,  ,
            8012-43470 ,  ,  ,
            8013-54006 ,  ,  ,
            8014-44388 ,  ,  ,
            8015-53639 ,  ,  ,
            8016-43566 ,  ,  ,
```

TrnSkms.s

```
8017-43173 ,  ,  ,
8018-44792 ,  ,  ,
8019-53232 ,  ,  ,
8020-44311 ,  ,  ,
8021-53841 ,  ,  ,
8022-46418 ,  ,  ,
8023-46437 ,  ,  ,
8024-44265 ,  ,  ,
8027-44829 ,  ,  ,
8028-43326 ,  ,  ,
8029-44300 ,  ,  ,
8030-53825 ,  ,  ,
8032-46705 ,  ,  ,
8033-44755 ,  ,  ,
8034-44766 ,  ,  ,
8035-44523 ,  ,  ,
8036-44038 ,  ,  ,
8037-53629 ,  ,  ,
8038-53730 ,  ,  ,
8039-49572 ,  ,  ,
8040-49873 ,  ,  ,
8041-54060 ,  ,  ,
8042-53249 ,  ,  ,
8043-43449 ,  ,  ,
8044-54252 ,  ,  ,
8045-43607 ,  ,  ,
8046-43340 ,  ,  ,
8047-54261 ,  ,  ,
8048-53802 ,  ,  ,
8049-43576 ,  ,  ,
8050-43563 ,  ,  ,
8100-44487 ,  ,  ,
8102-43326 ,  ,  ,
8104-54228 ,  ,  ,
8105-54109 ,  ,  ,
8106-54148 ,  ,  ,
8107-54147 ,  ,  ,
8108-46395 ,  ,  ,
8110-54086 ,  ,  ,
8111-43846 ,  ,  ,
8112-43734 ,  ,  ,
8200-46651 ,  ,  ,
8201-46430 ,  ,  ,
8202-47013 ,  ,  ,
8203-46741 ,  ,  ,
8204-46774 ,  ,  ,
8205-45084 ,  ,  ,
8206-47058 ,  ,  ,
8207-46426 ,  ,  ,
8208-43437 ,  ,  ,
8209-46425 ,  ,  ,
8210-46436 ,  ,  ,
8211-46390 ,  ,  ,
8212-46225 ,  ,  ,
8213-54588 ,  ,  ,
8214-54701 ,  ,  ,
8215-54708 ,  ,  ,
8216-54595 ,  ,  ,
8217-54573 ,  ,  ,
8218-46222 ,  ,  ,
8219-46002 ,  ,  ,
8220-50555 ,  ,  ,
8221-46197 ,  ,  ,
8222-46914 ,  ,  ,
8223-50521 ,  ,  ,
```

TrnSkms.s

```
            8224-46315 ,  ,  ,
            8225-46828 ,  ,  ,
            8226-46731 ,  ,  ,
            8227-46809 ,  ,  ,
            8228-47005 ,  ,  ,
            8229-50844 ,  ,  ,
            8230-46312 ,  ,  ,
            8231-43305 ,  ,  ,
            8232-53811 ,  ,  ,
            8233-54014 ,  ,  ,
            8234-47157 ,  ,  ,
            8235-47134 ,  ,  ,
            8236-55808 ,  ,  ,
            8237-55805 ,  ,  ,
            8238-46708 ,  ,  ,
            8239-50703 ,  ,  ,
            8240-43533 ,  ,  ,
            8242-46770 ,  ,  ,
            8243-43128 ,  ,  ,
            8244-43560 ,  ,  ,
            8245-43708 ,  ,  ,
            8246-55648 ,  ,  ,
            8247-55647 ,  ,  ,
            8248-46906 ,  ,  ,
            8249-46975 ,  ,  ,
            8250-44641 ,  ,  ,
            8251-44661 ,  ,  ,
            8252-44407 ,  ,  ,
            8253-44401 ,  ,  ,
            8254-47035 ,  ,  ,
            8255-47046 ,  ,  ,
            8256-53657 ,  ,  ,
            8257-50822 ,  ,  ,
            8258-47212 ,  ,  ,
            8259-54313 ,  ,  ,
            8260-47009 ,  ,  ,
            8261-46227 ,  ,  ,
            8262-43740 ,  ,  ,
            8263-54219 ,  ,  ,
            8264-50410 ,  ,  ,
            8265-44265 ,  ,  ,
            8266-43574 ,  ,  ,
            8267-43552 ,  ,  ,
            8268-46090 ,  ,  ,
            8269-50888 ,  ,  ,
            8270-56011 ,  ,  ,
            8031-43500 ,  ,  ,
            8100-44623 ,  ,  ,
            8236-55809 ,  ,  ,
            8237-55806 ,  ,  ,
            8246-55608 ,  ,  ,
            8247-55618 ,  ,  ,
            8250-44708 ,  ,  ,
            ONEWAY=TRUE
    ENDPHASE

    PHASE=SKIMIJ

      MW[1] =IWAITA(0)                                               ; Initial wait time, actual, avg
      MW[2] =XWAITA(0)                                               ; Transfer wait time, actual, avg
      MW[3] =MIN(TIMEA(0,13),20)+TIMEA(0,12)                         ; Walk Time - max time it can take people to walk a mile is 20 mins
      MW[4] =TIMEA(0,11)                                             ; Auto Time
      MW[5] =DIST(0,11)                                              ; Auto Distance
      MW[7] =MAX((BRDINGS(0,ALLMODES)-1),0)                          ; Number of Trnsfers = (# of Boardings -1), can't be Negative.
      MW[8] =TIMEA(0,1)+TIMEA(0,2)+TIMEA(0,3)                        ; Bus Time
```

TrnSkms.s

```
      MW[9]  =TIMEA(0,4)+TIMEA(0,5)+TIMEA(0,6)                                  ; Rail Time
      MW[10]=TIMEA(0,TMODES)                                                    ; Actual time all Transit modes
      MW[11]=BESTJRNY                                                           ; Best Journey Time
      MW[12]=MW[1]+MW[2]+MW[3]+MW[10]                                           ; Cheapest Journey Time
      MW[13]=TIMEA(0,1)                                                         ; Local Bus Time
      MW[14]=TIMEA(0,2)+ TIMEA(0,3)                                             ; Express Bus Time + Premium Bus Time
      MW[15]=TIMEA(0,4) + TIMEA(0,5)                                            ; Metro Rail Time + Light Rail
      MW[16]=TIMEA(0,6)                                                         ; Commuter Rail Time
      MW[17]=XFERPENA(0,ALLMODES)                                               ; Transfer Penalty, Actual, allmodes
      MW[18]=BRDPEN(0,ALLMODES)                                                 ; Boarding Penalties, perceived
      MW[19]=TIMEA(0,7)                                                         ; Amtrak TimeA
      MW[20]=TIMEA(0,8)                                                         ; Greyhound TimeA
      MW[21]=DIST(0,7)                                                          ; Amtrak Dist
      MW[22]=DIST(0,8)                                                          ; Greyhound Dist
   ENDPHASE
ENDRUN
ENDDISTRIBUTEMULTISTEP
ENDLOOP

LOOP OPSkim = 1,10        ; Off-Peak Skim Loop
  prd = 'OP'
  IF (OPSkim=1)    ST='WBus'
  IF (OPSkim=2)    ST='WCRail'
  IF (OPSkim=3)    ST='WExpBus'
  IF (OPSkim=4)    ST='WRail'
  IF (OPSkim=5)    ST='DBus'
  IF (OPSkim=6)    ST='DCRail'
  IF (OPSkim=7)    ST='DExpBus'
  IF (OPSkim=8)    ST='DRail'
  IF (OPSkim=9)    ST='WTrn'
  IF (OPSkim=10)   ST='DTrn'

  num=OPSkim+10
    IF (num=16)
      IF (MULTISTEP1=1) Wait4Files Files= MSTM8.script.end, MSTM9.script.end, MSTM10.script.end, MSTM11.script.end, MSTM12.script.end,
      MSTM13.script.end, MSTM14.script.end, CheckReturnCode=T, printfiles=MERGE
    ENDIF
DISTRIBUTEMULTISTEP ProcessID='MSTM', ProcessNum=num

  RUN PGM=PT    PRNFILE='..\@scenario@\Outputs\@ST@ Off-Peak Transit Skims.PRN'    MSG='@ST@ Off-Peak Transit Skims'          ; Off-Peak Paths/Skims
   ID = "Off Peak Walk Paths/Skims"
   FILEI NETI   = ..\@scenario@\Outputs\MSTM_TrnSpd.tmp                          ;The Highway network with the transit time calculated
    FACTORI = ..\@scenario@\Parameters\@ST@@prd@.fac
    SYSTEMI = ..\@scenario@\Parameters\SYSFILE.PTS
   LINEI[1] = ..\@scenario@\Inputs\RailLines(OP).lin, LIST=T
   LINEI[2] = ..\@scenario@\Inputs\BusLines(OP).lin, LIST=T
   LINEI[3] = ..\@scenario@\Inputs\AmtrakLines(OP).lin, LIST=T
   LINEI[4] = ..\@scenario@\Inputs\GreyHound(OP).lin, LIST=T
 ;   FILEI FAREI

    FILEO MATO[1]=..\@scenario@\Outputs\@ST@@prd@.skm, MO=1-22, DEC=1*2,
               NAME= InitialWaitTime, XferWaitTime, WALKTIME, AUTOTIME, AUTODIST,      ; 1-5
                     FARE, NUMXFERS, BUSTIME, RAILTIME, TModesTimeA,           ; 6-10
                     BestJrnyTime, CheapJrnyTime, LocalBusTime, ExpBusTime, RailTime,  ; 11-15
                     ComRailTime, XFERPEN, BRDPEN, AmtrakTimeA, GreyTimeA,           ; 16-20
                     AmtrakDist, GreyDist                                    ; 21-25

    FILEO ROUTEO[1]   = ..\@scenario@\Outputs\ROUTE_@ST@@prd@.RTE, REPORTI=1194,1314,1054,1028,1515,1556,1155,1671,1656,64,934,707,15,
                            REPORTJ=1194,1314,1054,1028,1515,1556,1155,1671,1656,64,934,707,15,
                            TRACEI=1194,1314,1054,1028,1515,1556,1155,1671,1656,64,934,707,15,
                            TRACEJ=1194,1314,1054,1028,1515,1556,1155,1671,1656,64,934,707,15
    FILEO REPORTO     = ..\@scenario@\Outputs\REPORT_@ST@@prd@.txt
    NETO = ..\@scenario@\Outputs\MSTM_@ST@@prd@.NET

  ; Global Parameters
```

TrnSkms.s

```
   PARAMETERS FARE=N, ; Specifies that fares are not to be included as a component of Generalized cost in Route Evaluation
   HDWAYPERIOD=2,
   USERCLASSES=1,
   TRANTIME=LI.TRNTMOP,
   EXTENDREPORT=T                      ; The program prints messages whenever a line's calculated travel times exceed
                                        ; the values specified by RUNTIME/RT/NNTIME.

   PHASE=DATAPREP
     ;generate 1: Zonal WALK Access and Egress Legs (From Zones to All Nodes)
       GENERATE,
         NTLEGMODE=13, COST=LI.DISTANCE, MAXCOST=8*1.0,
         FROMNODE=1-1832, TONODE=1833-120000, DIRECTION=3,
         INCLUDELINK=(LI.SWFT=4-6,10-13,21-26), MAXNTLEGS=8*4,
         ONEWAY=FALSE, EXTRACTCOST=(60*(LI.DISTANCE/2.5))
; SLACK= 6*0.25 if MAXCOST[4]=20, SLACK[4]=8 and the best leg has a generalized cost of 6 minutes, legs up to a cost of 14 minutes,
; rather than 20, will be saved


       GENERATE,                 ;WALK TRANSFER LEGS (From all nodes to all nodes!)
         NTLEGMODE=12, COST=LI.DISTANCE, MAXCOST=8*0.5,
         FROMNODE=1833-120000, TONODE=1833-120000, DIRECTION=3,
         INCLUDELINK=(LI.SWFT=4-6,10-13,21-26), MAXNTLEGS=8*4,
         ONEWAY=FALSE, EXTRACTCOST= (60*(LI.DISTANCE/2.5))

       GENERATE,                 ; Zonal Drive Access Legs for Intercity Transit
         NTLEGMODE=11, COST=LI.DISTANCE, MAXCOST=8*10,
         FROMNODE=1-1832, DIRECTION=3, ONEWAY=T,
         INCLUDELINK=(LI.SWFT=1-13), MAXNTLEGS=8*2,
         EXTRACTCOST=60*((LI.DISTANCE/LI.FFSPD)+(LI.TOLLOP/1400)),
       ACCESSLINK =
           4801-4501,,,
           4802-4502,,,
           4803-4503,,,
           4804-4504,,,
           4805-4505,,,
           4806-4506,,,
           4807-4507,,,
           4808-4508,,,
           4809-4509,,,
           4810-4510,,,
           4811-4511,,,
           4812-4512,,,
           4813-4513,,,
           4814-4514,,,
           4815-4515,,,
           4816-4516,,,
           4817-4517,,,
           4818-4518,,,
           4819-4519,,,
           4820-4520,,,
           4821-4521,,,
           4822-4522,,,
           4823-4523,,,
           4824-4524,,,
           4825-4525,,,
           4826-4526,,,
           4827-4527,,,
           4828-4528,,,
           4829-4529,,,
           4830-4530,,,
           4831-4531,,,
           4832-4532,,,
           4833-4533,,,
           4834-4534,,,
           4835-4535,,,
```

TrnSkms.s

```
4836-4536,,,
4837-4537,,,
4838-4538,,,
4839-4539,,,
4840-4540,,,
4841-4541,,,
4841-4541,,,
4842-4542,,,
4843-4543,,,
4844-4544,,,
4845-4545,,,
4845-4545,,,
4846-4546,,,
4847-4547,,,
4848-4548,,,
4849-4549,,,
4850-4550,,,
4851-4551,,,
4852-4552,,,
4853-4553,,,
4854-4554,,,
4855-4555,,,
4856-4556,,,
4857-4557,,,
4501-4801,,,
4502-4802,,,
4503-4803,,,
4504-4804,,,
4505-4805,,,
4506-4806,,,
4507-4807,,,
4508-4808,,,
4509-4809,,,
4510-4810,,,
4511-4811,,,
4512-4812,,,
4513-4813,,,
4514-4814,,,
4515-4815,,,
4516-4816,,,
4517-4817,,,
4518-4818,,,
4519-4819,,,
4520-4820,,,
4521-4821,,,
4522-4822,,,
4523-4823,,,
4524-4824,,,
4525-4825,,,
4526-4826,,,
4527-4827,,,
4528-4828,,,
4529-4829,,,
4530-4830,,,
4531-4831,,,
4532-4832,,,
4533-4833,,,
4534-4834,,,
4535-4835,,,
4536-4836,,,
4537-4837,,,
4538-4838,,,
4539-4839,,,
4540-4840,,,
4541-4841,,,
```

TrnSkms.s

```
         4541-4841,,,
         4542-4842,,,
         4543-4843,,,
         4544-4844,,,
         4545-4845,,,
         4545-4845,,,
         4546-4846,,,
         4547-4847,,,
         4548-4848,,,
         4549-4849,,,
         4550-4850,,,
         4551-4851,,,
         4552-4852,,,
         4553-4853,,,
         4554-4854,,,
         4555-4855,,,
         4556-4856,,,
         4557-4857,,  ONEWAY=TRUE

      GENERATE,                    ; ZONAL AUTO ACCESS LEGS (BMC PNR Stations)
        NTLEGMODE=11, COST=LI.DISTANCE, MAXCOST=8*10,
        FROMNODE=1-1832, DIRECTION=1, ONEWAY=TRUE,
        INCLUDELINK=(LI.SWFT=1-13), MAXNTLEGS=8*2,
        EXTRACTCOST=60*((LI.DISTANCE/LI.FFSPD)+(LI.TOLLOP/1400)),
      ACCESSLINK=
         3002-4002,,,  ; Explanation:
         3003-4003,,,  ; 3002 -      4002          ,              ,
         3005-4005,,,  ; PNR  - STATION SERVED     , COST         ,      DISTANCE ,
         3014-4014,,,  ; (WHERE THESE WILL BE ADDED TO THE CORROSPONDING VALUES OBTAINED FROM THE ROUTE FROM fROMNODES TO THE PNRs.)
         3016-4016,,,
         3017-4017,,,
         3018-4018,,,
         3019-4019,,,
         3059-4059,,,
         3062-4062,,,
         3063-4063,,,
         3064-4064,,,
         3065-4065,,,
         3066-4066,,,
         3067-7635,,,
         3068-4068,,,
         3097-14710,,,
         3105-4105,,,
         3107-4107,,,
         3108-4108,,,
         3109-4109,,,
         3110-4110,,,
         3111-4111,,,
         3112-4112,,,
         3205-4205,,,
         3209-4209,,,
         3211-4211,,,
         3213-4213,,,
         3236-4236,,,
         3237-4237,,,
         3241-4241,,,
         3252-4252,,,
         3253-4253,,,
         3254-4254,,,
         3255-4255,,,
         3258-4258,,,
         3267-26787,,,
         3501-5401,,,
         3502-5521,,,
         3503-5610,,,
```

TrnSkms.s

```
         3504-6791,,,
         3511-10277,,,
         3512-10578,,,
         3513-10594,,,
         3514-10818,,,
         3515-11027,,,
         3516-10883,,,
         3521-14603,,,
         3522-14624,,,
         3523-14827,,,
         3524-14836,,,
         3525-15134,,,
         3526-15148,,,
         3527-15330,,,
         3528-15549,,,
         3529-15580,,,
         3530-15816,,,
         3541-23065,,,
         3542-23091,,,
         3543-23094,,,
         3544-23135,,,
         3545-23130,,,
         3546-23283,,,
         3551-26056,,,
         3553-26646,,,
         3554-26380,,,
         3555-26486,,,
         3561-44265,,,
         3562-43546,,,
         3563-33963,,,
         3564-36473,, ONEWAY=TRUE

      GENERATE,                ; ZONAL AUTO ACCESS LEGS (MWCOG Rail PNR Stations)
        NTLEGMODE=11, COST=LI.DISTANCE, MAXCOST=8*10,
        FROMNODE=1-1832, DIRECTION=1, ONEWAY=TRUE,
        INCLUDELINK=(LI.SWFT=1-13), MAXNTLEGS=8*2,
        EXTRACTCOST=60*((LI.DISTANCE/LI.FFSPD)+(LI.TOLLOP/1400)),
      ACCESSLINK= 7501-59019 , , ,
                  7502-59017 , , ,
                  7503-59013 , , ,
                  7504-59016 , , ,
                  7505-59012 , , ,
                  7507-43048 , , ,
                  7519-49422 , , ,
                  7521-59043 , , ,
                  7523-59063 , , ,
                  7524-59026 , , ,
                  7525-59024 , , ,
                  7526-59022 , , ,
                  7527-59033 , , ,
                  7528-59034 , , ,
                  7529-59038 , , ,
                  7530-59040 , , ,
                  7540-49130 , , ,
                  7542-59059 , , ,
                  7543-59058 , , ,
                  7544-59057 , , ,
                  7545-59056 , , ,
                  7546-59001 , , ,
                  7547-59002 , , ,
                  7548-59003 , , ,
                  7557-59006 , , ,
                  7558-59009 , , ,
                  7559-59010 , , ,
                  7560-59011 , , ,
```

TrnSkms.s

```
7561-45105 ,   ,   ,
7575-49731 ,   ,   ,
7576-59050 ,   ,   ,
7577-59049 ,   ,   ,
7578-59047 ,   ,   ,
7579-59046 ,   ,   ,
7580-59044 ,   ,   ,
7582-59053 ,   ,   ,
7583-59052 ,   ,   ,
7585-45506 ,   ,   ,
7586-44183 ,   ,   ,
7587-44414 ,   ,   ,
7592-55808 ,   ,   ,
7593-55802 ,   ,   ,
7594-55806 ,   ,   ,
7595-55810 ,   ,   ,
7597-55648 ,   ,   ,
7598-55647 ,   ,   ,
7802-43178 ,   ,   ,
7803-43647 ,   ,   ,
7804-7604 ,   ,   ,
7805-43358 ,   ,   ,
7806-43425 ,   ,   ,
7807-43423 ,   ,   ,
7808-43163 ,   ,   ,
7809-43150 ,   ,   ,
7810-43432 ,   ,   ,
7811-7611 ,   ,   ,
7812-7612 ,   ,   ,
7813-53262 ,   ,   ,
7814-53368 ,   ,   ,
7815-54966 ,   ,   ,
7816-7616 ,   ,   ,
7817-53375 ,   ,   ,
7826-44070 ,   ,   ,
7827-44082 ,   ,   ,
7828-44095 ,   ,   ,
7829-44293 ,   ,   ,
7830-53918 ,   ,   ,
7831-53980 ,   ,   ,
7527-59033 ,   ,   ,
7834-53979 ,   ,   ,
7835-44273 ,   ,   ,
7836-53625 ,   ,   ,
7851-44147 ,   ,   ,
7852-44362 ,   ,   ,
7853-44329 ,   ,   ,
7854-53906 ,   ,   ,
7855-53927 ,   ,   ,
7905-46362 ,   ,   ,
7906-46229 ,   ,   ,
7907-46283 ,   ,   ,
7909-46467 ,   ,   ,
7910-46471 ,   ,   ,
7911-50186 ,   ,   ,
7547-59002 ,   ,   ,
7927-46191 ,   ,   ,
7928-46411 ,   ,   ,
7929-50438 ,   ,   ,
7930-50442 ,   ,   ,
7931-54554 ,   ,   ,
7932-54556 ,   ,   ,
7933-54594 ,   ,   ,
7934-50446 ,   ,   ,
7870-45748 ,   ,   ,
```

TrnSkms.s

```
7501-59020 ,  ,  ,
7502-43358 ,  ,  ,
7503-59014 ,  ,  ,
7504-43339 ,  ,  ,
7505-43334 ,  ,  ,
7521-49544 ,  ,  ,
7523-43178 ,  ,  ,
7524-43605 ,  ,  ,
7525-43607 ,  ,  ,
7526-43592 ,  ,  ,
7527-44094 ,  ,  ,
7528-59035 ,  ,  ,
7529-44036 ,  ,  ,
7530-44042 ,  ,  ,
7540-49845 ,  ,  ,
7542-44561 ,  ,  ,
7543-44557 ,  ,  ,
7544-44539 ,  ,  ,
7545-44515 ,  ,  ,
7546-45643 ,  ,  ,
7547-46151 ,  ,  ,
7548-59005 ,  ,  ,
7557-59007 ,  ,  ,
7558-46698 ,  ,  ,
7559-50507 ,  ,  ,
7560-45051 ,  ,  ,
7576-49667 ,  ,  ,
7577-49673 ,  ,  ,
7578-44148 ,  ,  ,
7579-44153 ,  ,  ,
7580-59045 ,  ,  ,
7582-49645 ,  ,  ,
7583-44189 ,  ,  ,
7585-45545 ,  ,  ,
7586-44963 ,  ,  ,
7587-44318 ,  ,  ,
7592-55809 ,  ,  ,
7593-55807 ,  ,  ,
7594-55805 ,  ,  ,
7802-47323 ,  ,  ,
7827-44083 ,  ,  ,
7828-44098 ,  ,  ,
7851-44181 ,  ,  ,
7905-50552 ,  ,  ,
7907-46337 ,  ,  ,
7910-46473 ,  ,  ,
7547-46151 ,  ,  ,
7929-50448 ,  ,  ,
7502-47605 ,  ,  ,
7503-43351 ,  ,  ,
7504-43682 ,  ,  ,
7523-47602 ,  ,  ,
7527-44100 ,  ,  ,
7528-44082 ,  ,  ,
7530-44043 ,  ,  ,
7542-49858 ,  ,  ,
7543-44560 ,  ,  ,
7544-44558 ,  ,  ,
7545-44554 ,  ,  ,
7546-45653 ,  ,  ,
7547-50821 ,  ,  ,
7548-46121 ,  ,  ,
7557-50630 ,  ,  ,
7559-50509 ,  ,  ,
7580-44181 ,  ,  ,
```

TrnSkms.s

```
                7585-47703 ,  ,  ,
                7802-47673 ,  ,  ,
                7907-46377 ,  ,  ,
                7910-47024 ,  ,  ,
                7502-43377 ,  ,  ,
                7503-43684 ,  ,  ,
                7527-47633 ,  ,  ,
                7528-47627 ,  ,  ,
                7543-49855 ,  ,  ,
                7547-47726 ,  ,  ,
                7580-47651 ,  ,  ,
                ONEWAY=TRUE

    GENERATE,                  ; ZONAL AUTO ACCESS LEGS (MWCOG Bus only PNR Stations)
      NTLEGMODE=11, COST=LI.DISTANCE, MAXCOST=8*10,
      FROMNODE=1-1832, DIRECTION=1,ONEWAY=TRUE,
      INCLUDELINK=(LI.SWFT=1-13), MAXNTLEGS=8*2,
      EXTRACTCOST=60*((LI.DISTANCE/LI.FFSPD)+(LI.TOLLOP/1400)),
ACCESSLINK= 8000-44781 ,  ,  ,
                8002-44376 ,  ,  ,
                8003-44373 ,  ,  ,
                8004-43514 ,  ,  ,
                8005-53814 ,  ,  ,
                8006-53733 ,  ,  ,
                8007-43546 ,  ,  ,
                8008-44118 ,  ,  ,
                8009-49211 ,  ,  ,
                8010-54155 ,  ,  ,
                8011-56734 ,  ,  ,
                8012-43470 ,  ,  ,
                8013-54006 ,  ,  ,
                8014-44388 ,  ,  ,
                8015-53639 ,  ,  ,
                8016-43566 ,  ,  ,
                8017-43173 ,  ,  ,
                8018-44792 ,  ,  ,
                8019-53232 ,  ,  ,
                8020-44311 ,  ,  ,
                8021-53841 ,  ,  ,
                8022-46418 ,  ,  ,
                8023-46437 ,  ,  ,
                8024-44265 ,  ,  ,
                8027-44829 ,  ,  ,
                8028-43326 ,  ,  ,
                8029-44300 ,  ,  ,
                8030-53825 ,  ,  ,
                8032-46705 ,  ,  ,
                8033-44755 ,  ,  ,
                8034-44766 ,  ,  ,
                8035-44523 ,  ,  ,
                8036-44038 ,  ,  ,
                8037-53629 ,  ,  ,
                8038-53730 ,  ,  ,
                8039-49572 ,  ,  ,
                8040-49873 ,  ,  ,
                8041-54060 ,  ,  ,
                8042-53249 ,  ,  ,
                8043-43449 ,  ,  ,
                8044-54252 ,  ,  ,
                8045-43607 ,  ,  ,
                8046-43340 ,  ,  ,
                8047-54261 ,  ,  ,
                8048-53802 ,  ,  ,
                8049-43576 ,  ,  ,
                8050-43563 ,  ,  ,
```

TrnSkms.s

```
8100-44487 ,  ,  ,
8102-43326 ,  ,  ,
8104-54228 ,  ,  ,
8105-54109 ,  ,  ,
8106-54148 ,  ,  ,
8107-54147 ,  ,  ,
8108-46395 ,  ,  ,
8110-54086 ,  ,  ,
8111-43846 ,  ,  ,
8112-43734 ,  ,  ,
8200-46651 ,  ,  ,
8201-46430 ,  ,  ,
8202-47013 ,  ,  ,
8203-46741 ,  ,  ,
8204-46774 ,  ,  ,
8205-45084 ,  ,  ,
8206-47058 ,  ,  ,
8207-46426 ,  ,  ,
8208-43437 ,  ,  ,
8209-46425 ,  ,  ,
8210-46436 ,  ,  ,
8211-46390 ,  ,  ,
8212-46225 ,  ,  ,
8213-54588 ,  ,  ,
8214-54701 ,  ,  ,
8215-54708 ,  ,  ,
8216-54595 ,  ,  ,
8217-54573 ,  ,  ,
8218-46222 ,  ,  ,
8219-46002 ,  ,  ,
8220-50555 ,  ,  ,
8221-46197 ,  ,  ,
8222-46914 ,  ,  ,
8223-50521 ,  ,  ,
8224-46315 ,  ,  ,
8225-46828 ,  ,  ,
8226-46731 ,  ,  ,
8227-46809 ,  ,  ,
8228-47005 ,  ,  ,
8229-50844 ,  ,  ,
8230-46312 ,  ,  ,
8231-43305 ,  ,  ,
8232-53811 ,  ,  ,
8233-54014 ,  ,  ,
8234-47157 ,  ,  ,
8235-47134 ,  ,  ,
8236-55808 ,  ,  ,
8237-55805 ,  ,  ,
8238-46708 ,  ,  ,
8239-50703 ,  ,  ,
8240-43533 ,  ,  ,
8242-46770 ,  ,  ,
8243-43128 ,  ,  ,
8244-43560 ,  ,  ,
8245-43708 ,  ,  ,
8246-55648 ,  ,  ,
8247-55647 ,  ,  ,
8248-46906 ,  ,  ,
8249-46975 ,  ,  ,
8250-44641 ,  ,  ,
8251-44661 ,  ,  ,
8252-44407 ,  ,  ,
8253-44401 ,  ,  ,
8254-47035 ,  ,  ,
8255-47046 ,  ,
```

TrnSkms.s

```
            8256-53657 ,  ,  ,
            8257-50822 ,  ,  ,
            8258-47212 ,  ,  ,
            8259-54313 ,  ,  ,
            8260-47009 ,  ,  ,
            8261-46227 ,  ,  ,
            8262-43740 ,  ,  ,
            8263-54219 ,  ,  ,
            8264-50410 ,  ,  ,
            8265-44265 ,  ,  ,
            8266-43574 ,  ,  ,
            8267-43552 ,  ,  ,
            8268-46090 ,  ,  ,
            8269-50888 ,  ,  ,
            8270-56011 ,  ,  ,
            8031-43500 ,  ,  ,
            8100-44623 ,  ,  ,
            8236-55809 ,  ,  ,
            8237-55806 ,  ,  ,
            8246-55608 ,  ,  ,
            8247-55618 ,  ,  ,
            8250-44708 ,  ,  ,
            ONEWAY=TRUE

    ENDPHASE

    PHASE=SKIMIJ

     MW[1]=IWAITA(0)                                          ; Initial wait time, actual, avg
     MW[2]=XWAITA(0)                                          ; Transfer wait time, actual, avg
     MW[3]=MIN(TIMEA(0,13),20)+TIMEA(0,12)                    ; Walk Time
     MW[4]=TIMEA(0,11)                                        ; Auto Time
     MW[5]=DIST(0,11)                                         ; Auto Distance
   ; MW[6]=FAREA(0,ALLMODES)                                  ; Fare Skims
     MW[7]=MAX((BRDINGS(0,ALLMODES)-1),0)                     ; Number of Trnsfers
     MW[8]=TIMEA(0,1)+TIMEA(0,3)                              ; Bus Time
     MW[9]=TIMEA(0,4)+TIMEA(0,5)+TIMEA(0,6)                   ; Rail Time
     MW[10]=TIMEA(0,TMODES)                                   ; Actual time all Transit modes
     MW[11]=BESTJRNY                                          ; Best Journey Time
     MW[12]=MW[1]+MW[2]+MW[3]+MW[10]                          ; Cheapest Journey Time
     MW[13]=TIMEA(0,1)                                        ; Local Bus Time
     MW[14]=TIMEA(0,2)+ TIMEA(0,3)                            ; Express Bus Time + Premium Bus Time
     MW[15]=TIMEA(0,4) + TIMEA(0,5)                           ; Metro Rail Time + Light Rail
     MW[16]=TIMEA(0,6)                                        ; Commuter Rail Time
     MW[17]=XFERPENA(0,ALLMODES)                              ; Transfer Penalty, Actual, allmodes
     MW[18]=BRDPEN(0,ALLMODES)                                ; Boarding Penalties, perceived
     MW[19]=TIMEA(0,7)                                        ; Amtrak TimeA
     MW[20]=TIMEA(0,8)                                        ; Greyhound TimeA
     MW[21]=DIST(0,7)                                         ; Amtrak Dist
     MW[22]=DIST(0,8)                                         ; Greyhound Dist
    ENDPHASE
  ENDRUN
 ENDDISTRIBUTEMULTISTEP
    IF (num=20)
      IF (MULTISTEP1=1) Wait4Files Files= MSTM15.script.end, MSTM16.script.end, MSTM17.script.end, MSTM18.script.end,
      MSTM19.script.end, MSTM20.script.end, CheckReturnCode=T, printfiles=MERGE
    ENDIF
ENDLOOP
```

HwySkm.s

```
; Maryland Statewide Travel Demand Model (MSTM)
;
; Script: Highway Skimming
;
; About:
; This script computes highway skims by two time periods peak (PK) and off-peak (OP) for three modes
; 1) Single occupancy vehicles 2) High occupancy vehicles and 3) Trucks
; The logic was orignally adopted from the BMC Model but later revised to add auto operating cost to the generalized cost.
;
; Description:
; STEP 1: Skim the highway network for the time, distance and Toll Cost based on impedence which equals sum of
;         travel time and time value of the imposed tolls on the links.
; STEP 2: Updates the skims by adding a table with intrazonal times and adding origin and destination terminal times
;         to be used in Trip Distribution (TDTime)
;         (hwyofpk.tmp, hwypeak.tmp => hwyofpk.skm, hwypeak.skm)

; Input Files
;  iteration.txt - Indicator of current iteration (for feedback loop)
;  MSTM.net - Highway network file
;  turn.pen - turn penalities

; Output skims
; Writes out HwyOP.skm, HwyPK.skm with the following tables
; SOVTime - Single occcupancy vehicle travel time
; SOVDist - Single occcupancy vehicle distance
; SOVToll - Single occcupancy vehicle toll cost
; HOVTime - High occcupancy vehicle travel time
; HOVDist - High occcupancy vehicle distance
; HOVToll - High occcupancy vehicle toll cost
; TDTime -  HOV Time with terminal + intrazonal travel time
; TDDist -  SOV distance  + intrazonal distance
; TrkTime - Truck time
; TrkDist - Truck distance

; Authors:
; Mayank Prakash Jain - jainm@pbworld.com  - 09/16/2008
; Amar Sarvepalli - sarvepalli@pbworld.com - 02/22/2011
; Rolf Moeckel - moeckel@pbworld.com       - 05/23/2012
; Version 1.1


;========================================================================
; Set Parameters:
READ File = '..\stamp.log'
READ File = '..\iteration.txt'

prevIter = iteration-1

;========================================================================
; STEP 1
;========================================================================
  if (iteration=1)
   useNet1 = ' '
   useNet2P = ';'
  else
   useNet1 = ';'
   useNet2P = ' '
  endif
```

HwySkm.s

```
RUN PGM=HIGHWAY  PRNFILE=..\@scenario@\Outputs\HwyNetwork.PRN MSG='Hwy Network'

  ID = "Skim highway network - time, distance, and cost"
   @useNet1@  NETI=..\@scenario@\Inputs\MSTM.net                 ;Input Network first iteration (base network)
        @useNet2p@ NETI=..\@scenario@\Outputs\MSTM_Veh_Dly_iter@prevIter@.net   ;Input Network subsequent iterations (network of previous assignment)

  TURNPENI = ..\@scenario@\Inputs\turn.pen, list=y          ;Input Penalty File

  MATO[1]= ..\@scenario@\Outputs\HwyOPskm_iter@iteration@.tmp, MO=1-6,20,21
  MATO[2]= ..\@scenario@\Outputs\HwyPKskm_iter@iteration@.tmp, MO=11-16,17,18

  PHASE=LINKREAD

  ; Compute total impedance for pathbuilding.
    LW.TIMEP    = 60*LI.DISTANCE/LI.CONGSPD
    LW.TIMEO    = 60*LI.DISTANCE/LI.FFSPD

    LW.TIMETOLLPK    = LW.TIMEP + LI.TOLLPK/@VoT@  + 0.25*LI.DISTANCE
    LW.TIMETOLLOP    = LW.TIMEO + LI.TOLLOP/@VoT@  + 0.25*LI.DISTANCE

    LW.TrkTIMETOLLPK = LW.TIMEP + LI.TOLLPK/@VoTe@ + 0.25*LI.DISTANCE
    LW.TrkTIMETOLLOP = LW.TIMEO + LI.TOLLOP/@VoTe@ + 0.25*LI.DISTANCE


; Set link usage restrictions for this period.  Definitions:
;     0,1 = no restriction           3 = HOV3
;     2   = HOV2                     4 = no trucks
;     6   = Transit Only             9 = No vehicles at all

    IF (LI.AMLIMIT =  2,3)                   ADDTOGROUP = 1   ; Group 1: HOV Lanes AM (For PK)
    IF (LI.OPLIMIT = 2,3)                    ADDTOGROUP = 2   ; Group 2: HOV Lanes OP
    IF (LI.AMLIMIT =  5-9 || LI.swft = 13-25) ADDTOGROUP = 3   ; Group 3: Transit Related and Display only links for PK
    IF (LI.OPLIMIT = 5-9  || LI.swft = 13-25) ADDTOGROUP = 4   ; Group 4: Transit Related and Display only links for OP
    IF (LI.AMLIMIT = 4)                      ADDTOGROUP = 5   ; Group 5: Trucks not Allowed
    IF (LI.OPLIMIT = 4)                      ADDTOGROUP = 6   ; Group 6: Trucks not Allowed

ENDPHASE

PHASE=ILOOP

  ; Off-peak SOV paths
  PATHLOAD path=lw.timetollop,
    MW[1]=pathtrace(lw.timeo), noaccess=0,
    MW[2]=pathtrace(li.distance), noaccess=0,
    MW[3]=pathtrace(li.TOLLOP), noaccess=0,
    excludegrp = 2,4, peni = 1, trace = @odtrace@

  ; Off-peak HOV paths
  PATHLOAD path=lw.timetollop,
    MW[4]=pathtrace(lw.timeo), noaccess=0,
    MW[5]=pathtrace(li.distance), noaccess=0,
    MW[6]=pathtrace(li.TOLLOP), noaccess=0,
    excludegrp = 4, peni=1,trace=@odtrace@

  ; OP Truck Paths
  PATHLOAD path=lw.TrkTIMETOLLOP,
    MW[20]=pathtrace(lw.timeo), noaccess=0,
    MW[21]=pathtrace(li.distance), noaccess=0,
    MW[22]=pathtrace(li.TOLLop), noaccess=0,
    excludegrp = 2,4,6, peni=1, trace = @odtrace@

; PK SOV paths
  PATHLOAD path=lw.timetollpk,
    MW[11]=pathtrace(lw.timep), noaccess=0,
    MW[12]=pathtrace(li.distance), noaccess=0,
```

HwySkm.s

```
    MW[13]=pathtrace(li.TOLLpk), noaccess=0,
    excludegrp=1,3, peni=1, trace=@odtrace@

  ; PK HOV paths
  PATHLOAD path=lw.timetollpk,
    MW[14]=pathtrace(lw.timep), noaccess=0,
    MW[15]=pathtrace(li.distance), noaccess=0,
    MW[16]=pathtrace(li.TOLLpk), noaccess=0,
    excludegrp = 3, peni=1, trace=@odtrace@

  ; PK TRUCK paths
  PATHLOAD path=lw.TrkTIMETOLLPK,
    MW[17]=pathtrace(lw.timep), noaccess=0,
    MW[18]=pathtrace(li.distance), noaccess=0,
    MW[19]=pathtrace(li.TOLLpk), noaccess=0,
    excludegrp = 1,3,5, peni=1, trace=@odtrace@
  ENDPHASE
ENDRUN



;========================================================================
; STEP 2: Add 7th table to peak and off-peak files, as HOV time with
;         intrazonal and terminal times included, for use in trip distribution.
;========================================================================

RUN PGM=MATRIX  PRNFILE=..\@scenario@\Outputs\HwySkims.PRN MSG='Hwy Skims'
  ID = "UPDATE HIGHWAY SKIMS"

  MATI[1] = ..\@scenario@\Outputs\HwyOPskm_iter@iteration@.tmp
  MATI[2] = ..\@scenario@\Outputs\HwyPKskm_iter@iteration@.tmp

; Output Impedance Tables
; 1 = SOV Time          4 = HOV Time
; 2 = SOV Distance      5 = HOV Distance
; 3 = SOV Toll          6 = HOV Toll
;                       7 = HOV Time with terminal + intrazonal (used for TD)

  MATO[1]= ..\@scenario@\Outputs\HwyOP_iter@iteration@.skm, MO=1-8,21,22, NAME=SOVTime,SOVDist,SOVToll,HOVTime,
          HOVDist,HOVToll,TDTime,TDDist, TrkTime, TrkDist
  @useNet1@  MATO[2]= ..\@scenario@\Outputs\HwyPK_iter@iteration@.skm, MO=11-18,23,24, NAME=SOVTime,SOVDist,SOVToll,HOVTime,HOVDist,HOVToll,TDTime,TDDist, TrkTime, TrkDist
  @useNet2p@ MATO[2]= ..\@scenario@\Outputs\HwyPKraw_iter@iteration@.skm, MO=11-18,23,24, NAME=SOVTime,SOVDist,SOVToll,HOVTime,HOVDist,HOVToll,TDTime,TDDist, TrkTime, TrkDist

;open lookup table of SMZ by Areatype
  LOOKUP NAME=at,
  LOOKUP[1]=1, result=2,
  fail=0,
  file=..\@scenario@\Parameters\areatype.dat

;terminal time lookup table, as a function of area type
  LOOKUP NAME=termtm,
  LOOKUP[1]=1, result=2,
  interpolate=n,
  fail=0,0,0,

  ; AT  Term
  r='1    1',
   '2    1',
   '3    1',
   '4    1',
   '5    1',
   '6    2',
   '7    2',
   '8    3',
```

HwySkm.s

```
     '9    6'

   FILLMW MW[1]  = MI.1.1(6)
   FILLMW MW[11] = MI.2.1(6)

   MW[7]   = MW[4]                ; HOV PK Time
   MW[17]  = MW[14]               ; HOV OP Time
   MW[8]   = MW[2]                ; TD dist matrix for OP
   MW[18]  = MW[12]               ; TD dist matrix for PK

   MW[21]  = MI.1.7               ; Truck Dist PK, added later
   MW[22]  = MI.1.8               ; Truck dist PK, added later
   MW[23]  = MI.2.7               ; Truck Dist PK, added later
   MW[24]  = MI.2.8               ; Truck dist PK, added later

; Including intrazonal times and distances in Highway Skims
; sum of 3 lowest cells in working matrix 8 that are >= 0.01 and < 9999, exclude values with J=I.
     INTRAZONAL MW[1]  = 0.60 * (LOWEST(1 ,3,0.01,9999,I)/3)
     INTRAZONAL MW[2]  = 0.60 * (LOWEST(2 ,3,0.01,9999,I)/3)
     INTRAZONAL MW[4]  = 0.60 * (LOWEST(4 ,3,0.01,9999,I)/3)
     INTRAZONAL MW[5]  = 0.60 * (LOWEST(5 ,3,0.01,9999,I)/3)
     INTRAZONAL MW[11] = 0.60 * (LOWEST(11,3,0.01,9999,I)/3)
     INTRAZONAL MW[12] = 0.60 * (LOWEST(12,3,0.01,9999,I)/3)
     INTRAZONAL MW[14] = 0.60 * (LOWEST(14,3,0.01,9999,I)/3)
     INTRAZONAL MW[15] = 0.60 * (LOWEST(15,3,0.01,9999,I)/3)

; Intrazonal time is calculated separately by region.
     INTRAZONAL MW[7]  = 0.60 * (LOWEST(7,3,0.01,9999,I)/3)
     INTRAZONAL MW[17] = 0.60 * (LOWEST(17,3,0.01,9999,I)/3)

; Intrazonal Distance for the TD
     INTRAZONAL MW[8]  = 0.60 * (LOWEST(8,3,0.01,9999,I)/3)
     INTRAZONAL MW[18] = 0.60 * (LOWEST(18,3,0.01,9999,I)/3)

; Intrazonal Truck time and distance
     INTRAZONAL MW[21] = 0.60 * (LOWEST(21,3,0.01,9999,I)/3)
     INTRAZONAL MW[22] = 0.60 * (LOWEST(22,3,0.01,9999,I)/3)
     INTRAZONAL MW[23] = 0.60 * (LOWEST(23,3,0.01,9999,I)/3)
     INTRAZONAL MW[24] = 0.60 * (LOWEST(24,3,0.01,9999,I)/3)

; Add origin and destination terminal times, which are looked up from table.
     AREATYPEI=AT(1,I)
     oterm = termtm(1,areatypei)

     JLOOP
       IF (MW[7] < 0.01) continue
       areatypej = at(1,j)
       dterm     = termtm(1,areatypej)
       MW[7]  = MW[7]  + oterm + dterm          ;off peak
       MW[17] = MW[17] + oterm + dterm          ;peak
     ENDJLOOP

ENDRUN
*del *.tmp
```

msAverage.s

```
; Maryland Statewide Travel Demand Model (MSTM)
;
; Script: msAverage (Method of Successive Averages)
;
; About:
; Calculates the average between the skimmed travel time of the previous iteration and the current iteration.
;
; Description:
;  1. Read skim from previous iteration
;  2. Read skim from current iteration
;  3. Calculate average between two skims
;  4. Write out revised skim for current iteration
;
; Input Files:
; HwyPK_iter@iteration@.skm: skim of current iteration
; HwyPK_iter@previousIteration@.skm: skim of previous iteration
;
; Output Files:
; HwyPKave_iter@iteration@.skm: revised skim of current iteration
;
; Authors:
; Rolf Moeckel - moeckel@pbworld.com - 06/07/2012
; Version 1.0
;
;=========================================================================
; Set Parameters:
READ File = '..\stamp.log'
READ File = '..\iteration.txt'

  prevIter = iteration-1


;=========================================================================
; Calculate MSA
;=========================================================================

; Calculate average only in iterations 2 and following. In first iteration, use initial skim matrix without adjustment
if (iteration>1)

         run pgm = matrix


                  filei mati[1] = ..\@scenario@\outputs\HwyPKraw_iter@iteration@.skm
                  filei mati[2] = ..\@scenario@\outputs\HwyPK_iter@prevIter@.skm

                  fileo mato = ..\@scenario@\outputs\HwyPK_iter@iteration@.skm, mo = 31,32,33,34,35,36,37,38,39,40 name = SOVTime, SOVDist, SOVToll, HOVTime, HOVDist, HOVToll,
TDTime, TDDist, TrkTime, TrkDist

                  mw[1]  = MI.1.SOVTime
                  mw[2]  = MI.1.SOVDist
                  mw[3]  = MI.1.SOVToll
                  mw[4]  = MI.1.HOVTime
                  mw[5]  = MI.1.HOVDist
                  mw[6]  = MI.1.HOVToll
                  mw[7]  = MI.1.TDTime
                  mw[8]  = MI.1.TDDist
                  mw[9]  = MI.1.TrkTime
                  mw[10] = MI.1.TrkDist

                  mw[11] = MI.2.SOVTime
                  mw[12] = MI.2.SOVDist
                  mw[13] = MI.2.SOVToll
                  mw[14] = MI.2.HOVTime
                  mw[15] = MI.2.HOVDist
                  mw[16] = MI.2.HOVToll
```

msAverage.s

```
            mw[17] = MI.2.TDTime
            mw[18] = MI.2.TDDist
            mw[19] = MI.2.TrkTime
            mw[20] = MI.2.TrkDist

            mw[31] = (mw[1]  + mw[11]) / 2
            mw[32] = (mw[2]  + mw[12]) / 2
            mw[33] = (mw[3]  + mw[13]) / 2
            mw[34] = (mw[4]  + mw[14]) / 2
            mw[35] = (mw[5]  + mw[15]) / 2
            mw[36] = (mw[6]  + mw[16]) / 2
            mw[37] = (mw[7]  + mw[17]) / 2
            mw[38] = (mw[8]  + mw[18]) / 2
            mw[39] = (mw[9]  + mw[19]) / 2
            mw[40] = (mw[10] + mw[20]) / 2

        endrun

endif
```

IPF.s

```
; Maryland Statewide Travel Demand Model (MSTM)
;
; Script: IPF process
;
; About:
; Runs iterative proportional fitting (IPF) process to generate Households by income,workers and size groups
; from the census 2000 allocations at the zone level.
;
; Description:
;  1. Reads seed file (zones with 25 cols)
;     computes col sum (csum1 - csum25) and col shares (cshare1 to cshare25 by HHsize)
;  2. Reads target file, which has target totals of HH Size (Thh1-Thh5) and total zone HHs (TZs-Target Households)
;     Computes sub-targets by hhs and inc groups (i,e; th1inc1 = cshare1 * Thh1 for all groups)
;  3. Computes col factors (Cfac1 = th1inc1 /csum1).
;  4. Multiplies seed file (#1) with col facctors (Cfac1 - Cfac25) to produce Cadjusted file.
;  5. Computes row sums from Cadjusted file (rsum) and row shares (rshare=TZs/rsum)
;  6. Multiplies Cadjusted file with rshare.
;  7. Writes out the output file.
;
; Input Files:
; Cen2000Seed_HH_By_SIZ_INC.csv - Census 2000 household distribution by income and size
; Cen2000Seed_HH_By_WRK_INC.csv - Census 2000 household distribution by income and workers
; Target_Size_Wrk_Inc.csv  - Model zonal households
; Target_HH_Size_Wrks.dat  - Model aggregate households by workers, size and income
;
; Output Files:
; HH_By_SIZ_INC.csv - Model zonal households by income and size
; HH_By_WRK_INC.csv - Model zonal households by income and workers
;
; Authors:
; Amar Sarvepalli - Sarvepalli@pbworld.com - 12/04/10
; Version 1.0


;=========================================================================

 READ File = '..\stamp.log'

 RUN PGM MATRIX
ZONES=1

PRINT LIST = ";This script is created on the fly by:  IPF.s  **DO NOT MODIFY OR DELETE**",
                FILE = ..\Scripts\IPF_Preprocessor1.s
PRINT LIST = "fname1 = '..\@scenario@\Inputs\Cen2000Seed_HH_By_SIZ_INC.csv'     ; Census HHs by SIZE and Inc data",
                FILE = ..\Scripts\IPF_Preprocessor1.s
PRINT LIST = "fname2 = '..\@scenario@\Inputs\Cen2000Seed_HH_By_WRK_INC.csv'     ; Census HHS by Wrks and Inc data",
                FILE = ..\Scripts\IPF_Preprocessor1.s
;
PRINT LIST = ";This script is created on the fly by:  IPF.s  **DO NOT MODIFY OR DELETE**",
                FILE = ..\Scripts\IPF_Preprocessor2.s
PRINT LIST = "fname1 = '..\@scenario@\Inputs\Seed_HH_By_SIZ_INC.csv'            ; Census HHs by SIZE and Inc data",
                FILE = ..\Scripts\IPF_Preprocessor2.s
PRINT LIST = "fname2 = '..\@scenario@\Inputs\Seed_HH_By_WRK_INC.csv'            ; Census HHS by Wrks and Inc data",
                FILE = ..\Scripts\IPF_Preprocessor2.s
ENDRUN

; MSTM IPF process

Loop F = 1,2
    IF (F =1)
       siz  = ' '
       wrk  = ';'
       ftype = 'SIZ'
       n = '1'
    ENDIF
```

IPF.s

```
   IF (F =2)
     siz  = ';'
     wrk  = ' '
     ftype = 'WRK'
     n = '2'
   ENDIF

 LOOP p =1,10   ; Iterations

  IF (p =1)
     READ File = '..\Scripts\IPF_Preprocessor1.s'
  ENDIF
  IF (p > 1)
     READ File = '..\Scripts\IPF_Preprocessor2.s'
  ENDIF

  Run PGM=MATRIX PRNFILE= ..\@scenario@\Outputs\IPF.PRN  MSG='IPF'
      ; Reads Census 2000 HHs by Size and Income seed file
      ; Grp is either Wrks grp (0-3) or Size(1-5)
      ; Switch @siz@ will limit groups to 20 in worker loop (k=2)
      @siz@ FILEI DBI[1]='@fname1@', DELIMITER=',' SMZ=1,
      @wrk@ FILEI DBI[1]='@fname2@', DELIMITER=',' SMZ=1,
                Grp1_IQ1=2, Grp1_IQ2=3, Grp1_IQ3=4, Grp1_IQ4=5, Grp1_IQ5=6,
                Grp2_IQ1=7, Grp2_IQ2=8, Grp2_IQ3=9, Grp2_IQ4=10,Grp2_IQ5=11,
                Grp3_IQ1=12,Grp3_IQ2=13,Grp3_IQ3=14,Grp3_IQ4=15,Grp3_IQ5=16,
                Grp4_IQ1=17,Grp4_IQ2=18,Grp4_IQ3=19,Grp4_IQ4=20,Grp4_IQ5=21,
          @siz@ Grp5_IQ1=22,Grp5_IQ2=23,Grp5_IQ3=24,Grp5_IQ4=25,Grp5_IQ5=26,total=27
          @wrk@   total=22

      FILEI DBI[2]= '..\@scenario@\Inputs\Target_Size_Wrk_Inc.csv', DELIMITER=',' SMZ=1,HH =2,SORT=SMZ, JOINTODBI=1 JOINTOFIELDS=SMZ
      FILEO PRINTO[1] = '..\@scenario@\Outputs\RCAdjust.csv'

      ZONES=1
      LOOP K=2,DBI.1.NUMRECORDS
      X1=DBIReadRecord(1,K)

        ; Compute Seed Column Sums (Csum1 - Csum25)
            Csum1  = Csum1  + DI.1.Grp1_IQ1
            Csum2  = Csum2  + DI.1.Grp1_IQ2
            Csum3  = Csum3  + DI.1.Grp1_IQ3
            Csum4  = Csum4  + DI.1.Grp1_IQ4
            Csum5  = Csum5  + DI.1.Grp1_IQ5
            Csum6  = Csum6  + DI.1.Grp2_IQ1
            Csum7  = Csum7  + DI.1.Grp2_IQ2
            Csum8  = Csum8  + DI.1.Grp2_IQ3
            Csum9  = Csum9  + DI.1.Grp2_IQ4
            Csum10 = Csum10 + DI.1.Grp2_IQ5
            Csum11 = Csum11 + DI.1.Grp3_IQ1
            Csum12 = Csum12 + DI.1.Grp3_IQ2
            Csum13 = Csum13 + DI.1.Grp3_IQ3
            Csum14 = Csum14 + DI.1.Grp3_IQ4
            Csum15 = Csum15 + DI.1.Grp3_IQ5
            Csum16 = Csum16 + DI.1.Grp4_IQ1
            Csum17 = Csum17 + DI.1.Grp4_IQ2
            Csum18 = Csum18 + DI.1.Grp4_IQ3
            Csum19 = Csum19 + DI.1.Grp4_IQ4
            Csum20 = Csum20 + DI.1.Grp4_IQ5
      @siz@ Csum21 = Csum21 + DI.1.Grp5_IQ1
      @siz@ Csum22 = Csum22 + DI.1.Grp5_IQ2
      @siz@ Csum23 = Csum23 + DI.1.Grp5_IQ3
      @siz@ Csum24 = Csum24 + DI.1.Grp5_IQ4
      @siz@ Csum25 = Csum25 + DI.1.Grp5_IQ5

        ; Seed households by size
        Grp1 = Grp1 + DI.1.Grp1_IQ1+DI.1.Grp1_IQ2+DI.1.Grp1_IQ3+DI.1.Grp1_IQ4+DI.1.Grp1_IQ5
```

IPF.s

```
        Grp2 = Grp2 + DI.1.Grp2_IQ1+DI.1.Grp2_IQ2+DI.1.Grp2_IQ3+DI.1.Grp2_IQ4+DI.1.Grp2_IQ5
        Grp3 = Grp3 + DI.1.Grp3_IQ1+DI.1.Grp3_IQ2+DI.1.Grp3_IQ3+DI.1.Grp3_IQ4+DI.1.Grp3_IQ5
        Grp4 = Grp4 + DI.1.Grp4_IQ1+DI.1.Grp4_IQ2+DI.1.Grp4_IQ3+DI.1.Grp4_IQ4+DI.1.Grp4_IQ5
        @siz@ Grp5 = Grp5 + DI.1.Grp5_IQ1+DI.1.Grp5_IQ2+DI.1.Grp5_IQ3+DI.1.Grp5_IQ4+DI.1.Grp5_IQ5

        ; Seed total households
        totalhh = totalhh+ DI.1.total

        ; Target households
        @siz@ Tsize  = TSize+ DI.2.HH
        @wrk@ Tsize  = TSize+ DI.2.HH

    ENDLOOP

; Reads aggregate targets  (hhs by size and hhs by workers)
        read file = ..\@scenario@\Inputs\Target_HH_Size_Wrks.dat
        IF(@n@=1)
          Tsize1 = HHSIZ1
          Tsize2 = HHSIZ2
          Tsize3 = HHSIZ3
          Tsize4 = HHSIZ4
          Tsize5 = HHSIZ5
        ENDIF
        IF(@n@=2)
          Tsize1 = HHW0
          Tsize2 = HHW1
          Tsize3 = HHW2
          Tsize4 = HHW3
        ENDIF

; Compute col factors
        cfac1  = ((Csum1 /Grp1 )* TSize1)/Csum1
        cfac2  = ((Csum2 /Grp1 )* TSize1)/Csum2
        cfac3  = ((Csum3 /Grp1 )* TSize1)/Csum3
        cfac4  = ((Csum4 /Grp1 )* TSize1)/Csum4
        cfac5  = ((Csum5 /Grp1 )* TSize1)/Csum5
        cfac6  = ((Csum6 /Grp2 )* TSize2)/Csum6
        cfac7  = ((Csum7 /Grp2 )* TSize2)/Csum7
        cfac8  = ((Csum8 /Grp2 )* TSize2)/Csum8
        cfac9  = ((Csum9 /Grp2 )* TSize2)/Csum9
        cfac10 = ((Csum10/Grp2 )* TSize2)/Csum10
        cfac11 = ((Csum11/Grp3 )* TSize3)/Csum11
        cfac12 = ((Csum12/Grp3 )* TSize3)/Csum12
        cfac13 = ((Csum13/Grp3 )* TSize3)/Csum13
        cfac14 = ((Csum14/Grp3 )* TSize3)/Csum14
        cfac15 = ((Csum15/Grp3 )* TSize3)/Csum15
        cfac16 = ((Csum16/Grp4 )* TSize4)/Csum16
        cfac17 = ((Csum17/Grp4 )* TSize4)/Csum17
        cfac18 = ((Csum18/Grp4 )* TSize4)/Csum18
        cfac19 = ((Csum19/Grp4 )* TSize4)/Csum19
        cfac20 = ((Csum20/Grp4 )* TSize4)/Csum20
        @siz@ cfac21 = ((Csum21/Grp5 )  * TSize5) / Csum21
        @siz@ cfac22 = ((Csum22/Grp5 )  * TSize5) / Csum22
        @siz@ cfac23 = ((Csum23/Grp5 )  * TSize5) / Csum23
        @siz@ cfac24 = ((Csum24/Grp5 )  * TSize5) / Csum24
        @siz@ cfac25 = ((Csum25/Grp5 )  * TSize5) / Csum25

; Apply col factors to the seed
        ZONES=1
        LOOP K=2,DBI.1.NUMRECORDS
        X=DBIReadRecord(1,K)
        SMZ = DI.2.SMZ

        IF(DI.1.Grp1_IQ1>0) C_Grp1_IQ1 = DI.1.Grp1_IQ1 * cfac1
        IF(DI.1.Grp1_IQ2>0) C_Grp1_IQ2 = DI.1.Grp1_IQ2 * cfac2
```

IPF.s

```
            IF(DI.1.Grp1_IQ3>0) C_Grp1_IQ3 = DI.1.Grp1_IQ3 * cfac3
            IF(DI.1.Grp1_IQ4>0) C_Grp1_IQ4 = DI.1.Grp1_IQ4 * cfac4
            IF(DI.1.Grp1_IQ5>0) C_Grp1_IQ5 = DI.1.Grp1_IQ5 * cfac5
            IF(DI.1.Grp2_IQ1>0) C_Grp2_IQ1 = DI.1.Grp2_IQ1 * cfac6
            IF(DI.1.Grp2_IQ2>0) C_Grp2_IQ2 = DI.1.Grp2_IQ2 * cfac7
            IF(DI.1.Grp2_IQ3>0) C_Grp2_IQ3 = DI.1.Grp2_IQ3 * cfac8
            IF(DI.1.Grp2_IQ4>0) C_Grp2_IQ4 = DI.1.Grp2_IQ4 * cfac9
            IF(DI.1.Grp2_IQ5>0) C_Grp2_IQ5 = DI.1.Grp2_IQ5 * cfac10
            IF(DI.1.Grp3_IQ1>0) C_Grp3_IQ1 = DI.1.Grp3_IQ1 * cfac11
            IF(DI.1.Grp3_IQ2>0) C_Grp3_IQ2 = DI.1.Grp3_IQ2 * cfac12
            IF(DI.1.Grp3_IQ3>0) C_Grp3_IQ3 = DI.1.Grp3_IQ3 * cfac13
            IF(DI.1.Grp3_IQ4>0) C_Grp3_IQ4 = DI.1.Grp3_IQ4 * cfac14
            IF(DI.1.Grp3_IQ5>0) C_Grp3_IQ5 = DI.1.Grp3_IQ5 * cfac15
            IF(DI.1.Grp4_IQ1>0) C_Grp4_IQ1 = DI.1.Grp4_IQ1 * cfac16
            IF(DI.1.Grp4_IQ2>0) C_Grp4_IQ2 = DI.1.Grp4_IQ2 * cfac17
            IF(DI.1.Grp4_IQ3>0) C_Grp4_IQ3 = DI.1.Grp4_IQ3 * cfac18
            IF(DI.1.Grp4_IQ4>0) C_Grp4_IQ4 = DI.1.Grp4_IQ4 * cfac19
            IF(DI.1.Grp4_IQ5>0) C_Grp4_IQ5 = DI.1.Grp4_IQ5 * cfac20
      @siz@ IF(DI.1.Grp5_IQ1>0) C_Grp5_IQ1 = DI.1.Grp5_IQ1 * cfac21
      @siz@ IF(DI.1.Grp5_IQ2>0) C_Grp5_IQ2 = DI.1.Grp5_IQ2 * cfac22
      @siz@ IF(DI.1.Grp5_IQ3>0) C_Grp5_IQ3 = DI.1.Grp5_IQ3 * cfac23
      @siz@ IF(DI.1.Grp5_IQ4>0) C_Grp5_IQ4 = DI.1.Grp5_IQ4 * cfac24
      @siz@ IF(DI.1.Grp5_IQ5>0) C_Grp5_IQ5 = DI.1.Grp5_IQ5 * cfac25
     ; IF any zone in seed is 0 but target has value then paste a value of target share of total households
            IF(DI.1.Grp1_IQ1=0) C_Grp1_IQ1 = ((Csum1 /Grp1 )  * TSize1) / Tsize
            IF(DI.1.Grp1_IQ2=0) C_Grp1_IQ2 = ((Csum2 /Grp1 )  * TSize1) / Tsize
            IF(DI.1.Grp1_IQ3=0) C_Grp1_IQ3 = ((Csum3 /Grp1 )  * TSize1) / Tsize
            IF(DI.1.Grp1_IQ4=0) C_Grp1_IQ4 = ((Csum4 /Grp1 )  * TSize1) / Tsize
            IF(DI.1.Grp1_IQ5=0) C_Grp1_IQ5 = ((Csum5 /Grp1 )  * TSize1) / Tsize
            IF(DI.1.Grp2_IQ1=0) C_Grp2_IQ1 = ((Csum6 /Grp2 )  * TSize2) / Tsize
            IF(DI.1.Grp2_IQ2=0) C_Grp2_IQ2 = ((Csum7 /Grp2 )  * TSize2) / Tsize
            IF(DI.1.Grp2_IQ3=0) C_Grp2_IQ3 = ((Csum8 /Grp2 )  * TSize2) / Tsize
            IF(DI.1.Grp2_IQ4=0) C_Grp2_IQ4 = ((Csum9 /Grp2 )  * TSize2) / Tsize
            IF(DI.1.Grp2_IQ5=0) C_Grp2_IQ5 = ((Csum10/Grp2 )  * TSize2) / Tsize
            IF(DI.1.Grp3_IQ1=0) C_Grp3_IQ1 = ((Csum11/Grp3 )  * TSize3) / Tsize
            IF(DI.1.Grp3_IQ2=0) C_Grp3_IQ2 = ((Csum12/Grp3 )  * TSize3) / Tsize
            IF(DI.1.Grp3_IQ3=0) C_Grp3_IQ3 = ((Csum13/Grp3 )  * TSize3) / Tsize
            IF(DI.1.Grp3_IQ4=0) C_Grp3_IQ4 = ((Csum14/Grp3 )  * TSize3) / Tsize
            IF(DI.1.Grp3_IQ5=0) C_Grp3_IQ5 = ((Csum15/Grp3 )  * TSize3) / Tsize
            IF(DI.1.Grp4_IQ1=0) C_Grp4_IQ1 = ((Csum16/Grp4 )  * TSize4) / Tsize
            IF(DI.1.Grp4_IQ2=0) C_Grp4_IQ2 = ((Csum17/Grp4 )  * TSize4) / Tsize
            IF(DI.1.Grp4_IQ3=0) C_Grp4_IQ3 = ((Csum18/Grp4 )  * TSize4) / Tsize
            IF(DI.1.Grp4_IQ4=0) C_Grp4_IQ4 = ((Csum19/Grp4 )  * TSize4) / Tsize
            IF(DI.1.Grp4_IQ5=0) C_Grp4_IQ5 = ((Csum20/Grp4 )  * TSize4) / Tsize
      @siz@ IF(DI.1.Grp5_IQ1=0) C_Grp5_IQ1 = ((Csum21/Grp5 )  * TSize5) / Tsize
      @siz@ IF(DI.1.Grp5_IQ2=0) C_Grp5_IQ2 = ((Csum22/Grp5 )  * TSize5) / Tsize
      @siz@ IF(DI.1.Grp5_IQ3=0) C_Grp5_IQ3 = ((Csum23/Grp5 )  * TSize5) / Tsize
      @siz@ IF(DI.1.Grp5_IQ4=0) C_Grp5_IQ4 = ((Csum24/Grp5 )  * TSize5) / Tsize
      @siz@ IF(DI.1.Grp5_IQ5=0) C_Grp5_IQ5 = ((Csum25/Grp5 )  * TSize5) / Tsize


      C_Total = C_Grp1_IQ1+C_Grp1_IQ2+C_Grp1_IQ3+C_Grp1_IQ4+C_Grp1_IQ5+
                C_Grp2_IQ1+C_Grp2_IQ2+C_Grp2_IQ3+C_Grp2_IQ4+C_Grp2_IQ5+
                C_Grp3_IQ1+C_Grp3_IQ2+C_Grp3_IQ3+C_Grp3_IQ4+C_Grp3_IQ5+
                C_Grp4_IQ1+C_Grp4_IQ2+C_Grp4_IQ3+C_Grp4_IQ4+C_Grp4_IQ5  @siz@ +
          @siz@ C_Grp5_IQ1+C_Grp5_IQ2+C_Grp5_IQ3+C_Grp5_IQ4+C_Grp5_IQ5

   ; Compute row factors as target row total  / Col adjusted row total
      IF(C_Total <>0)
         @siz@ rfac = DI.2.HH/C_Total
         @wrk@ rfac = DI.2.HH/C_Total
      ELSE
         rfac = 0
      ENDIF

   ; Apply row factors to col adjusted table
```

IPF.s

```
             RC_Grp1_IQ1 = C_Grp1_IQ1 * rfac
             RC_Grp1_IQ2 = C_Grp1_IQ2 * rfac
             RC_Grp1_IQ3 = C_Grp1_IQ3 * rfac
             RC_Grp1_IQ4 = C_Grp1_IQ4 * rfac
             RC_Grp1_IQ5 = C_Grp1_IQ5 * rfac
             RC_Grp2_IQ1 = C_Grp2_IQ1 * rfac
             RC_Grp2_IQ2 = C_Grp2_IQ2 * rfac
             RC_Grp2_IQ3 = C_Grp2_IQ3 * rfac
             RC_Grp2_IQ4 = C_Grp2_IQ4 * rfac
             RC_Grp2_IQ5 = C_Grp2_IQ5 * rfac
             RC_Grp3_IQ1 = C_Grp3_IQ1 * rfac
             RC_Grp3_IQ2 = C_Grp3_IQ2 * rfac
             RC_Grp3_IQ3 = C_Grp3_IQ3 * rfac
             RC_Grp3_IQ4 = C_Grp3_IQ4 * rfac
             RC_Grp3_IQ5 = C_Grp3_IQ5 * rfac
             RC_Grp4_IQ1 = C_Grp4_IQ1 * rfac
             RC_Grp4_IQ2 = C_Grp4_IQ2 * rfac
             RC_Grp4_IQ3 = C_Grp4_IQ3 * rfac
             RC_Grp4_IQ4 = C_Grp4_IQ4 * rfac
             RC_Grp4_IQ5 = C_Grp4_IQ5 * rfac
      @siz@  RC_Grp5_IQ1 = C_Grp5_IQ1 * rfac
      @siz@  RC_Grp5_IQ2 = C_Grp5_IQ2 * rfac
      @siz@  RC_Grp5_IQ3 = C_Grp5_IQ3 * rfac
      @siz@  RC_Grp5_IQ4 = C_Grp5_IQ4 * rfac
      @siz@  RC_Grp5_IQ5 = C_Grp5_IQ5 * rfac

      RCGrp1=RCGrp1+ RC_Grp1_IQ1+RC_Grp1_IQ2+RC_Grp1_IQ3+RC_Grp1_IQ4+RC_Grp1_IQ5
      RCGrp2=RCGrp2+ RC_Grp2_IQ1+RC_Grp2_IQ2+RC_Grp2_IQ3+RC_Grp2_IQ4+RC_Grp2_IQ5
      RCGrp3=RCGrp3+ RC_Grp3_IQ1+RC_Grp3_IQ2+RC_Grp3_IQ3+RC_Grp3_IQ4+RC_Grp3_IQ5
      RCGrp4=RCGrp4+ RC_Grp4_IQ1+RC_Grp4_IQ2+RC_Grp4_IQ3+RC_Grp4_IQ4+RC_Grp4_IQ5
      @siz@  RCGrp5=RCGrp5+ RC_Grp5_IQ1+RC_Grp5_IQ2+RC_Grp5_IQ3+RC_Grp5_IQ4+RC_Grp5_IQ5

      RC_Total =RC_Grp1_IQ1+RC_Grp1_IQ2+RC_Grp1_IQ3+RC_Grp1_IQ4+RC_Grp1_IQ5+
                RC_Grp2_IQ1+RC_Grp2_IQ2+RC_Grp2_IQ3+RC_Grp2_IQ4+RC_Grp2_IQ5+
                RC_Grp3_IQ1+RC_Grp3_IQ2+RC_Grp3_IQ3+RC_Grp3_IQ4+RC_Grp3_IQ5+
                RC_Grp4_IQ1+RC_Grp4_IQ2+RC_Grp4_IQ3+RC_Grp4_IQ4+RC_Grp4_IQ5 @siz@+
         @siz@  RC_Grp5_IQ1+RC_Grp5_IQ2+RC_Grp5_IQ3+RC_Grp5_IQ4+RC_Grp5_IQ5

       Adjtotal = Adjtotal+RC_Total

      IF(@n@=1 & smz=1)
       PRINT PRINTO=1 CSV=T LIST= ';SMZ','SIZ1_IQ1','SIZ1_IQ2','SIZ1_IQ3','SIZ1_IQ4','SIZ1_IQ5',
                                  ,'SIZ2_IQ1','SIZ2_IQ2','SIZ2_IQ3','SIZ2_IQ4','SIZ2_IQ5',
                                  ,'SIZ3_IQ1','SIZ3_IQ2','SIZ3_IQ3','SIZ3_IQ4','SIZ3_IQ5',
                                  ,'SIZ4_IQ1','SIZ4_IQ2','SIZ4_IQ3','SIZ4_IQ4','SIZ4_IQ5',
                                  ,'SIZ5_IQ1','SIZ5_IQ2','SIZ5_IQ3','SIZ5_IQ4','SIZ5_IQ5',
                                   'Total'
      ENDIF
      IF(@n@=2 & smz=1)
       PRINT PRINTO=1 CSV=T LIST= ';SMZ','WKR0_IQ1','WKR0_IQ2','WKR0_IQ3','WKR0_IQ4','WKR0_IQ5',
                                   'WKR1_IQ1','WKR1_IQ2','WKR1_IQ3','WKR1_IQ4','WKR1_IQ5',
                                   'WKR2_IQ1','WKR2_IQ2','WKR2_IQ3','WKR2_IQ4','WKR2_IQ5',
                                   'WKR3_IQ1','WKR3_IQ2','WKR3_IQ3','WKR3_IQ4','WKR3_IQ5',
                                   'Total'
      ENDIF

      PRINT PRINTO=1 CSV=T  LIST= SMZ(4.0),
                                  RC_Grp1_IQ1,RC_Grp1_IQ2,RC_Grp1_IQ3,RC_Grp1_IQ4,RC_Grp1_IQ5,
                                  RC_Grp2_IQ1,RC_Grp2_IQ2,RC_Grp2_IQ3,RC_Grp2_IQ4,RC_Grp2_IQ5,
                                  RC_Grp3_IQ1,RC_Grp3_IQ2,RC_Grp3_IQ3,RC_Grp3_IQ4,RC_Grp3_IQ5,
                                  RC_Grp4_IQ1,RC_Grp4_IQ2,RC_Grp4_IQ3,RC_Grp4_IQ4,RC_Grp4_IQ5,
                           @siz@ RC_Grp5_IQ1,RC_Grp5_IQ2,RC_Grp5_IQ3,RC_Grp5_IQ4,RC_Grp5_IQ5,
                                  RC_Total
      ENDLOOP
```

IPF.s

```
        ; Check for convergence
          ; Compute aggregate  group dIFference between target and seed
                DIFfGrp1 = Tsize1 - RCGrp1
                DIFfGrp2 = Tsize2 - RCGrp2
                DIFfGrp3 = Tsize3 - RCGrp3
                DIFfGrp4 = Tsize4 - RCGrp4
                @siz@ DIFfGrp5 = Tsize5 - RCGrp5
                @siz@  MaxDIFf = Max(abs(DIFfGrp1),abs(DIFfGrp2),abs(DIFfGrp3),abs(DIFfGrp4),abs(DIFfGrp5))
                @wrk@  MaxDIFf = Max(abs(DIFfGrp1),abs(DIFfGrp2),abs(DIFfGrp3),abs(DIFfGrp4))
          ; Compute colsum dIFferences
            DIFf = Tsize - Adjtotal

        ; Print dIFf
                print form =10.0,list= "Seedhhs  = ", Adjtotal , file=..\@scenario@\Outputs\DIFf.dat
                print form =10.0,list= "Targethhs= ", Tsize    , file=..\@scenario@\Outputs\DIFf.dat
                print form =10.0,list= "TotalDIFf= ", DIFf     , file=..\@scenario@\Outputs\DIFf.dat
                print form =10.0,list= " Target1 = ", Tsize1  , file=..\@scenario@\Outputs\DIFf.dat
                print form =10.0,list= " Target2 = ", Tsize2  , file=..\@scenario@\Outputs\DIFf.dat
                print form =10.0,list= " Target3 = ", Tsize3  , file=..\@scenario@\Outputs\DIFf.dat
                print form =10.0,list= " Target4 = ", Tsize4  , file=..\@scenario@\Outputs\DIFf.dat
         @siz@ print form =10.0,list= " Target5 = ", Tsize5  , file=..\@scenario@\Outputs\DIFf.dat
                print form =10.0,list= " seed1   = ", RCGrp1  , file=..\@scenario@\Outputs\DIFf.dat
                print form =10.0,list= " Sedd2   = ", RCGrp2  , file=..\@scenario@\Outputs\DIFf.dat
                print form =10.0,list= " Seed3   = ", RCGrp3  , file=..\@scenario@\Outputs\DIFf.dat
                print form =10.0,list= " Seed4   = ", RCGrp4  , file=..\@scenario@\Outputs\DIFf.dat
         @siz@ print form =10.0,list= " Seed5   = ", RCGrp5  , file=..\@scenario@\Outputs\DIFf.dat
                print form =10.0,list= "DIFfGrp1 = ", DIFfGrp1 , file=..\@scenario@\Outputs\DIFf.dat
                print form =10.0,list= "DIFfGrp2 = ", DIFfGrp2 , file=..\@scenario@\Outputs\DIFf.dat
                print form =10.0,list= "DIFfGrp3 = ", DIFfGrp3 , file=..\@scenario@\Outputs\DIFf.dat
                print form =10.0,list= "DIFfGrp4 = ", DIFfGrp4 , file=..\@scenario@\Outputs\DIFf.dat
         @siz@ print form =10.0,list= "DIFfGrp5 = ", DIFfGrp5 , file=..\@scenario@\Outputs\DIFf.dat
                print form =10.0,list= "MaxDIFf  = ", MaxDIFf  , file=..\@scenario@\Outputs\DIFf.dat


        ENDRUN

        *copy ..\@scenario@\Outputs\RCAdjust.csv ..\@scenario@\Outputs\Seed_HH_By_@ftype@_INC.csv
        *copy ..\@scenario@\Outputs\DIFf.dat ..\@scenario@\Outputs\IPF_HHby@ftype@Summary.dat

     ENDLOOP

ENDLOOP
*copy ..\@scenario@\Inputs\Seed_HH_By_SIZ_INC.csv ..\@scenario@\Outputs\HH_By_SIZ_INC.csv
*copy ..\@scenario@\Inputs\Seed_HH_By_WRK_INC.csv ..\@scenario@\Outputs\HH_By_WRKS_INC.csv

;Delete temp and other files
*del ..\@scenario@\Outputs\RCAdjust.csv
*del ..\@scenario@\Outputs\DIFf.dat
```

TripGeneration.s

```
; Maryland Statewide Travel Demand Model (MSTM)
;
; Script: Trip Generation
;
; About:
; This script computes trip generation rates for the home-based-work (HBW),home-based-shop (HBS),
; home-based-school (HBSc), home-based-other and the non-home-based trip purposes. All home-
; based trip purposes are segmented by five income groups and non-home-based are further classfied into
; non-home-based-work and other-based-other. This income segmentation resulted in the use of 18 trip purposes
; in the MSTM model.

; Description:
; The following are the list of trip purposes by income groups
; HBW1 - Home-based-work income group 1
; HBW2 - Home-based-work income group 2
; HBW3 - Home-based-work income group 3
; HBW4 - Home-based-work income group 4
; HBW5 - Home-based-work income group 5
; HBS1 - Home-based-shop income group 1
; HBS2 - Home-based-shop income group 2
; HBS3 - Home-based-shop income group 3
; HBS4 - Home-based-shop income group 4
; HBS5 - Home-based-shop income group 5
; HBO1 - Home-based-other income group 1
; HBO2 - Home-based-other income group 2
; HBO3 - Home-based-other income group 3
; HBO4 - Home-based-other income group 4
; HBO5 - Home-based-other income group 5
; HBSc - Home-based-school all income groups
; NHBW - Non-home-based-work all income group
; OBO - Other-based-other all income group

; STEP1: Activity Density
;       Reads  the Activities file. Computes the activity density calculation by adding up the HH00, RE00, TOT00
;       and then dividing the total activity by the that zones acres.
; STEP2: Computes income shares
;       Reads the HBW attraction shares by income, along with the trip rates files. Based on the home based attraction shares
;       by region and size, other trip attactions are computed by income. [The Productions in the rates txt files will need to
;       updated each time the population data changes]. The production numbers are before the motorized shares are
;       calculated and incorporated.

; STEP3: Trip Productions and Attractions
;       Trip Productions are computed based on the 1) motorized shares, 2) households by workers and income; and 3) households by size and income.
;       Trip purpose specific trip rates are used to compute trip prodcutions.
;       Trip attractions are computed based on the 1) motorized shares, 2) income shares, 3) activities and 4) activity density files
;       Balances productions and attractions. Note for non-home-based (NHBW and OBO), the zonal attractions were scaled and based on the total productions and
;       the zonal productions are replaced with the zonal attractions, since we have more confidence in the attractions than the productions for the NHBs.
;       School trip attractions are based on the enrollment data

; Input Files
; Activities.csv      - zonal employment data as activity at the zone
; ZonesToRegions.csv  - zone to region equivalency file
; HBWAttrShares.csv   - zonal home-based-work attraction shares by household income groups
; hbw_rates.txt       - home-based-work trip rates
; hbo_rates.txt       - home-based-other trip rates
; hbs_rates.txt       - home-based-shop trip rates
; hbsc_rates.txt      - home-based-school trip rates
; nhbw_rates.txt      - non-home-based-work trip rates
; obo_rates.txt       - other-based-other trip rates
; MotorizedShares.csv - zonal motorized shares
; HH_By_WRKS_INC.csv  - households by workers and income
; HH_By_SIZ_INC.csv   - households by size and income
; TripProductionDampening_NJPAWV.csv - dampening rates to remove trip produced in the model region but were attracted outside the region. This is applied to HBW only

; Output skims
```

TripGeneration.s

```
; ActivityDensity.csv - Activity density at the zone level
; INCQShares.dbf      - Share of total attractions by trip purpose and Income for purposes in DBF format
; INCQ_Shares.csv     - Share of total attractions by trip purpose and Income for purposes in CSV format
; PA.dbf              - List of productions and attractions by 18 trip purposes in DBF format
; MSTM_Ps.csv         - List of productions by 18 trip purposes in CSV format
; MSTM_As.csv         - List of attractions by 18 trip purposes in CSV format

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; Version 1.0

;=======================================================================
;Set Parameters:

READ File = '..\stamp.log'

RUN PGM=GENERATION  PRNFILE='..\@scenario@\Outputs\Trip Generation - Activity Density.PRN'  MSG='Trip Generation - Activity Density'
   ;Read in the activities file.
   FILEI ZDATI[1]= ..\@scenario@\Inputs\Activities.csv, Z=#1, ACRES=#2, HH00=#3, ENR=#4, RE00=#5, OFF00=#6, OTH00=#7, TOT00=#8

   ;Create a dbf that will hold the arrays that contain the activity density calculation.
   FILEO PAO[1] = ..\@scenario@\Outputs\ActDen.dbf,
   FORM=20.2SLR,LIST=Z(4), P[1],dbf=t

   ;Loop through the zones and calculate the activity density for each.
   zones=@lastSMZ@
   IF(I=@zoneblank@)CONTINUE
   LOOP purpose=1 EXCLUDE =@zoneblank@
       P[purpose] = MAX(MIN((HH00+RE00+TOT00)/ACRES,99),0.01) ; Calculate the activity density
   ENDLOOP

   ; Output the activity density for each zone in a csv file.
   PRINT FORM=6,LIST=Z(3),
                P[1]
   PHASE=ADJUST
     JLOOP EXCLUDE =@zoneblank@
         IF (J == 1)
           PRINT CSV=y,
       FILE = ..\@scenario@\Outputs\ActivityDensity.csv,
           LIST = ";SMZ", "ActivityDensity"
         ENDIF

         PRINT CSV=y,
       FILE =..\@scenario@\Outputs\ActivityDensity.csv,
           LIST=J(4), P[1]
     ENDJLOOP

   ENDPHASE
ENDRUN


RUN PGM=GENERATION  PRNFILE='..\@scenario@\Outputs\Trip Generation.PRN'  MSG='Trip Generation'
   FILEI ZDATI[1]=..\@scenario@\Inputs\HBWAttrShares.csv, Z=#1, HBW20K=#2, HBW40K=#3, HBW60K=#4, HBW100K=#5, HBW100KPLUS=#6, HBSSUM=#7, HBOSUM=#8
   FILEI ZDATI[2]= ..\@scenario@\Inputs\ZonesToRegions.csv, Z=#1, REG=#2
   FILEO PAO[1] = ..\@scenario@\Outputs\INCQShares.dbf,
   FORM=20.2SLR,LIST=Z(3), P[1],P[2],P[3],P[4],P[5],P[6],P[7],P[8],P[9],P[10],
                          P[11],P[12],P[13],P[14],P[15],P[16],P[17],P[18],dbf=t

   ZONES = 1697
```

TripGeneration.s

```
LOOP purpose=1,18  EXCLUDE =@zoneblank@
  IF(I=@zoneblank@)CONTINUE

   IF (purpose>=1 & purpose<=5)
        READ,
         FILE = ..\@scenario@\Inputs\hbw_rates.txt
        TotalProd = Prod20k + Prod40k + Prod60k + Prod100k + Prod100kPlus
        HBWProdShare20k = Prod20k/TotalProd
        HBWProdShare40k = Prod40k/TotalProd
        HBWProdShare60k = Prod60k/TotalProd
        HBWProdShare100k = Prod100k/TotalProd
        HBWProdShare100kPlus = Prod100kPlus/TotalProd
     ENDIF
     IF (purpose>=6 & purpose<=10)
        array Ri1s1=8, Ri1s2=8, Ri1s3=8, Ri1s4=8, Ri1s5=8
        array Ri2s1=8, Ri2s2=8, Ri2s3=8, Ri2s4=8, Ri2s5=8
        array Ri3s1=8, Ri3s2=8, Ri3s3=8, Ri3s4=8, Ri3s5=8
        array Ri4s1=8, Ri4s2=8, Ri4s3=8, Ri4s4=8, Ri4s5=8
        array Ri5s1=8, Ri5s2=8, Ri5s3=8, Ri5s4=8, Ri5s5=8
;        array AHarr_a=8, AHarr_b=3, AHarr_c=3
        array Harr_a=8, Harr_b=8, Harr_c=8
        READ,
         FILE = ..\@scenario@\Inputs\hbs_rates.txt
     ENDIF
     IF (purpose>=11 & purpose<=15)
        READ,
         FILE = ..\@scenario@\Inputs\hbo_rates.txt
     ENDIF
        TotalProd = Prod20k + Prod40k + Prod60k + Prod100k + Prod100kPlus
        ProdShare20k = Prod20k/TotalProd
        ProdShare40k = Prod40k/TotalProd
        ProdShare60k = Prod60k/TotalProd
        ProdShare100k = Prod100k/TotalProd
        ProdShare100kPlus = Prod100kPlus/TotalProd
        RAWSUM  =   (HBW20K * ProdShare20k/HBWProdShare20k) + (HBW40K * ProdShare40k/HBWProdShare40k)+
                    (HBW60K * ProdShare60k/HBWProdShare60k) + (HBW100K * ProdShare100k/HBWProdShare100k)+
                    (HBW100KPLUS * ProdShare100kPlus/HBWProdShare100kPlus)

    IF(RAWSUM == 0)
  RAWSUM    =      1
   ENDIF
   IF (purpose==1)
P[purpose] =    HBW20K
   ENDIF
   IF (purpose==2)
P[purpose] =    HBW40K
   ENDIF
   IF (purpose==3)
P[purpose] =    HBW60K
   ENDIF
   IF (purpose==4)
P[purpose] =    HBW100K
   ENDIF
   IF (purpose==5)
P[purpose] =    HBW100KPLUS
   ENDIF
   IF (purpose==6)
P[purpose] =    HBW20K + HBW40K + HBW60K + HBW100K + HBW100KPLUS
   ENDIF
   IF (purpose==7||purpose==13)
P[purpose] =    ((HBW20K * ProdShare20k)/HBWProdShare20k)/RAWSUM
SUM = P[purpose]
   ENDIF
   IF (purpose==8||purpose==14)
P[purpose] =    ((HBW40K * ProdShare40k)/HBWProdShare40k)/RAWSUM
```

TripGeneration.s

```
          SUM = SUM + P[purpose]
        ENDIF
        IF (purpose==9||purpose==15)
      P[purpose] =      ((HBW60K * ProdShare60k)/HBWProdShare60k)/RAWSUM
      SUM = SUM + P[purpose]
        ENDIF
        IF (purpose==10||purpose==16)
      P[purpose] =      ((HBW100K * ProdShare100k)/HBWProdShare100k)/RAWSUM
      SUM = SUM + P[purpose]
        ENDIF
        IF (purpose==11||purpose==17)
      P[purpose] =      ((HBW100KPLUS * ProdShare100kPlus)/HBWProdShare100kPlus)/RAWSUM
      SUM = SUM + P[purpose]
        ENDIF
        IF (purpose==12||purpose==18)
      P[purpose] =      SUM
        ENDIF
    ENDLOOP

    PRINT FORM=6,LIST=Z(3), P[1],P[2],P[3],P[4],P[5],P[6],P[7],P[8],P[9],P[10],
                            P[11],P[12],P[13],P[14],P[15],P[16],P[17],P[18]

    PHASE=ADJUST
      JLOOP EXCLUDE =@zoneblank@
          IF (J == 1)
          PRINT CSV=y,
        FILE = ..\@scenario@\Outputs\INCQ_Shares.csv,
            LIST = ";SMZ", "HBW<$20K", "HBW$20-40K", "HBW$40-60K", "HBW$60-100K", "HBW$100K+", "SUM",
                     "HBSHP<$20K", "HBSHP$20-40K", "HBSHP$40-60K", "HBSHP$60-100K", "HBSHP$100K+", "SUM",
                     "HBOTH<$20K", "HBOTH$20-40K", "HBOTH$40-60K", "HBOTH$60-100K", "HBOTH$100K+", "SUM"

          ENDIF

          PRINT CSV=y,
        FILE = ..\@scenario@\Outputs\INCQ_Shares.csv,
            LIST=J(4), P[1],P[2],P[3],P[4],P[5],P[6],P[7],P[8],P[9],P[10],
                       P[11],P[12],P[13],P[14],P[15],P[16],P[17],P[18]

      ENDJLOOP

    ENDPHASE

ENDRUN


RUN PGM=GENERATION  PRNFILE='..\@scenario@\Outputs\Trip Generation - Balance PnAs.PRN'  MSG='Trip Generation - Balance PnAs'
  FILEI ZDATI[1]=..\@scenario@\Inputs\MotorizedShares.csv, Z=#1, HBW1=#2, HBW2=#3, HBW3=#4, HBW4=#5, HBW5=#6, HBS1=#7,
                                     HBS2=#8, HBS3=#9, HBS4=#10, HBS5=#11, HBO1=#12, HBO2=#13,
                                     HBO3=#14, HBO4=#15, HBO5=#16, HBSCH=#17, NHBW=#18, NHBO=#19

  FILEI ZDATI[2]=..\@scenario@\Inputs\HH_By_WRKS_INC.csv, Z=#1, WKR0_IQ1=#2, WKR0_IQ2=#3, WKR0_IQ3=#4, WKR0_IQ4=#5, WKR0_IQ5=#6,
                                     WKR1_IQ1=#7, WKR1_IQ2=#8, WKR1_IQ3=#9, WKR1_IQ4=#10, WKR1_IQ5=#11,
                                     WKR2_IQ1=#12, WKR2_IQ2=#13, WKR2_IQ3=#14, WKR2_IQ4=#15, WKR2_IQ5=#16,
                                     WKR3_IQ1=#17, WKR3_IQ2=#18, WKR3_IQ3=#19, WKR3_IQ4=#20, WKR3_IQ5=#21

  FILEI ZDATI[3]=..\@scenario@\Outputs\HH_By_SIZ_INC.csv, Z=#1,  SIZ1_IQ1=#2, SIZ1_IQ2=#3, SIZ1_IQ3=#4, SIZ1_IQ4=#5, SIZ1_IQ5=#6,
                                     SIZ2_IQ1=#7, SIZ2_IQ2=#8, SIZ2_IQ3=#9, SIZ2_IQ4=#10, SIZ2_IQ5=#11,
                                     SIZ3_IQ1=#12, SIZ3_IQ2=#13, SIZ3_IQ3=#14, SIZ3_IQ4=#15, SIZ3_IQ5=#16,
                                     SIZ4_IQ1=#17, SIZ4_IQ2=#18, SIZ4_IQ3=#19, SIZ4_IQ4=#20, SIZ4_IQ5=#21,
                                     SIZ5_IQ1=#22, SIZ5_IQ2=#23, SIZ5_IQ3=#24, SIZ5_IQ4=#25, SIZ5_IQ5=#26

  FILEI ZDATI[4]=..\@scenario@\Outputs\INCQ_Shares.csv, Z=#1,    HBW20K=#2, HBW40K=#3, HBW60K=#4, HBW100K=#5, HBW100Kplus=#6,
                                     SUM1=#7, HBSHP20K=#8, HBSHP40K=#9, HBSHP60K=#10, HBSHP100K=#11,
                                     HBSHP100Kplus=#12, SUM2=#13, HBOTH20K=#14, HBOTH40K=#15, HBOTH60K=#16,
                                     HBOTH100K=#17, HBOTH100Kplus=#18, SUM3=#19

  FILEI ZDATI[5]=..\@scenario@\Inputs\Activities.csv, Z=#1, ACRES=#2, HH00=#3, ENR=#4, RE00=#5, OFF00=#6, OTH00=#7, TOT00=#8
```

TripGeneration.s

```
FILEI ZDATI[6]=..\@scenario@\Outputs\ActivityDensity.csv, Z=#1, ACTDEN=#2
FILEI ZDATI[7] =..\@scenario@\Inputs\ZonesToRegions.csv, Z=#1, REG=#2
FILEI ZDATI[8]= ..\@scenario@\Inputs\TripProductionDampening_NJPAWV.csv, Z=#1, DAMPGEN=#2

FILEO PAO[1] = ..\@scenario@\Outputs\PA.dbf,
FORM=20.2SLR,LIST=Z(4), P[1],P[2],P[3],P[4],P[5],P[6],P[7],P[8],P[9],P[10],P[11],P[12],P[13],P[14],P[15],P[16],P[17],P[18],
                        A[1],A[2],A[3],A[4],A[5],A[6],A[7],A[8],A[9],A[10],A[11],A[12],A[13],A[14],A[15],A[16],A[17],A[18],dbf=t

ZONES = 1697
LOOP purpose=1,18
  IF(I=@zoneblank@)CONTINUE

    IF (purpose>=1&purpose<=5)
        READ,
         FILE ..\@scenario@\Inputs\hbw_rates.txt
         TOT_HBWA = (TOT00param * TOT00 + AvgActDen * ACTDEN)
    ENDIF
    IF (purpose==16)
        READ,
         FILE = ..\@scenario@\Inputs\hbsc_rates.txt
    ENDIF
    IF (purpose>=6&purpose<=10)
        READ,
         FILE = ..\@scenario@\Inputs\hbs_rates.txt
         TOT_HBSHA = (RET00param * RE00 + AvgActDen * ACTDEN)
    ENDIF
    IF (purpose>=11&purpose<=15)
        READ,
         FILE = ..\@scenario@\Inputs\hbo_rates.txt
         TOT_HBOTHA = (HH00param * HH00 + OTH00param * OTH00)
    ENDIF
    IF (purpose==17)
        READ,
         FILE = ..\@scenario@\Inputs\nhbw_rates.txt
    ENDIF
    IF (purpose==18)
        READ,
         FILE = ..\@scenario@\Inputs\obo_rates.txt
    ENDIF

    IF (purpose==1)
    P[purpose] =       (i1w0*WKR0_IQ1+i1w1*WKR1_IQ1+i1w2*WKR2_IQ1+i1w3*WKR3_IQ1)* HBW1 * (1- ZI.8.DAMPGEN)
    A[purpose] =       TOT_HBWA * HBW20K
    ENDIF

    IF (purpose==2)
    P[purpose] =       (i2w0*WKR0_IQ2+i2w1*WKR1_IQ2+i2w2*WKR2_IQ2+i2w3*WKR3_IQ2)* HBW2 * (1- ZI.8.DAMPGEN)
    A[purpose] =       TOT_HBWA * HBW40K
    ENDIF

    IF (purpose==3)
    P[purpose] =       (i3w0*WKR0_IQ3+i3w1*WKR1_IQ3+i3w2*WKR2_IQ3+i3w3*WKR3_IQ3)* HBW3 * (1- ZI.8.DAMPGEN)
    A[purpose] =       TOT_HBWA * HBW60K
    ENDIF

    IF (purpose==4)
    P[purpose] =       (i4w0*WKR0_IQ4+i4w1*WKR1_IQ4+i4w2*WKR2_IQ4+i4w3*WKR3_IQ4)* HBW4 * (1- ZI.8.DAMPGEN)
    A[purpose] =       TOT_HBWA * HBW100K
    ENDIF

    IF (purpose==5)
    P[purpose] =       (i5w0*WKR0_IQ5+i5w1*WKR1_IQ5+i5w2*WKR2_IQ5+i5w3*WKR3_IQ5)* HBW5 * (1- ZI.8.DAMPGEN)
    A[purpose] =       TOT_HBWA * HBW100Kplus
    ENDIF
```

TripGeneration.s

```
IF (purpose==6)
P[purpose] =        (i1s1*SIZ1_IQ1+i1s2*SIZ2_IQ1+i1s3*SIZ3_IQ1+i1s4*SIZ4_IQ1+i1s5*SIZ5_IQ1)* HBS1
A[purpose] =        TOT_HBSHA * HBSHP20K
ENDIF

IF (purpose==7)
P[purpose] =        (i2s1*SIZ1_IQ2+i2s2*SIZ2_IQ2+i2s3*SIZ3_IQ2+i2s4*SIZ4_IQ2+i2s5*SIZ5_IQ2)* HBS2
A[purpose] =        TOT_HBSHA * HBSHP40K
ENDIF

IF (purpose==8)
P[purpose] =        (i3s1*SIZ1_IQ3+i3s2*SIZ2_IQ3+i3s3*SIZ3_IQ3+i3s4*SIZ4_IQ3+i3s5*SIZ5_IQ3)* HBS3
A[purpose] =        TOT_HBSHA * HBSHP60K
ENDIF

IF (purpose==9)
P[purpose] =        (i4s1*SIZ1_IQ4+i4s2*SIZ2_IQ4+i4s3*SIZ3_IQ4+i4s4*SIZ4_IQ4+i4s5*SIZ5_IQ4)* HBS4
A[purpose] =        TOT_HBSHA * HBSHP100K
ENDIF

IF (purpose==10)
P[purpose] =        (i5s1*SIZ1_IQ5+i5s2*SIZ2_IQ5+i5s3*SIZ3_IQ5+i5s4*SIZ4_IQ5+i5s5*SIZ5_IQ5)* HBS5
A[purpose] =        TOT_HBSHA * HBSHP100Kplus
ENDIF

IF (purpose==11)
P[purpose] =        (i1s1*SIZ1_IQ1+i1s2*SIZ2_IQ1+i1s3*SIZ3_IQ1+i1s4*SIZ4_IQ1+i1s5*SIZ5_IQ1)* HBO1
A[purpose] =        TOT_HBOTHA * HBOTH20K
ENDIF

IF (purpose==12)
P[purpose] =        (i2s1*SIZ1_IQ2+i2s2*SIZ2_IQ2+i2s3*SIZ3_IQ2+i2s4*SIZ4_IQ2+i2s5*SIZ5_IQ2)* HBO2
A[purpose] =        TOT_HBOTHA * HBOTH40K
ENDIF

IF (purpose==13)
P[purpose] =        (i3s1*SIZ1_IQ3+i3s2*SIZ2_IQ3+i3s3*SIZ3_IQ3+i3s4*SIZ4_IQ3+i3s5*SIZ5_IQ3)* HBO3
A[purpose] =        TOT_HBOTHA * HBOTH60K
ENDIF

IF (purpose==14)
P[purpose] =        (i4s1*SIZ1_IQ4+i4s2*SIZ2_IQ4+i4s3*SIZ3_IQ4+i4s4*SIZ4_IQ4+i4s5*SIZ5_IQ4)* HBO4
A[purpose] =        TOT_HBOTHA * HBOTH100K
ENDIF

IF (purpose==15)
P[purpose] =        (i5s1*SIZ1_IQ5+i5s2*SIZ2_IQ5+i5s3*SIZ3_IQ5+i5s4*SIZ4_IQ5+i5s5*SIZ5_IQ5)* HBO5
A[purpose] =        TOT_HBOTHA * HBOTH100Kplus
ENDIF

IF (purpose==16)
P[purpose] =        (i1s1*SIZ1_IQ1+i1s2*SIZ2_IQ1+i1s3*SIZ3_IQ1+i1s4*SIZ4_IQ1+i1s5*SIZ5_IQ1+
                    i2s1*SIZ1_IQ2+i2s2*SIZ2_IQ2+i2s3*SIZ3_IQ2+i2s4*SIZ4_IQ2+i2s5*SIZ5_IQ2+
                    i3s1*SIZ1_IQ3+i3s2*SIZ2_IQ3+i3s3*SIZ3_IQ3+i3s4*SIZ4_IQ3+i3s5*SIZ5_IQ3+
                    i4s1*SIZ1_IQ4+i4s2*SIZ2_IQ4+i4s3*SIZ3_IQ4+i4s4*SIZ4_IQ4+i4s5*SIZ5_IQ4+
                    i5s1*SIZ1_IQ5+i5s2*SIZ2_IQ5+i5s3*SIZ3_IQ5+i5s4*SIZ4_IQ5+i5s5*SIZ5_IQ5) * HBSCH * 0.5622   ; 0.5622 = factor to exclude school bus trips
A[purpose] =        (ENROLLparam * ENR) * HBSCH * 0.5622                                                      ; 0.5622 = factor to exclude school bus trips

ENDIF
IF (purpose==17)
P[purpose] =        (i1w0*WKR0_IQ1+i1w1*WKR1_IQ1+i1w2*WKR2_IQ1+i1w3*WKR3_IQ1+
                    i2w0*WKR0_IQ2+i2w1*WKR1_IQ2+i2w2*WKR2_IQ2+i2w3*WKR3_IQ2+
                    i3w0*WKR0_IQ3+i3w1*WKR1_IQ3+i3w2*WKR2_IQ3+i3w3*WKR3_IQ3+
                    i4w0*WKR0_IQ4+i4w1*WKR1_IQ4+i4w2*WKR2_IQ4+i4w3*WKR3_IQ4+
```

TripGeneration.s

```
                           i5w0*WKR0_IQ5+i5w1*WKR1_IQ5+i5w2*WKR2_IQ5+i5w3*WKR3_IQ5) * NHBW
     A[purpose] =          (RET00param * RE00 + OFF00param * OFF00 + OTH00param * OTH00 + AvgActDen * ACTDEN) * NHBW

     ENDIF

     IF (purpose==18)
        P[purpose] =       (i1s1*SIZ1_IQ1+i1s2*SIZ2_IQ1+i1s3*SIZ3_IQ1+i1s4*SIZ4_IQ1+i1s5*SIZ5_IQ1+
                           i2s1*SIZ1_IQ2+i2s2*SIZ2_IQ2+i2s3*SIZ3_IQ2+i2s4*SIZ4_IQ2+i2s5*SIZ5_IQ2+
                           i3s1*SIZ1_IQ3+i3s2*SIZ2_IQ3+i3s3*SIZ3_IQ3+i3s4*SIZ4_IQ3+i3s5*SIZ5_IQ3+
                           i4s1*SIZ1_IQ4+i4s2*SIZ2_IQ4+i4s3*SIZ3_IQ4+i4s4*SIZ4_IQ4+i4s5*SIZ5_IQ4+
                           i5s1*SIZ1_IQ5+i5s2*SIZ2_IQ5+i5s3*SIZ3_IQ5+i5s4*SIZ4_IQ5+i5s5*SIZ5_IQ5)  * NHBO
     A[purpose] =          (HH00param * HH00 + OTH00param * OTH00) * NHBO

    ENDIF
 ENDLOOP


; ----- print the input zonal data and computed productions and attractions
PRINT FORM=6,LIST=Z(3),
          P[1],P[2],P[3],P[4],P[5],P[6],P[7],P[8],P[9],P[10],P[11],P[12],P[13],P[14],P[15],P[16],P[17],P[18],
          A[1],A[2],A[3],A[4],A[5],A[6],A[7],A[8],A[9],A[10],A[11],A[12],A[13],A[14],A[15],A[16],A[17],A[18]

 ; ----- adjust zonal attractions so total attractions match total productions
PHASE=ADJUST
     A[1 ] = P[1 ][0]/A[1 ][0] * A[1 ]      ; adjust a's to match p's
     A[2 ] = P[2 ][0]/A[2 ][0] * A[2 ]
     A[3 ] = P[3 ][0]/A[3 ][0] * A[3 ]
     A[4 ] = P[4 ][0]/A[4 ][0] * A[4 ]
     A[5 ] = P[5 ][0]/A[5 ][0] * A[5 ]
     A[6 ] = P[6 ][0]/A[6 ][0] * A[6 ]
     A[7 ] = P[7 ][0]/A[7 ][0] * A[7 ]
     A[8 ] = P[8 ][0]/A[8 ][0] * A[8 ]
     A[9 ] = P[9 ][0]/A[9 ][0] * A[9 ]
     A[10 ] = P[10 ][0]/A[10 ][0] * A[10 ]
     A[11 ] = P[11 ][0]/A[11 ][0] * A[11 ]
     A[12 ] = P[12 ][0]/A[12 ][0] * A[12 ]
     A[13 ] = P[13 ][0]/A[13 ][0] * A[13 ]
     A[14 ] = P[14 ][0]/A[14 ][0] * A[14 ]
     A[15 ] = P[15 ][0]/A[15 ][0] * A[15 ]
     P[16 ] = A[16 ][0]/P[16 ][0] * P[16 ]  ; Attractions uses enrollment data.
     A[17 ] = P[17 ][0]/A[17 ][0] * A[17 ]  ; Scale A's to match total P's (since P's are HTS and have more confidence in total Productions)
     P[17 ] = A[17]                         ; Replace taz level productions with adjusted Attractions.
     A[18 ] = P[18 ][0]/A[18 ][0] * A[18 ]  ; Scale A's to match total P's (since P's are HTS and have more confidence in total Productions)
     P[18 ] = A[18]                         ; Replace taz level productions with adjusted Attractions.

     ; print links to a CSV
     JLOOP EXCLUDE =@zoneblank@
       IF (J == 1)
       PRINT CSV=y,
       FILE = ..\@scenario@\Outputs\MSTM_Ps.csv,
       LIST = ";SMZ", "HBWP1","HBWP2","HBWP3","HBWP4","HBWP5","HBSP1","HBSP2","HBSP3","HBSP4","HBSP5",
                 "HBOP1","HBOP2","HBOP3","HBOP4","HBOP5","HBSCHP","NHBW","OBOP"

       ENDIF

       PRINT CSV=y,
       FILE = ..\@scenario@\Outputs\MSTM_Ps.csv,
       ; increase trips by 20%
       LIST=J(4),
P[1],P[2],P[3],P[4],P[5],1.20*P[6],1.20*P[7],1.20*P[8],1.20*P[9],1.20*P[10],1.20*P[11],1.20*P[12],1.20*P[13],1.20*P[14],1.20*P[15],1.20*P[16],1.40*P[17],1.40*P[18]
     ENDJLOOP

     JLOOP EXCLUDE =@zoneblank@
       IF (J == 1)
       PRINT CSV=y,
       FILE = ..\@scenario@\Outputs\MSTM_As.csv,
```

TripGeneration.s

```
         LIST = ";SMZ", "HBWA1","HBWA2","HBWA3","HBWA4","HBWA5","HBSA1","HBSA2","HBSA3","HBSA4","HBSA5",
                        "HBOA1","HBOA2","HBOA3","HBOA4","HBOA5","HBSCHA","NHBW","OBOA"
           ENDIF

           PRINT CSV=y,
           FILE = ..\@scenario@\Outputs\MSTM_As.csv,
           LIST=J(4),
A[1],A[2],A[3],A[4],A[5],1.20*A[6],1.20*A[7],1.20*A[8],1.20*A[9],1.20*A[10],1.20*A[11],1.20*A[12],1.20*A[13],1.20*A[14],1.20*A[15],1.20*A[16],1.40*A[17],1.40*A[18]
        ENDJLOOP

     ENDPHASE

ENDRUN
```

TripDistribution.s

```
; Maryland Statewide Travel Demand Model (MSTM)
;
; Script: Trip Distribution
;
; About:
; This script distributes home-based-school trips based on gravity model.

; Description:
; STEP 1: Computes a composite time skim from the highway and walk to transit peak skims
; STEP 2: Computes friction factors (impedence)
; Step 3: Distributes productions and attractions based on the composite skims and impedence
; Step 4: Computes average trip length frequency distribution for the entire model and
;          for the survey region trips

; Input files:
; HwyPK.skm    - peak highway skim
; WTrnPK.skm   - peak walk to transit skims
; MSTM_Ps.csv  - model prodcutions
; MSTM_As.csv  - model attractions

; Output files:
; CT<purpose>.skm      - compostive skims by trip purpose
; <purpose>FFFile.CSV  - frictional factors by trip prupose
; <purpos>.trp         - trip tables by trip purpose
; FREQDIST.DAT         - frequency distribution report

; Authors:
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;
; Version 1.1

;=======================================================================
;Set Parameters:
READ File = '..\stamp.log'
READ File = '..\iteration.txt'

LOOP purpose=16,16

  IF (purpose=1)   TripMat='HBW1.trp' , X=0.30 , Y=0.90 , VoT=   8.4 , Beta=0.6 , Gamma=-0.174 , tm='PK' , Pname='HBW1', Adj = 1.555
  IF (purpose=2)   TripMat='HBW2.trp' , X=0.02 , Y=0.90 , VoT=  25.0 , Beta=0.7 , Gamma=-0.154 , tm='PK' , Pname='HBW2', Adj = 1.401
  IF (purpose=3)   TripMat='HBW3.trp' , X=0.00 , Y=0.90 , VoT=  41.7 , Beta=0.8 , Gamma=-0.116 , tm='PK' , Pname='HBW3', Adj = 1.261
  IF (purpose=4)   TripMat='HBW4.trp' , X=0.00 , Y=0.90 , VoT=  50.4 , Beta=1.1 , Gamma=-0.108 , tm='PK' , Pname='HBW4', Adj = 1.247
  IF (purpose=5)   TripMat='HBW5.trp' , X=0.00 , Y=0.00 , VoT= 106.4 , Beta=0.8 , Gamma=-0.102 , tm='PK' , Pname='HBW5', Adj = 1.259
```

TripDistribution.s

```
   IF (purpose=6)   TripMat='HBS1.trp' , X=0.00 , Y=2.10 , VoT=   8.4  , Beta=0.1 , Gamma=-0.66  , tm='PK' , Pname='HBS1', Adj = 1.552
   IF (purpose=7)   TripMat='HBS2.trp' , X=0.02 , Y=0.70 , VoT=  25.0  , Beta=0.1 , Gamma=-0.34  , tm='PK' , Pname='HBS2', Adj = 1.142
   IF (purpose=8)   TripMat='HBS3.trp' , X=0.01 , Y=0.70 , VoT=  41.7  , Beta=0.1 , Gamma=-0.3   , tm='PK' , Pname='HBS3', Adj = 1.057
   IF (purpose=9)   TripMat='HBS4.trp' , X=0.00 , Y=0.70 , VoT=  50.4  , Beta=0.1 , Gamma=-0.33  , tm='PK' , Pname='HBS4', Adj = 1.038
   IF (purpose=10)  TripMat='HBS5.trp' , X=0.00 , Y=0.70 , VoT= 106.4  , Beta=0.1 , Gamma=-0.36  , tm='PK' , Pname='HBS5', Adj = 1.040
   IF (purpose=11)  TripMat='HBO1.trp' , X=0.00 , Y=0.00 , VoT=   8.4  , Beta=0.1 , Gamma=-0.46  , tm='PK' , Pname='HBO1', Adj = 1.548
   IF (purpose=12)  TripMat='HBO2.trp' , X=0.05 , Y=1.35 , VoT=  25.0  , Beta=0.1 , Gamma=-0.21  , tm='PK' , Pname='HBO2', Adj = 1.218
   IF (purpose=13)  TripMat='HBO3.trp' , X=0.02 , Y=1.35 , VoT=  41.7  , Beta=0.1 , Gamma=-0.214 , tm='PK' , Pname='HBO3', Adj = 1.101
   IF (purpose=14)  TripMat='HBO4.trp' , X=0.00 , Y=1.35 , VoT=  50.4  , Beta=0.1 , Gamma=-0.26  , tm='PK' , Pname='HBO4', Adj = 1.045
   IF (purpose=15)  TripMat='HBO5.trp' , X=0.00 , Y=1.35 , VoT= 106.4  , Beta=0.1 , Gamma=-0.23  , tm='PK' , Pname='HBO5', Adj = 1.086
   IF (purpose=16)  TripMat='HBSc.trp ', X=0.00 , Y=0.00 , VoT=  45.2  , Beta=0.9 , Gamma=-0.36  , tm='PK' , Pname='HBSc', Adj = 1.546
   IF (purpose=17)  TripMat='NHBW.trp ', X=0.00 , Y=1.25 , VoT=  45.2  , Beta=0.1 , Gamma=-0.15  , tm='PK' , Pname='NHBW', Adj = 1.020
   IF (purpose=18)  TripMat='OBO.trp ' , X=0.00 , Y=2.10 , VoT=  45.2  , Beta=0.1 , Gamma=-0.26  , tm='PK' , Pname='OBO', Adj = 1.054


   Alpha = 10000000              ; Remains Same for all Purposes


   ; Creating CT matrix for this purpose
   RUN PGM=MATRIX    PRNFILE='..\@scenario@\Outputs\Trip Distribution-Composite Time Matrix.PRN'  MSG='Trip Distribution-Composite Time Matrix'
    MATI[1]=..\@scenario@\Outputs\Hwy@tm_iter@iteration@.skm
    MATI[2]=..\@scenario@\Outputs\WTrn@tm@.skm

    MATO[1]=..\@scenario@\Outputs\CT@Pname@.skm, MO=4, NAME=@Pname@CT
    zones=@lastSMZ@

    MW[1]=MI.1.7          ; HT with intrazonals
    MW[2]=MI.2.13         ; TT without intrazonals
    MW[3]=MI.1.3          ; Toll Matrix in cents


    IF (I= @zoneblank@)
      MW[2]= 0
    ELSE
      JLOOP EXCLUDE =@zoneblank@
        IF (MW[2]<>0)
          MW[4]= ((1/ ( 1/MW[1] + @X@/MW[2] ) ) + (@Y@*MW[3]/@VoT@)) * @Adj@ ; Create Composite Time Matrix = [1/( 1/HT + x/TT )] + [y*TL/vot]; in addition, adjust to account for average
average trip length difference between skims and travel times reported in the survey
        ELSE
          MW[4]= ((1/ ( 1/MW[1]              ) ) + (@Y@*MW[3]/@VoT@)) * @Adj@ ; CT matrix (LOS matrix for Gravity Model); in addition, adjust to account for average trip length
difference between skims and travel times reported in the survey
        ENDIF
      ENDJLOOP
    ENDIF
  ENDRUN


  ; ---- uncomment this is you need to use the funtions to calculate and output the friction factors.
  RUN PGM=MATRIX
    zones = 1
    FILEO PRINTO[1]= ..\@scenario@\Outputs\@Pname@FFFile.CSV, APPEND=F
    PRINT CSV=T, LIST=';Friction Factors', PRINTO=1, rewind=T

    LOOP CT= 1,151,3             ; Creating FFs for use in distribution
      FF=@alpha@*(CT^@Beta@)*exp(@gamma@*CT)
      PRINT CSV=T, FORM=10.5, LIST=CT,FF, PRINTO=1
    ENDLOOP
  ENDRUN


  RUN PGM=DISTRIBUTION  PRNFILE='..\@scenario@\Outputs\Trip Distribution.PRN'  MSG='Trip Distribution'
    MATI[1] = ..\@scenario@\Outputs\Hwy@tm_iter@iteration@.skm
    MATI[2] = ..\@scenario@\Outputs\CT@Pname@.skm
    ZDATI[1]                                                      =                          ..\@scenario@\Outputs\MSTM_Ps.csv,Z=#1,
P1=#2,P2=#3,P3=#4,P4=#5,P5=#6,P6=#7,P7=#8,P8=#9,P9=#10,P10=#11,P11=#12,P12=#13,P13=#14,P14=#15,P15=#16,P16=#17,P17=#18,P18=#19
    ZDATI[2]                                                      =                          ..\@scenario@\Outputs\MSTM_As.csv,Z=#1,
A1=#2,A2=#3,A3=#4,A4=#5,A5=#6,A6=#7,A7=#8,A8=#9,A9=#10,A10=#11,A11=#12,A12=#13,A13=#14,A14=#15,A15=#16,A16=#17,A17=#18,A18=#19
```

TripDistribution.s

```
     MATO = ..\@scenario@\Outputs\@Pname@.trp, MO=1

    MAXITERS = 10            ; Default is 3
    MAXRMSE  = 10            ; Default value

;   ----- setup friction factor lookup tables, input from file
     LOOKUP FILE=..\@scenario@\Outputs\@Pname@FFFile.CSV, INTERPOLATE=Y, NAME=FF,
       LOOKUP[1]=1,RESULT=2

;   ----- setup the working p's and a's
     SETPA P[1]=P@Purpose@  A[1]=A@Purpose@

;   ----- get the los matrix into work matrix
     MW[2]=MI.1.8            ; SOV Distance (mw1 is reserved for the Trips from the gravity model!)
     MW[3]=MI.2.1            ; CT matrix


;   ----- do the gravity model followed by frequency summation
     GRAVITY   PURPOSE=1, LOS=MW[3], FFACTORS=FF
;----- get a comparison report on last iteration
; REPORT ACOMP=1-4, ITERATIONS=1,5,10              ; print reports for 1st,5th and 10th iterations for purposes 1 to 4.
ENDRUN

RUN PGM=MATRIX   PRNFILE='..\@scenario@\Outputs\Trip Distribution-FQEQDIST.PRN'  MSG='Trip Distribution-FQEQDIST'
   FILEI MATI[1] = ..\@scenario@\Outputs\@Pname@.trp
   FILEI MATI[2] = ..\@scenario@\Outputs\Hwy@tm@_iter@iteration@.skm
   FILEO PRINTO[4] =  ..\@scenario@\Outputs\FREQDIST.DAT, APPEND = T
   MW[1]=MI.1.1            ; Trips by purpose
   MW[2]=MI.2.8            ; SOV Distance

   zones=@lastSMZ@

   JLOOP
    IF (I = 1-599, 609-966, 1188-1271)
      IF     ( 0 <= MW[2] & MW[2]<  5)
        T0 = T0 + MW[1]
      ELSEIF ( 5 <= MW[2] & MW[2]< 10)
        T5 = T5 + MW[1]
      ELSEIF (10 <= MW[2] & MW[2]< 15)
        T10 = T10 + MW[1]
      ELSEIF (15 <= MW[2] & MW[2]< 20)
        T15 = T15 + MW[1]
      ELSEIF (20 <= MW[2] & MW[2]< 30)
        T20 = T20 + MW[1]
      ELSEIF (30 <= MW[2] & MW[2]< 45)
        T30 = T30 + MW[1]
      ELSEIF   ( 45 <= MW[2])
        T45 = T45 + MW[1]
      ENDIF

      Tij   = Tij    + MW[1]
      TijDij = TijDij + MW[1]*MW[2]

    ENDIF
    MTij   = MTij    + MW[1]
    MTijDij = MTijDij + MW[1]*MW[2]
    IF (I=@lastSMZ@ & J=@lastSMZ@)
        ATL  = TijDij/Tij
        MATL = MTijDij/MTij

        F0  = T0 /Tij
        F5  = T5 /Tij
        F10 = T10/Tij
        F15 = T15/Tij
        F20 = T20/Tij
```

TripDistribution.s

```
           F30 = T30/Tij
           F45 = T45/Tij

           PRINT LIST = '    ITERATION   PURPOSE  GAMMA      BETA' PRINTO = 4
           PRINT LIST = @PURPOSE@(10.0),@gamma@ , @BETA@ PRINTO = 4

           PRINT LIST = '< 5      ',  F0(10.3) PRINTO = 4
           PRINT LIST = '5 to 10  ',  F5(10.3) PRINTO = 4
           PRINT LIST = '10 to 15 ', F10(10.3) PRINTO = 4
           PRINT LIST = '15 to 20 ', F15(10.3) PRINTO = 4
           PRINT LIST = '20 to 30 ', F20(10.3) PRINTO = 4
           PRINT LIST = '30 to 45 ', F30(10.3) PRINTO = 4
           PRINT LIST = '45+      ', F45(10.3) PRINTO = 4
      ENDIF
   ENDJLOOP

  LOG VAR=ATL
  LOG VAR=MATL
 ENDRUN

RUN PGM=MATRIX PRNFILE='..\@scenario@\Outputs\Trip Distribution-TDLF.PRN'  MSG='Trip Distribution-TDLF'
   ;  -----Create the trip length frequency distributions
   ;Read in the trip table by purpose
   FILEI MATI[1] = ..\@scenario@\Outputs\@TripMat@
   ;Read in the travel times
   FILEI MATI[2] = ..\@scenario@\Outputs\Hwy@tm@_iter@iteration@.skm

   MW[1]=MI.1.1
   MW[2]=MI.2.2

   FREQUENCY BASEMW=2,VALUEMW=1,RANGE=1-120-3,
   TITLE='*****@Pname@*****'
 ENDRUN

; Get Average TDLF for survey region trips only
RUN PGM=MATRIX PRNFILE='..\@scenario@\Outputs\Trip Distribution-TDLF Survey Region.PRN'  MSG='Trip Distribution-TDLF Survey Region'
   ;  -----Create the trip length frequency distributions
   ;Read in the trip table by purpose
   FILEI MATI[1] = ..\@scenario@\Outputs\@TripMat@
   ;Read in the travel times
   FILEI MATI[2] = ..\@scenario@\Outputs\Hwy@tm@_iter@iteration@.skm

   JLOOP
    if(I == @SurveyZones@ & J == @SurveyZones@)
     MW[1]=MI.1.1
     MW[2]=MI.2.2
    endif
   ENDJLOOP
   FREQUENCY BASEMW=2,VALUEMW=1,RANGE=1-120-3,
   TITLE='*****@Pname@*****'
 ENDRUN

ENDLOOP
```

DCModel.s

```
; Maryland Statewide Travel Demand Model (MSTM)
;
; Script: Destination Choice Model
;
; About:
; This script distributes trips by all purposes except home-based-school trips based on destination choice model.

; Description:
; STEP 1: Computes utilities by mode based on skims, parking cost, mode specific coeffiecients by purpose and income
;         and computes mode choice logsums by purpose
; STEP 2: Distributes trip productions based on destination choice model with logsums as the impedence and activity
;         as the attraction size term

; Input files:
; Hwy<OP/PK>.skm               - peak/off-peak highway skims
; <access><trnmode><OP/PK>.skm - peak/off-peak transit skims by walk and drive access
; FareByModes.mtx              - zonal transit fares by modes
; AreaType.dat                 - zonal area types
; ParkCost.dat                 - zonal parking cost
; SMZ_WalkShare.csv            - zone share of walk accessibility to transit
; ModeChoiceCoeff.dat          - mode specific coefficients
; destchoiceParameters.dat     - destiantion choice model coefficients
; HHbyIncome.csv               - households by income
; Activities.csv               - zonal activies (employment data)
; MSTM_ps.csv                  - zonal trip productions
; iteration.txt                - file indicating which iteration is running
; Output files:
; LogSum_<purpose>.mtx         - mode choice logsums by prupose
; Dest_<purpose>.trp           - distributed trips from the destination choice model

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;
; Version 1.0

;========================================================================

; Read general mode-specific constants from a file
READ File = '..\stamp.log'
READ File = '..\iteration.txt'

  LOOP p = 1,18    ; Purpose loop

    IF (p =1 )   pur = 'HBW1' ,  tm = 'PK' ,  Wrk='Wrk'    , purCoeff = 'HBW'  , Cgrp = '_1', Inc = 'Dcinc1', prods = '#2 '
    IF (p =2 )   pur = 'HBW2' ,  tm = 'PK' ,  Wrk='Wrk'    , purCoeff = 'HBW'  , Cgrp = '_1', Inc = 'Dcinc2', prods = '#3 '
    IF (p =3 )   pur = 'HBW3' ,  tm = 'PK' ,  Wrk='Wrk'    , purCoeff = 'HBW'  , Cgrp = '_1', Inc = 'Dcinc3', prods = '#4 '
    IF (p =4 )   pur = 'HBW4' ,  tm = 'PK' ,  Wrk='Wrk'    , purCoeff = 'HBW'  , Cgrp = '_1', Inc = 'Dcinc4', prods = '#5 '
    IF (p =5 )   pur = 'HBW5' ,  tm = 'PK' ,  Wrk='Wrk'    , purCoeff = 'HBW'  , Cgrp = '_1', Inc = 'Dcinc5', prods = '#6 '
    IF (p =6 )   pur = 'HBS1' ,  tm = 'OP' ,  Wrk='NonWrk' , purCoeff = 'HBS'  , Cgrp = '_2', Inc = 'Dcinc1', prods = '#7 '
    IF (p =7 )   pur = 'HBS2' ,  tm = 'OP' ,  Wrk='NonWrk' , purCoeff = 'HBS'  , Cgrp = '_2', Inc = 'Dcinc2', prods = '#8 '
    IF (p =8 )   pur = 'HBS3' ,  tm = 'OP' ,  Wrk='NonWrk' , purCoeff = 'HBS'  , Cgrp = '_2', Inc = 'Dcinc3', prods = '#9 '
    IF (p =9 )   pur = 'HBS4' ,  tm = 'OP' ,  Wrk='NonWrk' , purCoeff = 'HBS'  , Cgrp = '_2', Inc = 'Dcinc4', prods = '#10'
    IF (p =10)   pur = 'HBS5' ,  tm = 'OP' ,  Wrk='NonWrk' , purCoeff = 'HBS'  , Cgrp = '_2', Inc = 'Dcinc5', prods = '#11'
    IF (p =11)   pur = 'HBO1' ,  tm = 'OP' ,  Wrk='NonWrk' , purCoeff = 'HBO'  , Cgrp = '_2', Inc = 'Dcinc1', prods = '#12'
    IF (p =12)   pur = 'HBO2' ,  tm = 'OP' ,  Wrk='NonWrk' , purCoeff = 'HBO'  , Cgrp = '_2', Inc = 'Dcinc2', prods = '#13'
    IF (p =13)   pur = 'HBO3' ,  tm = 'OP' ,  Wrk='NonWrk' , purCoeff = 'HBO'  , Cgrp = '_2', Inc = 'Dcinc3', prods = '#14'
    IF (p =14)   pur = 'HBO4' ,  tm = 'OP' ,  Wrk='NonWrk' , purCoeff = 'HBO'  , Cgrp = '_2', Inc = 'Dcinc4', prods = '#15'
    IF (p =15)   pur = 'HBO5' ,  tm = 'OP' ,  Wrk='NonWrk' , purCoeff = 'HBO'  , Cgrp = '_2', Inc = 'Dcinc5', prods = '#16'
    IF (p =16) continue  ; DC Model is not applied to school trips
    IF (p =17)   pur = 'NHBW' ,  tm = 'PK' ,  Wrk='Wrk'    , purCoeff = 'NHBW' , Cgrp = '_1', Inc = 'Dcinc1', prods = '#18'
    IF (p =18)   pur = 'OBO'  ,  tm = 'OP' ,  Wrk='NonWrk' , purCoeff = 'OBO'  , Cgrp = '_3', Inc = 'Dcinc1', prods = '#19'

        ; Compute Utility
```

DCModel.s

```
RUN PGM=MATRIX     PRNFILE='..\@scenario@\Outputs\@pur@ DC Model-MC LogSums.PRN'  MSG='@pur@ DC Model-MC LogSums'

; Model structure:
;                              Person
;          _____|_____
;          |                                     |
;        Auto                               Transit(b)
;      ____|___                      _____|_____
;      |       |                     |                          |
;    SR(b)    DA                   Walk                       PnR(b)
;    __|__                 _____|_____  _____      _____|_____  _____
;    |    |                |       |      |       |     |      |      |        |
;  SR2  SR3+(b)           Bus    Rail(b) CR(b)  Exp(b)  Bus  Rail(b) CR(b)   Exp(b)

; (b) = carries bias coef

  MATI[1] =  ..\@scenario@\Outputs\Hwy@tm@_iter@iteration@.skm
  MATI[2] =  ..\@scenario@\Outputs\WBus@tm@.skm
  MATI[3] =  ..\@scenario@\Outputs\WExpBus@tm@.skm
  MATI[4] =  ..\@scenario@\Outputs\WRail@tm@.skm
  MATI[5] =  ..\@scenario@\Outputs\WCRail@tm@.skm
  MATI[6] =  ..\@scenario@\Outputs\DBus@tm@.skm
  MATI[7] =  ..\@scenario@\Outputs\DExpBus@tm@.skm
  MATI[8] =  ..\@scenario@\Outputs\DRail@tm@.skm
  MATI[9] =  ..\@scenario@\Outputs\DCRail@tm@.skm
  MATI[10] = ..\@scenario@\Outputs\WTrn@tm@.skm
  MATI[20] = ..\@scenario@\Outputs\DTrn@tm@.skm


; Fare inputs
  MATI[12] = ..\@scenario@\inputs\FareByModes.mtx

; Output skims (just for checking purposes not used in the model)
;  MATO[2] = @pur@UtilitiesTest.skm, MO = 1-11, NAME = Uda, Usr2, Usr3, Uwbus, Uwexpbus, Uwrail, Uwcrail, Udbus, Udexpbus, Udrail, Udcrail

;Output Logsums
 MATO[1] = ..\@scenario@\Outputs\LogSum_@pur@.mtx, Mo=24

; This model is applied only to SMZ-SMZ Interchanges.
  zones=@lastSMZ@

; Areatype table
  ZDATI[3]='..\@scenario@\Inputs\AreaType.dat', z=#1, atype=#2

; Parking Cost Lookup table
  ZDATI[1] = '..\@scenario@\Inputs\ParkCost.dat', z=#1, WrkPCost=#2, NonWrkPCost=#3, ActDen=#4

; Walk Shares
  ZDATI[2] = '..\@scenario@\Inputs\SMZ_WalkShare.csv', z=#1, WlkShr=#2

; Terminal time lookup table, as a function of area type.
  LOOKUP INTERPOLATE = n, FAIL = 0,0,0, NAME = termtm,
  ;      term AT
     r = '1  1',
         '1  2',
         '1  3',
         '1  4',
         '1  5',
         '2  6',
         '2  7',
         '3  8',
         '6  9'

; Lookup table for average occupancy of 3+ occupant vehicles, by purpose.
  LOOKUP interpolate = n, fail = 0,0,0, NAME = avg3,
```

DCModel.s

```
;       avg    purp
   r = '3.268  1 ',
        '3.268  2 ',
        '3.268  3 ',
        '3.268  4 ',
        '3.268  5 ',
        '3.438  6 ',
        '3.438  7 ',
        '3.438  8 ',
        '3.438  9 ',
        '3.454  10',
        '3.454  11',
        '3.454  12',
        '3.454  13',
        '3.454  14',
        '3.454  15',
        '3.278  16',
        '3.776  17',
        '3.413  18'


   IF (i=@zoneblank@) continue

; Read general mode-specIFic constants from a file
   READ FILE = '..\@scenario@\parameters\ModeChoiceCoeff.dat'


   JLOOP

; Calculate Various LOS Attributes that appear repeatedly in Utility Expressions:
; Terminal Times (From i To j)
   atypei = ZI.3.atype[I]
   atypej = ZI.3.atype[J]
   termi  = termtm(atypei)
   termj  = termtm(atypej)
   termij = termi + termj

   ;Calculate UTILITIES and Scale them to the Sub-mode level:
   ; 1. DA Utility
   MW[1] = (Civt@Cgrp@*    MI.1.SOVtime+
           Cterm@Cgrp@*    Termij+
           Copcost@Cgrp@ * (MI.1.sovdist*9.9)+
           Cpcost@Cgrp@ *  (MI.1.SOVToll+ ZI.1.@Wrk@PCost[J]))/CauNest

; 2. SR2 Utility
   MW[2] = (Civt@Cgrp@*     (MI.1.HOVTime)+
           Cterm@Cgrp@*     (Termij+1.1)+
           Copcost@Cgrp@*   ((MI.1.HovDist*9.9)/2)+
           Cpcost@Cgrp@ *   ((MI.1.HovToll+ZI.1.@Wrk@PCost[J])/2)+
           SRBias_@pur@)/CsrNest/CauNest

; 3. SR3 Utility
   MW[3] = (Civt@Cgrp@    *   (MI.1.HOVTime)+
           Cterm@Cgrp@    *   (Termij+2.5)+
           Copcost@Cgrp@  *   ((MI.1.HovDist*9.9)/avg3(@p@))+
           Cpcost@Cgrp@   *   ((MI.1.HovToll+ZI.1.@Wrk@PCost[J])/avg3(@p@))+
           SRBias_@pur@ + SR3Bias_@pur@)/CsrNest/CauNest

; 4. Walk to Bus Utility (Only if Bus IVT>0)
   IF (MI.2.LocalBusTime >0)
     MW[4] = (Civt@Cgrp@   * MI.2.LocalBusTime +
             Cwalk@Cgrp@   * MI.2.WalkTime+
             Cwait1s@Cgrp@ * min(MI.2.InitialWaitTime,7.5)+
             Cwait1l@Cgrp@ * max(MI.2.InitialWaitTime-7.5,0)+
             Cwait2@Cgrp@  * MI.2.XferWaitTime+
             Cxfers@Cgrp@  * MI.2.NumXfers+
```

DCModel.s

```
                    Cfare@Cgrp@   * MI.12.WBus@tm@+
                    TRNBias_@pur@ )/CtrNest/CwtNest
            ELSE
              MW[4] = -9999
            ENDIF

; 5. Walk to Express Bus (Only if Express Bus IVT>0) -- During mode choice calibration, targets for all other purposes for WexpBUS were zeros, hence.
       Purpose1 = '@purCoeff@'
       IF (Purpose1 = 'HBW')
         IF (MI.3.ExpBusTime >0)
           MW[5]= (Civt@Cgrp@ *     (MI.3.LocalBusTime+MI.3.ExpBusTime)+
                   Cwalk@Cgrp@ *   MI.3.WalkTime+
                   Cwait1s@Cgrp@ * min(MI.3.InitialWaitTime,7.5)+
                   Cwait1l@Cgrp@ * max(MI.3.InitialWaitTime-7.5,0)+
                   Cwait2@Cgrp@ *  MI.3.XferWaitTime+
                   Cxfers@Cgrp@ *  MI.3.NumXfers+
                   Cfare@Cgrp@   * MI.12.WExpBus@tm@+
                   WExpBusBias_@purCoeff@ + TRNBias_@pur@)/CtrNest/CwtNest
           ELSE
             MW[5] = -9999
           ENDIF
         ELSE
           MW[5] = -9999
         ENDIF

; 6. Walk to Rail  (Only if Rail IVT>0)
       IF (MI.4.RailTime >0)
         MW[6]= (Civt@Cgrp@     (MI.4.LocalBusTime+MI.4.ExpBusTime+MI.4.RailTime)+
                 Cwalk@Cgrp@ *   MI.4.WalkTime+
                 Cwait1s@Cgrp@ * min(MI.4.InitialWaitTime,7.5)+
                 Cwait1l@Cgrp@ * max(MI.4.InitialWaitTime-7.5,0)+
                 Cwait2@Cgrp@ *  MI.4.XferWaitTime+
                 Cxfers@Cgrp@ *  MI.4.NumXfers+
                 Cfare@Cgrp@   * MI.12.WRail@tm@+
                 WrailBias_@purCoeff@ + TRNBias_@pur@)/CtrNest/CwtNest
       ELSE
         MW[6] = -9999
       ENDIF

; 7. Walk to Commuter Rail   (Only if Commuter Rail IVT>0)
       IF (MI.5.ComRailTime >0)
         MW[7] = (Civt@Cgrp@    (MI.5.LocalBusTime+MI.5.ExpBusTime+MI.5.RailTime+ MI.5.ComRailTime)+
                  Cwalk@Cgrp@ *   MI.5.WalkTime+
                  Cwait1s@Cgrp@ * min(MI.5.InitialWaitTime,7.5)+
                  Cwait1l@Cgrp@ * max(MI.5.InitialWaitTime-7.5,0)+
                  Cwait2@Cgrp@ *  MI.5.XferWaitTime+
                  Cxfers@Cgrp@ *  MI.5.NumXfers+
                  Cfare@Cgrp@   * MI.12.WCRail@tm@+
                  WcrailBias_@purCoeff@ + TRNBias_@pur@)/CtrNest/CwtNest
       ELSE
         MW[7] = -9999
       ENDIF

; 8. Drive to Bus Utility (Only if Bus IVT>0 and Drive Time >0)
       IF (MI.6.LocalBusTime >0 & MI.6.AutoDist>0)
         MW[8] = (Civt@Cgrp@ *     MI.6.LocalBusTime+
                  Cwalk@Cgrp@ *   MI.6.WalkTime+
                  Cwait1s@Cgrp@ * min(MI.6.InitialWaitTime,7.5)+
                  Cwait1l@Cgrp@ * max(MI.6.InitialWaitTime-7.5,0)+
                  Cwait2@Cgrp@ *  MI.6.XferWaitTime+
                  Cxfers@Cgrp@ *  MI.6.NumXfers+
                  Cdrvtm@Cgrp@ *  MI.6.AutoTime+
                  Cfare@Cgrp@    * MI.12.DBus@tm@+
                  D2TrnBias_@pur@ + TRNBias_@pur@)/CtrNest/CdtNest
       ELSE
```

DCModel.s

```
            MW[8] = -9999
          ENDIF

        ; 9. Drive to Express Bus (Only if Express Bus IVT>0 and Drive Time >0)    During mode choice calibration, targets for all other purposes for WexpBUS were zeros,
hence.
          Purpose1 = '@purCoeff@'
          IF (Purpose1 = 'HBW')
           IF (MI.7.ExpBusTime >0 & MI.7.AutoDist>0)
             MW[9]= (Civt@Cgrp@     (MI.7.LocalBusTime+ MI.7.ExpBusTime)+
                     Cwalk@Cgrp@ *   MI.7.WalkTime+
                     Cwait1s@Cgrp@ * min(MI.7.InitialWaitTime,7.5)+
                     Cwait1l@Cgrp@ * max(MI.7.InitialWaitTime-7.5,0)+
                     Cwait2@Cgrp@ *  MI.7.XferWaitTime+
                     Cxfers@Cgrp@ *  MI.7.NumXfers+
                     Cdrvtm@Cgrp@ *  MI.7.AutoTime+
                     Cfare@Cgrp@   * MI.12.DExpBus@tm@+
                     DExpBusBias_@purCoeff@ +D2TrnBias_@pur@ + TRNBias_@pur@)/CtrNest/CdtNest
           ELSE
             MW[9] = -9999
           ENDIF
          ELSE
            MW[9] = -9999
          ENDIF

        ; 10. Drive to Rail  (Only if Rail IVT>0 and Drive Time >0)
          IF (MI.8.RailTime >0 & MI.8.AutoDist>0)
          MW[10] = (Civt@Cgrp@    (MI.8.LocalBusTime+ MI.8.ExpBusTime+ MI.8.RailTime)+
                    Cwalk@Cgrp@ *  MI.8.WalkTime+
                    Cwait1s@Cgrp@ * min(MI.8.InitialWaitTime,7.5)+
                    Cwait1l@Cgrp@ * max(MI.8.InitialWaitTime-7.5,0)+
                    Cwait2@Cgrp@ *   MI.8.XferWaitTime+
                    Cxfers@Cgrp@ *   MI.8.NumXfers+
                    Cdrvtm@Cgrp@ *  MI.8.AutoTime+
                    Cfare@Cgrp@   * MI.12.DRail@tm@+
                    DrailBias_@purCoeff@ + D2TrnBias_@pur@ + TRNBias_@pur@)/CtrNest/CdtNest
          ELSE
            MW[10] = -9999
          ENDIF

        ; 11. Drive to Commuter Rail  (Only if Commuter Rail IVT>0 and Drive Time >0 )
          IF (MI.9.ComRailTime >0 & MI.9.AutoDist>0)
            MW[11]= (Civt@Cgrp@ *   (MI.9.LocalBusTime+ MI.9.ExpBusTime+ MI.9.RailTime+  MI.9.ComRailTime)+
                     Cwalk@Cgrp@ *   MI.9.WalkTime+
                     Cwait1s@Cgrp@ * min(MI.9.InitialWaitTime,7.5)+
                     Cwait1l@Cgrp@ * max(MI.9.InitialWaitTime-7.5,0)+
                     Cwait2@Cgrp@ *  MI.9.XferWaitTime+
                     Cxfers@Cgrp@ *  MI.9.NumXfers+
                     Cdrvtm@Cgrp@ *  MI.9.AutoTime+
                     Cfare@Cgrp@   * MI.12.DCRail@tm@+
                     DcrailBias_@purCoeff@ + D2TrnBias_@pur@ + TRNBias_@pur@)/CtrNest/CdtNest
          ELSE
            MW[11] = -9999
          ENDIF
        ENDJLOOP


     ; Computes LogSums
        JLOOP
          ; Exponent of Base Utilities
          mw[100] = exp(mw[1])
          mw[101] = exp(mw[2])+exp(mw[3])
          mw[102] = exp(mw[4])+exp(mw[5])+exp(mw[6])+exp(mw[7])
          mw[103] = exp(mw[8])+exp(mw[9])+exp(mw[10])+exp(mw[11])

          ; Compute  2 Level Nest
```

DCModel.s

```
                 ; DA Utility and Exponent of Utility
                 if(mw[100] > 0)
                  MW[12] = ln(mw[100])                              ; Same as MW[12] = MW[1]
                  MW[16] = exp(MW[12])                              ; Same as MW[16] = MW[100]
                  else
                  MW[12] = -9999
                  MW[16] = 0
                 endif
                 ; SR Utility and Exponent of Utility
                 if(mw[101] > 0)
                  MW[13] = CsrNest *ln(mw[101])
                  MW[17] = exp(MW[13])
                  else
                  MW[13] = -9999
                  mw[17] = 0
                 endif
                 ; WTRN Utility and Exponent of Utility
                 if(mw[102] > 0)
                  MW[14] = CwtNest *ln(mw[102])
                  MW[18] = exp(MW[14])
                  else
                  MW[14] = -9999
                  MW[18] = 0
                 endif
                 ; DTRN Utility and Exponent of Utility
                 if(mw[103] > 0)
                  MW[15] = CdtNest *ln(mw[103])
                  MW[19] = exp(MW[15])
                  else
                  MW[15] = -9999
                  MW[19] = 0
                 endif

                 mw[104] = exp(mw[12])+exp(mw[13])
                 mw[105] = exp(mw[14])+exp(mw[15])

             ; Compute 1 Level Nest
                 ; Auto Utility
                 if(mw[104]>0)
                   mw[20] = CauNest * ln(mw[104])
                   else
                   MW[20]= -9999
                 endif
                 ; Transit Utility
                 if(mw[105]>0)
                   mw[21] = CtrNest * ln(mw[105])
                   else
                   MW[21]= -9999
                 endif

             ; Log Sum
                 mw[23] = exp(mw[20]) + exp(mw[21])
                 if(MW[23] >0)
                 mw[24] = ln(MW[23])
                   else
                   MW[24] = -9999
                 endif
             ENDJLOOP
         ENDRUN

;********************************************************************************
;-------------------------------------------------------------------------------
;                         DESTINATION CHOICE MODEL
;********************************************************************************
 RUN PGM=MATRIX PRNFILE='..\@scenario@\Outputs\@pur@ Destination Choice Main.PRN' MSG='@pur@ Destination Chocie Model'
```

DCModel.s

```
            READ FILE = '..\@scenario@\parameters\destchoiceParameters.dat'


        ; Read MC Logsums from GetLogsums.s
        MATI[1] = ..\@scenario@\Outputs\LogSum_@pur@.mtx                                              ; MC logsum by
purpose
        MATI[2] = ..\@scenario@\Outputs\Hwy@tm@_iter@iteration@.skm                                   ;
Highway time
        MATO[1] = ..\@scenario@\Outputs\Dest_@pur@.trp, mo = 200,name=trips ;, dec = 1*d              ; Output from
destination choice model
        ZONES=@lastSMZ@
        IF (i=@zoneblank@) continue

        ; Read Landuse File
        FILEI ZDATI[1]= ..\@scenario@\Inputs\HHbyIncome.csv, Z=#1, Inc1=#2, Inc2=#3, Inc3=#4, Inc4=#5, Inc5=#6
        FILEI ZDATI[2]= ..\@scenario@\Inputs\Activities.csv, Z=#1, ACRES=#2, HH=#3, ENR=#4, RET=#5, OFF=#6, OTH=#7, TOT=#8
        FILEI ZDATI[3]= ..\@scenario@\Outputs\MSTM_ps.csv, Z=#1, person=@prods@
        ; Read total productions by purpose

        IF (@p@ =1  | @p@=6  | @p@=11) hhInc = zi.1.Inc1                                               ; ReadIncome1 households
        IF (@p@ =2  | @p@=7  | @p@=12) hhInc = zi.1.Inc2                                               ; ReadIncome2 households
        IF (@p@ =3  | @p@=8  | @p@=13) hhInc = zi.1.Inc3                                               ; ReadIncome3 households
        IF (@p@ =4  | @p@=9  | @p@=14) hhInc = zi.1.Inc4                                               ; ReadIncome4 households
        IF (@p@ =5  | @p@=10 | @p@=15) hhInc = zi.1.Inc5                                               ; ReadIncome5 households
        IF (@p@ =16 | @p@=17 | @p@=18) hhInc = (zi.1.Inc1 + zi.1.Inc2 + zi.1.Inc3 + zi.1.Inc4 + zi.1.Inc5)  ; Read total households


        Array person = @lastSMZ@

         JLOOP
          MW[1] = MI.1.1                                                                              ; reads logsums by purpose
          IF (MI.2.SOVdist < Distance)  MW[2] = MI.2.SOVdist                                          ; reads peak highway distance if
distnace < 50 miles
          person[I] = zi.3.person                                                                    ; reads person trips by production
zones

          IF(I=J)          MW[102] = @purCoeff@intraz                                                 ; dummy constant for intrazonal trips
          IF(J = @washzones@) MW[103] = @purCoeff@washCBD                                             ; dummy constant for trips to
Washington CBD zones
          IF(J = @baltzones@) MW[104] = @purCoeff@baltCBD                                             ; dummy constant for trips to Baltimore
CBD zones
          IF(J = @cbdzones@)  MW[105] = @purCoeff@combCBD                                             ; dummy constant for trips to that end
at either Washington or Baltimore CBDs zones

          MW[106] = @purCoeff@bridge                                                                  ; fills all zones with a penality and
then in next line zeros out all intra river zonal penatlities
          IF((I == @riverReg1@ && J == @riverReg1@) || (I == @riverReg2@ && J == @riverReg2@) || (I == @riverReg3@ &&
            J == @riverReg3@)) mw[106] =  0                                                           ; dummy for bridge-crossing

          IF(I = @baltzones@) MW[107] = @purCoeff@Reg1 * MW[2]                                        ; Region 1 Coeff * Uncapped Distance
          IF(I = @washzones@) MW[108] = @purCoeff@Reg2 * MW[2]                                        ; Region 2 Coeff * Uncapped Distance
          IF(I = @baltReg3@)  MW[109] = @purCoeff@Reg3 * MW[2]                                        ; Region 3 Coeff * Uncapped Distance
          IF(I = @baltReg5@)  MW[110] = @purCoeff@Reg5 * MW[2]                                        ; Region 4 Coeff * Uncapped Distance
          IF(I = @washReg4@)  MW[111] = @purCoeff@Reg4 * MW[2]                                        ; Region 5 Coeff * Uncapped Distance
          IF(I = @washReg6@)  MW[112] = @purCoeff@Reg6 * MW[2]                                        ; Region 6 Coeff * Uncapped Distance
          IF(I = @rurReg7@)   MW[118] = @purCoeff@Reg7 * MW[2]                                        ; Region 7 Coeff * Uncapped Distance
          IF(I = @rurReg8@)   MW[119] = @purCoeff@Reg8 * MW[2]                                        ; Region 8 Coeff * Uncapped Distance
          IF(I = @Extreg1@)   MW[121] = @purCoeff@Extreg1 * MW[2]                                     ; Ext Region 1 Coeff * Uncapped
Distance
          IF(I = @Extreg2@)   MW[122] = @purCoeff@Extreg2 * MW[2]                                     ; Ext Region 2 Coeff * Uncapped
Distance
          IF(I = @Extreg3@)   MW[123] = @purCoeff@Extreg3 * MW[2]                                     ; Ext Region 3 Coeff * Uncapped
Distance
          IF(I = @Extreg4@)   MW[124] = @purCoeff@Extreg4 * MW[2]                                     ; Ext Region 4 Coeff * Uncapped
Distance
```

DCModel.s

```
        IF(MW[2] > 0 && MW[2] <=1) MW[113] = @purCoeff@dist01                                    ; dummy constant for distance 0-1 bin
        IF(MW[2] > 1 && MW[2] <=2) MW[113] = @purCoeff@dist12                                    ; dummy constant for distance 1-2 bin
        IF(MW[2] > 2 && MW[2] <=3) MW[113] = @purCoeff@dist23                                    ; dummy constant for distance 2-5 bin
        IF(MW[2] > 3 && MW[2] <=4) MW[113] = @purCoeff@dist34                                    ; dummy constant for distance 2-5 bin
        IF(MW[2] > 4 && MW[2] <=5) MW[113] = @purCoeff@dist45                                    ; dummy constant for distance 2-5 bin
        IF(MW[2] > 5 && MW[2] <=6) MW[113] = @purCoeff@dist56                                    ; dummy constant for distance 2-5 bin
        IF(MW[2] > 6 && MW[2] <=7) MW[113] = @purCoeff@dist67                                    ; dummy constant for distance 2-5 bin


        MW[114] = @purCoeff@other * ZI.2.OTH[J] + @purCoeff@retail * ZI.2.RET[J] + @purCoeff@office * ZI.2.OFF[J]+       ; size terms: Sum(coeff X size)
                  @purCoeff@indust * (ZI.2.TOT[J] - ZI.2.OTH[J] - ZI.2.RET[J] - ZI.2.OFF[J])+ @purCoeff@hhterm * ZI.2.HH[J]
        IF(MW[114] > 0)   MW[115] = Ln(MW[114])                                                  ; size terms: log (sum(coeff X size))

        IF(MW[2] > @purCoeff@distcap)
          MW[116] = @purCoeff@distcap
        ELSE
          MW[116] = MW[2]
        ENDIF

        IF(mw[2]>0)      MW[101] = (@purCoeff@lndist * ln(MW[116]))              ; compute log (distance) outside the utility equation
                                                                                ;  Apply distance between 0-maxdist
        IF(hhInc > 0)    MW[117] =  @purCoeff@@Inc@ * MW[116]                    ; Check Whether Production zone has income hhs and if yes do IncCoeff * Uncapped dist

         ; DC Utility
             ; Apply only to SMZ zones

        IF(mw[2]>0)                                                                              ; Since MW[2] = 0 if Distance > 50
Miles
        MW[100] =  @purCoeff@mcls * MW[1] + @purCoeff@dist * MW[116] + @purCoeff@distsquare * (POW(MW[116],2)) +         ; (set capping distance in
destchoiceParameters.dat)
                   @purCoeff@distcube * (POW(MW[116],3)) + MW[101] + MW[117] + MW[115] + MW[106] +                      ; Income coefficients, distance terms
and size terms
                   MW[102] + MW[103] + MW[104] + MW[105]  + MW[107] + MW[108] + MW[109] + MW[110] + MW[111]+ MW[112]+ MW[113]+   ; Regional dummy constants
                   MW[118] + MW[119] + MW[121] + MW[122] + MW[123] + MW[124]
        ELSE
        MW[100] = - 9999
        ENDIF

      ENDJLOOP

      ; Destination choice model
      XCHOICE,
      ALTERNATIVES = All,
      DEMAND = person[I],
      UTILITIESMW = 100,
      ODEMANDMW = 200,
      DESTSPLIT= TOTAL All, Exclude=@zoneblank@,
      STARTMW = 800
    ENDRUN
  ENDLOOP
```

ModeChoice.s

```
; Maryland Statewide Travel Demand Model (MSTM)
;
; Script: Mode Choice Model
;
; About:
; This script estimates trips by mode.

; Description:
; STEP 1: Computes utilities by mode based on skims, parking cost, mode specific coeffiecients by purpose and income
;         and splits total trips inot modal trips. A logit model is used where the above utilities are specifed.
;

; Input files:
; Hwy<OP/PK>.skm               - peak/off-peak highway skims
; <access><trnmode><OP/PK>.skm  - peak/off-peak transit skims by walk and drive access
; FareByModes.mtx              - zonal transit fares by modes
; AreaType.dat                 - zonal area types
; ParkCost.dat                 - zonal parking cost
; SMZ_WalkShare.csv            - zone share of walk accessibility to transit
; ModeChoiceCoeff.dat          - mode specific coefficients
; Dest_<purpose>.trp           - distributed trips from the destination choice model
; iteration.txt                - indicates current iteration

; Output files:
; MC_<purpose>.trp             - Modal trips by purpose from the mode choice model

; Authors:
; Mayank Prakash Jain - jainm@pbworld.com    - 09/16/2008
; Amar Sarvepalli     - sarvepalli@pbworld.com - 12/10/2010
; Rolf Moeckel        - moeckel@pbworld.com   - 05/23/2012
;
; Version 1.0

;========================================================================

; Read general mode-specific constants from a file
READ File = '..\stamp.log'
READ File = '..\iteration.txt'

DISTRIBUTE MULTISTEP=1
MULTISTEP=1  ; Set it equal to Zero when Wait4Files is not to be used. else set it to 1, when cluster multistep processing is to be used.


   LOOP p = 1,18    ; Purpose loop

     IF (p =1 )    pur = 'HBW1' ,   tm = 'PK' ,   Wrk='Wrk'      , purCoeff =  'HBW'  , Cgrp = '_1' , dest = ' ', nodest = ';'
     IF (p =2 )    pur = 'HBW2' ,   tm = 'PK' ,   Wrk='Wrk'      , purCoeff =  'HBW'  , Cgrp = '_1' , dest = ' ', nodest = ';'
     IF (p =3 )    pur = 'HBW3' ,   tm = 'PK' ,   Wrk='Wrk'      , purCoeff =  'HBW'  , Cgrp = '_1' , dest = ' ', nodest = ';'
     IF (p =4 )    pur = 'HBW4' ,   tm = 'PK' ,   Wrk='Wrk'      , purCoeff =  'HBW'  , Cgrp = '_1' , dest = ' ', nodest = ';'
     IF (p =5 )    pur = 'HBW5' ,   tm = 'PK' ,   Wrk='Wrk'      , purCoeff =  'HBW'  , Cgrp = '_1' , dest = ' ', nodest = ';'
     IF (p =6 )    pur = 'HBS1' ,   tm = 'OP' ,   Wrk='NonWrk'   , purCoeff =  'HBS'  , Cgrp = '_2' , dest = ' ', nodest = ';'
     IF (p =7 )    pur = 'HBS2' ,   tm = 'OP' ,   Wrk='NonWrk'   , purCoeff =  'HBS'  , Cgrp = '_2' , dest = ' ', nodest = ';'
     IF (p =8 )    pur = 'HBS3' ,   tm = 'OP' ,   Wrk='NonWrk'   , purCoeff =  'HBS'  , Cgrp = '_2' , dest = ' ', nodest = ';'
     IF (p =9 )    pur = 'HBS4' ,   tm = 'OP' ,   Wrk='NonWrk'   , purCoeff =  'HBS'  , Cgrp = '_2' , dest = ' ', nodest = ';'
     IF (p =10)    pur = 'HBS5' ,   tm = 'OP' ,   Wrk='NonWrk'   , purCoeff =  'HBS'  , Cgrp = '_2' , dest = ' ', nodest = ';'
     IF (p =11)    pur = 'HBO1' ,   tm = 'OP' ,   Wrk='NonWrk'   , purCoeff =  'HBO'  , Cgrp = '_2' , dest = ' ', nodest = ';'
     IF (p =12)    pur = 'HBO2' ,   tm = 'OP' ,   Wrk='NonWrk'   , purCoeff =  'HBO'  , Cgrp = '_2' , dest = ' ', nodest = ';'
     IF (p =13)    pur = 'HBO3' ,   tm = 'OP' ,   Wrk='NonWrk'   , purCoeff =  'HBO'  , Cgrp = '_2' , dest = ' ', nodest = ';'
     IF (p =14)    pur = 'HBO4' ,   tm = 'OP' ,   Wrk='NonWrk'   , purCoeff =  'HBO'  , Cgrp = '_2' , dest = ' ', nodest = ';'
     IF (p =15)    pur = 'HBO5' ,   tm = 'OP' ,   Wrk='NonWrk'   , purCoeff =  'HBO'  , Cgrp = '_2' , dest = ' ', nodest = ';'
     IF (p =16)    pur = 'HBSc' ,   tm = 'OP' ,   Wrk='NonWrk'   , purCoeff =  'HBSc' , Cgrp = '_2' , dest = ';', nodest = ' '
     IF (p =17)    pur = 'NHBW' ,   tm = 'PK' ,   Wrk='Wrk'      , purCoeff =  'NHBW' , Cgrp = '_1' , dest = ' ', nodest = ';'
     IF (p =18)    pur = 'OBO'  ,   tm = 'OP' ,   Wrk='NonWrk'   , purCoeff =  'OBO'  , Cgrp = '_3' , dest = ' ', nodest = ';'

; Cgrp is the Coeff Group for System coefficients (to calculate the utilities).
```

ModeChoice.s

```
DISTRIBUTEMULTISTEP ProcessID='MSTM', ProcessNum=p

          ; Mode Choice Model
          RUN PGM=MATRIX     PRNFILE='..\@scenario@\Outputs\@pur@ Mode Choice Model.PRN'  MSG='@pur@ Mode Choice Model'

             ID = "Mode Choice Model"

          ; Model structure:
          ;                                 Person
          ;        _____|_____
          ;        |                                            |
          ;      Auto                                      Transit(b)
          ;      ___|___                            _____|_____
          ;     |       |                           |                           |
          ;   SR(b)    DA                          Walk                       PnR(b)
          ;   __|__                        _____|_____ _____          _____|_____ _____
          ;  |     |                       |      |      |      |         |      |      |       |
          ; SR2   SR3+(b)                 Bus   Rail(b) CR(b) Exp(b)     Bus   Rail(b) CR(b)  Exp(b)

          ; (b) = carries bias coef

             MATI[1] =  ..\@scenario@\Outputs\Hwy@tm@_iter@iteration@.skm
             MATI[2] =  ..\@scenario@\Outputs\WBus@tm@.skm
             MATI[3] =  ..\@scenario@\Outputs\WExpBus@tm@.skm
             MATI[4] =  ..\@scenario@\Outputs\WRail@tm@.skm
             MATI[5] =  ..\@scenario@\Outputs\WCRail@tm@.skm
             MATI[6] =  ..\@scenario@\Outputs\DBus@tm@.skm
             MATI[7] =  ..\@scenario@\Outputs\DExpBus@tm@.skm
             MATI[8] =  ..\@scenario@\Outputs\DRail@tm@.skm
             MATI[9] =  ..\@scenario@\Outputs\DCRail@tm@.skm
             MATI[10] = ..\@scenario@\Outputs\WTrn@tm@.skm
             MATI[20] = ..\@scenario@\Outputs\DTrn@tm@.skm

          ; Person trips by income
             @dest@   MATI[11] = ..\@scenario@\Outputs\Dest_@pur@.trp       ; use person trip tables from destination choice model (<dest_,purpose>.trp)
             @nodest@ MATI[11] = ..\@scenario@\Outputs\@pur@.trp            ; use school trip tables from trip distribution (HBSc.trp)

          ; Fare inputs
             MATI[12] = ..\@scenario@\Inputs\FareByModes.mtx

          ; Output tables
             MATO[1] = ..\@scenario@\Outputs\Mc_@Pur@.Trp, mo = 501-511,  NAME = DA,SR2,SR3,WBus,WExpBus,WRail,WCRail,DBus,DExpBus,DRail,DCRail;, dec = 11*d

          ; This model is applied only to SMZ-SMZ Interchanges.
             ZONES=@lastSMZ@

          ; Areatype table
             ZDATI[3]="..\@scenario@\Inputs\AreaType.dat", z=#1, atype=#2

          ; Parking Cost Lookup table
             ZDATI[1] = "..\@scenario@\Inputs\ParkCost.dat", z=#1, WrkPCost=#2, NonWrkPCost=#3, ActDen=#4

          ; Walk Shares
             ZDATI[2] = "..\@scenario@\Inputs\SMZ_WalkShare.csv", z=#1, WlkShr=#2

          ; Terminal time lookup table, as a function of area type.
             LOOKUP INTERPOLATE = n, FAIL = 0,0,0, NAME = termtm,
          ;        term AT
             r = '1  1',
                 '1  2',
                 '1  3',
                 '1  4',
                 '1  5',
                 '2  6',
                 '2  7',
```

ModeChoice.s

```
                        '3  8',
                        '6  9'

          ; Lookup table for average occupancy of 3+ occupant vehicles, by purpose.
            LOOKUP interpolate = n, fail = 0,0,0, NAME = avg3,
            ;        avg    purp
              r = '3.268  1 ',
                  '3.268  2 ',
                  '3.268  3 ',
                  '3.268  4 ',
                  '3.268  5 ',
                  '3.438  6 ',
                  '3.438  7 ',
                  '3.438  8 ',
                  '3.438  9 ',
                  '3.454  10',
                  '3.454  11',
                  '3.454  12',
                  '3.454  13',
                  '3.454  14',
                  '3.454  15',
                  '3.278  16',
                  '3.776  17',
                  '3.413  18'


            IF (i=@zoneblank@) continue

        ; Read general mode-specIFic constants from a file
            READ FILE = '..\@scenario@\Parameters\ModeChoiceCoeff.dat'

        JLOOP

          wkpcti = ZI.2.WlkShr[I]
          wkpctj = ZI.2.WlkShr[J]
        ; Determine transit access market shares.
          walkacc = wkpcti * wkpctj
          IF (walkacc < 0.0001) walkacc = 0

          IF (MI.20.4 > 0)          ; Only if Drive to Transit Auto Time is positive (i.e person has spent some time in driving to PnR lot)
            drivacc = (1.0 - wkpcti) * wkpctj        ; people who can only drive to transit and not walk (visualize using venn diagrams)
          ELSE
            drivacc = 0
          ENDIF
          notracc = 1.0 - walkacc - drivacc
          ; if Driving is available, then all the people can drive to transit so no-one falls in "w" category
          IF (drivacc>0 & walkacc >0)     dwacc = walkacc
          IF (drivacc=0 || walkacc = 0)   dwacc = 0         ; if Driving to transit is not available, then dw is zero and nothing else changes
          IF (dwacc >0)     walkacc=0

          ; MW[100] = MI.11.1
          MW[100] = dwacc    * MI.11.1
          MW[200] = walkacc * MI.11.1
          MW[300] = drivacc * MI.11.1
          MW[400] = notracc * MI.11.1

        ; Calculate Various LOS Attributes that appear repeatedly in Utility Expressions:
        ; Terminal Times (From i To j)
            atypei = ZI.3.atype[I]
            atypej = ZI.3.atype[J]
            termi  = termtm(atypei)
            termj  = termtm(atypej)
            termij = termi + termj

            ;Calculate UTILITIES and Scale them to the Sub-mode level:
            ; 1. DA Utility
```

ModeChoice.s

```
       MW[1] = (Civt@Cgrp@*    MI.1.SOVtime+
               Cterm@Cgrp@*    Termij+
               Copcost@Cgrp@ * (MI.1.sovdist*@opcostmi@)+
               Cpcost@Cgrp@ *  (MI.1.SOVToll+ ZI.1.@Wrk@PCost[J]))/CauNest

       ; 2. SR2 Utility
       MW[2] = (Civt@Cgrp@*    (MI.1.HOVTime)+
               Cterm@Cgrp@*     (Termij+1.1)+
               Copcost@Cgrp@*  ((MI.1.HovDist*@opcostmi@)/2)+
               Cpcost@Cgrp@ *  ((MI.1.HovToll+ZI.1.@Wrk@PCost[J])/2)+
               SRBias_@pur@)/CsrNest/CauNest

       ; 3. SR3 Utility
       MW[3] = (Civt@Cgrp@    *  (MI.1.HOVTime)+
               Cterm@Cgrp@    *  (Termij+2.5)+
               Copcost@Cgrp@  *  ((MI.1.HovDist*@opcostmi@)/avg3(@p@))+
               Cpcost@Cgrp@   *  ((MI.1.HovToll+ZI.1.@Wrk@PCost[J])/avg3(@p@))+
               SRBias_@pur@ + SR3Bias_@pur@)/CsrNest/CauNest

       ; 4. Walk to Bus Utility (Only if Bus IVT>0)
       IF (MI.2.LocalBusTime >0)
         MW[4] = (Civt@Cgrp@   * MI.2.LocalBusTime +
                 Cwalk@Cgrp@   * MI.2.WalkTime+
                 Cwait1s@Cgrp@ * min(MI.2.InitialWaitTime,7.5)+
                 Cwait1l@Cgrp@ * max(MI.2.InitialWaitTime-7.5,0)+
                 Cwait2@Cgrp@  * MI.2.XferWaitTime+
                 Cxfers@Cgrp@  * MI.2.NumXfers+
                 Cfare@Cgrp@   * MI.12.WBus@tm@+
                 TRNBias_@pur@ )/CtrNest/CwtNest
       ELSE
         MW[4] = -9999
       ENDIF

       ; 5. Walk to Express Bus (Only if Express Bus IVT>0) -- During mode choice calibration, targets for all other purposes for WexpBUS were zeros, hence.
         Purpose1 = '@purCoeff@'
         IF (Purpose1 = 'HBW')
          IF (MI.3.ExpBusTime >0)
            U5  = Civt@Cgrp@ *    (MI.3.LocalBusTime+MI.3.ExpBusTime)+
                  Cwalk@Cgrp@ *   MI.3.WalkTime+
                  Cwait1s@Cgrp@ * min(MI.3.InitialWaitTime,7.5)+
                  Cwait1l@Cgrp@ * max(MI.3.InitialWaitTime-7.5,0)+
                  Cwait2@Cgrp@  * MI.3.XferWaitTime+
                  Cxfers@Cgrp@  * MI.3.NumXfers+
                  Cfare@Cgrp@   * MI.12.WExpBus@tm@+
                  WExpBusBias_@purCoeff@ + TRNBias_@pur@
           MW[5] = U5/CtrNest/CwtNest
          ELSE
            MW[5] = -9999
          ENDIF
         ELSE
           MW[5] = -9999
         ENDIF

       ; 6. Walk to Rail  (Only if Rail IVT>0)
       IF (MI.4.RailTime >0)
          U6  = Civt@Cgrp@ *    (MI.4.LocalBusTime+MI.4.ExpBusTime+MI.4.RailTime)+
                Cwalk@Cgrp@ *   MI.4.WalkTime+
                Cwait1s@Cgrp@ * min(MI.4.InitialWaitTime,7.5)+
                Cwait1l@Cgrp@ * max(MI.4.InitialWaitTime-7.5,0)+
                Cwait2@Cgrp@  * MI.4.XferWaitTime+
                Cxfers@Cgrp@  * MI.4.NumXfers+
                Cfare@Cgrp@   * MI.12.WRail@tm@+
                WrailBias_@purCoeff@ + TRNBias_@pur@
          MW[6]= U6/CtrNest/CwtNest
       ELSE
```

ModeChoice.s

```
          MW[6] = -9999
        ENDIF

    ; 7. Walk to Commuter Rail  (Only if Commuter Rail IVT>0)
        IF (MI.5.ComRailTime >0)
          MW[7] = (Civt@Cgrp@ *    (MI.5.LocalBusTime+MI.5.ExpBusTime+MI.5.RailTime+ MI.5.ComRailTime)+
                   Cwalk@Cgrp@ *   MI.5.WalkTime+
                   Cwait1s@Cgrp@ * min(MI.5.InitialWaitTime,7.5)+
                   Cwait1l@Cgrp@ * max(MI.5.InitialWaitTime-7.5,0)+
                   Cwait2@Cgrp@ *  MI.5.XferWaitTime+
                   Cxfers@Cgrp@ *  MI.5.NumXfers+
                   Cfare@Cgrp@   * MI.12.WCRail@tm@+
                   WcrailBias_@purCoeff@ + TRNBias_@pur@)/CtrNest/CwtNest
        ELSE
          MW[7] = -9999
        ENDIF

    ; 8. Drive to Bus Utility (Only if Bus IVT>0 and Drive Time >0)
        IF (MI.6.LocalBusTime >0 & MI.6.AutoDist>0)
          MW[8] = (Civt@Cgrp@ *    MI.6.LocalBusTime+
                   Cwalk@Cgrp@ *   MI.6.WalkTime+
                   Cwait1s@Cgrp@ * min(MI.6.InitialWaitTime,7.5)+
                   Cwait1l@Cgrp@ * max(MI.6.InitialWaitTime-7.5,0)+
                   Cwait2@Cgrp@ *  MI.6.XferWaitTime+
                   Cxfers@Cgrp@ *  MI.6.NumXfers+
                   Cdrvtm@Cgrp@ *  MI.6.AutoTime+
                   Cfare@Cgrp@   * MI.12.DBus@tm@+
                   D2TrnBias_@pur@ + TRNBias_@pur@)/CtrNest/CdtNest
        ELSE
          MW[8] = -9999
        ENDIF

  ; 9. Drive to Express Bus (Only if Express Bus IVT>0 and Drive Time >0)    During mode choice calibration, targets for all other purposes for WexpBUS were zeros, hence.
        Purpose1 = '@purCoeff@'
        IF (Purpose1 = 'HBW')
          IF (MI.7.ExpBusTime >0 & MI.7.AutoDist>0)
            U9   = Civt@Cgrp@ *    (MI.7.LocalBusTime+ MI.7.ExpBusTime)+
                   Cwalk@Cgrp@ *   MI.7.WalkTime+
                   Cwait1s@Cgrp@ * min(MI.7.InitialWaitTime,7.5)+
                   Cwait1l@Cgrp@ * max(MI.7.InitialWaitTime-7.5,0)+
                   Cwait2@Cgrp@ *  MI.7.XferWaitTime+
                   Cxfers@Cgrp@ *  MI.7.NumXfers+
                   Cdrvtm@Cgrp@ *  MI.7.AutoTime+
                   Cfare@Cgrp@   * MI.12.DExpBus@tm@+
                   DExpBusBias_@purCoeff@ +D2TrnBias_@pur@ + TRNBias_@pur@
            MW[9]= U9/CtrNest/CdtNest
          ELSE
            MW[9] = -9999
          ENDIF
        ELSE
          MW[9] = -9999
        ENDIF

    ; 10. Drive to Rail  (Only if Rail IVT>0 and Drive Time >0)
        IF (MI.8.RailTime >0 & MI.8.AutoDist>0)
          MW[10] = (Civt@Cgrp@ *    (MI.8.LocalBusTime+ MI.8.ExpBusTime+ MI.8.RailTime)+
                   Cwalk@Cgrp@ *  MI.8.WalkTime+
                   Cwait1s@Cgrp@ * min(MI.8.InitialWaitTime,7.5)+
                   Cwait1l@Cgrp@ * max(MI.8.InitialWaitTime-7.5,0)+
                   Cwait2@Cgrp@ *   MI.8.XferWaitTime+
                   Cxfers@Cgrp@ *  MI.8.NumXfers+
                   Cdrvtm@Cgrp@ *  MI.8.AutoTime+
                   Cfare@Cgrp@   * MI.12.DRail@tm@+
                   DrailBias_@purCoeff@ + D2TrnBias_@pur@ + TRNBias_@pur@)/CtrNest/CdtNest
        ELSE
```

ModeChoice.s

```
    MW[10] = -9999
  ENDIF

; 11. Drive to Commuter Rail  (Only if Commuter Rail IVT>0 and Drive Time >0 )
  IF (MI.9.ComRailTime >0 & MI.9.AutoDist>0)
    MW[11]= (Civt@Cgrp@ *   (MI.9.LocalBusTime+ MI.9.ExpBusTime+ MI.9.RailTime+  MI.9.ComRailTime)+
            Cwalk@Cgrp@ *   MI.9.WalkTime+
            Cwait1s@Cgrp@ * min(MI.9.InitialWaitTime,7.5)+
            Cwait1l@Cgrp@ * max(MI.9.InitialWaitTime-7.5,0)+
            Cwait2@Cgrp@ *  MI.9.XferWaitTime+
            Cxfers@Cgrp@ *  MI.9.NumXfers+
            Cdrvtm@Cgrp@ *  MI.9.AutoTime+
            Cfare@Cgrp@   * MI.12.DCRail@tm@+
            DcrailBias_@purCoeff@ + D2TrnBias_@pur@ + TRNBias_@pur@)/CtrNest/CdtNest
  ELSE
    MW[11] = -9999
  ENDIF
        MW[601] =  Civt@Cgrp@ *   (MI.9.LocalBusTime+ MI.9.ExpBusTime+ MI.9.RailTime+  MI.9.ComRailTime)
        MW[602] =  Cwalk@Cgrp@ *   MI.9.WalkTime
        MW[603] =  Cwait1s@Cgrp@ * min(MI.9.InitialWaitTime,7.5)
        MW[604] =  Cwait1l@Cgrp@ * max(MI.9.InitialWaitTime-7.5,0)
        MW[605] =  Cwait2@Cgrp@ *  MI.9.XferWaitTime
        MW[606] =  Cxfers@Cgrp@ *  MI.9.NumXfers
        MW[607] =  Cdrvtm@Cgrp@ *  MI.9.AutoTime
        MW[608] =  Cfare@Cgrp@   * MI.12.DCRail@tm@
        MW[609] =  DcrailBias_@purCoeff@ + D2TrnBias_@pur@ + TRNBias_@pur@


  MW[12] = -9999              ; Dummy matrix so that it can be used to produce zero utility for any purpose in market segmentation part.
ENDJLOOP

; Mode Choice for people who can Both Drive and Walk to Transit
  XCHOICE,
  ALTERNATIVES =DA,SR2,SR3, WBus,WExpBus,WRail,WCRail, DBus,DExpBus,DRail,DCRail,  ;KBus,KExpBus,KRail,KCRail,       ; XChoice Choices
  DEMANDMW = 100,                                                                                                   ; Input Total Demand
  UTILITIESMW = 1,2,3,4,5,6,7,8,9,10,11,                                                                            ; Utility matrices
  ODEMANDMW = 101,102,103,104,105,106,107,108,109,110,111,                                                         ; Forecast Demand
  SPLIT= TOTAL CauNest Auto CtrNest Transit,                                                                        ; Auto and Transit nests
  SPLIT= Transit CwtNest Wtr CdtNest Dtr,                                                                           ; Walk and drive to transit
  SPLIT= Auto 1.0 DA CsrNest SR,                                                                                    ; DA and Shared Ride
  SPLIT= SR 1.0 SR2 1.0 SR3,                                                                                        ; SR Nest
  SPLIT= Wtr 1.0 WBus 1.0 WExpBus 1.0 WRail 1.0 WCRail,                                                             ; Walk to transit nest
  SPLIT= Dtr 1.0 DBus 1.0 DExpBus 1.0 DRail 1.0 DCRail,                                                             ; Drive to transit nest
  STARTMW = 800                                                                                                     ; Working matrices

; Mode Choice for people who can Only Walk to Transit
  XCHOICE,
  ALTERNATIVES =DA,SR2,SR3, WBus,WExpBus,WRail,WCRail, DBus,DExpBus,DRail,DCRail,  ;KBus,KExpBus,KRail,KCRail,       ; XChoice Choices
  DEMANDMW = 200,                                                                                                   ; Input Total Demand
  UTILITIESMW = 1,2,3,4,5,6,7,12,12,12,12,                                                                          ; Utility matrices
  ODEMANDMW = 201,202,203,204,205,206,207,208,209,210,211,                                                         ; Forecast Demand
  SPLIT= TOTAL CauNest Auto CtrNest Transit,                                                                        ; Auto and Transit nests
  SPLIT= Transit CwtNest Wtr CdtNest Dtr,                                                                           ; Walk and drive to transit
  SPLIT= Auto 1.0 DA CsrNest SR,                                                                                    ; DA and Shared Ride
  SPLIT= SR 1.0 SR2 1.0 SR3,                                                                                        ; SR Nest
  SPLIT= Wtr 1.0 WBus 1.0 WExpBus 1.0 WRail 1.0 WCRail,                                                             ; Walk to transit nest
  SPLIT= Dtr 1.0 DBus 1.0 DExpBus 1.0 DRail 1.0 DCRail,                                                             ; Drive to transit nest
  STARTMW = 800                                                                                                     ; Working matrices

; Mode Choice for people who can Only Drive to Transit
  XCHOICE,
  ALTERNATIVES =DA,SR2,SR3, WBus,WExpBus,WRail,WCRail, DBus,DExpBus,DRail,DCRail,  ;KBus,KExpBus,KRail,KCRail,       ; XChoice Choices
  DEMANDMW = 300,                                                                                                   ; Input Total Demand
  UTILITIESMW = 1,2,3,12,12,12,12,8,9,10,11,                                                                        ; Utility matrices
  ODEMANDMW = 301,302,303,304,305,306,307,308,309,310,311,                                                         ; Forecast Demand
```

ModeChoice.s

```
            SPLIT= TOTAL CauNest Auto CtrNest Transit,                                                    ; Auto and Transit nests
            SPLIT= Transit CwtNest Wtr CdtNest Dtr,                                                       ; Walk and drive to transit
            SPLIT= Auto 1.0 DA CsrNest SR,                                                                ; DA and Shared Ride
            SPLIT= SR 1.0 SR2 1.0 SR3,                                                                    ; SR Nest
            SPLIT= Wtr 1.0 WBus 1.0 WExpBus 1.0 WRail 1.0 WCRail,                                         ; Walk to transit nest
            SPLIT= Dtr 1.0 DBus 1.0 DExpBus 1.0 DRail 1.0 DCRail,                                         ; Drive to transit nest
            STARTMW = 800                                                                                 ; Working matrices


         ; Mode Choice for people who have No Access to Transit
            XCHOICE,
            ALTERNATIVES =DA,SR2,SR3,WBus,WExpBus,WRail,WCRail, DBus,DExpBus,DRail,DCRail,  ;KBus,KExpBus,KRail,KCRail,   ; XChoice Choices
            DEMANDMW = 400,                                                                               ; Input Total Demand
            UTILITIESMW = 1,2,3,12,12,12,12,12,12,12,12,                                                  ; Utility matrices
            ODEMANDMW = 401,402,403,404,405,406,407,408,409,410,411,                                      ; Forecast Demand
            SPLIT= TOTAL CauNest Auto CtrNest Transit,                                                    ; Auto and Transit nests
            SPLIT= Transit CwtNest Wtr CdtNest Dtr,                                                       ; Walk and drive to transit
            SPLIT= Auto 1.0 DA CsrNest SR, ;SPLITCOMP=150,                                                ; DA and Shared Ride
            SPLIT= SR 1.0 SR2 1.0 SR3,                                                                    ; SR Nest
            SPLIT= Wtr 1.0 WBus 1.0 WExpBus 1.0 WRail 1.0 WCRail,                                         ; Walk to transit nest
            SPLIT= Dtr 1.0 DBus 1.0 DExpBus 1.0 DRail 1.0 DCRail,                                         ; Drive to transit nest
            STARTMW = 800                                                                                 ; Working matrices


         JLOOP
           MW[501] = MW[101] + MW[201] + MW[301] + MW[401]
           MW[502] = MW[102] + MW[202] + MW[302] + MW[402]
           MW[503] = MW[103] + MW[203] + MW[303] + MW[403]
           MW[504] = MW[104] + MW[204] + MW[304] + MW[404]
           MW[505] = MW[105] + MW[205] + MW[305] + MW[405]
           MW[506] = MW[106] + MW[206] + MW[306] + MW[406]
           MW[507] = MW[107] + MW[207] + MW[307] + MW[407]
           MW[508] = MW[108] + MW[208] + MW[308] + MW[408]
           MW[509] = MW[109] + MW[209] + MW[309] + MW[409]
           MW[510] = MW[110] + MW[210] + MW[310] + MW[410]
           MW[511] = MW[111] + MW[211] + MW[311] + MW[411]
         ENDJLOOP

       ENDRUN
  endDistributeMULTISTEP
ENDLOOP
IF (MULTISTEP=1)  Wait4Files Files=MSTM1.script.end, MSTM2.script.end, MSTM3.script.end,
   MSTM4.script.end, MSTM5.script.end, MSTM6.script.end,
   MSTM7.script.end, MSTM8.script.end, MSTM9.script.end,
   MSTM10.script.end, MSTM11.script.end, MSTM12.script.end,
   MSTM13.script.end, MSTM14.script.end, MSTM15.script.end,
   MSTM17.script.end, MSTM18.script.end,
   printfiles=MERGE, checkReturnCode=T
```

TOD.s

```
; Maryland Statewide Travel Demand Model (MSTM)
;
; Script: Time of Day Model
;
; About:
; This script distributes total daily trips estimated from the mode choice model into trips by time period.

; Description:
; Time of Day definition: The total daily trips are spilt into four time periods as defined:
;   AM = 6:30am - 9:30am
;   MD = 9:30am - 3:30pm
;   PM = 3:30pm - 6:30pm
;   NT = 6:30pm - 6:30am

; STEP 1: Computes vehicle trips by time of day. EE auto proportions are simply the proportion of person trips alloted to each time period generated
;         from the Trip Totals (AlltripSummary script) Fraction of vehicles Trips only.
; STEP 2: Writes out regional model truck summaries by truck class: Commerical vehicles, 2) Medium heavy duty trucks, 3) heavy heavy duty trucks and
;         regional trucks
; STEP 3: Creates truck trip matrices from the trip list outputs of the regional model
; STEP 4: Writes out summaries of regional model external-to-external (EE) and regional long distance auto (RA) trips
; STEP 5: Creates EE and Regional Auto Matrices from the regional model trip lists
; STEP 6: Combines truck, EE and RA trips matrices
; STEP 7: Applies TOD factors to all regional trips to estimate demand by time period from the regional model

; ----------------------------------------------------------------|----------|
; Assignment         |                          Vehicle           |          |
;  Period (P->A Only) |Com-Veh   sdSUT   sdMUT   ldTRKS    RA      | EE autos* |
; ================================================================|===========|
; AM  6:30-9:30       | 16.982 | 16.982 | 16.982 |  20   | RA_AM  |  16.05%   |
; Midday 9:30a-3:30p  | 42.845 | 42.845 | 42.845 |  50   |  0     |  37.07%   |
; PM 3:30-6:30        | 15.426 | 15.426 | 15.426 |  20   | RA_PM  |  25.19%   |
; Night 6:30p-6:30a   | 24.747 | 24.747 | 24.747 |  10   |  0     |  21.69%   |
; ----------------------------------------------------------------|-----------|
; Total               |100.00% |100.00% |100.00% |100.00% |100.00% |  100.00% |
; ================================================================|===========|
; Regional Autos derive their values directly from the matrices listed above, regional model gives out the am and pm period trips, there are no trips in
; off-peak periods.

; Input files:
; MC_<purpose>.trp    - Modal trips by purpose from the mode choice model
; truckTrips.csv      - truck trip list from the regional model
; regAutoTrips.csv    - regional long distance auto and external auto trips from the regional model

; Output files:
; Veh_@pur@_AM.trp    - Derived vehicle trips from mode choice person trips
; RegTrpsSummary.CSV  - regional truck, external auto and regional long distance auto trip summary
; regionalAndStatewideTruckFlows1.csv - regional external auto and regional long distance auto trip summary
; RAEEAutoTrips1.csv  - regional truck trip summary
; CV.TRP              - Commerical vehicle trips by time period
; sdSUT.TRP           - medium heavy duty truck trips by time period
; shMUT.TRP            - heavy heavy duty truck trips by time period
; RT.TRP              - regional truck trips
; RAEE.TRP            - regional auto and external auto trips
; RegionalFlows.TRP   - total regional trips (truck _ auto trips)
; Veh_Regional_AM.trp - total passenger vehicle, truck and regional auto trips by time of day

; Authors:
; Mayank Prakash Jain - jainm@pbworld.com     - 09/16/2008
; Amar Sarvepalli    - sarvepalli@pbworld.com - 12/10/2010
; Rolf Moeckel       - moeckel@pbworld.com    - 07/16/2012
; Rolf Moeckel       - moeckel@umd.edu        - 07/07/2014
;
; Version 1.1

;===========================================================================
```

TOD.s

```
READ File = '..\stamp.log'

 DISTRIBUTE MULTISTEP=1
 MULTISTEP=1  ; Set it equal to Zero when Wait4Files is not to be used. else set it to 1, when cluster multistep processing is to be used.

; This script only deals with highway time of day
LOOP p = 1,18
;                                            AM                               MD                            PM                          NT
;                           |+++++++++++++++++++++++++++||++++++++++++++++++++++++++++++| |+++++++++++++++++++++++++| |+++++++++++++++++++++++++++|
IF (p =1 )  pur = 'HBW1' , PA_AM=0.575,  AP_AM =0.0395,  PA_MD =0.1636, AP_MD =0.2491, PA_PM =0.0532, AP_PM =0.4517, PA_NT =0.2082, AP_NT =0.2597
IF (p =2 )  pur = 'HBW2' , PA_AM=0.6395, AP_AM =0.0272,  PA_MD =0.1275, AP_MD =0.2034, PA_PM =0.0378, AP_PM =0.5085, PA_NT =0.1951, AP_NT =0.2609
IF (p =3 )  pur = 'HBW3' , PA_AM=0.687,  AP_AM =0.0182,  PA_MD =0.0902, AP_MD =0.1956, PA_PM =0.0251, AP_PM =0.5724, PA_NT =0.1978, AP_NT =0.2137
IF (p =4 )  pur = 'HBW4' , PA_AM=0.7214, AP_AM =0.02,     PA_MD =0.0729, AP_MD =0.181,  PA_PM =0.0182, AP_PM =0.588,  PA_NT =0.1875, AP_NT =0.211
IF (p =5 )  pur = 'HBW5' , PA_AM=0.7433, AP_AM =0.0091,  PA_MD =0.0725, AP_MD =0.1616, PA_PM =0.0139, AP_PM =0.5951, PA_NT =0.1702, AP_NT =0.2342
IF (p =6 )  pur = 'HBS1' , PA_AM=0.1425, AP_AM =0.0242,  PA_MD =0.5255, AP_MD =0.4336, PA_PM =0.2007, AP_PM =0.2961, PA_NT =0.1313, AP_NT =0.2462
IF (p =7 )  pur = 'HBS2' , PA_AM=0.1368, AP_AM =0.0211,  PA_MD =0.4227, AP_MD =0.3612, PA_PM =0.2196, AP_PM =0.275,  PA_NT =0.2208, AP_NT =0.3428
IF (p =8 )  pur = 'HBS3' , PA_AM=0.1264, AP_AM =0.0191,  PA_MD =0.4094, AP_MD =0.3733, PA_PM =0.2672, AP_PM =0.2662, PA_NT =0.1969, AP_NT =0.3414
IF (p =9 )  pur = 'HBS4' , PA_AM=0.1246, AP_AM =0.0153,  PA_MD =0.3669, AP_MD =0.3234, PA_PM =0.2636, AP_PM =0.2673, PA_NT =0.245,  AP_NT =0.3941
IF (p =10)  pur = 'HBS5' , PA_AM=0.1486, AP_AM =0.0178,  PA_MD =0.3344, AP_MD =0.3307, PA_PM =0.2385, AP_PM =0.245,  PA_NT =0.2784, AP_NT =0.4066
IF (p =11)  pur = 'HBO1' , PA_AM=0.3646, AP_AM =0.0865,  PA_MD =0.3924, AP_MD =0.3937, PA_PM =0.1348, AP_PM =0.2854, PA_NT =0.1082, AP_NT =0.2344
IF (p =12)  pur = 'HBO2' , PA_AM=0.3172, AP_AM =0.0843,  PA_MD =0.3562, AP_MD =0.3163, PA_PM =0.1726, AP_PM =0.2741, PA_NT =0.154,  AP_NT =0.3253
IF (p =13)  pur = 'HBO3' , PA_AM=0.3182, AP_AM =0.1011,  PA_MD =0.3253, AP_MD =0.3061, PA_PM =0.206,  AP_PM =0.2729, PA_NT =0.1505, AP_NT =0.3199
IF (p =14)  pur = 'HBO4' , PA_AM=0.3052, AP_AM =0.0876,  PA_MD =0.313,  AP_MD =0.2796, PA_PM =0.2198, AP_PM =0.3011, PA_NT =0.1619, AP_NT =0.3318
IF (p =15)  pur = 'HBO5' , PA_AM=0.319,  AP_AM =0.0971,  PA_MD =0.2826, AP_MD =0.2656, PA_PM =0.2178, AP_PM =0.2956, PA_NT =0.1805, AP_NT =0.3417
IF (p =16)  pur = 'HBSc' , PA_AM=0.924,  AP_AM =0.003,   PA_MD =0.0271, AP_MD =0.5637, PA_PM =0.025,  AP_PM =0.3539, PA_NT =0.0239, AP_NT =0.0794
IF (p =17)  pur = 'NHBW' , PA_AM=0.0325, AP_AM =0.2384,  PA_MD =0.4523, AP_MD =0.6035, PA_PM =0.4496, AP_PM =0.0786, PA_NT =0.0656, AP_NT =0.0795
IF (p =18)  pur = 'OBO'  , PA_AM=0.0671, AP_AM =0.0818,  PA_MD =0.5706, AP_MD =0.5534, PA_PM =0.2159, AP_PM =0.2304, PA_NT =0.1465, AP_NT =0.1344


DISTRIBUTEMULTISTEP ProcessID='ToDFactor', ProcessNum=p
 ;Calculate vehicle trips by period
 RUN PGM=MATRIX   PRNFILE='..\@scenario@\Outputs\@pur@ TOD - Auto vehicle trips by period.PRN'  MSG='@pur@ TOD - Auto vehicle trips by period'
   ID = "Calculate vehicle trips by period"

   MATI[1]  = ..\@scenario@\Outputs\MC_@pur@.trp

   MATO[1] = ..\@scenario@\Outputs\Veh_@pur@_AM.trp, MO= 1- 3, NAME = AMsov,AMhov2,AMhov3+, DEC=3*S
   MATO[2] = ..\@scenario@\Outputs\Veh_@pur@_MD.trp, MO= 6- 8, NAME = MDsov,MDhov2,MDhov3+, DEC=3*S
   MATO[3] = ..\@scenario@\Outputs\Veh_@pur@_PM.trp, MO=11-13, NAME = PMsov,PMhov2,PMhov3+, DEC=3*S
   MATO[4] = ..\@scenario@\Outputs\Veh_@pur@_NT.trp, MO=16-18, NAME = NTsov,NThov2,NThov3+, DEC=3*S


 ; Lookup table for average occupancy of 3+ occupant vehicles, by purpose.
   LOOKUP interpolate = n, fail = 0,0,0, NAME = avg3,
   ;     avg    purp
    r = '3.861  1 ',
        '3.861  2 ',
        '3.861  3 ',
        '3.861  4 ',
        '3.861  5 ',
        '3.626  6 ',
        '3.626  7 ',
        '3.626  8 ',
        '3.626  9 ',
        '3.626  10',
        '3.671  11',
        '3.671  12',
        '3.671  13',
        '3.671  14',
        '3.671  15',
        '3.672  16',
        '3.668  17',
        '3.663  18'

   JLOOP
```

TOD.s

```
      ; AM peak SOV, HOV2 and HOV3+ matrices
          MW[1] = 0.5 * (@PA_AM@ * MI.1.1 + @AP_AM@ * MI.1.1.T )
          MW[2] = 0.5 * (0.5 * (@PA_AM@ * MI.1.2 + @AP_AM@ * MI.1.2.T)                 )
          MW[3] = 0.5 * ((1.00/avg3(@p@)) * (@PA_AM@ * MI.1.3 + @AP_AM@ * MI.1.3.T)    )

      ; MD peak SOV, HOV2 and HOV3+ matrices
          MW[6] = 0.5 * (@PA_MD@ * MI.1.1 + @AP_MD@ * MI.1.1.T                       )
          MW[7] = 0.5 * (0.5 * (@PA_MD@ * MI.1.2 + @AP_MD@ * MI.1.2.T)               )
          MW[8] = 0.5 * ((1.00/avg3(@p@)) * (@PA_MD@ * MI.1.3 + @AP_MD@ * MI.1.3.T)  )

      ; PM peak SOV, HOV2 and HOV3+ matrices
          MW[11] = 0.5 * (@PA_PM@ * MI.1.1 + @AP_PM@ * MI.1.1.T             )
          MW[12] = 0.5 * (0.5 * (@PA_PM@ * MI.1.2 + @AP_PM@ * MI.1.2.T)     )
          MW[13] = 0.5 * ((1.00/avg3(@p@)) * (@PA_PM@ * MI.1.3 + @AP_PM@ * MI.1.3.T))

      ; NT peak SOV, HOV2 and HOV3+ matrices
          MW[16] = 0.5 * (@PA_NT@ * MI.1.1 + @AP_NT@ * MI.1.1.T             )
          MW[17] = 0.5 * (0.5 * (@PA_NT@ * MI.1.2 + @AP_NT@ * MI.1.2.T)     )
          MW[18] = 0.5 * ((1.00/avg3(@p@)) * (@PA_NT@ * MI.1.3 + @AP_NT@ * MI.1.3.T))

      ENDJLOOP
    ENDRUN
ENDDISTRIBUTEMULTISTEP
ENDLOOP

IF (MULTISTEP=1)   Wait4Files Files=ToDFactor1.script.end, ToDFactor2.script.end, ToDFactor3.script.end,
    ToDFactor4.script.end, ToDFactor5.script.end, ToDFactor6.script.end,
    ToDFactor7.script.end, ToDFactor8.script.end, ToDFactor9.script.end,
    ToDFactor10.script.end, ToDFactor11.script.end, ToDFactor12.script.end,
    ToDFactor13.script.end, ToDFactor14.script.end, ToDFactor15.script.end,
    ToDFactor17.script.end, ToDFactor18.script.end,
    printfiles=MERGE, checkReturnCode=T

RUN PGM=MATRIX PRNFILE='..\@scenario@\Outputs\TOD - Truck Summaries.PRN'  MSG='TOD - Truck Summaries'
  ID="Sort the Input CSV from Regional Model"
  RECI= ..\@scenario@\RegionalModel\output\NationalAndStatewideTruckTrips.csv, Orgn=#1, Dstn=#2 ,CMV=#3, sdSUT=#4, sdMUT=#5, ldSUT=#6, ldMUT=#7,
  DELIMITER=",", SORT=Orgn,Dstn

  PRINTO[1]= ..\@scenario@\Outputs\RegionalandStatewideTruckFlows1.CSV
  PRINTO[2]= ..\@scenario@\Outputs\RegTrpsSummary.CSV, APPEND = T
  IF (RECI.recno=1) CONTINUE

    ldTRK = RI.ldSUT + RI.ldMUT

  PRINT PRINTO=1, CSV=T, LIST= RI.Orgn, RI.Dstn, RI.CMV, RI.sdSUT, RI.sdMUT, ldTRK

  ; Generating Summaries
    CMVtrps   = CMVtrps  + RI.CMV
    sdSUTtrps = sdSUTtrps + RI.sdSUT
    sdMUTtrps = sdMUTtrps + RI.sdMUT
    ldTRKtrps = ldTRKtrps + RI.ldSUT + RI.ldMUT

  IF (I = 0)
    PRINT PRINTO=2, REWIND=T, CSV=T, LIST = 'Trucks from Java Model'
    PRINT PRINTO=2,           CSV=T, LIST = 'CMV', 'sdSUT', 'sdMUT', 'ldTRK'
    PRINT PRINTO=2,           CSV=T, LIST = CMVtrps, sdSUTtrps, sdMUTtrps, ldTRKtrps
  ENDIF

ENDRUN

; Generating matrix from TO_From Zone data for CV,MHDT,HHDT,RT Flows
RUN PGM=MATRIX  PRNFILE='..\@scenario@\Outputs\TOD - Create Truck Matrices.PRN'  MSG='TOD - Create Truck Matrices'
  ID = "Generating matrix from TO_From Zone data"
  ;MATI=TEST.TXT, FIELDS=1-5,6-10,11-15-1, PATTERN=I:JV
  MATI=..\@scenario@\Outputs\regionalAndStatewideTruckFlows1.csv, FIELDS=#1,#2,0,#3,#4,#5,#6 PATTERN=IJM:V
```

TOD.s

```
   ZONES=@zones@
   MATO[1]=..\@scenario@\Outputs\CV.TRP, MO=1
   MATO[2]=..\@scenario@\Outputs\sdSUT.TRP, MO=2
   MATO[3]=..\@scenario@\Outputs\sdMUT.TRP, MO=3
   MATO[4]=..\@scenario@\Outputs\ldTRK.TRP, MO=4
   Fillmw MW[1]=MI.1.1(4)
ENDRUN

RUN PGM=MATRIX PRNFILE='..\@scenario@\Outputs\TOD - Long-Distance Auto Summaries.PRN'  MSG='TOD - Long-Distance Auto Summaries'

   ID="Sort the Input CSV from Regional Auto Model"
   RECI= ..\@scenario@\regionalModel\output\regAutoByZones.csv, Orgn=#1, Dstn=#2, ldAuto=#3,
   DELIMITER=",", SORT=Orgn,Dstn
   PRINTO[1]=..\@scenario@\Outputs\LongDistanceAutoTrips1.csv
   PRINTO[2]= ..\@scenario@\Outputs\RegTrpsSummary.CSV, APPEND = T

   IF (RECI.recno=1) CONTINUE
   PRINT PRINTO=1, CSV=T, LIST= RI.Orgn, RI.Dstn ,RI.ldAuto


; Generating Summaries
   sum_ldAuto = sum_ldAuto + RI.ldAuto
   IF (I = 0)
     PRINT PRINTO=2, CSV=T, LIST= 'ldAuto from Java Model'
     PRINT PRINTO=2, CSV=T, LIST= sum_ldAuto
   ENDIF

ENDRUN

; Generating matrix from TO_From Zone data for long-distance auto Flows
RUN PGM=MATRIX PRNFILE='..\@scenario@\Outputs\TOD - Create Long-Distance Auto Matrices.PRN'  MSG='TOD - Create Long-Distance Auto Matrices'

   ID = "Generating matrix from TO_From Zone data"
   MATI=..\@scenario@\Outputs\LongDistanceAutoTrips1.csv, FIELDS=#1,2,3, PATTERN=I:JV
   ZONES=@zones@
   MATO=..\@scenario@\Outputs\ldAutos.TRP, MO=1
   MW[1]=MI.1.1

ENDRUN

; Combine Matrices
RUN PGM=MATRIX PRNFILE='..\@scenario@\Outputs\TOD - Combine Truck and Long-Distance Auto Matrices.PRN'  MSG='TOD - Combine Truck and Long-Distance Auto Matrices'
MATI[1]= ..\@scenario@\Outputs\CV.TRP
MATI[2]= ..\@scenario@\Outputs\sdSUT.TRP
MATI[3]= ..\@scenario@\Outputs\sdMUT.TRP
MATI[4]= ..\@scenario@\Outputs\ldTRK.TRP
MATI[5]= ..\@scenario@\Outputs\ldAutos.TRP

MW[1]=MI.1.1
MW[2]=MI.2.1
MW[3]=MI.3.1
MW[4]=MI.4.1
MW[5]=MI.5.1

MATO = ..\@scenario@\Outputs\RegionalFlows.TRP, MO=1-5, NAME= CV,sdSUT,sdMUT,ldTRK,ldAutos
ENDRUN

; Calculate vehicle trips by period for Regional Model
RUN PGM=MATRIX PRNFILE='..\@scenario@\Outputs\TOD - All vehicle trips by period.PRN'  MSG='TOD - All vehicle trips by period'

   ID = "Calculate vehicle trips by period"

   MATI[1]  = ..\@scenario@\Outputs\RegionalFlows.TRP
   PRINTO[1]= ..\@scenario@\Outputs\RegTrpsSummary.CSV, APPEND = T
```

TOD.s

```
   MATO[1] = ..\@scenario@\Outputs\Veh_Regional_AM.trp, MO= 1- 5, NAME = CV, sdSUT, sdMUT, ldTRK, ldAutos, DEC=6*S
   MATO[2] = ..\@scenario@\Outputs\Veh_Regional_MD.trp, MO= 6-10, NAME = CV, sdSUT, sdMUT, ldTRK, ldAutos, DEC=6*S
   MATO[3] = ..\@scenario@\Outputs\Veh_Regional_PM.trp, MO=11-15, NAME = CV, sdSUT, sdMUT, ldTRK, ldAutos, DEC=6*S
   MATO[4] = ..\@scenario@\Outputs\Veh_Regional_NT.trp, MO=16-20, NAME = CV, sdSUT, sdMUT, ldTRK, ldAutos, DEC=6*S

  JLOOP

    ; AM peak
      MW[1]=  MI.1.1*0.16982 ,   MW[2] =MI.1.2*0.16982 ,  MW[3] =MI.1.3*0.16982 ,  MW[4] =MI.1.4*0.200 ,  MW[5]  = MI.1.5 * 0.1605

    ; MD off-peak
      MW[6]=  MI.1.1*0.42845 ,   MW[7] =MI.1.2*0.42845 ,  MW[8] =MI.1.3*0.42845 ,  MW[9] =MI.1.4*0.500 ,  MW[10] = MI.1.5 * 0.3707

    ; PM peak
      MW[11]= MI.1.1*0.15426 ,   MW[12]=MI.1.2*0.15426 ,  MW[13]=MI.1.3*0.15426 ,  MW[14]=MI.1.4*0.200 ,  MW[15] = MI.1.5 * 0.2519

    ; NT off-peak
      MW[16]= MI.1.1*0.24747 ,   MW[17]=MI.1.2*0.24747 ,  MW[18]=MI.1.3*0.24747 ,  MW[19]=MI.1.4*0.100 ,  MW[20] = MI.1.5 * 0.2169

  IF (I=ZONES & J = ZONES)

    PRINT PRINTO=1, CSV=T, LIST= 'AssignedVolumes','CV', 'sdSUT', 'sdMUT', 'ldTRK', 'ldAutos'
    PRINT PRINTO=1, CSV=T, LIST= 'AM', CV_AM, sdSUT_AM, sdMUT_AM, ldTRK_AM, ldAutos_AM
    PRINT PRINTO=1, CSV=T, LIST= 'MD', CV_MD, sdSUT_MD, sdMUT_MD, ldTRK_MD, ldAutos_MD
    PRINT PRINTO=1, CSV=T, LIST= 'PM', CV_PM, sdSUT_PM, sdMUT_PM, ldTRK_PM, ldAutos_PM
    PRINT PRINTO=1, CSV=T, LIST= 'NT', CV_NT, sdSUT_NT, sdMUT_NT, ldTRK_NT, ldAutos_NT

  ENDIF

  ENDJLOOP

; Generating Summaries
  CV_AM       = ROWSUM(1)  + CV_AM
  sdSUT_AM    = ROWSUM(2)  + sdSUT_AM
  sdMUT_AM    = ROWSUM(3)  + sdMUT_AM
  ldTRK_AM    = ROWSUM(4)  + ldTRK_AM
  ldAutos_AM  = ROWSUM(5)  + ldAutos_AM

  CV_MD       = ROWSUM(06) + CV_MD
  sdSUT_MD    = ROWSUM(07) + sdSUT_MD
  sdMUT_MD    = ROWSUM(08) + sdMUT_MD
  ldTRK_MD    = ROWSUM(09) + ldTRK_MD
  ldAutos_MD  = ROWSUM(10) + ldAutos_MD

  CV_PM       = ROWSUM(11) + CV_PM
  sdSUT_PM    = ROWSUM(12) + sdSUT_PM
  sdMUT_PM    = ROWSUM(13) + sdMUT_PM
  ldTRK_PM    = ROWSUM(14) + ldTRK_PM
  ldAutos_PM  = ROWSUM(15) + ldAutos_PM

  CV_NT       = ROWSUM(16) + CV_NT
  sdSUT_NT    = ROWSUM(17) + sdSUT_NT
  sdMUT_NT    = ROWSUM(18) + sdMUT_NT
  ldTRK_NT    = ROWSUM(19) + ldTRK_NT
  ldAutos_NT  = ROWSUM(20) + ldAutos_NT
ENDRUN
```

HwyAssign.s

```
; Maryland Statewide Travel Demand Model (MSTM)
;
; Script: Highway Assignment
;
; About:
; This script assigns trips to the highway networks by time of day.
;
; Description:
; STEP 1: Recodes facility type (SWFT) into Volume Delay Function groups to use different SWFT by vehicle types;
;         and estimates link volumes by vehicle and truck classes. The volume delay function uses the slighlty different
;         generalized cost than the one used in the highway skims. Here the auto operating cost is not used. Also a set of
;         value of time costs (see model\parameter.dat) is used where as in the skims a generalized value of time is used.
; STEP 2: Computes link level total auto and truck trips
; STEP 3: Writes out loaded highway networks by time of day and adds vehicle class trips across all time periods
;         and writes out a daily loaded network
;
; Input files:
; Veh_<purpose>_<timeperiod>.trp - vehicle trips by time of day and trip purpose
; Veh_Regional_<timeperiod>.TRP  - regional auto and truck trips by time of day
; MSTM.net                       - Highway network
;
; Output files:
; MSTM_Veh_<prd>.net - loaded highway network by time of day
; MSTM_Veh_Dly.net   - loaded highway network
;
; Authors:
; Mayank Prakash Jain - jainm@pbworld.com      - 09/16/2008
; Amar Sarvepalli     - sarvepalli@pbworld.com - 02/22/2011
; Moeckel, Rolf       - Moeckel@pbworld.com    - 06/20/2010, 05/23/2012
;
; Version 1.0
;
;========================================================================
;
; Do the assignment for all the four Time of day Segments
; MAXIMUM ITERATIONS HERE ARE FOLLOWING:
;maxIterns = 50
DISTRIBUTE INTRASTEP= 1

READ File = '..\stamp.log'
READ File = '..\iteration.txt'

LOOP ToD=1,4
   IF (ToD=1) prd = 'AM'  , Ispk = 'PK', prd2='AM' , spd='CONGSPD', ConFac = 0.39
   IF (ToD=2) prd = 'MD'  , Ispk = 'OP', prd2='OP' , spd='CONGSPD', ConFac = 0.21
   IF (ToD=3) prd = 'PM'  , Ispk = 'PK', prd2='PM' , spd='CONGSPD', ConFac = 0.34
   IF (ToD=4) prd = 'NT'  , Ispk = 'OP', prd2='OP' , spd='FFSPD'  , ConFac = 0.22

; Highway Assignment for all vehicles
RUN PGM=HIGHWAY   PRNFILE='..\@scenario@\Outputs\@prd@ Highway Assignment.PRN'  MSG='@prd@ Highway Assignment'
  NETI    = ..\@scenario@\Inputs\MSTM.net              ;Input Network
  MATI[1 ] = ..\@scenario@\Outputs\Veh_HBW1_@prd@.trp
  MATI[2 ] = ..\@scenario@\Outputs\Veh_HBW2_@prd@.trp
  MATI[3 ] = ..\@scenario@\Outputs\Veh_HBW3_@prd@.trp
  MATI[4 ] = ..\@scenario@\Outputs\Veh_HBW4_@prd@.trp
  MATI[5 ] = ..\@scenario@\Outputs\Veh_HBW5_@prd@.trp
  MATI[6 ] = ..\@scenario@\Outputs\Veh_HBS1_@prd@.trp
  MATI[7 ] = ..\@scenario@\Outputs\Veh_HBS2_@prd@.trp
  MATI[8 ] = ..\@scenario@\Outputs\Veh_HBS3_@prd@.trp
  MATI[9 ] = ..\@scenario@\Outputs\Veh_HBS4_@prd@.trp
  MATI[10] = ..\@scenario@\Outputs\Veh_HBS5_@prd@.trp
  MATI[11] = ..\@scenario@\Outputs\Veh_HBO1_@prd@.trp
  MATI[12] = ..\@scenario@\Outputs\Veh_HBO2_@prd@.trp
  MATI[13] = ..\@scenario@\Outputs\Veh_HBO3_@prd@.trp
  MATI[14] = ..\@scenario@\Outputs\Veh_HBO4_@prd@.trp
```

HwyAssign.s

```
    MATI[15] = ..\@scenario@\Outputs\Veh_HBO5_@prd@.trp
    MATI[16] = ..\@scenario@\Outputs\Veh_HBSc_@prd@.trp
    MATI[17] = ..\@scenario@\Outputs\Veh_NHBW_@prd@.trp
    MATI[18] = ..\@scenario@\Outputs\Veh_OBO_@prd@.trp
    MATI[19] = ..\@scenario@\Outputs\Veh_Regional_@prd@.TRP

    FILEO NETO = ..\@scenario@\Outputs\MSTMHwyAsgn_@prd@.tmp
    MATO[1]=..\@scenario@\Outputs\RT_Dist_@prd@.skm, MO=1-2

    DistributeINTRASTEP ProcessID='HwyAssignIDP',ProcessList=1-@maxcores@,MinGroupSize=77, SavePrn=T

    ;Set run PARAMETERS and Controls
    PARAMETERS ZONEMSG=100,  MAXITERS=@maxIterns@, COMBINE=EQUI, GAP= 0.0, RELATIVEGAP = 0.005

PHASE=LINKREAD

    T0 = 60* (LI.DISTANCE/LI.@spd@)
    C  = LI.@Ispk@CAP*LI.@prd2@LANE/@ConFac@

    LW.COSTa = T0 + (LI.TOLL@ispk@/@VoTa@) + 0.25*LI.DISTANCE
    LW.COSTb = T0 + (LI.TOLL@ispk@/@VoTb@) + 0.25*LI.DISTANCE
    LW.COSTc = T0 + (LI.TOLL@ispk@/@VoTc@) + 0.25*LI.DISTANCE
    LW.COSTd = T0 + (LI.TOLL@ispk@/@VoTd@) + 0.25*LI.DISTANCE
    LW.COSTe = T0 + (LI.TOLL@ispk@/@VoTe@) + 0.25*LI.DISTANCE
    ; update COSTf: average of free-flow time and congested speed is used for regional autos and trucks
    LW.COSTf = ((LI.DISTANCE*60)/LI.FFSPD * 0.5 + T0 * 0.5) + (LI.TOLL@ispk@/@VoTe@) + 0.25*LI.DISTANCE

  ; Recode facility type (SWFT) into VDF groups.
    IF (LI.SWFT = 1,2,3,7,8,9)      LINKCLASS = 1     ; Freeway/Expwy & Ramps
    IF (LI.SWFT = 4,5,6)            LINKCLASS = 2     ; Arterial
    IF (LI.SWFT = 10)               LINKCLASS = 3     ; Collectors/Local
    IF (LI.SWFT = 11)               LINKCLASS = 4     ; Centroid Connectors

            ; Set link usage restrictions for this period.  Definitions:
            ; 0,1 = no restriction         3 = HOV3
            ; 2   = HOV2                    4 = no trucks
            ; 6   = Transit Only           9 = No vehicles at all

;Rail tracks, Drive to PNR, and other PNR/Transit Links OR  No vehicles and Transit vehicles Only Links)
    IF (LI.SWFT= 13,15,21,22,23,24 || LI.@prd2@LIMIT = 6,9) ADDTOGROUP = 1
    IF (LI.@prd2@LIMIT = 4)                                 ADDTOGROUP = 2     ; no Trucks (MT or HT)
    IF (LI.@prd2@LIMIT = 2)                                 ADDTOGROUP = 3     ; HOV2  only
    IF (LI.@prd2@LIMIT = 3)                                 ADDTOGROUP = 4     ; HOV3+ only


ENDPHASE

PHASE=ILOOP
  ; SOV
    PATHLOAD VOL[1]=MI.1.1+MI.6.1 +MI.11.1,                        EXCLUDEGROUP=1,3,4,  PATH=LW.COSTa   ; Inc Gp 1
    PATHLOAD VOL[2]=MI.2.1+MI.7.1 +MI.12.1,                        EXCLUDEGROUP=1,3,4,  PATH=LW.COSTb   ; Inc Gp 2
    PATHLOAD VOL[3]=MI.3.1+MI.8.1 +MI.13.1 +MI.16.1+MI.17.1+MI.18.1,  EXCLUDEGROUP=1,3,4,  PATH=LW.COSTc   ; Inc Gp 3
    PATHLOAD VOL[4]=MI.4.1+MI.9.1 +MI.14.1,                        EXCLUDEGROUP=1,3,4,  PATH=LW.COSTd   ; Inc Gp 4
    PATHLOAD VOL[5]=MI.5.1+MI.10.1+MI.15.1,                        EXCLUDEGROUP=1,3,4,  PATH=LW.COSTe   ; Inc Gp 5
  ; HOV2
    PATHLOAD VOL[6] =MI.1.2+MI.6.2 +MI.11.2,                       EXCLUDEGROUP=1,4,    PATH=LW.COSTa   ; Inc Gp 1
    PATHLOAD VOL[7] =MI.2.2+MI.7.2 +MI.12.2,                       EXCLUDEGROUP=1,4,    PATH=LW.COSTb   ; Inc Gp 2
    PATHLOAD VOL[8] =MI.3.2+MI.8.2 +MI.13.2 +MI.16.2+MI.17.2+MI.18.2, EXCLUDEGROUP=1,4,    PATH=LW.COSTc   ; Inc Gp 3
    PATHLOAD VOL[9] =MI.4.2+MI.9.2 +MI.14.2,                       EXCLUDEGROUP=1,4,    PATH=LW.COSTd   ; Inc Gp 4
    PATHLOAD VOL[10]=MI.5.2+MI.10.2+MI.15.2,                       EXCLUDEGROUP=1,4,    PATH=LW.COSTe   ; Inc Gp 5
  ; HOV3+
    PATHLOAD VOL[11]=MI.1.3+MI.6.3 +MI.11.3,                       EXCLUDEGROUP=1,      PATH=LW.COSTa   ; Inc Gp 1
    PATHLOAD VOL[12]=MI.2.3+MI.7.3 +MI.12.3,                       EXCLUDEGROUP=1,      PATH=LW.COSTb   ; Inc Gp 2
    PATHLOAD VOL[13]=MI.3.3+MI.8.3 +MI.13.3 +MI.16.3+MI.17.3+MI.18.3, EXCLUDEGROUP=1,      PATH=LW.COSTc   ; Inc Gp 3
    PATHLOAD VOL[14]=MI.4.3+MI.9.3 +MI.14.3,                       EXCLUDEGROUP=1,      PATH=LW.COSTd   ; Inc Gp 4
```

HwyAssign.s

```
    PATHLOAD VOL[15]=MI.5.3+MI.10.3+MI.15.3,                   EXCLUDEGROUP=1,         PATH=LW.COSTe      ; Inc Gp 5

    PATHLOAD VOL[16]=MI.19.1,                                 EXCLUDEGROUP=1,3,4,     PATH=LW.COSTe      ; CV
    PATHLOAD VOL[17]=MI.19.2,                                 EXCLUDEGROUP=1,2,3,4,   PATH=LW.COSTe, MW[1]=pathtrace(LI.distance), NOACCESS=0 ; sdSUT
    PATHLOAD VOL[18]=MI.19.3,                                 EXCLUDEGROUP=1,2,3,4,   PATH=LW.COSTe      ; sdMUT
    PATHLOAD VOL[19]=MI.19.4,                                 EXCLUDEGROUP=1,2,3,4,   PATH=LW.COSTf, MW[2]=pathtrace(LI.distance) NOACCESS=0  ; ldTRK
    PATHLOAD VOL[20]=MI.19.5,                                 EXCLUDEGROUP=1,         PATH=LW.COSTf      ; RA+ EE Autos-These are allowed on all the lanes, as it is assumed
                                                                                                        ; that people would carpool if they travel far and wide!
                                                                                                        ; Uses freeflow time / cost function as EE/RA users will plan their
trip
                                                                                                        ; in advance and also maynot have knowledge on alternative routes
to switch.
ENDPHASE

PHASE=ADJUST

function {
    V=VOL[1]+VOL[2]+VOL[3]+VOL[4]+VOL[5]+ VOL[6]+VOL[7]+VOL[8]+VOL[9]+ VOL[10]+ VOL[11]+
      VOL[12]+ VOL[13]+ VOL[14]+ VOL[15]+ VOL[16]+ VOL[17]*@PCE_SUT@+ VOL[18]*@PCE_MUT@+ VOL[19]*@PCE_ldTRK@+ VOL[20]

    TC[1] = Min(T0 * (1 + 0.70*(V/C)^8), T0*100)
    TC[2] = Min(T0 * (1 + 0.55*(V/C)^6), T0*100)
    TC[3] = Min(T0 * (1 + 0.17*(V/C)^4), T0*100)
    TC[4] = T0
    }

  LW.COSTa=TIME + (LI.TOLL@Ispk@/@VoTa@) + 0.25*LI.DISTANCE
  LW.COSTb=TIME + (LI.TOLL@Ispk@/@VoTb@) + 0.25*LI.DISTANCE
  LW.COSTc=TIME + (LI.TOLL@Ispk@/@VoTc@) + 0.25*LI.DISTANCE
  LW.COSTd=TIME + (LI.TOLL@Ispk@/@VoTd@) + 0.25*LI.DISTANCE
  LW.COSTe=TIME + (LI.TOLL@Ispk@/@VoTe@) + 0.25*LI.DISTANCE
  ; update COSTf: average of free-flow time and congested speed is used for regional autos and trucks
  LW.COSTf = ((LI.DISTANCE*60)/LI.FFSPD * 0.5 + TIME * 0.5) + (LI.TOLL@ispk@/@VoTe@) + 0.25*LI.DISTANCE

ENDPHASE
ENDRUN

; Post processing after Highway Assignment
RUN PGM=NETWORK    PRNFILE='..\@scenario@\Outputs\@prd@ Highway Assignment - Post Process.PRN'  MSG='@prd@ Highway Assignment - Post Process'

FILEI LINKI[1] =  ..\@scenario@\Outputs\MSTMHwyAsgn_@prd@.tmp

  ComVeh      = V16_1
  sdSUT       = V17_1
  sdMUT       = V18_1
  ldTRK       = V19_1
  ldAuto      = V20_1
  Total_Vol   = V_1
  VHT         = VHT_1
  VMT         = VDT_1
  AsgnCSPD    = CSPD_1
  VolCap      = VC_1

  Inc1Veh = V1_1+V6_1 +V11_1
  Inc2Veh = V2_1+V7_1 +V12_1
  Inc3Veh = V3_1+V8_1 +V13_1
  Inc4Veh = V4_1+V9_1 +V14_1
  Inc5Veh = V5_1+V10_1+V15_1
  CongTime= TIME_1

  Autos  = Inc1Veh + Inc2Veh + Inc3Veh + Inc4Veh + Inc5Veh + ComVeh + ldAuto
  Trucks = sdSUT + sdMUT + ldTRK

  FILEO NETO = ..\@scenario@\Outputs\MSTM_Veh_@prd@_iter@iteration@.net, EXCLUDE =  ;Exclude indicated fields
          V1_1,V2_1,V3_1,V4_1,V5_1,V6_1,V7_1,V8_1,V9_1,V10_1,V11_1,V12_1,V13_1,V14_1,V15_1,V16_1,V17_1,V18_1,V19_1,V20_1,
```

HwyAssign.s

```
            V1T_1,V2T_1,V3T_1,V4T_1,V5T_1,V6T_1,V7T_1,V8T_1,V9T_1,V10T_1,V11T_1,V12T_1,V13T_1,V14T_1,V15T_1,V16T_1,V17T_1,V18T_1,V19T_1,V20T_1,
            VT_1, V_1, TIME_1, VC_1, CSPD_1, VDT_1, VHT_1
ENDRUN
ENDLOOP

; Merging the Networks
RUN PGM=NETWORK    PRNFILE='..\@scenario@\Outputs\Highway Assignment - Merge Networks.PRN'  MSG='Highway Assignment - Merge Networks'
  ID = 'Merging the Networks'
  FILEI LINKI[1] =  ..\@scenario@\Outputs\MSTM_Veh_AM_iter@iteration@.net
  FILEI LINKI[2] =  ..\@scenario@\Outputs\MSTM_Veh_MD_iter@iteration@.net
  FILEI LINKI[3] =  ..\@scenario@\Outputs\MSTM_Veh_PM_iter@iteration@.net
  FILEI LINKI[4] =  ..\@scenario@\Outputs\MSTM_Veh_NT_iter@iteration@.net
  FILEO NETO     =  ..\@scenario@\Outputs\MSTM_Veh_Dly_iter@iteration@.net

       Inc1Veh  = LI.1.Inc1Veh   + LI.2.Inc1Veh   + LI.3.Inc1Veh   + LI.4.Inc1Veh
       Inc2Veh  = LI.1.Inc2Veh   + LI.2.Inc2Veh   + LI.3.Inc2Veh   + LI.4.Inc2Veh
       Inc3Veh  = LI.1.Inc3Veh   + LI.2.Inc3Veh   + LI.3.Inc3Veh   + LI.4.Inc3Veh
       Inc4Veh  = LI.1.Inc4Veh   + LI.2.Inc4Veh   + LI.3.Inc4Veh   + LI.4.Inc4Veh
       Inc5Veh  = LI.1.Inc5Veh   + LI.2.Inc5Veh   + LI.3.Inc5Veh   + LI.4.Inc5Veh

       ComVeh   = LI.1.ComVeh    + LI.2.ComVeh    + LI.3.ComVeh    + LI.4.ComVeh
       ldAuto   = LI.1.ldAuto    + LI.2.ldAuto    + LI.3.ldAuto    + LI.4.ldAuto
       ldTRK    = LI.1.ldTRK     + LI.2.ldTRK     + LI.3.ldTRK     + LI.4.ldTRK
       sdSUT    = LI.1.sdSUT     + LI.2.sdSUT     + LI.3.sdSUT     + LI.4.sdSUT
       sdMUT    = LI.1.sdMUT     + LI.2.sdMUT     + LI.3.sdMUT     + LI.4.sdMUT

       Autos    = LI.1.Autos     + LI.2.Autos     + LI.3.Autos     + LI.4.Autos
       Trucks   = LI.1.Trucks    + LI.2.Trucks    + LI.3.Trucks    + LI.4.Trucks
       VHT      = LI.1.VHT       + LI.2.VHT       + LI.3.VHT       + LI.4.VHT
       VMT      = LI.1.VMT       + LI.2.VMT       + LI.3.VMT       + LI.4.VMT
       CONGSPD  = MIN(LI.1.AsgnCspd, LI.2.AsgnCspd, LI.3.AsgnCspd, LI.4.AsgnCspd)

ENDRUN

RUN PGM=NETWORK    PRNFILE='..\@scenario@\Outputs\Highway Assignment - Merge Networks.PRN'  MSG='Highway Assignment - Merge Networks'
  ID = 'Merging the Networks'
  FILEI LINKI[1] =  ..\@scenario@\Outputs\MSTM_Veh_AM_iter@iteration@.net
  FILEI LINKI[2] =  ..\@scenario@\Outputs\MSTM_Veh_MD_iter@iteration@.net
  FILEI LINKI[3] =  ..\@scenario@\Outputs\MSTM_Veh_PM_iter@iteration@.net
  FILEI LINKI[4] =  ..\@scenario@\Outputs\MSTM_Veh_NT_iter@iteration@.net
  FILEO NETO     =  ..\@scenario@\Outputs\MSTM_Veh_Dly.net,
           EXCLUDE = Inc1Veh, Inc2Veh, Inc3Veh, Inc4Veh, Inc5Veh, Autos, Trucks, VMT, VHT,
                     ldAuto, ldTRK, sdSUT, sdMUT, Tot_Vol, ComVeh, Tot_Vol

; Time-of-Day Summaries

  AM_Autos   = ROUND(LI.1.Autos)
  MD_Autos   = ROUND(LI.2.Autos)
  PM_Autos   = ROUND(LI.3.Autos)
  NT_Autos   = ROUND(LI.4.Autos)

  AM_ComVeh  = ROUND(LI.1.ComVeh)
  MD_ComVeh  = ROUND(LI.2.ComVeh)
  PM_ComVeh  = ROUND(LI.3.ComVeh)
  NT_ComVeh  = ROUND(LI.4.ComVeh)

  AM_sdSUT   = ROUND(LI.1.sdSUT)
  MD_sdSUT   = ROUND(LI.2.sdSUT)
  PM_sdSUT   = ROUND(LI.3.sdSUT)
  NT_sdSUT   = ROUND(LI.4.sdSUT)

  AM_sdMUT   = ROUND(LI.1.sdMUT)
  MD_sdMUT   = ROUND(LI.2.sdMUT)
  PM_sdMUT   = ROUND(LI.3.sdMUT)
  NT_sdMUT   = ROUND(LI.4.sdMUT)
```

HwyAssign.s

```
AM_ldTRK   = ROUND(LI.1.ldTRK)
MD_ldTRK   = ROUND(LI.2.ldTRK)
PM_ldTRK   = ROUND(LI.3.ldTRK)
NT_ldTRK   = ROUND(LI.4.ldTRK)

AM_ldAuto  = ROUND(LI.1.ldAuto)
MD_ldAuto  = ROUND(LI.2.ldAuto)
PM_ldAuto  = ROUND(LI.3.ldAuto)
NT_ldAuto  = ROUND(LI.4.ldAuto)

; Daily Summaries

 COMMVEH24      = ROUND(LI.1.ComVeh   + LI.2.ComVeh   + LI.3.ComVeh   + LI.4.ComVeh)
 ldAUTO24       = ROUND(LI.1.ldAuto   + LI.2.ldAuto   + LI.3.ldAuto   + LI.4.ldAuto)
 ldTRK24        = ROUND(LI.1.ldTRK    + LI.2.ldTRK    + LI.3.ldTRK    + LI.4.ldTRK)
 sdSUT24        = ROUND(LI.1.sdSUT    + LI.2.sdSUT    + LI.3.sdSUT    + LI.4.sdSUT)
 sdMUT24        = ROUND(LI.1.sdMUT    + LI.2.sdMUT    + LI.3.sdMUT    + LI.4.sdMUT)

 AUTO24         = ROUND(LI.1.Autos    + LI.2.Autos    + LI.3.Autos    + LI.4.Autos)
 TRUCK24        = ROUND(LI.1.Trucks   + LI.2.Trucks   + LI.3.Trucks   + LI.4.Trucks)
 VEHS24         = ROUND(AUTO24+TRUCK24)

 AM_VHT         = ROUND(LI.1.VHT)
 MD_VHT         = ROUND(LI.2.VHT)
 PM_VHT         = ROUND(LI.3.VHT)
 NT_VHT         = ROUND(LI.4.VHT)

 AM_VMT         = ROUND(LI.1.VMT)
 MD_VMT         = ROUND(LI.2.VMT)
 PM_VMT         = ROUND(LI.3.VMT)
 NT_VMT         = ROUND(LI.4.VMT)
 VHT24          = ROUND(LI.1.VHT + LI.2.VHT + LI.3.VHT + LI.4.VHT)
 VMT24          = ROUND(LI.1.VMT + LI.2.VMT + LI.3.VMT + LI.4.VMT)

 CONGSPD_AM     = ROUND(LI.1.AsgnCspd)
 CONGSPD_MD     = ROUND(LI.2.AsgnCspd)
 CONGSPD_PM     = ROUND(LI.3.AsgnCspd)
 CONGSPD_NT     = ROUND(LI.4.AsgnCspd)
 MIN_CONGSPD    = MIN(LI.1.AsgnCspd, LI.2.AsgnCspd, LI.3.AsgnCspd, LI.4.AsgnCspd)


ENDRUN
```

TransitAssign.s

```
; Maryland Statewide Travel Demand Model (MSTM)
;
; Script: Transit Assignment
;
; About:
; This script assigns transit trips to the transit networks.

; Description:
; STEP 1: Adds all mode choice transit trips to transit peak and offpeak trips by <access> and <transit mode>
; STEP 2: Zeros out any transit trip less than 0.5
; STEP 3: Assigns peak and offpeak trips to the transit network created during transit skimming

; Input files:
; MC_<purpose>.trp                      - mode choice person trips by purpose
; MSTM_<access-transit mode><PK/OP>.NET - transit networks for each access and transit mode combiantions by timeperiod

; Output files:
; TransitPK.trp - transit peak trips
; TransitOP.trp - transit offpeak trips
; ROUTE_@SM@@prd@.RTE  - transit route boardings
; MSTMAsgn_<access-transit mode><PK/OP>.NET  - Assigned Transit networks by time of day
; REPORT_Asgn<access-transit mode><PK/OP>.txt -  reports transit trips by access and transit mode by time of day
; loadedlegs_asgn_<access-transit mode><PK/OP>.dbf - loadings on the non-transit network links (access/transfer/egress links)
; loadedlegs_withroute_asgn_<access-transit mode><PK/OP>.dbf -  loadings on the non-transit network links with route information (access/transfer/egress links)

; Authors:
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; Amar Sarvepalli    - sarvepalli@pbworld.com - 02/22/2011

; Version 1.0

;========================================================================
READ File = '..\stamp.log'

DISTRIBUTE MULTISTEP = 1
multistep1=1

RUN PGM=MATRIX  PRNFILE='..\@scenario@\Outputs\Transit Assignment - Peak and Off-Peak Trips.PRN'  MSG='Transit Assignment - Peak and Off-Peak Trips'
  MATI[1 ]=..\@scenario@\Outputs\MC_HBW1.trp
  MATI[2 ]=..\@scenario@\Outputs\MC_HBW2.trp
  MATI[3 ]=..\@scenario@\Outputs\MC_HBW3.trp
  MATI[4 ]=..\@scenario@\Outputs\MC_HBW4.trp
  MATI[5 ]=..\@scenario@\Outputs\MC_HBW5.trp
  MATI[6 ]=..\@scenario@\Outputs\MC_HBS1.trp
  MATI[7 ]=..\@scenario@\Outputs\MC_HBS2.trp
  MATI[8 ]=..\@scenario@\Outputs\MC_HBS3.trp
  MATI[9 ]=..\@scenario@\Outputs\MC_HBS4.trp
  MATI[10]=..\@scenario@\Outputs\MC_HBS5.trp
  MATI[11]=..\@scenario@\Outputs\MC_HBO1.trp
  MATI[12]=..\@scenario@\Outputs\MC_HBO2.trp
  MATI[13]=..\@scenario@\Outputs\MC_HBO3.trp
  MATI[14]=..\@scenario@\Outputs\MC_HBO4.trp
  MATI[15]=..\@scenario@\Outputs\MC_HBO5.trp
  MATI[16]=..\@scenario@\Outputs\MC_HBSc.trp
  MATI[17]=..\@scenario@\Outputs\MC_NHBW.trp
  MATI[18]=..\@scenario@\Outputs\MC_OBO.trp

  MATO[1]=..\@scenario@\Outputs\TransitPK.trp    , MO=1-8, NAME=WBus,WExpBus,WRail,WCRail,  DBus,DExpBus,DRail,DCRail
  MATO[2]=..\@scenario@\Outputs\TransitOP.trp    , MO=11-18, NAME=WBus,WExpBus,WRail,WCRail,  DBus,DExpBus,DRail,DCRail

  MW[1]=MI.1.4 +MI.2.4 +MI.3.4 +MI.4.4 +MI.5.4 +MI.17.4
  MW[2]=MI.1.5 +MI.2.5 +MI.3.5 +MI.4.5 +MI.5.5 +MI.17.5
  MW[3]=MI.1.6 +MI.2.6 +MI.3.6 +MI.4.6 +MI.5.6 +MI.17.6
  MW[4]=MI.1.7 +MI.2.7 +MI.3.7 +MI.4.7 +MI.5.7 +MI.17.7
  MW[5]=MI.1.8 +MI.2.8 +MI.3.8 +MI.4.8 +MI.5.8 +MI.17.8
```

TransitAssign.s

```
MW[6]=MI.1.9 +MI.2.9 +MI.3.9 +MI.4.9 +MI.5.9 +MI.17.9
MW[7]=MI.1.10+MI.2.10+MI.3.10+MI.4.10+MI.5.10+MI.17.10
MW[8]=MI.1.11+MI.2.11+MI.3.11+MI.4.11+MI.5.11+MI.17.11

MW[11] = MI.6.4 +MI.7.4 +MI.8.4 +MI.9.4 +MI.10.4 +MI.11.4 +MI.12.4 +MI.13.4 +MI.14.4 +MI.15.4 +MI.16.4 +MI.18.4
MW[12] = MI.6.5 +MI.7.5 +MI.8.5 +MI.9.5 +MI.10.5 +MI.11.5 +MI.12.5 +MI.13.5 +MI.14.5 +MI.15.5 +MI.16.5 +MI.18.5
MW[13] = MI.6.6 +MI.7.6 +MI.8.6 +MI.9.6 +MI.10.6 +MI.11.6 +MI.12.6 +MI.13.6 +MI.14.6 +MI.15.6 +MI.16.6 +MI.18.6
MW[14] = MI.6.7 +MI.7.7 +MI.8.7 +MI.9.7 +MI.10.7 +MI.11.7 +MI.12.7 +MI.13.7 +MI.14.7 +MI.15.7 +MI.16.7 +MI.18.7
MW[15] = MI.6.8 +MI.7.8 +MI.8.8 +MI.9.8 +MI.10.8 +MI.11.8 +MI.12.8 +MI.13.8 +MI.14.8 +MI.15.8 +MI.16.8 +MI.18.8
MW[16] = MI.6.9 +MI.7.9 +MI.8.9 +MI.9.9 +MI.10.9 +MI.11.9 +MI.12.9 +MI.13.9 +MI.14.9 +MI.15.9 +MI.16.9 +MI.18.9
MW[17] = MI.6.10+MI.7.10+MI.8.10+MI.9.10+MI.10.10+MI.11.10+MI.12.10+MI.13.10+MI.14.10+MI.15.10+MI.16.10+MI.18.10
MW[18] = MI.6.11+MI.7.11+MI.8.11+MI.9.11+MI.10.11+MI.11.11+MI.12.11+MI.13.11+MI.14.11+MI.15.11+MI.16.11+MI.18.11

ENDRUN

RUN PGM=MATRIX  PRNFILE='..\@scenario@\Outputs\Transit Assignment - Process Peak and Off-Peak Trips.PRN'  MSG='Transit Assignment - Process Peak and Off-Peak Trips'

  MATI[1]=..\@scenario@\Outputs\transitPK.trp
  MATI[2]=..\@scenario@\Outputs\transitOP.trp

  MATO[1]= ..\@scenario@\Outputs\transitPK1.trp, MO=1-8, NAME=WBus,WExpBus,WRail,WCRail,DBus,DExpBus,DRail,DCRail
  MATO[2]= ..\@scenario@\Outputs\transitOP1.trp, MO=11-18, NAME=WBus,WExpBus,WRail,WCRail,DBus,DExpBus,DRail,DCRail

  FILLMW MW[1] = MI.1.1(8)
  FILLMW MW[11] = MI.2.1(8)

  JLOOP
    IF (MW[1]<0.50) MW[1]=0
    IF (MW[2]<0.50) MW[2]=0
    IF (MW[3]<0.50) MW[3]=0
    IF (MW[4]<0.50) MW[4]=0
    IF (MW[5]<0.50) MW[5]=0
    IF (MW[6]<0.50) MW[6]=0
    IF (MW[7]<0.50) MW[7]=0
    IF (MW[8]<0.50) MW[8]=0

    IF (MW[11]<0.50) MW[11]=0
    IF (MW[12]<0.50) MW[12]=0
    IF (MW[13]<0.50) MW[13]=0
    IF (MW[14]<0.50) MW[14]=0
    IF (MW[15]<0.50) MW[15]=0
    IF (MW[16]<0.50) MW[16]=0
    IF (MW[17]<0.50) MW[17]=0
    IF (MW[18]<0.50) MW[18]=0
  ENDJLOOP

ENDRUN

LOOP p=1,2

  IF (p=1) prd='PK'
  IF (p=2) prd='OP'
LOOP TA=1,8

  IF (TA=1) SM='WBus'          ; SM = Sub-Mode
  IF (TA=2) SM='WExpBus'
  IF (TA=3) SM='WRail'
  IF (TA=4) SM='WCRail'
  IF (TA=5) SM='DBus'
  IF (TA=6) SM='DExpBus'
  IF (TA=7) SM='DRail'
  IF (TA=8) SM='DCRail'


DISTRIBUTEMULTISTEP ProcessID='MSTM', ProcessNum=TA
```

TransitAssign.s

```
RUN PGM=PT        PRNFILE="Loads_@prd@_@SM@.PRN"   ; @prd@ Transit Assignment
  ID = "Off Peak Walk Transit Assignment"

  NETI    = ..\@scenario@\Outputs\MSTM_@SM@@prd@.NET    ; Built Transit Network from Skimming Step.
  MATI[1] = ..\@scenario@\Outputs\Transit@prd@1.trp
  ROUTEI  = ..\@scenario@\Outputs\ROUTE_@SM@@prd@.RTE

  NETO    = ..\@scenario@\Outputs\MSTMAsgn_@SM@@prd@.NET   ; Assigned Transit network with Loadings.
  REPORTO = ..\@scenario@\Outputs\REPORT_Asgn@SM@@prd@.txt
  linko[1] = ..\@scenario@\Outputs\loadedlegs_asgn_@SM@@prd@.dbf, ntbylink=Y, onelinkrec=Y, volfields=Y
  linko[2] = ..\@scenario@\Outputs\loadedlegs_withroute_asgn_@SM@@prd@.dbf,  volfields=Y


;Specific Global params to invoke Loading.

  PARAMETERS  TRIPSIJ[1] = MI.1.@SM@,           ; Trips for that Submode
              TRANTIME=LI.TRNTM@prd@,
              NOROUTEERRS = 30,
              NOROUTEMSGS = 30

;Selection of Loading Reports
REPORT LINES=T, SORT=LINE, LINEVOLS=F, STOPSONLY=T, SKIP0=T


ENDRUN

endDistributeMULTISTEP
ENDLOOP
IF (Multistep1=1) Wait4Files Files= MSTM1.script.end, MSTM2.script.end,MSTM3.script.end,MSTM4.script.end,
MSTM5.script.end,MSTM6.script.end,MSTM7.script.end,MSTM8.script.end,checkreturncode=T, printfiles=MERGE

ENDLOOP
```

VMT_VHT_ByCountyOnly.s

```
; Maryland Statewide Travel Demand Model (MSTM)
;
; Script: VMT and VHT by county
;
; About:
; This script computes vehicle miles of travel  (VMT) and vehvile housr of travel (VHT) by facility type (SWFT)

; Description:
; This section will calculate the VMT and VHT by county for the state of Maryland. The following are the list of counties:
; ALLEGANY, ANNE ARUNDEL, BALTIMORE CO., CALVERT, CAROLINE, CARROLL, CECIL, CHARLES, DORCHESTER, FREDERICK, GARRETT, HARFORD, HOWARD, KENT,
; MONTGOMERY, PRINCE GEORGE'S, QUEEN ANNE'S, ST. MARY'S, SOMERSET, TALBOT,WASHINGTON,WICOMICO,WORCESTER,BALTIMORE CITY

; Input files:
; MSTM_Veh_Dly.net - loaded highway network

; Output files:
; ValidationLinks.dbf - Converts loaded highway network into a link file in DBF format
; VMT_BySWFT.csv      - VMT and VHT by county in CSV format with following fields
;                       CtyName,county,VMT,ComVehVMT,MedHDTVMT,HvyHDTVMT,VHT

; Authors:
; Mayank Prakash Jain - jainm@pbworld.com      - 09/16/2008
; Amar Sarvepalli     - sarvepalli@pbworld.com - 02/22/2011
; Rolf Moeckel        - moeckel@pbworld.com    - 05/30/2012
;
; Version 1.0

;========================================================================

READ File = '..\stamp.log'

RUN PGM=NETWORK  PRNFILE='..\@scenario@\Outputs\Validation - Convert Network to DBF.PRN'  MSG='Validation - Convert Network to DBF'
             ;NETI=..\@scenario@\Outputs\MSTM_Veh_Dly_iter@iteration@.net
   NETI=..\@scenario@\Outputs\MSTM_Veh_Dly.net
  LINKO=..\@scenario@\Outputs\ValidationLinks.dbf
ENDRUN

LOOP cty = 1,24
     IF(cty=1) county = 24001, ctyName = 'ALLEGANY'
     IF(cty=2) county = 24003, ctyName = 'ANNE_ARUNDEL'
     IF(cty=3) county = 24005, ctyName = 'BALTIMORE_CO.'
     IF(cty=4) county = 24009, ctyName = 'CALVERT'
     IF(cty=5) county = 24011, ctyName = 'CAROLINE'
     IF(cty=6) county = 24013, ctyName = 'CARROLL'
     IF(cty=7) county = 24015, ctyName = 'CECIL'
     IF(cty=8) county = 24017, ctyName = 'CHARLES'
     IF(cty=9) county = 24019, ctyName = 'DORCHESTER'
     IF(cty=10) county = 24021, ctyName = 'FREDERICK'
     IF(cty=11) county = 24023, ctyName = 'GARRETT'
     IF(cty=12) county = 24025, ctyName = 'HARFORD'
     IF(cty=13) county = 24027, ctyName = 'HOWARD'
     IF(cty=14) county = 24029, ctyName = 'KENT'
     IF(cty=15) county = 24031, ctyName = 'MONTGOMERY'
     IF(cty=16) county = 24033, ctyName = 'PRINCE_GEORGES'
     IF(cty=17) county = 24035, ctyName = 'QUEEN_ANNES'
     IF(cty=18) county = 24037, ctyName = 'ST._MARYS'
     IF(cty=19) county = 24039, ctyName = 'SOMERSET'
     IF(cty=20) county = 24041, ctyName = 'TALBOT'
     IF(cty=21) county = 24043, ctyName = 'WASHINGTON'
     IF(cty=22) county = 24045, ctyName = 'WICOMICO'
     IF(cty=23) county = 24047, ctyName = 'WORCESTER'
     IF(cty=24) county = 24510, ctyName = 'BALTIMORE_CITY'

RUN PGM=MATRIX  PRNFILE='..\@scenario@\Outputs\Validation - VMT_VHT by County.PRN'  MSG='Validation - VMT_VHT by County'
  RECI    = ..\@scenario@\Outputs\ValidationLinks.dbf
```

VMT_VHT_ByCountyOnly.s

```
    IF (RI.FIPS = @county@ & RI.SWFT < 11)  ; does not include centroid connector VMT
              VHT       = VHT + (RI.AUTO24 + RI.TRUCK24)* RI.CongTime / 60
              VMT       = VMT + (RI.AUTO24 + RI.TRUCK24)* RI.Distance
              ComVehVMT = ComVehVMT + (RI.COMMVEH24) * RI.Distance
              sd_SUT    = sd_SUT + (RI.SDSUT24) * RI.Distance
              sd_MUT    = sd_MUT + (RI.SDMUT24) * RI.Distance
                        ld_TRK    = ld_TRK + (RI.LDTRK24) * RI.Distance
    ENDIF

  FILEO PRINTO[1] = ..\@scenario@\validation\VMT_VHT_byCty.csv,APPEND=T
    IF (I =0)
     LOOP row=1,@cty@
      Prn1  = '@ctyName@'
      Prn2  = '@county@'
      Prn3  = VMT
      Prn4  = VHT
      Prn5  = ComVehVMT
      Prn6  = sd_SUT
      Prn7  = sd_MUT
      Prn8  = ld_TRK
      IF (row=1 & @cty@ = 1) PRINT PRINTO=1 CSV=T LIST= 'CtyName','county','VMT','ComVehVMT','sdSUT','sdMUT','ldTRK','VHT'
      IF (row = @cty@) PRINT PRINTO=1 CSV=T LIST= Prn1,Prn2,Prn3,Prn5,Prn6,Prn7,Prn8,Prn4
     ENDLOOP
    ENDIF
ENDRUN
ENDLOOP
```

VMT_By_SWFT.s

```
; Maryland Statewide Travel Demand Model (MSTM)
;
; Script: VMT and VHT by facility type
;
; About:
; This script computes vehicle miles of travel  (VMT) and vehvile housr of travel (VHT) by facility type (SWFT)

; Description:
; This section will calculate the VMT and VHT by facility type. The following are the list of facility types:
; Interstate, Freeway, Expressway, Major Arterial, Minor Arterial, CollARFORD, HOWARD, KENT,
; Medium Speed Ramps, High Speed Ramps, Local Roads, Centroid Connector

; Input files:
; MSTM_Veh_Dly.net - loaded highway network

; Output files:
; ValidationLinks.dbf - Converts loaded highway network into a link file in DBF format
; VMT_BySWFT.csv      - VMT and VHT by county and facility types in CSV format with following fields
;                       County name, SWFT, VMT, VHT, AutosVMT, TrucksVMT, ComVehVMT, MedHDTVMT, HvyHDTVMT

; Authors:
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; Amar Sarvepalli     - sarvepalli@pbworld.com - 02/22/2011
; Rolf Moeckel        - moeckel@pbworld.com    - 05/30/2012
;
; Version 1.0

;========================================================================
READ File = '..\stamp.log'

; General parameters
RUN PGM=NETWORK  PRNFILE='..\@scenario@\Outputs\Validation - Convert Network to DBF-2.PRN'  MSG='Validation - Convert Network to DBF-2'
  ;NETI=..\@scenario@\Outputs\MSTM_Veh_Dly_iter@iteration@.net
    NETI=..\@scenario@\Outputs\MSTM_Veh_Dly.net
   LINKO=..\@scenario@\Outputs\ValidationLinks.dbf
ENDRUN

LOOP ft = 1,11
     IF(ft=1) SWFT = 1, NAME = 'Interstate'
     IF(ft=2) SWFT = 2, NAME = 'Freeway'
     IF(ft=3) SWFT = 3, NAME = 'Expressway'
     IF(ft=4) SWFT = 4, NAME = 'Major Arterial'
     IF(ft=5) SWFT = 5, NAME = 'Minor Arterial'
     IF(ft=6) SWFT = 6, NAME = 'Collector'
     IF(ft=7) continue
     IF(ft=8) SWFT = 8, NAME = 'Medium Speed Ramps'
     IF(ft=9) SWFT = 9, NAME = 'High Speed Ramps'
     IF(ft=10) SWFT = 10, NAME = 'Local Roads'
     IF(ft=11) SWFT = 11, NAME = 'Centroid Connector'

RUN PGM=MATRIX  PRNFILE='..\@scenario@\Outputs\Validation - VMT by SWFT.PRN'  MSG='Validation - VMT by SWFT'
  RECI    = ..\@scenario@\Outputs\ValidationLinks.dbf

   DISTANCE   = RI.Distance

   AM_VEHS = RI.AM_AUTOS + RI.AM_COMVEH + RI.AM_sdSUT + RI.AM_sdMUT + RI.AM_ldTRK + RI.AM_ldAUTO
   MD_VEHS = RI.MD_AUTOS + RI.MD_COMVEH + RI.MD_sdSUT + RI.MD_sdMUT + RI.MD_ldTRK + RI.MD_ldAUTO
   PM_VEHS = RI.PM_AUTOS + RI.PM_COMVEH + RI.PM_sdSUT + RI.PM_sdMUT + RI.PM_ldTRK + RI.PM_ldAUTO
   NT_VEHS = RI.NT_AUTOS + RI.NT_COMVEH + RI.NT_sdSUT + RI.NT_sdMUT + RI.NT_ldTRK + RI.NT_ldAUTO

   CONGSPD_AM = RI.CONGSPD_AM
   CONGSPD_MD = RI.CONGSPD_MD
   CONGSPD_PM = RI.CONGSPD_PM
   CONGSPD_NT = RI.CONGSPD_NT
```

VMT_By_SWFT.s

```
    IF (RI.SWFT == @SWFT@ & RI.FIPS > 24000 & RI.FIPS <24511)

       IF (RI.CONGSPD_AM > 0 && RI.CONGSPD_MD > 0 && RI.CONGSPD_PM > 0 && RI.CONGSPD_NT > 0 )
       VHT = AM_VEHS*(Distance/CONGSPD_AM)+ MD_VEHS*(Distance/CONGSPD_MD)+ PM_VEHS*(Distance/CONGSPD_PM)+ NT_VEHS*(Distance/CONGSPD_NT)

       ENDIF

      ;VHT       = VHT + (RI.AUTO24 + RI.TRUCK24)* RI.CongTime * 60
       VMT       = VMT + (RI.AUTO24+ RI.TRUCK24)* RI.Distance
       AutosVMT  = AutosVMT + (RI.AUTO24)* RI.Distance
       TrucksVMT = TrucksVMT + (RI.TRUCK24)* RI.Distance
       ComVehVMT = ComVehVMT + (RI.COMMVEH24) * RI.Distance
       sd_SUT    = sd_SUT + (RI.SDSUT24) * RI.Distance
       sd_MUT    = sd_MUT + (RI.SDMUT24) * RI.Distance
       ld_TRK    = ld_TRK + (RI.LDTRK24) * RI.Distance
    ENDIF

  FILEO PRINTO[1] = ..\@scenario@\Validation\VMT_BySWFT.csv,APPEND=T
    IF (I =0)

      LOOP row=1,11
        Prn1  = '@NAME@'
        Prn2  = '@SWFT@'
        Prn3  = VMT
        Prn4  = VHT
        Prn5  = AutosVMT
        Prn6  = TrucksVMT
        Prn7  = ComVehVMT
        Prn8  = sd_SUT
        Prn9  = sd_MUT
        Prn10 = ld_TRK

        IF (row=1 & @ft@ = 1) PRINT PRINTO=1 CSV=T LIST= 'Name','SWFT','VMT','VHT','AutosVMT','TrucksVMT','ComVehVMT','sdSUT','sdMUT','ldTRK'
        IF (row = @ft@) PRINT PRINTO=1 CSV=T LIST= Prn1,Prn2,Prn3,Prn4,Prn5,Prn6,Prn7,Prn8,Prn9,Prn10
      ENDLOOP
    ENDIF
ENDRUN
ENDLOOP
```

ComVeh_Truck_TLFD.s

```
; Maryland Statewide Travel Demand Model (MSTM)
;
; Script: Commericial vehicle truck TDLF
;
; About:
; This script computes commericial vehicle truck trip length frequency distribution.

; Description:
; STEP 1: This script takes the highway peak period and off peak period skims and takes the average
;         of the two then creates a new matrix.
; STEP 2: Then adds the regional trip tables from all of the time periods.
; STEP 3: Creates trip length frequency distributions for both time and distance.

; Input files:
; HwyPK.skm           - highway peak skim
; HwyOP.skm           - highway offpeak skim
; Veh_Regional_AM.trp - regional auto,truck and external trips for the AM period
; Veh_Regional_MD.trp - regional auto,truck and external trips for the MD period
; Veh_Regional_PM.trp - regional auto,truck and external trips for the PM period
; Veh_Regional_NT.trp - regional auto,truck and external trips for the NT period
;

; Output files:
; Veh_Regional_DLY.TRP - total daily regional vehicle trips


; Authors:
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; Amar Sarvepalli     - sarvepalli@pbworld.com - 02/22/2011
; Rolf Moeckel        - moeckel@pbworld.com   - 05/30/2012
;
; Version 1.0

;========================================================================
READ File = '..\stamp.log'
READ File = '..\iteration.txt'


RUN PGM=MATRIX          ; Merging the Matricies
  ID = 'Merging the Matricies'
;Reading in the highway skims
  FILEI MATI[1] = ..\@scenario@\Outputs\HwyPK_iter@iteration@.skm
  FILEI MATI[2] = ..\@scenario@\Outputs\HwyOP_iter@iteration@.skm
;The new skim file
  FILEO MATO[1]   = ..\@scenario@\Outputs\Hwy.skm MO=1-2 NAME='TDTime','TDDist'
;setting the matricies to working matricies
  MW[1] = MI.1.7
  MW[2] = MI.2.7
  MW[3] = MI.1.8
  MW[4] = MI.2.8
;calculating the average for the two time periods.
  TDTime = (MW[1] + MW[2])/2
  TDDist = (MW[3] + MW[4])/2

ENDRUN
RUN PGM=MATRIX          ; Merging the Matricies
  ID = 'Merging the Matricies'
;Reading in the trip tables
  FILEI MATI[1] = ..\@scenario@\Outputs\Veh_Regional_AM.trp
  FILEI MATI[2] = ..\@scenario@\Outputs\Veh_Regional_MD.trp
  FILEI MATI[3] = ..\@scenario@\Outputs\Veh_Regional_PM.trp
  FILEI MATI[4] = ..\@scenario@\Outputs\Veh_Regional_NT.trp
;The new trip table output
  FILEO MATO[1]   = ..\@scenario@\Outputs\Veh_Regional_DLY.trp MO=1-3 NAME='ComVeh','MedHDT','HvyHDT'
;setting the matricies to working matricies
```

ComVeh_Truck_TLFD.s

```
   MW[1]= MI.1.1
   MW[2]= MI.2.1
   MW[3]= MI.3.1
   MW[4]= MI.4.1
   MW[5]= MI.1.2
   MW[6]= MI.2.2
   MW[7]= MI.3.2
   MW[8]= MI.4.2
   MW[9]= MI.1.3
   MW[10]= MI.2.3
   MW[11]= MI.3.4
   MW[12]= MI.4.4
;adding the matricies together based on the vehicle type
   ComVeh    = MW[1] + MW[2]+ MW[3] +  MW[4]
   MedHDT    = MW[5] + MW[6] + MW[7] +  MW[8]
   HvyHDT    = MW[9] + MW[10] + MW[11] +  MW[12]
ENDRUN


LOOP veh=1,3
     IF(veh=1) tt = 'ComVeh_Time', td = 'ComVeh_Dist', matNum = 1
     IF(veh=2) tt = 'MedHDT_Time', td = 'MedHDT_Dist', matNum = 2
     IF(veh=3) tt = 'HvyHDT_Time', td = 'HvyHDT_Dist', matNum = 3


RUN PGM=MATRIX
  ID = 'Creating TLFD'
;   -----Create the trip length frequency distributions
;Read in the trip table
FILEI MATI[1] = ..\@scenario@\Outputs\Veh_Regional_DLY.TRP
;Read in the travel times and distances
FILEI MATI[2] = ..\@scenario@\Outputs\Hwy.skm

  MW[1]= MI.1.1
  MW[2]= MI.1.2
  MW[3]= MI.1.3
  MW[21]=MI.2.1
  MW[31]=MI.2.2

  FREQUENCY BASEMW=21,VALUEMW=@matNum@,RANGE=1-120-3,
  TITLE='*****@tt@*****'

  FREQUENCY BASEMW=31,VALUEMW=@matNum@,RANGE=1-120-3,
  TITLE='*****@td@*****'
ENDRUN
ENDLOOP
```

ExportNET2DBF.s

```
; Maryland Statewide Travel Demand Model (MSTM)
;
; Script: ExportNET2DBF
;
; About:
; Exports highway networks to DBF files
;
; Description:
; The loaded highway networks by time of day and daily are converted to DBF link files.
; The following are the input and output files
;
; Input Files:
; MSTM_Veh_Dly.net - Daily highway loaded network file
; MSTM_Veh_<timeperiod>.net - Time of day specific highway loaded network file
;
; Output Files:
; MSTM_Veh_Dly.dbf - Daily highway loaded network file in DBF format
; MSTM_Veh_<timeperiod>.dbf - ime of day specific highway loaded network file in DBF format

;
; Authors:
; Amar Sarvepalli - Sarvepalli@pbworld.com - 02/22/2011
; Rolf Moeckel    - moeckel@pbworld.com    - 05/30/2012
; Version 1.0

;======================================================================

; Export all NET files to link files

READ File = '..\stamp.log'
READ File = '..\iteration.txt'

RUN PGM=NETWORK  PRNFILE='..\@scenario@\Outputs\Validation - Convert Network to DBF-2.PRN'  MSG='Validation - Convert Network to DBF-2'
  NETI=..\@scenario@\Outputs\MSTM_Veh_Dly_iter@iteration@.net
  LINKO=..\@scenario@\Outputs\MSTM_Veh_Dly.dbf
ENDRUN
RUN PGM=NETWORK  PRNFILE='..\@scenario@\Outputs\Validation - Convert Network to DBF-2.PRN'  MSG='Validation - Convert Network to DBF-2'
  NETI=..\@scenario@\Outputs\MSTM_Veh_AM_iter@iteration@.net
  LINKO=..\@scenario@\Outputs\MSTM_Veh_AM.dbf
ENDRUN
RUN PGM=NETWORK  PRNFILE='..\@scenario@\Outputs\Validation - Convert Network to DBF-2.PRN'  MSG='Validation - Convert Network to DBF-2'
  NETI=..\@scenario@\Outputs\MSTM_Veh_MD_iter@iteration@.net
  LINKO=..\@scenario@\Outputs\MSTM_Veh_MD.dbf
ENDRUN
RUN PGM=NETWORK  PRNFILE='..\@scenario@\Outputs\Validation - Convert Network to DBF-2.PRN'  MSG='Validation - Convert Network to DBF-2'
  NETI=..\@scenario@\Outputs\MSTM_Veh_PM_iter@iteration@.net
  LINKO=..\@scenario@\Outputs\MSTM_Veh_PM.dbf
ENDRUN
RUN PGM=NETWORK  PRNFILE='..\@scenario@\Outputs\Validation - Convert Network to DBF-2.PRN'  MSG='Validation - Convert Network to DBF-2'
  NETI=..\@scenario@\Outputs\MSTM_Veh_NT_iter@iteration@.net
  LINKO=..\@scenario@\Outputs\MSTM_Veh_NT.dbf
ENDRUN
```

Validation_TripGeneration.s

```
; Maryland Statewide Travel Demand Model (MSTM)
;
; Script: Trip Generation Validation
;
; About:
; This script summarizes trips by purpose, for review purposes

; Description:
; The script follows same logic as in TripGeneration.s but summarizes trips after trip production, attractions.
; Script also write out the trip summaries by county and region
; Additionally script writes out summaries before and after balancing productions and attractions

; Input Files
; Activities.csv     - zonal employment data as activity at the zone
; ZonesToRegions.csv  - zone to region equivalency file
; HBWAttrShares.csv  - zonal home-based-work attraction shares by household income groups
; hbw_rates.txt      - home-based-work trip rates
; hbo_rates.txt      - home-based-other trip rates
; hbs_rates.txt      - home-based-shop trip rates
; hbsc_rates.txt     - home-based-school trip rates
; nhbw_rates.txt     - non-home-based-work trip rates
; obo_rates.txt      - other-based-other trip rates
; MotorizedShares.csv - zonal motorized shares
; HH_By_WRKS_INC.csv - households by workers and income
; HH_By_SIZ_INC.csv  - households by size and income
; TripProductionDampening_NJPAWV.csv - dampening rates to remove trip produced in the model region but were attracted outside the region. This is applied to HBW only
; Validation_TripGen(before).s  - A code block file that reports trip prodcution and attractions
;
; Output skims
; IPF_HHbySIZSummary.dat    - Activity density at the zone level
; IPF_HHbyWRKSummary.dat    - Share of total attractions by trip purpose and Income for purposes in DBF format
; TG_before_balance.rpt     - trip by purpose before balancing

; Authors:
; Amar Sarvepalli    - sarvepalli@pbworld.com - 02/22/2011

; Version 1.0

;=========================================================================
;Set Parameters:
READ File = '..\stamp.log'

RUN PGM=GENERATION  PRNFILE='..\@scenario@\Validation\Trip Generation - Activity Density.PRN'  MSG='Trip Generation - Activity Density'
  ;Read in the activities file.
  FILEI ZDATI[1]= ..\@scenario@\Inputs\Activities.csv, Z=#1, ACRES=#2, HH00=#3, ENR=#4, RE00=#5, OFF00=#6, OTH00=#7, TOT00=#8

  ;Create a dbf that will hold the arrays that contain the activity density calculation.
  FILEO PAO[1] = ..\@scenario@\Outputs\ActDen.dbf,
  FORM=20.2SLR,LIST=Z(4), P[1],dbf=t

  ;Loop through the zones and calculate the activity density for each.
  zones=@lastSMZ@
  IF(I=@zoneblank@)CONTINUE
  LOOP purpose=1 EXCLUDE =@zoneblank@
      P[purpose] = MAX(MIN((HH00+RE00+TOT00)/ACRES,99),0.01) ; Calculate the activity density
  ENDLOOP

  ; Output the activity density for each zone in a csv file.
  PRINT FORM=6,LIST=Z(3),
               P[1]
  PHASE=ADJUST
    JLOOP EXCLUDE =@zoneblank@
        IF (J == 1)
        PRINT CSV=y,
      FILE = ..\@scenario@\Outputs\ActivityDensity.csv,
```

Validation_TripGeneration.s

```
            LIST = ";SMZ", "ActivityDensity"
          ENDIF

          PRINT CSV=y,
        FILE =..\@scenario@\Outputs\ActivityDensity.csv,
            LIST=J(4), P[1]
     ENDJLOOP

  ENDPHASE
ENDRUN

READ File = '..\stamp.log'

RUN PGM=GENERATION  PRNFILE='..\@scenario@\Validation\Trip Generation.PRN'  MSG='Trip Generation'
  FILEI ZDATI[1]= ..\@scenario@\Inputs\HBWAttrShares.csv, Z=#1, HBW20K=#2, HBW40K=#3, HBW60K=#4, HBW100K=#5, HBW100KPLUS=#6, HBSSUM=#7, HBOSUM=#8
  FILEI ZDATI[2]= ..\@scenario@\Inputs\ZonesToRegions.csv, Z=#1, REG=#2
  FILEO PAO[1] = ..\@scenario@\Inputs\INCQShares.dbf,
  FORM=20.2SLR,LIST=Z(3), P[1],P[2],P[3],P[4],P[5],P[6],P[7],P[8],P[9],P[10],
                         P[11],P[12],P[13],P[14],P[15],P[16],P[17],P[18],dbf=t

  ZONES = 1697

  LOOP purpose=1,18  EXCLUDE =@zoneblank@
    IF(I=@zoneblank@)CONTINUE

    IF (purpose>=1 & purpose<=5)
         READ,
          FILE = ..\@scenario@\Inputs\hbw_rates.txt
         TotalProd = Prod20k + Prod40k + Prod60k + Prod100k + Prod100kPlus
         HBWProdShare20k = Prod20k/TotalProd
         HBWProdShare40k = Prod40k/TotalProd
         HBWProdShare60k = Prod60k/TotalProd
         HBWProdShare100k = Prod100k/TotalProd
         HBWProdShare100kPlus = Prod100kPlus/TotalProd
    ENDIF
    IF (purpose>=6 & purpose<=10)
       array Ri1s1=8, Ri1s2=8, Ri1s3=8, Ri1s4=8, Ri1s5=8
       array Ri2s1=8, Ri2s2=8, Ri2s3=8, Ri2s4=8, Ri2s5=8
       array Ri3s1=8, Ri3s2=8, Ri3s3=8, Ri3s4=8, Ri3s5=8
       array Ri4s1=8, Ri4s2=8, Ri4s3=8, Ri4s4=8, Ri4s5=8
       array Ri5s1=8, Ri5s2=8, Ri5s3=8, Ri5s4=8, Ri5s5=8
;      array AHarr_a=8, AHarr_b=3, AHarr_c=3
       array Harr_a=8, Harr_b=8, Harr_c=8
       READ,
        FILE = ..\@scenario@\Inputs\hbs_rates.txt
    ENDIF
    IF (purpose>=11 & purpose<=15)
       READ,
        FILE = ..\@scenario@\Inputs\hbo_rates.txt
    ENDIF
       TotalProd = Prod20k + Prod40k + Prod60k + Prod100k + Prod100kPlus
       ProdShare20k = Prod20k/TotalProd
       ProdShare40k = Prod40k/TotalProd
       ProdShare60k = Prod60k/TotalProd
       ProdShare100k = Prod100k/TotalProd
       ProdShare100kPlus = Prod100kPlus/TotalProd
       RAWSUM   =   (HBW20K * ProdShare20k/HBWProdShare20k) + (HBW40K * ProdShare40k/HBWProdShare40k)+
                    (HBW60K * ProdShare60k/HBWProdShare60k) + (HBW100K * ProdShare100k/HBWProdShare100k)+
                    (HBW100KPLUS * ProdShare100kPlus/HBWProdShare100kPlus)

     IF(RAWSUM == 0)
    RAWSUM   =      1
     ENDIF
     IF (purpose==1)
   P[purpose] =     HBW20K
```

Validation_TripGeneration.s

```
      ENDIF
      IF (purpose==2)
   P[purpose] =        HBW40K
      ENDIF
      IF (purpose==3)
   P[purpose] =        HBW60K
      ENDIF
      IF (purpose==4)
   P[purpose] =        HBW100K
      ENDIF
      IF (purpose==5)
   P[purpose] =        HBW100KPLUS
      ENDIF
      IF (purpose==6)
   P[purpose] =        HBW20K + HBW40K + HBW60K + HBW100K + HBW100KPLUS
      ENDIF
      IF (purpose==7||purpose==13)
   P[purpose] =        ((HBW20K * ProdShare20k)/HBWProdShare20k)/RAWSUM
   SUM = P[purpose]
      ENDIF
      IF (purpose==8||purpose==14)
   P[purpose] =        ((HBW40K * ProdShare40k)/HBWProdShare40k)/RAWSUM
   SUM = SUM + P[purpose]
      ENDIF
      IF (purpose==9||purpose==15)
   P[purpose] =        ((HBW60K * ProdShare60k)/HBWProdShare60k)/RAWSUM
   SUM = SUM + P[purpose]
      ENDIF
      IF (purpose==10||purpose==16)
   P[purpose] =        ((HBW100K * ProdShare100k)/HBWProdShare100k)/RAWSUM
   SUM = SUM + P[purpose]
      ENDIF
      IF (purpose==11||purpose==17)
   P[purpose] =        ((HBW100KPLUS * ProdShare100kPlus)/HBWProdShare100kPlus)/RAWSUM
   SUM = SUM + P[purpose]
      ENDIF
      IF (purpose==12||purpose==18)
   P[purpose] =        SUM
      ENDIF
  ENDLOOP

  PRINT FORM=6,LIST=Z(3), P[1],P[2],P[3],P[4],P[5],P[6],P[7],P[8],P[9],P[10],
                          P[11],P[12],P[13],P[14],P[15],P[16],P[17],P[18]

  PHASE=ADJUST
    JLOOP EXCLUDE =@zoneblank@
        IF (J == 1)
        PRINT CSV=y,
      FILE = ..\@scenario@\Outputs\INCQ_Shares.csv,
        LIST = ";SMZ", "HBW<$20K", "HBW$20-40K", "HBW$40-60K", "HBW$60-100K", "HBW$100K+", "SUM",
                      "HBSHP<$20K", "HBSHP$20-40K", "HBSHP$40-60K", "HBSHP$60-100K", "HBSHP$100K+", "SUM",
                      "HBOTH<$20K", "HBOTH$20-40K", "HBOTH$40-60K", "HBOTH$60-100K", "HBOTH$100K+", "SUM"
        ENDIF

        PRINT CSV=y,
      FILE = ..\@scenario@\Outputs\INCQ_Shares.csv,
           LIST=J(4), P[1],P[2],P[3],P[4],P[5],P[6],P[7],P[8],P[9],P[10],
                      P[11],P[12],P[13],P[14],P[15],P[16],P[17],P[18]
    ENDJLOOP

  ENDPHASE

ENDRUN

;READ File = '..\stamp.log'
```

Validation_TripGeneration.s

```
RUN PGM=GENERATION  PRNFILE='..\%scenario%\Validation\Trip Generation Balance PnAs.PRN' MSG='Trip Generation - Balance PnAs'
  FILEI ZDATI[1]= ..\@scenario@\Inputs\MotorizedShares.csv, Z=#1, HBW1=#2, HBW2=#3, HBW3=#4, HBW4=#5, HBW5=#6, HBS1=#7,
                                          HBS2=#8, HBS3=#9, HBS4=#10, HBS5=#11, HBO1=#12, HBO2=#13,
                                          HBO3=#14, HBO4=#15, HBO5=#16, HBSCH=#17, NHBW=#18, NHBO=#19

  FILEI ZDATI[2]= ..\@scenario@\Inputs\HH_By_WRKS_INC.csv, Z=#1, WKR0_IQ1=#2, WKR0_IQ2=#3, WKR0_IQ3=#4, WKR0_IQ4=#5, WKR0_IQ5=#6,
                                          WKR1_IQ1=#7, WKR1_IQ2=#8, WKR1_IQ3=#9, WKR1_IQ4=#10, WKR1_IQ5=#11,
                                          WKR2_IQ1=#12, WKR2_IQ2=#13, WKR2_IQ3=#14, WKR2_IQ4=#15, WKR2_IQ5=#16,
                                          WKR3_IQ1=#17, WKR3_IQ2=#18, WKR3_IQ3=#19, WKR3_IQ4=#20, WKR3_IQ5=#21

  FILEI ZDATI[3]= ..\@scenario@\Inputs\HH_By_SIZ_INC.csv, Z=#1,  SIZ1_IQ1=#2, SIZ1_IQ2=#3, SIZ1_IQ3=#4, SIZ1_IQ4=#5, SIZ1_IQ5=#6,
                                          SIZ2_IQ1=#7, SIZ2_IQ2=#8, SIZ2_IQ3=#9, SIZ2_IQ4=#10, SIZ2_IQ5=#11,
                                          SIZ3_IQ1=#12, SIZ3_IQ2=#13, SIZ3_IQ3=#14, SIZ3_IQ4=#15, SIZ3_IQ5=#16,
                                          SIZ4_IQ1=#17, SIZ4_IQ2=#18, SIZ4_IQ3=#19, SIZ4_IQ4=#20, SIZ4_IQ5=#21,
                                          SIZ5_IQ1=#22, SIZ5_IQ2=#23, SIZ5_IQ3=#24, SIZ5_IQ4=#25, SIZ5_IQ5=#26

  FILEI ZDATI[4]= ..\@scenario@\Outputs\INCQ_Shares.csv, Z=#1,   HBW20K=#2, HBW40K=#3, HBW60K=#4, HBW100K=#5, HBW100Kplus=#6,
                                          SUM1=#7, HBSHP20K=#8, HBSHP40K=#9, HBSHP60K=#10, HBSHP100K=#11,
                                          HBSHP100Kplus=#12, SUM2=#13, HBOTH20K=#14, HBOTH40K=#15, HBOTH60K=#16,
                                          HBOTH100K=#17, HBOTH100Kplus=#18, SUM3=#19

  FILEI ZDATI[5]= ..\@scenario@\Inputs\Activities.csv, Z=#1, ACRES=#2, HH00=#3, ENR=#4, RE00=#5, OFF00=#6, OTH00=#7, TOT00=#8

  FILEI ZDATI[6]= ..\@scenario@\Outputs\ActivityDensity.csv, Z=#1, ACTDEN=#2
  FILEI ZDATI[7]= ..\@scenario@\Inputs\ZonesToRegions.csv, Z=#1, REG=#2
  FILEI ZDATI[8]= ..\@scenario@\Inputs\TripProductionDampening_NJPAWV.csv, Z=#1, DAMPGEN=#2

  FILEO PAO[1] = ..\@scenario@\Outputs\PA.dbf,
FORM=20.2SLR,LIST=Z(4), P[1],P[2],P[3],P[4],P[5],P[6],P[7],P[8],P[9],P[10],P[11],P[12],P[13],P[14],P[15],P[16],P[17],P[18],
                        A[1],A[2],A[3],A[4],A[5],A[6],A[7],A[8],A[9],A[10],A[11],A[12],A[13],A[14],A[15],A[16],A[17],A[18],dbf=t

  ZONES = 1697
  LOOP purpose=1,18
    IF(I=@zoneblank@)CONTINUE

    IF (purpose>=1&purpose<=5)
          READ,
           FILE = ..\@scenario@\Inputs\hbw_rates.txt
          TOT_HBWA = (TOT00param * TOT00 + AvgActDen * ACTDEN)
      ENDIF
    IF (purpose==16)
          READ,
           FILE = ..\@scenario@\Inputs\hbsc_rates.txt
      ENDIF
    IF (purpose>=6&purpose<=10)
          READ,
           FILE = ..\@scenario@\Inputs\hbs_rates.txt
          TOT_HBSHA = (RET00param * RE00 + AvgActDen * ACTDEN)
      ENDIF
    IF (purpose>=11&purpose<=15)
          READ,
           FILE = ..\@scenario@\Inputs\hbo_rates.txt
          TOT_HBOTHA = (HH00param * HH00 + OTH00param * OTH00)
      ENDIF
    IF (purpose==17)
          READ,
           FILE = ..\@scenario@\Inputs\nhbw_rates.txt
      ENDIF
    IF (purpose==18)
          READ,
           FILE = ..\@scenario@\Inputs\obo_rates.txt
      ENDIF

    IF (purpose==1)
```

Validation_TripGeneration.s

```
P[purpose] =        (i1w0*WKR0_IQ1+i1w1*WKR1_IQ1+i1w2*WKR2_IQ1+i1w3*WKR3_IQ1)* HBW1 * (1- ZI.8.DAMPGEN)
A[purpose] =        TOT_HBWA * HBW20K
ENDIF

IF (purpose==2)
P[purpose] =        (i2w0*WKR0_IQ2+i2w1*WKR1_IQ2+i2w2*WKR2_IQ2+i2w3*WKR3_IQ2)* HBW2 * (1- ZI.8.DAMPGEN)
A[purpose] =        TOT_HBWA * HBW40K
ENDIF

IF (purpose==3)
P[purpose] =        (i3w0*WKR0_IQ3+i3w1*WKR1_IQ3+i3w2*WKR2_IQ3+i3w3*WKR3_IQ3)* HBW3 * (1- ZI.8.DAMPGEN)
A[purpose] =        TOT_HBWA * HBW60K
ENDIF

IF (purpose==4)
P[purpose] =        (i4w0*WKR0_IQ4+i4w1*WKR1_IQ4+i4w2*WKR2_IQ4+i4w3*WKR3_IQ4)* HBW4 * (1- ZI.8.DAMPGEN)
A[purpose] =        TOT_HBWA * HBW100K
ENDIF

IF (purpose==5)
P[purpose] =        (i5w0*WKR0_IQ5+i5w1*WKR1_IQ5+i5w2*WKR2_IQ5+i5w3*WKR3_IQ5)* HBW5 * (1- ZI.8.DAMPGEN)
A[purpose] =        TOT_HBWA * HBW100Kplus
ENDIF

IF (purpose==6)
P[purpose] =        (i1s1*SIZ1_IQ1+i1s2*SIZ2_IQ1+i1s3*SIZ3_IQ1+i1s4*SIZ4_IQ1+i1s5*SIZ5_IQ1)* HBS1
A[purpose] =        TOT_HBSHA * HBSHP20K
ENDIF

IF (purpose==7)
P[purpose] =        (i2s1*SIZ1_IQ2+i2s2*SIZ2_IQ2+i2s3*SIZ3_IQ2+i2s4*SIZ4_IQ2+i2s5*SIZ5_IQ2)* HBS2
A[purpose] =        TOT_HBSHA * HBSHP40K
ENDIF

IF (purpose==8)
P[purpose] =        (i3s1*SIZ1_IQ3+i3s2*SIZ2_IQ3+i3s3*SIZ3_IQ3+i3s4*SIZ4_IQ3+i3s5*SIZ5_IQ3)* HBS3
A[purpose] =        TOT_HBSHA * HBSHP60K
ENDIF

IF (purpose==9)
P[purpose] =        (i4s1*SIZ1_IQ4+i4s2*SIZ2_IQ4+i4s3*SIZ3_IQ4+i4s4*SIZ4_IQ4+i4s5*SIZ5_IQ4)* HBS4
A[purpose] =        TOT_HBSHA * HBSHP100K
ENDIF

IF (purpose==10)
P[purpose] =        (i5s1*SIZ1_IQ5+i5s2*SIZ2_IQ5+i5s3*SIZ3_IQ5+i5s4*SIZ4_IQ5+i5s5*SIZ5_IQ5)* HBS5
A[purpose] =        TOT_HBSHA * HBSHP100Kplus
ENDIF

IF (purpose==11)
P[purpose] =        (i1s1*SIZ1_IQ1+i1s2*SIZ2_IQ1+i1s3*SIZ3_IQ1+i1s4*SIZ4_IQ1+i1s5*SIZ5_IQ1)* HBO1
A[purpose] =        TOT_HBOTHA * HBOTH20K
ENDIF

IF (purpose==12)
P[purpose] =        (i2s1*SIZ1_IQ2+i2s2*SIZ2_IQ2+i2s3*SIZ3_IQ2+i2s4*SIZ4_IQ2+i2s5*SIZ5_IQ2)* HBO2
A[purpose] =        TOT_HBOTHA * HBOTH40K
ENDIF

IF (purpose==13)
P[purpose] =        (i3s1*SIZ1_IQ3+i3s2*SIZ2_IQ3+i3s3*SIZ3_IQ3+i3s4*SIZ4_IQ3+i3s5*SIZ5_IQ3)* HBO3
A[purpose] =        TOT_HBOTHA * HBOTH60K
ENDIF

IF (purpose==14)
```

Validation_TripGeneration.s

```
        P[purpose] =       (i4s1*SIZ1_IQ4+i4s2*SIZ2_IQ4+i4s3*SIZ3_IQ4+i4s4*SIZ4_IQ4+i4s5*SIZ5_IQ4)* HBO4
        A[purpose] =       TOT_HBOTHA * HBOTH100K
        ENDIF

        IF (purpose==15)
        P[purpose] =       (i5s1*SIZ1_IQ5+i5s2*SIZ2_IQ5+i5s3*SIZ3_IQ5+i5s4*SIZ4_IQ5+i5s5*SIZ5_IQ5)* HBO5
        A[purpose] =       TOT_HBOTHA * HBOTH100Kplus
        ENDIF

        IF (purpose==16)
        P[purpose] =       (i1s1*SIZ1_IQ1+i1s2*SIZ2_IQ1+i1s3*SIZ3_IQ1+i1s4*SIZ4_IQ1+i1s5*SIZ5_IQ1+
                            i2s1*SIZ1_IQ2+i2s2*SIZ2_IQ2+i2s3*SIZ3_IQ2+i2s4*SIZ4_IQ2+i2s5*SIZ5_IQ2+
                            i3s1*SIZ1_IQ3+i3s2*SIZ2_IQ3+i3s3*SIZ3_IQ3+i3s4*SIZ4_IQ3+i3s5*SIZ5_IQ3+
                            i4s1*SIZ1_IQ4+i4s2*SIZ2_IQ4+i4s3*SIZ3_IQ4+i4s4*SIZ4_IQ4+i4s5*SIZ5_IQ4+
                            i5s1*SIZ1_IQ5+i5s2*SIZ2_IQ5+i5s3*SIZ3_IQ5+i5s4*SIZ4_IQ5+i5s5*SIZ5_IQ5) * HBSCH * 0.5622    ; 0.5622 = factor to exclude school bus trips
        A[purpose] =       (ENROLLparam * ENR) * HBSCH * 0.5622                                       ; 0.5622 = factor to exclude school bus trips

        ENDIF
        IF (purpose==17)
        P[purpose] =       (i1w0*WKR0_IQ1+i1w1*WKR1_IQ1+i1w2*WKR2_IQ1+i1w3*WKR3_IQ1+
                            i2w0*WKR0_IQ2+i2w1*WKR1_IQ2+i2w2*WKR2_IQ2+i2w3*WKR3_IQ2+
                            i3w0*WKR0_IQ3+i3w1*WKR1_IQ3+i3w2*WKR2_IQ3+i3w3*WKR3_IQ3+
                            i4w0*WKR0_IQ4+i4w1*WKR1_IQ4+i4w2*WKR2_IQ4+i4w3*WKR3_IQ4+
                            i5w0*WKR0_IQ5+i5w1*WKR1_IQ5+i5w2*WKR2_IQ5+i5w3*WKR3_IQ5) * NHBW
        A[purpose] =       (RET00param * RE00 + OFF00param * OFF00 + OTH00param * OTH00 + AvgActDen * ACTDEN) * NHBW

        ENDIF

        IF (purpose==18)
         P[purpose] =      (i1s1*SIZ1_IQ1+i1s2*SIZ2_IQ1+i1s3*SIZ3_IQ1+i1s4*SIZ4_IQ1+i1s5*SIZ5_IQ1+
                            i2s1*SIZ1_IQ2+i2s2*SIZ2_IQ2+i2s3*SIZ3_IQ2+i2s4*SIZ4_IQ2+i2s5*SIZ5_IQ2+
                            i3s1*SIZ1_IQ3+i3s2*SIZ2_IQ3+i3s3*SIZ3_IQ3+i3s4*SIZ4_IQ3+i3s5*SIZ5_IQ3+
                            i4s1*SIZ1_IQ4+i4s2*SIZ2_IQ4+i4s3*SIZ3_IQ4+i4s4*SIZ4_IQ4+i4s5*SIZ5_IQ4+
                            i5s1*SIZ1_IQ5+i5s2*SIZ2_IQ5+i5s3*SIZ3_IQ5+i5s4*SIZ4_IQ5+i5s5*SIZ5_IQ5)  * NHBO
        A[purpose] =       (HH00param * HH00 + OTH00param * OTH00) * NHBO

      ENDIF
   ENDLOOP

; Used only for validation purposes
 READ FILE =  ..\scripts\Validation_TripGen(before).s
 READ File = '..\stamp.log'

 ;   ----- print the input zonal data and computed productions and attractions
 PRINT FORM=6,LIST=Z(3),
         P[1],P[2],P[3],P[4],P[5],P[6],P[7],P[8],P[9],P[10],P[11],P[12],P[13],P[14],P[15],P[16],P[17],P[18],
         A[1],A[2],A[3],A[4],A[5],A[6],A[7],A[8],A[9],A[10],A[11],A[12],A[13],A[14],A[15],A[16],A[17],A[18]

   ;   ----- adjust zonal attractions so total attractions match total productions
 PHASE=ADJUST
        A[1 ] = P[1 ][0]/A[1 ][0] * A[1 ]        ; adjust a's to match p's
        A[2 ] = P[2 ][0]/A[2 ][0] * A[2 ]
        A[3 ] = P[3 ][0]/A[3 ][0] * A[3 ]
        A[4 ] = P[4 ][0]/A[4 ][0] * A[4 ]
        A[5 ] = P[5 ][0]/A[5 ][0] * A[5 ]
        A[6 ] = P[6 ][0]/A[6 ][0] * A[6 ]
        A[7 ] = P[7 ][0]/A[7 ][0] * A[7 ]
        A[8 ] = P[8 ][0]/A[8 ][0] * A[8 ]
        A[9 ] = P[9 ][0]/A[9 ][0] * A[9 ]
        A[10 ] = P[10 ][0]/A[10 ][0] * A[10 ]
        A[11 ] = P[11 ][0]/A[11 ][0] * A[11 ]
        A[12 ] = P[12 ][0]/A[12 ][0] * A[12 ]
        A[13 ] = P[13 ][0]/A[13 ][0] * A[13 ]
        A[14 ] = P[14 ][0]/A[14 ][0] * A[14 ]
        A[15 ] = P[15 ][0]/A[15 ][0] * A[15 ]
```

Validation_TripGeneration.s

```
        P[16 ] = A[16 ][0]/P[16 ][0] * P[16 ]  ; Attractions uses enrollment data.
        A[17 ] = P[17 ][0]/A[17 ][0] * A[17 ]  ; Scale A's to match total P's (since P's are HTS and have more confidence in total Productions)
        P[17 ] = A[17]                        ; Replace taz level productions with adjusted Attractions.
        A[18 ] = P[18 ][0]/A[18 ][0] * A[18 ]  ; Scale A's to match total P's (since P's are HTS and have more confidence in total Productions)
        P[18 ] = A[18]                        ; Replace taz level productions with adjusted Attractions.


        ; print links to a CSV
        JLOOP EXCLUDE =@zoneblank@
          IF (J == 1)
          PRINT CSV=y,
          FILE = ..\@scenario@\Outputs\MSTM_Ps.csv,
          LIST = ";SMZ", "HBWP1","HBWP2","HBWP3","HBWP4","HBWP5","HBSP1","HBSP2","HBSP3","HBSP4","HBSP5",
                    "HBOP1","HBOP2","HBOP3","HBOP4","HBOP5","HBSCHP","NHBW","OBOP"

          ENDIF

          PRINT CSV=y,
          FILE = ..\@scenario@\Outputs\MSTM_Ps.csv,
          ; increase trips by 20%
                LIST=J(4), P[1],P[2],P[3],P[4],P[5],1.20*P[6],1.20*P[7],1.20*P[8],1.20*P[9],1.20*P[10],1.20*P[11],1.20*P[12],1.20*P[13],
                        1.20*P[14],1.20*P[15],1.20*P[16],1.40*P[17],1.40*P[18]
        ENDJLOOP

        JLOOP EXCLUDE =@zoneblank@
          IF (J == 1)
          PRINT CSV=y,
          FILE = ..\@scenario@\Outputs\MSTM_As.csv,
          LIST = ";SMZ", "HBWA1","HBWA2","HBWA3","HBWA4","HBWA5","HBSA1","HBSA2","HBSA3","HBSA4","HBSA5",
                    "HBOA1","HBOA2","HBOA3","HBOA4","HBOA5","HBSCHA","NHBW","OBOA"

          ENDIF

          PRINT CSV=y,
          FILE = ..\@scenario@\Outputs\MSTM_As.csv,
          LIST=J(4),
A[1],A[2],A[3],A[4],A[5],1.20*A[6],1.20*A[7],1.20*A[8],1.20*A[9],1.20*A[10],1.20*A[11],1.20*A[12],1.20*A[13],1.20*A[14],1.20*A[15],1.20*A[16],1.40*A[17],1.40*A[18]
        ENDJLOOP

      ENDPHASE

ENDRUN

*copy ..\@scenario@\Outputs\IPF_HHbySIZSummary.dat ..\@scenario@\Validation\IPF_HHbySIZSummary.dat
*copy ..\@scenario@\Outputs\IPF_HHbySIZSummary.dat ..\@scenario@\Validation\IPF_HHbyWRKSummary.dat
```

Validation_TripGeneration(before).s

```
; Maryland Statewide Travel Demand Model (MSTM)
;
; Script: Trip Generation Validation before balancing
;
; About:
; This is just a code block script and is called from Validation_TripGeneration.s

; Description:
; This script is not run as a standalone one rather called /read during the TG to write out some summaries
; Used only for validation purposes

; Authors:
; Amar Sarvepalli    - sarvepalli@pbworld.com - 02/22/2011

; Version 1.0

;=========================================================================
READ File = '..\stamp.log'

; This is a Trip generation validation Script
     PrintP1 = PrintP1  + P[1 ]
     PrintP2 = PrintP2  + P[2 ]
     PrintP3 = PrintP3  + P[3 ]
     PrintP4 = PrintP4  + P[4 ]
     PrintP5 = PrintP5  + P[5 ]
     PrintP6 = PrintP6  + P[6 ]
     PrintP7 = PrintP7  + P[7 ]
     PrintP8 = PrintP8  + P[8 ]
     PrintP9 = PrintP9  + P[9 ]
     PrintP10= PrintP10 + P[10]
     PrintP11= PrintP11 + P[11]
     PrintP12= PrintP12 + P[12]
     PrintP13= PrintP13 + P[13]
     PrintP14= PrintP14 + P[14]
     PrintP15= PrintP15 + P[15]
     PrintP16= PrintP16 + P[16]
     PrintP17= PrintP17 + P[17]
     PrintP18= PrintP18 + P[18]

     PrintA1 = PrintA1  + A[1 ]
     PrintA2 = PrintA2  + A[2 ]
     PrintA3 = PrintA3  + A[3 ]
     PrintA4 = PrintA4  + A[4 ]
     PrintA5 = PrintA5  + A[5 ]
     PrintA6 = PrintA6  + A[6 ]
     PrintA7 = PrintA7  + A[7 ]
     PrintA8 = PrintA8  + A[8 ]
     PrintA9 = PrintA9  + A[9 ]
     PrintA10= PrintA10 + A[10]
     PrintA11= PrintA11 + A[11]
     PrintA12= PrintA12 + A[12]
     PrintA13= PrintA13 + A[13]
     PrintA14= PrintA14 + A[14]
     PrintA15= PrintA15 + A[15]
     PrintA16= PrintA16 + A[16]
     PrintA17= PrintA17 + A[17]
     PrintA18= PrintA18 + A[18]

   IF (I = @lastSMZ@)
     print form =10.0, LIST = "Purpose", 'Productions', 'Attractions', file=..\@scenario@\Outputs\TG_before_balance.rpt
     print form =10.0, LIST = "HBW1", PrintP1 , PrintA1 , file=..\@scenario@\Outputs\TG_before_balance.rpt
     print form =10.0, LIST = "HBW2", PrintP2 , PrintA2 , file=..\@scenario@\Outputs\TG_before_balance.rpt
     print form =10.0, LIST = "HBW3", PrintP3 , PrintA3 , file=..\@scenario@\Outputs\TG_before_balance.rpt
     print form =10.0, LIST = "HBW4", PrintP4 , PrintA4 , file=..\@scenario@\Outputs\TG_before_balance.rpt
     print form =10.0, LIST = "HBW5", PrintP5 , PrintA5 , file=..\@scenario@\Outputs\TG_before_balance.rpt
```

Validation_TripGeneration(before).s

```
     print form =10.0, LIST = "HBS1", PrintP6 , PrintA6 , file=..\@scenario@\Outputs\TG_before_balance.rpt
     print form =10.0, LIST = "HBS2", PrintP7 , PrintA7 , file=..\@scenario@\Outputs\TG_before_balance.rpt
     print form =10.0, LIST = "HBS3", PrintP8 , PrintA8 , file=..\@scenario@\Outputs\TG_before_balance.rpt
     print form =10.0, LIST = "HBS4", PrintP9 , PrintA9 , file=..\@scenario@\Outputs\TG_before_balance.rpt
     print form =10.0, LIST = "HBS5", PrintP10, PrintA10, file=..\@scenario@\Outputs\TG_before_balance.rpt
     print form =10.0, LIST = "HBO1", PrintP11, PrintA11, file=..\@scenario@\Outputs\TG_before_balance.rpt
     print form =10.0, LIST = "HBO2", PrintP12, PrintA12, file=..\@scenario@\Outputs\TG_before_balance.rpt
     print form =10.0, LIST = "HBO3", PrintP13, PrintA13, file=..\@scenario@\Outputs\TG_before_balance.rpt
     print form =10.0, LIST = "HBO4", PrintP14, PrintA14, file=..\@scenario@\Outputs\TG_before_balance.rpt
     print form =10.0, LIST = "HBO5", PrintP15, PrintA15, file=..\@scenario@\Outputs\TG_before_balance.rpt
     print form =10.0, LIST = "HBSc", PrintP16, PrintA16, file=..\@scenario@\Outputs\TG_before_balance.rpt
     print form =10.0, LIST = "NHBW", PrintP17, PrintA17, file=..\@scenario@\Outputs\TG_before_balance.rpt
     print form =10.0, LIST = "OBO ", PrintP18, PrintA18, file=..\@scenario@\Outputs\TG_before_balance.rpt
  ENDIF
```

Validation_TripGeneration(after).s

```
; Maryland Statewide Travel Demand Model (MSTM)
;
; Script: Trip Generation Validation after balancing
;
; About:
; This script summarizes trips by purpose and regions in the surveyed area and is used for validation only

; Description:
; The script summarizes trip production and attractions by purpose

; Input Files
; MSTM_Ps.CSV      - zonal trip productions
; MSTM_Ps.CSV      - zonal trip attractions

; Output skims
; TG_after_balance.rpt      - trip by purpose after balancing

; Authors:
; Amar Sarvepalli    - sarvepalli@pbworld.com - 02/22/2011

; Version 1.0

;========================================================================
READ File = '..\stamp.log'

 RUN PGM = MATRIX PRNFILE='..\@scenario@\Outputs\Validation Trip Generation - After Balancing.PRN'  MSG='Trip Generation - Validation'
    FILEI ZDATI[1]= ..\@scenario@\Outputs\MSTM_Ps.CSV, Z=#1,P1=#2, P2=#3, P3=#4, P4=#5, P5=#6, P6=#7, P7=#8, P8=#9,
P9=#10,P10=#11,P11=#12,P12=#13,P13=#14,P14=#15,P15=#16,P16=#17,P17=#18,P18=#19
    FILEI ZDATI[2]= ..\@scenario@\Outputs\MSTM_As.CSV, Z=#1,A1=#2, A2=#3, A3=#4, A4=#5, A5=#6, A6=#7, A7=#8, A8=#9,
A9=#10,A10=#11,A11=#12,A12=#13,A13=#14,A14=#15,A15=#16,A16=#17,A17=#18,A18=#19

       Zones = @lastSMZ@
       PrintP1 = PrintP1  + P1
       PrintP2 = PrintP2  + P2
       PrintP3 = PrintP3  + P3
       PrintP4 = PrintP4  + P4
       PrintP5 = PrintP5  + P5
       PrintP6 = PrintP6  + P6
       PrintP7 = PrintP7  + P7
       PrintP8 = PrintP8  + P8
       PrintP9 = PrintP9  + P9
       PrintP10= PrintP10 + P10
       PrintP11= PrintP11 + P11
       PrintP12= PrintP12 + P12
       PrintP13= PrintP13 + P13
       PrintP14= PrintP14 + P14
       PrintP15= PrintP15 + P15
       PrintP16= PrintP16 + P16
       PrintP17= PrintP17 + P17
       PrintP18= PrintP18 + P18

       PrintA1 = PrintA1  + A1
       PrintA2 = PrintA2  + A2
       PrintA3 = PrintA3  + A3
       PrintA4 = PrintA4  + A4
       PrintA5 = PrintA5  + A5
       PrintA6 = PrintA6  + A6
       PrintA7 = PrintA7  + A7
       PrintA8 = PrintA8  + A8
       PrintA9 = PrintA9  + A9
       PrintA10= PrintA10 + A10
       PrintA11= PrintA11 + A11
       PrintA12= PrintA12 + A12
       PrintA13= PrintA13 + A13
       PrintA14= PrintA14 + A14
```

Validation_TripGeneration(after).s

```
   PrintA15= PrintA15 + A15
   PrintA16= PrintA16 + A16
   PrintA17= PrintA17 + A17
   PrintA18= PrintA18 + A18

 IF (I = @lastSMZ@)
  print form =10.0, LIST = "Purpose", 'Productions', 'Attractions', file=..\@scenario@\Outputs\TG_after_balance.rpt
  print form =10.0, LIST = "HBW1",PrintP1 ,PrintA1 , file=..\@scenario@\Outputs\TG_after_balance.rpt
  print form =10.0, LIST = "HBW2",PrintP2 ,PrintA2 , file=..\@scenario@\Outputs\TG_after_balance.rpt
  print form =10.0, LIST = "HBW3",PrintP3 ,PrintA3 , file=..\@scenario@\Outputs\TG_after_balance.rpt
  print form =10.0, LIST = "HBW4",PrintP4 ,PrintA4 , file=..\@scenario@\Outputs\TG_after_balance.rpt
  print form =10.0, LIST = "HBW5",PrintP5 ,PrintA5 , file=..\@scenario@\Outputs\TG_after_balance.rpt
  print form =10.0, LIST = "HBS1",PrintP6 ,PrintA6 , file=..\@scenario@\Outputs\TG_after_balance.rpt
  print form =10.0, LIST = "HBS2",PrintP7 ,PrintA7 , file=..\@scenario@\Outputs\TG_after_balance.rpt
  print form =10.0, LIST = "HBS3",PrintP8 ,PrintA8 , file=..\@scenario@\Outputs\TG_after_balance.rpt
  print form =10.0, LIST = "HBS4",PrintP9 ,PrintA9 , file=..\@scenario@\Outputs\TG_after_balance.rpt
  print form =10.0, LIST = "HBS5",PrintP10,PrintA10, file=..\@scenario@\Outputs\TG_after_balance.rpt
  print form =10.0, LIST = "HBO1",PrintP11,PrintA11, file=..\@scenario@\Outputs\TG_after_balance.rpt
  print form =10.0, LIST = "HBO2",PrintP12,PrintA12, file=..\@scenario@\Outputs\TG_after_balance.rpt
  print form =10.0, LIST = "HBO3",PrintP13,PrintA13, file=..\@scenario@\Outputs\TG_after_balance.rpt
  print form =10.0, LIST = "HBO4",PrintP14,PrintA14, file=..\@scenario@\Outputs\TG_after_balance.rpt
  print form =10.0, LIST = "HBO5",PrintP15,PrintA15, file=..\@scenario@\Outputs\TG_after_balance.rpt
  print form =10.0, LIST = "HBSc",PrintP16,PrintA16, file=..\@scenario@\Outputs\TG_after_balance.rpt
  print form =10.0, LIST = "NHBW",PrintP17,PrintA17, file=..\@scenario@\Outputs\TG_after_balance.rpt
  print form =10.0, LIST = "OBO ",PrintP18,PrintA18, file=..\@scenario@\Outputs\TG_after_balance.rpt
 ENDIF
ENDRUN

Loop R =1,12
   ;        region     regional zones
   if (R=1 )  reg='1' , regnum= '1-110'
   if (R=2 )  reg='2' , regnum= '1188-1307'
   if (R=3 )  reg='3' , regnum= '111-405,525-599'
   if (R=4 )  reg='4' , regnum= '609-943,1308-1355'
   if (R=5 )  reg='5' , regnum= '406-524,944-966'
   if (R=6 )  reg='6' , regnum= '992-1009,1356-1397'
   if (R=7 )  reg='7' , regnum= '967-991'
   if (R=8 )  reg='8' , regnum= '1398-1442,1470-1499'
   if (R=9 )  reg='9' , regnum= '1509-1543,1634-1650,1684-1697'
   if (R=10)  reg='10', regnum= '1615-1633,1651-1674'
   if (R=11)  reg='11', regnum= '1093-1178,1443-1460,1544-1605'
   if (R=12)  reg='12', regnum= '1019-1083'

  RUN PGM = Matrix PRNFILE='..\@scenario@\Outputs\Validation Trip Generation - After Balancing- Region.PRN'  MSG='Trip Generation - Validation'
  FILEI ZDATI[1]= ..\@scenario@\Outputs\MSTM_Ps.CSV, Z=#1,P1=#2, P2=#3, P3=#4, P4=#5, P5=#6, P6=#7, P7=#8, P8=#9,
P9=#10,P10=#11,P11=#12,P12=#13,P13=#14,P14=#15,P15=#16,P16=#17,P17=#18,P18=#19
  FILEI ZDATI[2]= ..\@scenario@\Outputs\MSTM_As.CSV, Z=#1,A1=#2, A2=#3, A3=#4, A4=#5, A5=#6, A6=#7, A7=#8, A8=#9,
A9=#10,A10=#11,A11=#12,A12=#13,A13=#14,A14=#15,A15=#16,A16=#17,A17=#18,A18=#19

   Zones = @lastSMZ@
   IF (I = @regnum@)
   RegA01@R@= RegA01@R@ + A1
   RegA02@R@= RegA02@R@ + A2
   RegA03@R@= RegA03@R@ + A3
   RegA04@R@= RegA04@R@ + A4
   RegA05@R@= RegA05@R@ + A5
   RegA06@R@= RegA06@R@ + A6
   RegA07@R@= RegA07@R@ + A7
   RegA08@R@= RegA08@R@ + A8
   RegA09@R@= RegA09@R@ + A9
   RegA10@R@= RegA10@R@ + A10
   RegA11@R@= RegA11@R@ + A11
   RegA12@R@= RegA12@R@ + A12
   RegA13@R@= RegA13@R@ + A13
   RegA14@R@= RegA14@R@ + A14
```

Validation_TripGeneration(after).s

```
     RegA15@R@= RegA15@R@ + A15
     RegA16@R@= RegA16@R@ + A16
     RegA17@R@= RegA17@R@ + A17
     RegA18@R@= RegA18@R@ + A18
    ENDIF

    IF (I = @lastSMZ@)
    if(@R@=1 ) print form =10.0, LIST = "purpose    "," HBW1   "," HBW2   "," HBW3   "," HBW4   "," HBW5   "," HBS1   "," HBS2   "," HBS3   "," HBS4
"," HBS5   "," HBO1   "," HBO2   "," HBO3   "," HBO4   "," HBO5   "," HBSc   "," NHBW   "," OBO "                                            ,
file=..\@scenario@\Outputs\TG_after_balance(region).rpt
    if(@R@=1 ) print form =10.0, LIST = "region1 ",RegA011 , RegA021, RegA031, RegA041 , RegA051 , RegA061 , RegA071, RegA081 ,RegA091 , RegA101, RegA111, RegA121, RegA131,
RegA141, RegA151,RegA161,RegA171,RegA181,                            ,
file=..\@scenario@\Outputs\TG_after_balance(region).rpt, append=t
    if(@R@=2 ) print form =10.0, LIST = "region2 ",RegA012 , RegA022, RegA032, RegA042 , RegA052 , RegA062 , RegA072, RegA082 ,RegA092 , RegA102, RegA112, RegA122, RegA132,
RegA142, RegA152,RegA162,RegA172,RegA182                             ,
file=..\@scenario@\Outputs\TG_after_balance(region).rpt, append=t
    if(@R@=3 ) print form =10.0, LIST = "region3 ",RegA013 , RegA023, RegA033, RegA043 , RegA053 , RegA063 , RegA073, RegA083 ,RegA093 , RegA103, RegA113, RegA123, RegA133,
RegA143, RegA153,RegA163,RegA173,RegA183                             ,
file=..\@scenario@\Outputs\TG_after_balance(region).rpt, append=t
    if(@R@=4 ) print form =10.0, LIST = "region4 ",RegA014 , RegA024, RegA034, RegA044 , RegA054 , RegA064 , RegA074, RegA084 ,RegA094 , RegA104, RegA114, RegA124, RegA134,
RegA144, RegA154,RegA164,RegA174,RegA184                             ,
file=..\@scenario@\Outputs\TG_after_balance(region).rpt, append=t
    if(@R@=5 ) print form =10.0, LIST = "region5 ",RegA015 , RegA025, RegA035, RegA045 , RegA055 , RegA065 , RegA075, RegA085 ,RegA095 , RegA105, RegA115, RegA125, RegA135,
RegA145, RegA155,RegA165,RegA175,RegA185                             ,
file=..\@scenario@\Outputs\TG_after_balance(region).rpt, append=t
    if(@R@=6 ) print form =10.0, LIST = "region6 ",RegA016 , RegA026, RegA036, RegA046 , RegA056 , RegA066 , RegA076, RegA086 ,RegA096 , RegA106, RegA116, RegA126, RegA136,
RegA146, RegA156,RegA166,RegA176,RegA186                             ,
 file=..\@scenario@\Outputs\TG_after_balance(region).rpt, append=t
    if(@R@=7 ) print form =10.0, LIST = "region7 ",RegA017 , RegA027, RegA037, RegA047 , RegA057 , RegA067 , RegA077, RegA087 ,RegA097 , RegA107, RegA117, RegA127, RegA137,
RegA147, RegA157,RegA167,RegA177,RegA187                             ,
file=..\@scenario@\Outputs\TG_after_balance(region).rpt, append=t
    if(@R@=8 ) print form =10.0, LIST = "region8 ",RegA018 , RegA028, RegA038, RegA048 , RegA058 , RegA068 , RegA078, RegA088 ,RegA098 , RegA108, RegA118, RegA128, RegA138,
RegA148, RegA158,RegA168,RegA178,RegA188                             ,
file=..\@scenario@\Outputs\TG_after_balance(region).rpt, append=t
    if(@R@=9 ) print form =10.0, LIST = "region9 ",RegA019 , RegA029, RegA039, RegA049 , RegA059 , RegA069 , RegA079, RegA089 ,RegA099 , RegA109, RegA119, RegA129, RegA139,
RegA149, RegA159,RegA169,RegA179,RegA189                             ,
file=..\@scenario@\Outputs\TG_after_balance(region).rpt, append=t
    if(@R@=10) print form =10.0, LIST = "region10",RegA0110 , RegA0210, RegA0310, RegA0410 , RegA0510 , RegA0610 , RegA0710, RegA0810 ,RegA0910 , RegA1010, RegA1110, RegA1210,
RegA1310, RegA1410, RegA1510,RegA1610,RegA1710,RegA1810    ,
file=..\@scenario@\Outputs\TG_after_balance(region).rpt, append=t
    if(@R@=11) print form =10.0, LIST = "region11",RegA0111 , RegA0211, RegA0311, RegA0411 , RegA0511 , RegA0611 , RegA0711, RegA0811 ,RegA0911 , RegA1011, RegA1111, RegA1211,
RegA1311, RegA1411, RegA1511,RegA1611,RegA1711,RegA1811    ,
file=..\@scenario@\Outputs\TG_after_balance(region).rpt, append=t
    if(@R@=12) print form =10.0, LIST = "region12",RegA0112 , RegA0212, RegA0312, RegA0412 , RegA0512 , RegA0612 , RegA0712, RegA0812 ,RegA0912 , RegA1012, RegA1112, RegA1212,
RegA1312, RegA1412, RegA1512,RegA1612,RegA1712,RegA1812    ,
file=..\@scenario@\Outputs\TG_after_balance(region).rpt, append=t

   ENDIF
  ENDRUN
ENDLOOP

*Copy  ..\@scenario@\Outputs\TG_before_balance.rpt ..\@scenario@\validation\TG_before_balance.rpt
*Copy  ..\@scenario@\Outputs\TG_after_balance(region).rpt ..\@scenario@\validation\TG_after_balance(region).rpt
*Copy  ..\@scenario@\Outputs\TG_after_balance.rpt ..\@scenario@\validation\TG_after_balance.rpt
```

Validation_DCModel.s

```
; Maryland Statewide Travel Demand Model (MSTM)
;
; Script: Mode Choice validation
;
; About:
; This script summarizes mode chocie trips by purpose in the model region and is used for calibration only

; Description:
; STEP 1: The script summarizes mode choice model trips by trip purpose

; Input Files
; MC_<purpose>.trp  - mode choice model trip tables by purpose

; Output skims
; MC_Summary.rpt - mode choice trips by purpose

; Authors:
; Amar Sarvepalli    - sarvepalli@pbworld.com - 01/25/2011

; Version 1.0
;=======================================================================
READ File = '..\stamp.log'

; GET MODE CHOICE SUMMARIES

   LOOP p = 1,18     ; Purpose loop

     IF (p =1 )    pur = 'HBW1' ,   tm = 'PK' ,   Wrk='Wrk'      , purCoeff =  'HBW'  , Cgrp = '_1'
     IF (p =2 )    pur = 'HBW2' ,   tm = 'PK' ,   Wrk='Wrk'      , purCoeff =  'HBW'  , Cgrp = '_1'
     IF (p =3 )    pur = 'HBW3' ,   tm = 'PK' ,   Wrk='Wrk'      , purCoeff =  'HBW'  , Cgrp = '_1'
     IF (p =4 )    pur = 'HBW4' ,   tm = 'PK' ,   Wrk='Wrk'      , purCoeff =  'HBW'  , Cgrp = '_1'
     IF (p =5 )    pur = 'HBW5' ,   tm = 'PK' ,   Wrk='Wrk'      , purCoeff =  'HBW'  , Cgrp = '_1'
     IF (p =6 )    pur = 'HBS1' ,   tm = 'OP' ,   Wrk='NonWrk'   , purCoeff =  'HBS'  , Cgrp = '_2'
     IF (p =7 )    pur = 'HBS2' ,   tm = 'OP' ,   Wrk='NonWrk'   , purCoeff =  'HBS'  , Cgrp = '_2'
     IF (p =8 )    pur = 'HBS3' ,   tm = 'OP' ,   Wrk='NonWrk'   , purCoeff =  'HBS'  , Cgrp = '_2'
     IF (p =9 )    pur = 'HBS4' ,   tm = 'OP' ,   Wrk='NonWrk'   , purCoeff =  'HBS'  , Cgrp = '_2'
     IF (p =10)    pur = 'HBS5' ,   tm = 'OP' ,   Wrk='NonWrk'   , purCoeff =  'HBS'  , Cgrp = '_2'
     IF (p =11)    pur = 'HBO1' ,   tm = 'OP' ,   Wrk='NonWrk'   , purCoeff =  'HBO'  , Cgrp = '_2'
     IF (p =12)    pur = 'HBO2' ,   tm = 'OP' ,   Wrk='NonWrk'   , purCoeff =  'HBO'  , Cgrp = '_2'
     IF (p =13)    pur = 'HBO3' ,   tm = 'OP' ,   Wrk='NonWrk'   , purCoeff =  'HBO'  , Cgrp = '_2'
     IF (p =14)    pur = 'HBO4' ,   tm = 'OP' ,   Wrk='NonWrk'   , purCoeff =  'HBO'  , Cgrp = '_2'
     IF (p =15)    pur = 'HBO5' ,   tm = 'OP' ,   Wrk='NonWrk'   , purCoeff =  'HBO'  , Cgrp = '_2'
     IF (p =16)    pur = 'HBSc' ,   tm = 'OP' ,   Wrk='NonWrk'   , purCoeff =  'HBSc' , Cgrp = '_2'
     IF (p =17)    pur = 'NHBW' ,   tm = 'PK' ,   Wrk='Wrk'      , purCoeff =  'NHBW' , Cgrp = '_1'
     IF (p =18)    pur = 'OBO'  ,   tm = 'OP' ,   Wrk='NonWrk'   , purCoeff =  'OBO'  , Cgrp = '_3'

     RUN PGM=MATRIX   PRNFILE='..\@scenario@\Outputs\Mode choice calibration summaries.PRN' MSG='Mode choice calibration summaries'
       MATI[1] = ..\@scenario@\Outputs\MC_@pur@.trp
       Fillmw MW[1]  = MI.1.1(11)    ; All tables from purpose HBW INC 1

        JLOOP
         IF(I<(@lastSMZ@+1))         ; Only the SMZ zones
          EDA  = EDA + MW[1]
          ESR2 = ESR2+ MW[2]
          ESR3 = ESR3+ MW[3]
          WB   = WB  + MW[4]
          WE   = WE  + MW[5]
          WR   = WR  + MW[6]
          WC   = WC  + MW[7]
          DB   = DB  + MW[8]
          DE   = DE  + MW[9]
          DR   = DR  + MW[10]
          DC   = DC  + MW[11]

          WKTRN = WB+WE+WR+WC
```

Validation_DCModel.s

```
          DRTRN = DB+DE+DR+DC
          ESR   = ESR2+ESR3
          TRN   = WKTRN + DRTRN
          AUT   = EDA+ESR
          TOT   = AUT + TRN
       ENDIF
     ENDJLOOP

     if(I = @lastSMZ@)
       if(@P@=1 ) print form =10.0, list= 'Purpose ', ' Total    ',' DA     ',' SR2    ',' SR3+   ',' WB    ',' WE   ',' WR   ',' WC   ',' DB   ',' DE    ',' DR    ',' DC   ',
file=..\@scenario@\Outputs\MCEstimate.rpt
       if(@P@=1 ) print form =10.0, list= 'HBW-1', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate.rpt, APPEND=T
       if(@P@=2 ) print form =10.0, list= 'HBW-2', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate.rpt, APPEND=T
       if(@P@=3 ) print form =10.0, list= 'HBW-3', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate.rpt, APPEND=T
       if(@P@=4 ) print form =10.0, list= 'HBW-4', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate.rpt, APPEND=T
       if(@P@=5 ) print form =10.0, list= 'HBW-5', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate.rpt, APPEND=T
       if(@P@=6 ) print form =10.0, list= 'HBS-1', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate.rpt, APPEND=T
       if(@P@=7 ) print form =10.0, list= 'HBS-2', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate.rpt, APPEND=T
       if(@P@=8 ) print form =10.0, list= 'HBS-3', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate.rpt, APPEND=T
       if(@P@=9 ) print form =10.0, list= 'HBS-4', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate.rpt, APPEND=T
       if(@P@=10) print form =10.0, list= 'HBS-5', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate.rpt, APPEND=T
       if(@P@=11) print form =10.0, list= 'HBO-1', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate.rpt, APPEND=T
       if(@P@=12) print form =10.0, list= 'HBO-2', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate.rpt, APPEND=T
       if(@P@=13) print form =10.0, list= 'HBO-3', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate.rpt, APPEND=T
       if(@P@=14) print form =10.0, list= 'HBO-4', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate.rpt, APPEND=T
       if(@P@=15) print form =10.0, list= 'HBO-5', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate.rpt, APPEND=T
       if(@P@=16) print form =10.0, list= 'HBSc ', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate.rpt, APPEND=T
       if(@P@=17) print form =10.0, list= 'NHBW ', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate.rpt, APPEND=T
       if(@P@=18) print form =10.0, list= 'OBO  ', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate.rpt, APPEND=T
     endif
   ENDRUN
 ENDLOOP

 *Copy ..\%scenario%\Outputs\MCEstimate.rpt    ..\%scenario%\Validation\MC_Summary.rpt
```

Validation_DCModel_All.s

```
; Maryland Statewide Travel Demand Model (MSTM)
;
; Script: Destination Model validation
;
; About:
; This script summarizes destination choice trips by purpose in the model region and is used for validation only

; Description:
; STEP 1: The script summarizes destination choice model trips by regions and trip purpose
; STEP 2: Exports regional trip tables to csv file format
; STEP 3: Computes river crossings

; Input Files
; Dest_<purpose>.trp  - destination choice model trip tables by purpose
; Hwy<PK/OP>.skm      - highway distance skim
; dist.txt            - zonal to region eqivanlency file
; RiverZones.txt      - zonal to bridge crossing eqivanlency file

; Output skims
; Model_Dist_Dest.trp        - regional flow table
; DC_District_Flows_All.csv  - district flows in CSV format
; Model_River_Dest.trp       - bridge crossing table
; DC_River_Flows_All.csv     - bridge crossings in CSV format
; <purpose>TDLF.dbf          - trip length frequency distribution in DBF format
; <purpose>TDLF.csv          - trip length frequency distribution in CSV format
; DC_triplength_All.rpt      - trip length frequency report by regions


; Authors:
; Amar Sarvepalli    - sarvepalli@pbworld.com - 01/25/2011
; Rolf Moeckel       - moeckel@pbworld.com    - 05/30/2012

; Version 1.0
;=========================================================================
READ File = '..\stamp.log'
READ File = '..\iteration.txt'



;READ File = ..\iteration.txt
;READ File = ..\stamp2.txt
;scenario='TEST_2030'
;TEST='TEST_2030'
;
RUN PGM=MATRIX   PRNFILE = '..\@scenario@\Outputs\District Summaries Model Region.PRN' MSG='Model District Flows'

        MATI[1]  ='..\@scenario@\Outputs\Dest_HBW1.trp'
        MATI[2]  =..\@scenario@\Outputs\Dest_HBW2.trp
        MATI[3]  =..\@scenario@\Outputs\Dest_HBW3.trp
        MATI[4]  =..\@scenario@\Outputs\Dest_HBW4.trp
        MATI[5]  =..\@scenario@\Outputs\Dest_HBW5.trp
        MATI[6]  =..\@scenario@\Outputs\Dest_HBS1.trp
        MATI[7]  =..\@scenario@\Outputs\Dest_HBS2.trp
        MATI[8]  =..\@scenario@\Outputs\Dest_HBS3.trp
        MATI[9]  =..\@scenario@\Outputs\Dest_HBS4.trp
        MATI[10] =..\@scenario@\Outputs\Dest_HBS5.trp
        MATI[11] =..\@scenario@\Outputs\Dest_HBO1.trp
        MATI[12] =..\@scenario@\Outputs\Dest_HBO2.trp
        MATI[13] =..\@scenario@\Outputs\Dest_HBO3.trp
        MATI[14] =..\@scenario@\Outputs\Dest_HBO4.trp
        MATI[15] =..\@scenario@\Outputs\Dest_HBO5.trp
        MATI[16] =..\@scenario@\Outputs\Dest_NHBW.trp
        MATI[17] =..\@scenario@\Outputs\Dest_OBO.trp
        MATO[1] = ..\@scenario@\Outputs\Model_Dist_Dest.trp, mo=1-17
```

Validation_DCModel_All.s

```
              IF(I < (@lastSMZ@+1))                    ; Model region and no RMZ's
                MW[1 ]=MI.1.1
                MW[2 ]=MI.2.1
                MW[3 ]=MI.3.1
                MW[4 ]=MI.4.1
                MW[5 ]=MI.5.1
                MW[6 ]=MI.6.1
                MW[7 ]=MI.7.1
                MW[8 ]=MI.8.1
                MW[9 ]=MI.9.1
                MW[10]=MI.10.1
                MW[11]=MI.11.1
                MW[12]=MI.12.1
                MW[13]=MI.13.1
                MW[14]=MI.14.1
                MW[15]=MI.15.1
                MW[16]=MI.16.1
                MW[17]=MI.17.1
              ENDIF

            ; Summarizes by survey zones in 1-8 regions
             RENUMBER FILE   ="..\@scenario@\Inputs\dist.txt"
          ENDRUN

        ; Export to CSV file
READ File = '..\stamp.log'
          RUN PGM=MATRIX PRNFILE='..\@scenario@\Outputs\Export District Summaries to CSV.PRN' MSG='Export Model District Flows'
           MATI[1] = ..\@scenario@\Outputs\Model_Dist_Dest.trp
           FILEO PRINTO[1] = ..\@scenario@\Outputs\District_Flows.csv
           JLOOP
             MW[1] = mi.1.1 + mi.1.2 +mi.1.3+ mi.1.4 +mi.1.5        ; HBW Inc 1-5
             MW[2] = mi.1.6 + mi.1.7 +mi.1.8+ mi.1.9 +mi.1.10       ; HBS Inc 1-5
             MW[3] = mi.1.11 + mi.1.12 +mi.1.13+ mi.1.14 +mi.1.15   ; HBO Inc 1-5
             MW[4] = mi.1.16                                        ; NHBW
             MW[5] = mi.1.17                                        ; OBO
               IF(I < (@lastSMZ@+1))                                ; Model region and no RMZ's
                 OTAZ = I
                 DTAZ = J
                 HBW = MW[1]
                 HBS = MW[2]
                 HBO = MW[3]
                 NHBW= MW[4]
                 OBO = MW[5]
                 TOTAL = MW[1]+MW[2]+MW[3]+MW[4]+MW[5]
               ENDIF
             ; Print header
             IF (OTAZ = 1 && DTAZ = 1)
              PRINT PRINTO=1 CSV=T LIST = 'OTAZ','DTAZ','HBW','HBS','HBO','NHBW','OBO','TOTAL'
             ENDIF
             ; print values to CSV
             PRINT PRINTO=1 CSV=T LIST= OTAZ(4.0),DTAZ(4.0),HBW,HBS,HBO,NHBW,OBO,TOTAL
           ENDJLOOP
          ENDRUN

; GET RIVER REGIONAL SUMMARIES
READ File = '..\stamp.log'
;SCENARIO='TEST_2030'

; Get river region (across bridges) summaries
          RUN PGM=MATRIX PRNFILE='..\@scenario@\Outputs\River Zone Summaries.PRN' MSG='River Region Flows'
           MATI[1 ] =..\@scenario@\Outputs\Dest_HBW1.trp
           MATI[2 ] =..\@scenario@\Outputs\Dest_HBW2.trp
           MATI[3 ] =..\@scenario@\Outputs\Dest_HBW3.trp
           MATI[4 ] =..\@scenario@\Outputs\Dest_HBW4.trp
           MATI[5 ] =..\@scenario@\Outputs\Dest_HBW5.trp
```

Validation_DCModel_All.s

```
        MATI[6 ] =..\@scenario@\Outputs\Dest_HBS1.trp
        MATI[7 ] =..\@scenario@\Outputs\Dest_HBS2.trp
        MATI[8 ] =..\@scenario@\Outputs\Dest_HBS3.trp
        MATI[9 ] =..\@scenario@\Outputs\Dest_HBS4.trp
        MATI[10] =..\@scenario@\Outputs\Dest_HBS5.trp
        MATI[11] =..\@scenario@\Outputs\Dest_HBO1.trp
        MATI[12] =..\@scenario@\Outputs\Dest_HBO2.trp
        MATI[13] =..\@scenario@\Outputs\Dest_HBO3.trp
        MATI[14] =..\@scenario@\Outputs\Dest_HBO4.trp
        MATI[15] =..\@scenario@\Outputs\Dest_HBO5.trp
        MATI[16] =..\@scenario@\Outputs\Dest_NHBW.trp
        MATI[17] =..\@scenario@\Outputs\Dest_OBO.trp
        MATO[1] = ..\@scenario@\Outputs\Model_River_Dest.trp, mo=1-17

        IF(I < (@lastSMZ@+1))            ; Model region and no RMZ's
          MW[1 ]=MI.1.1
          MW[2 ]=MI.2.1
          MW[3 ]=MI.3.1
          MW[4 ]=MI.4.1
          MW[5 ]=MI.5.1
          MW[6 ]=MI.6.1
          MW[7 ]=MI.7.1
          MW[8 ]=MI.8.1
          MW[9 ]=MI.9.1
          MW[10]=MI.10.1
          MW[11]=MI.11.1
          MW[12]=MI.12.1
          MW[13]=MI.13.1
          MW[14]=MI.14.1
          MW[15]=MI.15.1
          MW[16]=MI.16.1
          MW[17]=MI.17.1
        ENDIF

        ; Summarizes by survey zones in 1-8 regions
          RENUMBER FILE  ="..\@scenario@\Inputs\RiverZones.txt"
        ENDRUN

        ; Export to CSV file
        RUN PGM=MATRIX PRNFILE='..\@scenario@\Outputs\Export River Regions to CSV.PRN' MSG='Export River Region Flows'
          MATI[1] = ..\@scenario@\Outputs\Model_River_Dest.trp
          FILEO PRINTO[1] = "..\@scenario@\Outputs\River_Flows.csv"
          JLOOP
            MW[1] = mi.1.1 + mi.1.2 +mi.1.3+ mi.1.4 +mi.1.5        ; HBW Inc 1-5
            MW[2] = mi.1.6 + mi.1.7 +mi.1.8+ mi.1.9 +mi.1.10       ; HBS Inc 1-5
            MW[3] = mi.1.11 + mi.1.12 +mi.1.13+ mi.1.14 +mi.1.15  ; HBO Inc 1-5
            MW[4] = mi.1.16                                   ; NHBW
            MW[5] = mi.1.17                                   ; OBO
                OTAZ = I
                DTAZ = J
                HBW = MW[1]
                HBS = MW[2]
                HBO = MW[3]
                NHBW= MW[4]
                OBO = MW[5]
                TOTAL = MW[1]+MW[2]+MW[3]+MW[4]+MW[5]

            ; Print header
            IF (OTAZ = 1 && DTAZ = 1) PRINT PRINTO=1 CSV=T LIST = 'OTAZ','DTAZ','HBW','HBS','HBO','NHBW','OBO','TOTAL'
            ; print values to CSV
            IF(OTAZ <4 && DTAZ <4)  PRINT PRINTO=1 CSV=T LIST= OTAZ(4.0),DTAZ(4.0),HBW,HBS,HBO,NHBW,OBO,TOTAL

            ; print values to CSV
            IF(OTAZ = 4 || DTAZ =4)  PRINT PRINTO=1 CSV=T LIST= OTAZ(4.0),DTAZ(4.0),'0','0','0','0','0','0'
```

Validation_DCModel_All.s

```
            ENDJLOOP
            ENDRUN

; Compute TDLF and report average trip length distribution
;READ File = '..\stamp.log'
;READ File = '..\iteration.txt'


  LOOP p = 1,18
    IF (p =1 )   pur = 'HBW1' ,  tm='PK',  purCoeff='HBW',  Inc = 'Dcinc1'
    IF (p =2 )   pur = 'HBW2' ,  tm='PK',  purCoeff='HBW',  Inc = 'Dcinc2'
    IF (p =3 )   pur = 'HBW3' ,  tm='PK',  purCoeff='HBW',  Inc = 'Dcinc3'
    IF (p =4 )   pur = 'HBW4' ,  tm='PK',  purCoeff='HBW',  Inc = 'Dcinc4'
    IF (p =5 )   pur = 'HBW5' ,  tm='PK',  purCoeff='HBW',  Inc = 'Dcinc5'
    IF (p =6 )   pur = 'HBS1' ,  tm='OP',  purCoeff='HBS',  Inc = 'Dcinc1'
    IF (p =7 )   pur = 'HBS2' ,  tm='OP',  purCoeff='HBS',  Inc = 'Dcinc2'
    IF (p =8 )   pur = 'HBS3' ,  tm='OP',  purCoeff='HBS',  Inc = 'Dcinc3'
    IF (p =9 )   pur = 'HBS4' ,  tm='OP',  purCoeff='HBS',  Inc = 'Dcinc4'
    IF (p =10)   pur = 'HBS5' ,  tm='OP',  purCoeff='HBS',  Inc = 'Dcinc5'
    IF (p =11)   pur = 'HBO1' ,  tm='OP',  purCoeff='HBO',  Inc = 'Dcinc1'
    IF (p =12)   pur = 'HBO2' ,  tm='OP',  purCoeff='HBO',  Inc = 'Dcinc2'
    IF (p =13)   pur = 'HBO3' ,  tm='OP',  purCoeff='HBO',  Inc = 'Dcinc3'
    IF (p =14)   pur = 'HBO4' ,  tm='OP',  purCoeff='HBO',  Inc = 'Dcinc4'
    IF (p =15)   pur = 'HBO5' ,  tm='OP',  purCoeff='HBO',  Inc = 'Dcinc5'
    IF (p =16) continue  ; pur = 'HBSc' ,   tm='OP',   purCoeff='HBSc',  Inc = 'Dcinc1'
    IF (p =17)   pur = 'NHBW' ,  tm='PK',  purCoeff='NHBW', Inc = 'Dcinc1'
    IF (p =18)   pur = 'OBO'  ,  tm='OP',  purCoeff='OBO',  Inc = 'Dcinc1'

    ; Computes TDLF
    RUN PGM=MATRIX PRNFILE='..\@scenario@\Outputs\TDLF by production district All.PRN' MSG='TDLF by production district All'
        FILEI MATI[1] = ..\@scenario@\Outputs\Dest_@pur@.trp
        FILEI MATI[2] = ..\@scenario@\Outputs\Hwy@tm@_iter@iteration@.skm
        FILEO RECO[1] = ..\@scenario@\Temp\@pur@TDLF.dbf,
         FIELDS= HIGH,MID,LOW,TRIPS(16.8)
        FILEO PRINTO[1] = '..\@scenario@\Temp\@pur@TDLF.csv'

        MW[1]=MI.1.1
        MW[2]=MI.2.2
        gps=50-1
        Array trips=50

        JLOOP
        ;group = min(max(round(mw[2]),1),50)
        group = min(INT(mw[2]/1),gps) + 1
        trips[group]=trips[group]+mw[1]
        ENDJLOOP

        IF (i=zones)
          LOOP group=1,50
            ro.LOW = group-1
            ro.MID = group-0.5
            ro.HIGH= group
            ro.TRIPS=trips[group]
            write reco=1
            PRINT PRINTO=1 CSV=T  LIST= ro.HIGH,ro.MID,ro.LOW,ro.TRIPS
          ENDLOOP
        ENDIF
        FREQUENCY BASEMW=2 VALUEMW=1 RANGE=0-100-1
    ENDRUN
  ENDLOOP    ; purpose loop

  ; Loop by five purposes
  LOOP p = 1,5
    IF (p =1 ) purpose='HBW' , Inc=' ', All= ';'
```

Validation_DCModel_All.s

```
        IF (p =2 ) purpose='HBS' , Inc=' ', All= ';'
        IF (p =3 ) purpose='HBO' , Inc=' ', All= ';'
        IF (p =4 ) purpose='NHBW', Inc=';', All= ' '
        IF (p =5 ) purpose='OBO' , Inc=';', All= ' '

          RUN PGM=MATRIX PRNFILE='..\@scenario@\Outputs\Avg Trip length by production district All.PRN' MSG='Avg Trip length by production district All'
          Zones = 50        ; 60 bins

          ; Reads TDLF by Purpose and Income (HBW,HBS and HBO)
          @Inc@ FILEI ZDATI[1] = "..\@scenario@\Temp\@purpose@1TDLF.csv",Z=#1, mid1=#2, trips1=#4
          @Inc@ FILEI ZDATI[2] = "..\@scenario@\Temp\@purpose@2TDLF.csv",Z=#1, mid2=#2, trips2=#4
          @Inc@ FILEI ZDATI[3] = "..\@scenario@\Temp\@purpose@3TDLF.csv",Z=#1, mid3=#2, trips3=#4
          @Inc@ FILEI ZDATI[4] = "..\@scenario@\Temp\@purpose@4TDLF.csv",Z=#1, mid4=#2, trips4=#4
          @Inc@ FILEI ZDATI[5] = "..\@scenario@\Temp\@purpose@5TDLF.csv",Z=#1, mid5=#2, trips5=#4

          ; Reads TDLF by Purpose (NHBW and OBO)
          @All@ FILEI ZDATI[1] = "..\@scenario@\Temp\@purpose@TDLF.csv",Z=#1, mid1=#2, trips1=#4

                tottrips1 = tottrips1 + trips1
          @Inc@ tottrips2 = tottrips2 + trips2
          @Inc@ tottrips3 = tottrips3 + trips3
          @Inc@ tottrips4 = tottrips4 + trips4
          @Inc@ tottrips5 = tottrips5 + trips5

                tripdist1 = tripdist1 + mid1 * trips1
          @Inc@ tripdist2 = tripdist2 + mid2 * trips2
          @Inc@ tripdist3 = tripdist3 + mid3 * trips3
          @Inc@ tripdist4 = tripdist4 + mid4 * trips4
          @Inc@ tripdist5 = tripdist5 + mid5 * trips5

          @inc@ totaltrips = totaltrips + trips1+trips2+trips3+trips4+trips5
          @inc@ tripdist   = tripdist + mid1*trips1 + mid2*trips2 + mid3*trips3 + mid4*trips4 + mid5*trips5

          @all@ totaltrips = totaltrips + trips1
          @all@ tripdist   = tripdist + mid1*trips1

          IF (z = 50)
              ; Total trips = 0 in Regions 9 - 12
                    if(totaltrips<>0) avgtriplength  = tripdist/totaltrips
                    if(tottrips1<>0)  avgtriplength1 = tripdist1/tottrips1
          @Inc@ if(tottrips2<>0)  avgtriplength2 = tripdist2/tottrips2
          @Inc@ if(tottrips3<>0)  avgtriplength3 = tripdist3/tottrips3
          @Inc@ if(tottrips4<>0)  avgtriplength4 = tripdist4/tottrips4
          @Inc@ if(tottrips5<>0)  avgtriplength5 = tripdist5/tottrips5

                    if(totaltrips=0) avgtriplength  = 0
                    if(tottrips1=0)  avgtriplength1 = 0
          @Inc@ if(tottrips2=0)  avgtriplength2 = 0
          @Inc@ if(tottrips3=0)  avgtriplength3 = 0
          @Inc@ if(tottrips4=0)  avgtriplength4 = 0
          @Inc@ if(tottrips5=0)  avgtriplength5 = 0

              ; Print header
              IF(@p@=1) print form =15.4,list= "Purpose ","   totaltrips  ", "  avgtriplength ", " Trips-Inc1  ","   Len-Inc1  ", " Trips-Inc2    ","   Len-Inc2  ", "
Trips-Inc3    ","   Len-Inc3  ", " Trips-Inc4    ","   Len-Inc4 ", " Trips-Inc5   ", "   Len-Inc5 ",
file=..\@scenario@\Outputs\triplength_All.rpt
              ; Print regional trips for HBW
              IF (@p@ = 1) print form =15.4,list= " HBW ", " = ", totaltrips, avgtriplength,tottrips1, avgtriplength1, tottrips2, avgtriplength2, tottrips3, avgtriplength3,
tottrips4, avgtriplength4, tottrips5, avgtriplength5,
file=..\@scenario@\Outputs\triplength_All.rpt, APPEND=T
              ; Print regional trips for HBS
              IF (@p@ = 2) print form =15.4,list= " HBS ", " = ", totaltrips, avgtriplength,tottrips1, avgtriplength1, tottrips2, avgtriplength2, tottrips3, avgtriplength3,
tottrips4, avgtriplength4, tottrips5, avgtriplength5,
file=..\@scenario@\Outputs\triplength_All.rpt, APPEND=T
              ; Print regional trips for HBO
```

Validation_DCModel_All.s

```
        IF (@p@ = 3) print form =15.4,list= "HBO ", " = ", totaltrips, avgtriplength,tottrips1, avgtriplength1, tottrips2, avgtriplength2, tottrips3, avgtriplength3,
tottrips4, avgtriplength4, tottrips5, avgtriplength5,
file=..\@scenario@\Outputs\triplength_All.rpt, APPEND=T
                ; Print regional trips for NHBW
        IF (@p@ = 4) print form =15.4,list= "NHBW", " = ", totaltrips, avgtriplength,
file=..\@scenario@\Outputs\triplength_All.rpt, APPEND=T
                ; Print regional trips for OBO
        IF (@p@ = 5) print form =15.4,list= "OBO ", " = ", totaltrips, avgtriplength,
file=..\@scenario@\Outputs\triplength_All.rpt, APPEND=T
            ENDIF
        ENDRUN
    ENDLOOP

; copy report files to validation folder
 *Copy ..\@scenario@\Outputs\triplength_All.rpt ..\@scenario@\Validation\DC_triplength_All.rpt
 *Copy ..\@scenario@\Outputs\District_Flows.csv ..\@scenario@\Validation\DC_District_Flows_All.csv
 *Copy ..\@scenario@\Outputs\River_Flows.csv ..\@scenario@\Validation\DC_River_Flows_All.csv
```

Validation_MCModel.s

```
; Maryland Statewide Travel Demand Model (MSTM)
;
; Script: Mode Choice validation
;
; About:
; This script summarizes mode chocie trips by purpose in the model region and is used for calibration only

; Description:
; STEP 1: The script summarizes mode choice model trips by trip purpose

; Input Files
; MC_<purpose>.trp  - mode choice model trip tables by purpose

; Output skims
; MC_Summary.rpt - mode choice trips by purpose

; Authors:
; Amar Sarvepalli    - sarvepalli@pbworld.com - 01/25/2011

; Version 1.0
;==============================================================================
READ File = '..\stamp.log'

; GET MODE CHOICE SUMMARIES

   LOOP p = 1,18     ; Purpose loop

     IF (p =1 )    pur = 'HBW1' ,   tm = 'PK' ,   Wrk='Wrk'     , purCoeff =  'HBW'  , Cgrp = '_1'
     IF (p =2 )    pur = 'HBW2' ,   tm = 'PK' ,   Wrk='Wrk'     , purCoeff =  'HBW'  , Cgrp = '_1'
     IF (p =3 )    pur = 'HBW3' ,   tm = 'PK' ,   Wrk='Wrk'     , purCoeff =  'HBW'  , Cgrp = '_1'
     IF (p =4 )    pur = 'HBW4' ,   tm = 'PK' ,   Wrk='Wrk'     , purCoeff =  'HBW'  , Cgrp = '_1'
     IF (p =5 )    pur = 'HBW5' ,   tm = 'PK' ,   Wrk='Wrk'     , purCoeff =  'HBW'  , Cgrp = '_1'
     IF (p =6 )    pur = 'HBS1' ,   tm = 'OP' ,   Wrk='NonWrk'  , purCoeff =  'HBS'  , Cgrp = '_2'
     IF (p =7 )    pur = 'HBS2' ,   tm = 'OP' ,   Wrk='NonWrk'  , purCoeff =  'HBS'  , Cgrp = '_2'
     IF (p =8 )    pur = 'HBS3' ,   tm = 'OP' ,   Wrk='NonWrk'  , purCoeff =  'HBS'  , Cgrp = '_2'
     IF (p =9 )    pur = 'HBS4' ,   tm = 'OP' ,   Wrk='NonWrk'  , purCoeff =  'HBS'  , Cgrp = '_2'
     IF (p =10)    pur = 'HBS5' ,   tm = 'OP' ,   Wrk='NonWrk'  , purCoeff =  'HBS'  , Cgrp = '_2'
     IF (p =11)    pur = 'HBO1' ,   tm = 'OP' ,   Wrk='NonWrk'  , purCoeff =  'HBO'  , Cgrp = '_2'
     IF (p =12)    pur = 'HBO2' ,   tm = 'OP' ,   Wrk='NonWrk'  , purCoeff =  'HBO'  , Cgrp = '_2'
     IF (p =13)    pur = 'HBO3' ,   tm = 'OP' ,   Wrk='NonWrk'  , purCoeff =  'HBO'  , Cgrp = '_2'
     IF (p =14)    pur = 'HBO4' ,   tm = 'OP' ,   Wrk='NonWrk'  , purCoeff =  'HBO'  , Cgrp = '_2'
     IF (p =15)    pur = 'HBO5' ,   tm = 'OP' ,   Wrk='NonWrk'  , purCoeff =  'HBO'  , Cgrp = '_2'
     IF (p =16)    pur = 'HBSc' ,   tm = 'OP' ,   Wrk='NonWrk'  , purCoeff =  'HBSc' , Cgrp = '_2'
     IF (p =17)    pur = 'NHBW' ,   tm = 'PK' ,   Wrk='Wrk'     , purCoeff =  'NHBW' , Cgrp = '_1'
     IF (p =18)    pur = 'OBO'  ,   tm = 'OP' ,   Wrk='NonWrk'  , purCoeff =  'OBO'  , Cgrp = '_3'

     RUN PGM=MATRIX  PRNFILE='..\@scenario@\Outputs\Mode choice calibration summaries.PRN' MSG='Mode choice calibration summaries'
       MATI[1] = ..\@scenario@\Outputs\MC_@pur@.trp
      Fillmw MW[1]  = MI.1.1(11)    ; All tables from purpose HBW INC 1

        JLOOP
        IF(I<(@lastSMZ@+1))            ; Only the SMZ zones
         EDA  = EDA + MW[1]
         ESR2 = ESR2+ MW[2]
         ESR3 = ESR3+ MW[3]
         WB   = WB  + MW[4]
         WE   = WE  + MW[5]
         WR   = WR  + MW[6]
         WC   = WC  + MW[7]
         DB   = DB  + MW[8]
         DE   = DE  + MW[9]
         DR   = DR  + MW[10]
         DC   = DC  + MW[11]

         WKTRN = WB+WE+WR+WC
```

Validation_MCModel.s

```
         DRTRN = DB+DE+DR+DC
         ESR   = ESR2+ESR3
         TRN   = WKTRN + DRTRN
         AUT   = EDA+ESR
         TOT   = AUT + TRN
       ENDIF
     ENDJLOOP

     if(I = @lastSMZ@)
     if(@P@=1 ) print form =10.0, list= 'Purpose ', ' Total    ',' DA      ',' SR2    ',' SR3+   ',' WB   ',' WE  ',' WR   ',' WC   ',' DB   ',' 
DE    ',' DR   ',' DC   ',
file=..\@scenario@\Outputs\MCEstimate.rpt
         if(@P@=1 ) print form =10.0, list= 'HBW-1', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate.rpt, APPEND=T
         if(@P@=2 ) print form =10.0, list= 'HBW-2', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate.rpt, APPEND=T
         if(@P@=3 ) print form =10.0, list= 'HBW-3', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate.rpt, APPEND=T
         if(@P@=4 ) print form =10.0, list= 'HBW-4', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate.rpt, APPEND=T
         if(@P@=5 ) print form =10.0, list= 'HBW-5', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate.rpt, APPEND=T
         if(@P@=6 ) print form =10.0, list= 'HBS-1', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate.rpt, APPEND=T
         if(@P@=7 ) print form =10.0, list= 'HBS-2', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate.rpt, APPEND=T
         if(@P@=8 ) print form =10.0, list= 'HBS-3', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate.rpt, APPEND=T
         if(@P@=9 ) print form =10.0, list= 'HBS-4', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate.rpt, APPEND=T
         if(@P@=10) print form =10.0, list= 'HBS-5', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate.rpt, APPEND=T
         if(@P@=11) print form =10.0, list= 'HBO-1', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate.rpt, APPEND=T
         if(@P@=12) print form =10.0, list= 'HBO-2', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate.rpt, APPEND=T
         if(@P@=13) print form =10.0, list= 'HBO-3', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate.rpt, APPEND=T
         if(@P@=14) print form =10.0, list= 'HBO-4', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate.rpt, APPEND=T
         if(@P@=15) print form =10.0, list= 'HBO-5', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate.rpt, APPEND=T
         if(@P@=16) print form =10.0, list= 'HBSc ', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate.rpt, APPEND=T
         if(@P@=17) print form =10.0, list= 'NHBW ', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate.rpt, APPEND=T
         if(@P@=18) print form =10.0, list= 'OBO  ', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate.rpt, APPEND=T
       endif
     ENDRUN
   ENDLOOP

   *Copy ..\%scenario%\Outputs\MCEstimate.rpt    ..\%scenario%\Validation\MC_Summary.rpt
```

Validation_MCModel_SurveyReg.s

```
; Maryland Statewide Travel Demand Model (MSTM)
;
; Script: Mode Choice validation
;
; About:
; This script summarizes mode chocie trips by purpose in the survey region and is used for calibration only

; Description:
; STEP 1: The script summarizes mode choice model trips by trip purpose

; Input Files
; MC_<purpose>.trp  - mode choice model trip tables by purpose

; Output skims
; MC_Summary_SurveyReg - mode choice trips by purpose in the survey region

; Authors:
; Amar Sarvepalli    - sarvepalli@pbworld.com - 01/25/2011

; Version 1.0
;=====================================================================
READ File = '..\stamp.log'

; GET MODE CHOICE SUMMARIES

  LOOP p = 1,18    ; Purpose loop

    IF (p =1 )    pur = 'HBW1' ,   tm = 'PK' ,   Wrk='Wrk'     , purCoeff =  'HBW'  , Cgrp = '_1'
    IF (p =2 )    pur = 'HBW2' ,   tm = 'PK' ,   Wrk='Wrk'     , purCoeff =  'HBW'  , Cgrp = '_1'
    IF (p =3 )    pur = 'HBW3' ,   tm = 'PK' ,   Wrk='Wrk'     , purCoeff =  'HBW'  , Cgrp = '_1'
    IF (p =4 )    pur = 'HBW4' ,   tm = 'PK' ,   Wrk='Wrk'     , purCoeff =  'HBW'  , Cgrp = '_1'
    IF (p =5 )    pur = 'HBW5' ,   tm = 'PK' ,   Wrk='Wrk'     , purCoeff =  'HBW'  , Cgrp = '_1'
    IF (p =6 )    pur = 'HBS1' ,   tm = 'OP' ,   Wrk='NonWrk'  , purCoeff =  'HBS'  , Cgrp = '_2'
    IF (p =7 )    pur = 'HBS2' ,   tm = 'OP' ,   Wrk='NonWrk'  , purCoeff =  'HBS'  , Cgrp = '_2'
    IF (p =8 )    pur = 'HBS3' ,   tm = 'OP' ,   Wrk='NonWrk'  , purCoeff =  'HBS'  , Cgrp = '_2'
    IF (p =9 )    pur = 'HBS4' ,   tm = 'OP' ,   Wrk='NonWrk'  , purCoeff =  'HBS'  , Cgrp = '_2'
    IF (p =10)    pur = 'HBS5' ,   tm = 'OP' ,   Wrk='NonWrk'  , purCoeff =  'HBS'  , Cgrp = '_2'
    IF (p =11)    pur = 'HBO1' ,   tm = 'OP' ,   Wrk='NonWrk'  , purCoeff =  'HBO'  , Cgrp = '_2'
    IF (p =12)    pur = 'HBO2' ,   tm = 'OP' ,   Wrk='NonWrk'  , purCoeff =  'HBO'  , Cgrp = '_2'
    IF (p =13)    pur = 'HBO3' ,   tm = 'OP' ,   Wrk='NonWrk'  , purCoeff =  'HBO'  , Cgrp = '_2'
    IF (p =14)    pur = 'HBO4' ,   tm = 'OP' ,   Wrk='NonWrk'  , purCoeff =  'HBO'  , Cgrp = '_2'
    IF (p =15)    pur = 'HBO5' ,   tm = 'OP' ,   Wrk='NonWrk'  , purCoeff =  'HBO'  , Cgrp = '_2'
    IF (p =16)    pur = 'HBSc' ,   tm = 'OP' ,   Wrk='NonWrk'  , purCoeff =  'HBSc' , Cgrp = '_2'
    IF (p =17)    pur = 'NHBW' ,   tm = 'PK' ,   Wrk='Wrk'     , purCoeff =  'NHBW' , Cgrp = '_1'
    IF (p =18)    pur = 'OBO'  ,   tm = 'OP' ,   Wrk='NonWrk'  , purCoeff =  'OBO'  , Cgrp = '_3'

    RUN PGM=MATRIX  PRNFILE='..\@scenario@\Outputs\Mode choice calibration summaries survey.PRN' MSG='Mode choice calibration summaries'
     MATI[1] = ..\@scenario@\Outputs\MC_@pur@.trp
     Fillmw MW[1]  = MI.1.1(11)    ; All tables from purpose HBW INC 1

       JLOOP
        IF(I<(@lastSMZ@+1) & I=@SurveyZones@)         ; Only the SMZ zones
         EDA  = EDA + MW[1]
         ESR2 = ESR2+ MW[2]
         ESR3 = ESR3+ MW[3]
         WB   = WB  + MW[4]
         WE   = WE  + MW[5]
         WR   = WR  + MW[6]
         WC   = WC  + MW[7]
         DB   = DB  + MW[8]
         DE   = DE  + MW[9]
         DR   = DR  + MW[10]
         DC   = DC  + MW[11]

         WKTRN = WB+WE+WR+WC
```

Validation_MCModel_SurveyReg.s

```
          DRTRN = DB+DE+DR+DC
          ESR   = ESR2+ESR3
          TRN   = WKTRN + DRTRN
          AUT   = EDA+ESR
          TOT   = AUT + TRN
        ENDIF
      ENDJLOOP

      if(I = @lastSMZ@)
        if(@P@=1 ) print form =10.0, list= 'Purpose ', ' Total    ',' DA     ',' SR2    ',' SR3+   ',' WB    ','  WE   ','  WR   ','  WC   ','  DB   ','
 DE   ','  DR   ','   DC  ',file=..\@scenario@\Outputs\MCEstimate_SurveyReg.rpt
        if(@P@=1 ) print form =10.0, list= 'HBW-1', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate_SurveyReg.rpt, APPEND=T
        if(@P@=2 ) print form =10.0, list= 'HBW-2', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate_SurveyReg.rpt, APPEND=T
        if(@P@=3 ) print form =10.0, list= 'HBW-3', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate_SurveyReg.rpt, APPEND=T
        if(@P@=4 ) print form =10.0, list= 'HBW-4', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate_SurveyReg.rpt, APPEND=T
        if(@P@=5 ) print form =10.0, list= 'HBW-5', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate_SurveyReg.rpt, APPEND=T
        if(@P@=6 ) print form =10.0, list= 'HBS-1', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate_SurveyReg.rpt, APPEND=T
        if(@P@=7 ) print form =10.0, list= 'HBS-2', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate_SurveyReg.rpt, APPEND=T
        if(@P@=8 ) print form =10.0, list= 'HBS-3', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate_SurveyReg.rpt, APPEND=T
        if(@P@=9 ) print form =10.0, list= 'HBS-4', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate_SurveyReg.rpt, APPEND=T
        if(@P@=10) print form =10.0, list= 'HBS-5', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate_SurveyReg.rpt, APPEND=T
        if(@P@=11) print form =10.0, list= 'HBO-1', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate_SurveyReg.rpt, APPEND=T
        if(@P@=12) print form =10.0, list= 'HBO-2', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate_SurveyReg.rpt, APPEND=T
        if(@P@=13) print form =10.0, list= 'HBO-3', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate_SurveyReg.rpt, APPEND=T
        if(@P@=14) print form =10.0, list= 'HBO-4', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate_SurveyReg.rpt, APPEND=T
        if(@P@=15) print form =10.0, list= 'HBO-5', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate_SurveyReg.rpt, APPEND=T
        if(@P@=16) print form =10.0, list= 'HBSc ', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate_SurveyReg.rpt, APPEND=T
        if(@P@=17) print form =10.0, list= 'NHBW ', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate_SurveyReg.rpt, APPEND=T
        if(@P@=18) print form =10.0, list= 'OBO  ', TOT, EDA, ESR2, ESR3, WB, WE, WR, WC, DB, DE, DR, DC, file=..\@scenario@\Outputs\MCEstimate_SurveyReg.rpt, APPEND=T
      endif
    ENDRUN
  ENDLOOP

  *Copy ..\@scenario@\Outputs\MCEstimate_SurveyReg.rpt    ..\@scenario@\validation\MC_Summary_SurveyReg.rpt
```

Validation_TOD.s

```
; Maryland Statewide Travel Demand Model (MSTM)
;
; Script: Time of Day model validation
;
; About:
; This script summarizes time of day trips by purpose in the model region and is used for validation only

; Description:
; STEP 1: The script summarizes vehicle trips by trip purpose and time of day and reports
;         VMT and VHT by county and facility types

; Input Files
; MC_<purpose>.trp  - mode choice model trip tables by purpose
; Validation_TOD(trips).s - A code block file

; Output skims
; RegTrpsSummary.CSV  - regional trip summaries
; VMT_VHT_byCty.csv   - regional VMT and VHT by county
; VMT_BySWFT.CSV      - regional VMT and VHT by facility type
; Veh_@pur@_AM.trp    - Derived vehicle trips from mode choice person trips
; TOD_Summary.CSV     - Time of day summary

; Authors:
; Amar Sarvepalli     - sarvepalli@pbworld.com - 01/25/2011

; Version 1.0
;=====================================================================
READ File = '..\stamp.log'

 ; This script only deals with highway time of day
LOOP p = 1,18
;                                AM                              MD                              PM                             NT
;                    |+++++++++++++++++++++++++||+++++++++++++++++++++++++++++| |+++++++++++++++++++++++++++| |+++++++++++++++++++++++++++|
IF (p =1 )  pur = 'HBW1' , PA_AM=0.575,  AP_AM =0.0395,   PA_MD =0.1636, AP_MD =0.2491, PA_PM =0.0532, AP_PM =0.4517, PA_NT =0.2082, AP_NT =0.2597
IF (p =2 )  pur = 'HBW2' , PA_AM=0.6395, AP_AM =0.0272,   PA_MD =0.1275, AP_MD =0.2034, PA_PM =0.0378, AP_PM =0.5085, PA_NT =0.1951, AP_NT =0.2609
IF (p =3 )  pur = 'HBW3' , PA_AM=0.687,  AP_AM =0.0182,   PA_MD =0.0902, AP_MD =0.1956, PA_PM =0.0251, AP_PM =0.5724, PA_NT =0.1978, AP_NT =0.2137
IF (p =4 )  pur = 'HBW4' , PA_AM=0.7214, AP_AM =0.02,     PA_MD =0.0729, AP_MD =0.181,  PA_PM =0.0182, AP_PM =0.588,  PA_NT =0.1875, AP_NT =0.211
IF (p =5 )  pur = 'HBW5' , PA_AM=0.7433, AP_AM =0.0091,   PA_MD =0.0725, AP_MD =0.1616, PA_PM =0.0139, AP_PM =0.5951, PA_NT =0.1702, AP_NT =0.2342
IF (p =6 )  pur = 'HBS1' , PA_AM=0.1425, AP_AM =0.0242,   PA_MD =0.5255, AP_MD =0.4336, PA_PM =0.2007, AP_PM =0.2961, PA_NT =0.1313, AP_NT =0.2462
IF (p =7 )  pur = 'HBS2' , PA_AM=0.1368, AP_AM =0.0211,   PA_MD =0.4227, AP_MD =0.3612, PA_PM =0.2196, AP_PM =0.275,  PA_NT =0.2208, AP_NT =0.3428
IF (p =8 )  pur = 'HBS3' , PA_AM=0.1264, AP_AM =0.0191,   PA_MD =0.4094, AP_MD =0.3733, PA_PM =0.2672, AP_PM =0.2662, PA_NT =0.1969, AP_NT =0.3414
IF (p =9 )  pur = 'HBS4' , PA_AM=0.1246, AP_AM =0.0153,   PA_MD =0.3669, AP_MD =0.3234, PA_PM =0.2636, AP_PM =0.2673, PA_NT =0.245,  AP_NT =0.3941
IF (p =10)  pur = 'HBS5' , PA_AM=0.1486, AP_AM =0.0178,   PA_MD =0.3344, AP_MD =0.3307, PA_PM =0.2385, AP_PM =0.245,  PA_NT =0.2784, AP_NT =0.4066
IF (p =11)  pur = 'HBO1' , PA_AM=0.3646, AP_AM =0.0865,   PA_MD =0.3924, AP_MD =0.3937, PA_PM =0.1348, AP_PM =0.2854, PA_NT =0.1082, AP_NT =0.2344
IF (p =12)  pur = 'HBO2' , PA_AM=0.3172, AP_AM =0.0843,   PA_MD =0.3562, AP_MD =0.3163, PA_PM =0.1726, AP_PM =0.2741, PA_NT =0.154,  AP_NT =0.3253
IF (p =13)  pur = 'HBO3' , PA_AM=0.3182, AP_AM =0.1011,   PA_MD =0.3253, AP_MD =0.3061, PA_PM =0.206,  AP_PM =0.2729, PA_NT =0.1505, AP_NT =0.3199
IF (p =14)  pur = 'HBO4' , PA_AM=0.3052, AP_AM =0.0876,   PA_MD =0.313,  AP_MD =0.2796, PA_PM =0.2198, AP_PM =0.3011, PA_NT =0.1619, AP_NT =0.3318
IF (p =15)  pur = 'HBO5' , PA_AM=0.319,  AP_AM =0.0971,   PA_MD =0.2826, AP_MD =0.2656, PA_PM =0.2178, AP_PM =0.2956, PA_NT =0.1805, AP_NT =0.3417
IF (p =16)  pur = 'HBSc' , PA_AM=0.924,  AP_AM =0.003,    PA_MD =0.0271, AP_MD =0.5637, PA_PM =0.025,  AP_PM =0.3539, PA_NT =0.0239, AP_NT =0.0794
IF (p =17)  pur = 'NHBW' , PA_AM=0.0325, AP_AM =0.2384,   PA_MD =0.4523, AP_MD =0.6035, PA_PM =0.4496, AP_PM =0.0786, PA_NT =0.0656, AP_NT =0.0795
IF (p =18)  pur = 'OBO'  , PA_AM=0.0671, AP_AM =0.0818,   PA_MD =0.5706, AP_MD =0.5534, PA_PM =0.2159, AP_PM =0.2304, PA_NT =0.1465, AP_NT =0.1344

;Calculate vehicle trips by period
 RUN PGM=MATRIX    PRNFILE='..\@scenario@\Outputs\Validation @pur@ TOD - Auto vehicle trips by period.PRN'  MSG='@pur@ TOD - Auto vehicle trips by period'
   ID = "Calculate vehicle trips by period"

   MATI[1]  = ..\@scenario@\Outputs\MC_@pur@.trp

   MATO[1] = ..\@scenario@\Outputs\Veh_@pur@_AM.trp, MO= 1- 3, NAME = AMsov,AMhov2,AMhov3+, DEC=3*S
   MATO[2] = ..\@scenario@\Outputs\Veh_@pur@_MD.trp, MO= 6- 8, NAME = MDsov,MDhov2,MDhov3+, DEC=3*S
   MATO[3] = ..\@scenario@\Outputs\Veh_@pur@_PM.trp, MO=11-13, NAME = PMsov,PMhov2,PMhov3+, DEC=3*S
   MATO[4] = ..\@scenario@\Outputs\Veh_@pur@_NT.trp, MO=16-18, NAME = NTsov,NThov2,NThov3+, DEC=3*S

 ; Lookup table for average occupancy of 3+ occupant vehicles, by purpose.
   LOOKUP interpolate = n, fail = 0,0,0, NAME = avg3,
```

Validation_TOD.s

```
;        avg     purp
   r = '3.861  1 ',
       '3.861  2 ',
       '3.861  3 ',
       '3.861  4 ',
       '3.861  5 ',
       '3.626  6 ',
       '3.626  7 ',
       '3.626  8 ',
       '3.626  9 ',
       '3.626  10',
       '3.671  11',
       '3.671  12',
       '3.671  13',
       '3.671  14',
       '3.671  15',
       '3.672  16',
       '3.668  17',
       '3.663  18'
JLOOP
; AM peak SOV, HOV2 and HOV3+ matrices
   MW[1] = 0.5 * (@PA_AM@ * MI.1.1 + @AP_AM@ * MI.1.1.T )
   MW[2] = 0.5 * (0.5 * (@PA_AM@ * MI.1.2 + @AP_AM@ * MI.1.2.T)          )
   MW[3] = 0.5 * ((1.00/avg3(@p@)) * (@PA_AM@ * MI.1.3 + @AP_AM@ * MI.1.3.T)     )

; MD peak SOV, HOV2 and HOV3+ matrices
   MW[6] = 0.5 * (@PA_MD@ * MI.1.1 + @AP_MD@ * MI.1.1.T                 )
   MW[7] = 0.5 * (0.5 * (@PA_MD@ * MI.1.2 + @AP_MD@ * MI.1.2.T)          )
   MW[8] = 0.5 * ((1.00/avg3(@p@)) * (@PA_MD@ * MI.1.3 + @AP_MD@ * MI.1.3.T)   )

; PM peak SOV, HOV2 and HOV3+ matrices
   MW[11] = 0.5 * (@PA_PM@ * MI.1.1 + @AP_PM@ * MI.1.1.T             )
   MW[12] = 0.5 * (0.5 * (@PA_PM@ * MI.1.2 + @AP_PM@ * MI.1.2.T)       )
   MW[13] = 0.5 * ((1.00/avg3(@p@)) * (@PA_PM@ * MI.1.3 + @AP_PM@ * MI.1.3.T))

; NT peak SOV, HOV2 and HOV3+ matrices
   MW[16] = 0.5 * (@PA_NT@ * MI.1.1 + @AP_NT@ * MI.1.1.T             )
   MW[17] = 0.5 * (0.5 * (@PA_NT@ * MI.1.2 + @AP_NT@ * MI.1.2.T)        )
   MW[18] = 0.5 * ((1.00/avg3(@p@)) * (@PA_NT@ * MI.1.3 + @AP_NT@ * MI.1.3.T))

   ENDJLOOP
   READ FILE = ..\scripts\Validation_TOD(trips).s
 ENDRUN
ENDLOOP

*COPY ..\@scenario@\Outputs\RegTrpsSummary.CSV ..\@scenario@\Validation\RegTrpsSummary.CSV
*COPY ..\@scenario@\Outputs\VMT_VHT_byCty.csv  ..\@scenario@\Validation\VMT_VHT_byCty.csv
*COPY ..\@scenario@\Outputs\VMT_BySWFT.CSV     ..\@scenario@\Validation\VMT_BySWFT.CSV
```

Validation_TOD-Survey.s

```
; Maryland Statewide Travel Demand Model (MSTM)
;
; Script: Time of Day model validation for the survey region
;
; About:
; This script summarizes time of day trips by purpose in the survey region and is used for validation only

; Description:
; STEP 1: The script summarizes vehicle trips by trip purpose and time of day and reports
;         VMT and VHT by county and facility types

; Input Files
; MC_<purpose>.trp  - mode choice model trip tables by purpose
; Validation_TOD(trips)_SurveyRegion.s - A code block file

; Output skims
; RegTrpsSummary.CSV  - regional trip summaries
; VMT_VHT_byCty.csv   - regional VMT and VHT by county
; VMT_BySWFT.CSV      - regional VMT and VHT by facility type
; Veh_@pur@_AM.trp    - Derived vehicle trips from mode choice person trips
; TOD_Summary_SurveyRegion.CSV    - Time of day summary for the survey region

; Authors:
; Amar Sarvepalli     - sarvepalli@pbworld.com - 01/25/2011

; Version 1.0
;========================================================================
READ File = '..\stamp.log'

 ; This script only deals with highway time of day
LOOP p = 1,18
;                               AM                         MD                          PM                            NT
;                  |++++++++++++++++++++++++||++++++++++++++++++++++++++| |++++++++++++++++++++++++++| |++++++++++++++++++++++++++|
IF (p =1 )  pur = 'HBW1' , PA_AM=0.575,  AP_AM =0.0395,  PA_MD =0.1636, AP_MD =0.2491, PA_PM =0.0532, AP_PM =0.4517, PA_NT =0.2082, AP_NT =0.2597
IF (p =2 )  pur = 'HBW2' , PA_AM=0.6395, AP_AM =0.0272,  PA_MD =0.1275, AP_MD =0.2034, PA_PM =0.0378, AP_PM =0.5085, PA_NT =0.1951, AP_NT =0.2609
IF (p =3 )  pur = 'HBW3' , PA_AM=0.687,  AP_AM =0.0182,  PA_MD =0.0902, AP_MD =0.1956, PA_PM =0.0251, AP_PM =0.5724, PA_NT =0.1978, AP_NT =0.2137
IF (p =4 )  pur = 'HBW4' , PA_AM=0.7214, AP_AM =0.02,    PA_MD =0.0729, AP_MD =0.181,  PA_PM =0.0182, AP_PM =0.588,  PA_NT =0.1875, AP_NT =0.211
IF (p =5 )  pur = 'HBW5' , PA_AM=0.7433, AP_AM =0.0091,  PA_MD =0.0725, AP_MD =0.1616, PA_PM =0.0139, AP_PM =0.5951, PA_NT =0.1702, AP_NT =0.2342
IF (p =6 )  pur = 'HBS1' , PA_AM=0.1425, AP_AM =0.0242,  PA_MD =0.5255, AP_MD =0.4336, PA_PM =0.2007, AP_PM =0.2961, PA_NT =0.1313, AP_NT =0.2462
IF (p =7 )  pur = 'HBS2' , PA_AM=0.1368, AP_AM =0.0211,  PA_MD =0.4227, AP_MD =0.3612, PA_PM =0.2196, AP_PM =0.275,  PA_NT =0.2208, AP_NT =0.3428
IF (p =8 )  pur = 'HBS3' , PA_AM=0.1264, AP_AM =0.0191,  PA_MD =0.4094, AP_MD =0.3733, PA_PM =0.2672, AP_PM =0.2662, PA_NT =0.1969, AP_NT =0.3414
IF (p =9 )  pur = 'HBS4' , PA_AM=0.1246, AP_AM =0.0153,  PA_MD =0.3669, AP_MD =0.3234, PA_PM =0.2636, AP_PM =0.2673, PA_NT =0.245,  AP_NT =0.3941
IF (p =10)  pur = 'HBS5' , PA_AM=0.1486, AP_AM =0.0178,  PA_MD =0.3344, AP_MD =0.3307, PA_PM =0.2385, AP_PM =0.245,  PA_NT =0.2784, AP_NT =0.4066
IF (p =11)  pur = 'HBO1' , PA_AM=0.3646, AP_AM =0.0865,  PA_MD =0.3924, AP_MD =0.3937, PA_PM =0.1348, AP_PM =0.2854, PA_NT =0.1082, AP_NT =0.2344
IF (p =12)  pur = 'HBO2' , PA_AM=0.3172, AP_AM =0.0843,  PA_MD =0.3562, AP_MD =0.3163, PA_PM =0.1726, AP_PM =0.2741, PA_NT =0.154,  AP_NT =0.3253
IF (p =13)  pur = 'HBO3' , PA_AM=0.3182, AP_AM =0.1011,  PA_MD =0.3253, AP_MD =0.3061, PA_PM =0.206,  AP_PM =0.2729, PA_NT =0.1505, AP_NT =0.3199
IF (p =14)  pur = 'HBO4' , PA_AM=0.3052, AP_AM =0.0876,  PA_MD =0.313,  AP_MD =0.2796, PA_PM =0.2198, AP_PM =0.3011, PA_NT =0.1619, AP_NT =0.3318
IF (p =15)  pur = 'HBO5' , PA_AM=0.319,  AP_AM =0.0971,  PA_MD =0.2826, AP_MD =0.2656, PA_PM =0.2178, AP_PM =0.2956, PA_NT =0.1805, AP_NT =0.3417
IF (p =16)  pur = 'HBSc' , PA_AM=0.924,  AP_AM =0.003,   PA_MD =0.0271, AP_MD =0.5637, PA_PM =0.025,  AP_PM =0.3539, PA_NT =0.0239, AP_NT =0.0794
IF (p =17)  pur = 'NHBW' , PA_AM=0.0325, AP_AM =0.2384,  PA_MD =0.4523, AP_MD =0.6035, PA_PM =0.4496, AP_PM =0.0786, PA_NT =0.0656, AP_NT =0.0795
IF (p =18)  pur = 'OBO'  , PA_AM=0.0671, AP_AM =0.0818,  PA_MD =0.5706, AP_MD =0.5534, PA_PM =0.2159, AP_PM =0.2304, PA_NT =0.1465, AP_NT =0.1344

;Calculate vehicle trips by period
 RUN PGM=MATRIX    PRNFILE='..\@scenario@\Outputs\Validation @pur@ TOD - Auto vehicle trips by period Survey.PRN'  MSG='@pur@ TOD - Auto vehicle trips by period'
   ID = "Calculate vehicle trips by period"

   MATI[1]  = ..\@scenario@\Outputs\MC_@pur@.trp

   MATO[1] = ..\@scenario@\Outputs\Veh_@pur@_AM.trp, MO= 1- 3, NAME = AMsov,AMhov2,AMhov3+, DEC=3*S
   MATO[2] = ..\@scenario@\Outputs\Veh_@pur@_MD.trp, MO= 6- 8, NAME = MDsov,MDhov2,MDhov3+, DEC=3*S
   MATO[3] = ..\@scenario@\Outputs\Veh_@pur@_PM.trp, MO=11-13, NAME = PMsov,PMhov2,PMhov3+, DEC=3*S
   MATO[4] = ..\@scenario@\Outputs\Veh_@pur@_NT.trp, MO=16-18, NAME = NTsov,NThov2,NThov3+, DEC=3*S

 ; Lookup table for average occupancy of 3+ occupant vehicles, by purpose.
   LOOKUP interpolate = n, fail = 0,0,0, NAME = avg3,
```

Validation_TOD-Survey.s

```
;       avg     purp
    r = '3.861  1 ',
        '3.861  2 ',
        '3.861  3 ',
        '3.861  4 ',
        '3.861  5 ',
        '3.626  6 ',
        '3.626  7 ',
        '3.626  8 ',
        '3.626  9 ',
        '3.626  10',
        '3.671  11',
        '3.671  12',
        '3.671  13',
        '3.671  14',
        '3.671  15',
        '3.672  16',
        '3.668  17',
        '3.663  18'
  JLOOP
  IF(I == @SurveyZones@ & J == @SurveyZones@)
; AM peak SOV, HOV2 and HOV3+ matrices
    MW[1] = 0.5 * (@PA_AM@ * MI.1.1 + @AP_AM@ * MI.1.1.T )
    MW[2] = 0.5 * (0.5 * (@PA_AM@ * MI.1.2 + @AP_AM@ * MI.1.2.T)            )
    MW[3] = 0.5 * ((1.00/avg3(@p@)) * (@PA_AM@ * MI.1.3 + @AP_AM@ * MI.1.3.T)     )

; MD peak SOV, HOV2 and HOV3+ matrices
    MW[6] = 0.5 * (@PA_MD@ * MI.1.1 + @AP_MD@ * MI.1.1.T                 )
    MW[7] = 0.5 * (0.5 * (@PA_MD@ * MI.1.2 + @AP_MD@ * MI.1.2.T)          )
    MW[8] = 0.5 * ((1.00/avg3(@p@)) * (@PA_MD@ * MI.1.3 + @AP_MD@ * MI.1.3.T)   )

; PM peak SOV, HOV2 and HOV3+ matrices
    MW[11] = 0.5 * (@PA_PM@ * MI.1.1 + @AP_PM@ * MI.1.1.T               )
    MW[12] = 0.5 * (0.5 * (@PA_PM@ * MI.1.2 + @AP_PM@ * MI.1.2.T)         )
    MW[13] = 0.5 * ((1.00/avg3(@p@)) * (@PA_PM@ * MI.1.3 + @AP_PM@ * MI.1.3.T))

; NT peak SOV, HOV2 and HOV3+ matrices
    MW[16] = 0.5 * (@PA_NT@ * MI.1.1 + @AP_NT@ * MI.1.1.T               )
    MW[17] = 0.5 * (0.5 * (@PA_NT@ * MI.1.2 + @AP_NT@ * MI.1.2.T)         )
    MW[18] = 0.5 * ((1.00/avg3(@p@)) * (@PA_NT@ * MI.1.3 + @AP_NT@ * MI.1.3.T))
  ENDIF
  ENDJLOOP
  READ FILE = ..\scripts\Validation_TOD(trips)_SurveyRegion.s
 ENDRUN
ENDLOOP
```

Validation_TOD(trips).s

```
; Maryland Statewide Travel Demand Model (MSTM)
;
; Script: Time of day validation
;
; About:
; This is just a code block script and is called from Validation_TOD.s

; Description:
; This script is not run as a standalone one rather called /read during the TG to write out some summaries
; Used only for validation purposes

; Authors:
; Amar Sarvepalli     - sarvepalli@pbworld.com - 02/22/2011

; Version 1.0

;=========================================================================
READ File = '..\stamp.log'

; TOD Validation
Zones = @lastSMZ@

  PRINTO[1]= ..\@scenario@\Validation\TOD_Summary.CSV, APPEND = T
  JLOOP
   IF (I=ZONES & J = ZONES)
    if(@p@=1) PRINT PRINTO=1, CSV=T, LIST= 'MODE','-----------Drive Alone--------','','','','-----------HOV2--------','','','', '-----------HOV3+--------','','','','---------
-TOTAL--------'
     if(@p@=1) PRINT PRINTO=1, CSV=T, LIST= 'Purpose','AM', 'MD', 'PM', 'NT',     'AM', 'MD', 'PM', 'NT',              'AM', 'MD', 'PM', 'NT',             'AM', 'MD', 'PM', 'NT'
     if(@p@=1 )PRINT PRINTO=1, CSV=T, LIST= 'HBW1',   DA_AM, DA_MD, DA_PM, DA_NT, HOV2_AM, HOV2_MD, HOV2_PM, HOV2_NT, HOV3_AM, HOV3_MD, HOV3_PM, HOV3_NT, TOT_AM, TOT_MD, TOT_PM,
TOT_NT
     if(@p@=2 )PRINT PRINTO=1, CSV=T, LIST= 'HBW2',   DA_AM, DA_MD, DA_PM, DA_NT, HOV2_AM, HOV2_MD, HOV2_PM, HOV2_NT, HOV3_AM, HOV3_MD, HOV3_PM, HOV3_NT, TOT_AM, TOT_MD, TOT_PM,
TOT_NT
     if(@p@=3 )PRINT PRINTO=1, CSV=T, LIST= 'HBW3',   DA_AM, DA_MD, DA_PM, DA_NT, HOV2_AM, HOV2_MD, HOV2_PM, HOV2_NT, HOV3_AM, HOV3_MD, HOV3_PM, HOV3_NT, TOT_AM, TOT_MD, TOT_PM,
TOT_NT
     if(@p@=4 )PRINT PRINTO=1, CSV=T, LIST= 'HBW4',   DA_AM, DA_MD, DA_PM, DA_NT, HOV2_AM, HOV2_MD, HOV2_PM, HOV2_NT, HOV3_AM, HOV3_MD, HOV3_PM, HOV3_NT, TOT_AM, TOT_MD, TOT_PM,
TOT_NT
     if(@p@=5 )PRINT PRINTO=1, CSV=T, LIST= 'HBW5',   DA_AM, DA_MD, DA_PM, DA_NT, HOV2_AM, HOV2_MD, HOV2_PM, HOV2_NT, HOV3_AM, HOV3_MD, HOV3_PM, HOV3_NT, TOT_AM, TOT_MD, TOT_PM,
TOT_NT
     if(@p@=6 )PRINT PRINTO=1, CSV=T, LIST= 'HBS1',   DA_AM, DA_MD, DA_PM, DA_NT, HOV2_AM, HOV2_MD, HOV2_PM, HOV2_NT, HOV3_AM, HOV3_MD, HOV3_PM, HOV3_NT, TOT_AM, TOT_MD, TOT_PM,
TOT_NT
     if(@p@=7 )PRINT PRINTO=1, CSV=T, LIST= 'HBS2',   DA_AM, DA_MD, DA_PM, DA_NT, HOV2_AM, HOV2_MD, HOV2_PM, HOV2_NT, HOV3_AM, HOV3_MD, HOV3_PM, HOV3_NT, TOT_AM, TOT_MD, TOT_PM,
TOT_NT
     if(@p@=8 )PRINT PRINTO=1, CSV=T, LIST= 'HBS3',   DA_AM, DA_MD, DA_PM, DA_NT, HOV2_AM, HOV2_MD, HOV2_PM, HOV2_NT, HOV3_AM, HOV3_MD, HOV3_PM, HOV3_NT, TOT_AM, TOT_MD, TOT_PM,
TOT_NT
     if(@p@=9 )PRINT PRINTO=1, CSV=T, LIST= 'HBS4',   DA_AM, DA_MD, DA_PM, DA_NT, HOV2_AM, HOV2_MD, HOV2_PM, HOV2_NT, HOV3_AM, HOV3_MD, HOV3_PM, HOV3_NT, TOT_AM, TOT_MD, TOT_PM,
TOT_NT
     if(@p@=10)PRINT PRINTO=1, CSV=T, LIST= 'HBS5',   DA_AM, DA_MD, DA_PM, DA_NT, HOV2_AM, HOV2_MD, HOV2_PM, HOV2_NT, HOV3_AM, HOV3_MD, HOV3_PM, HOV3_NT, TOT_AM, TOT_MD, TOT_PM,
TOT_NT
     if(@p@=11)PRINT PRINTO=1, CSV=T, LIST= 'HBO1',   DA_AM, DA_MD, DA_PM, DA_NT, HOV2_AM, HOV2_MD, HOV2_PM, HOV2_NT, HOV3_AM, HOV3_MD, HOV3_PM, HOV3_NT, TOT_AM, TOT_MD, TOT_PM,
TOT_NT
     if(@p@=12)PRINT PRINTO=1, CSV=T, LIST= 'HBO2',   DA_AM, DA_MD, DA_PM, DA_NT, HOV2_AM, HOV2_MD, HOV2_PM, HOV2_NT, HOV3_AM, HOV3_MD, HOV3_PM, HOV3_NT, TOT_AM, TOT_MD, TOT_PM,
TOT_NT
     if(@p@=13)PRINT PRINTO=1, CSV=T, LIST= 'HBO3',   DA_AM, DA_MD, DA_PM, DA_NT, HOV2_AM, HOV2_MD, HOV2_PM, HOV2_NT, HOV3_AM, HOV3_MD, HOV3_PM, HOV3_NT, TOT_AM, TOT_MD, TOT_PM,
TOT_NT
     if(@p@=14)PRINT PRINTO=1, CSV=T, LIST= 'HBO4',   DA_AM, DA_MD, DA_PM, DA_NT, HOV2_AM, HOV2_MD, HOV2_PM, HOV2_NT, HOV3_AM, HOV3_MD, HOV3_PM, HOV3_NT, TOT_AM, TOT_MD, TOT_PM,
TOT_NT
     if(@p@=15)PRINT PRINTO=1, CSV=T, LIST= 'HBO5',   DA_AM, DA_MD, DA_PM, DA_NT, HOV2_AM, HOV2_MD, HOV2_PM, HOV2_NT, HOV3_AM, HOV3_MD, HOV3_PM, HOV3_NT, TOT_AM, TOT_MD, TOT_PM,
TOT_NT
     if(@p@=16)PRINT PRINTO=1, CSV=T, LIST= 'HBSc',   DA_AM, DA_MD, DA_PM, DA_NT, HOV2_AM, HOV2_MD, HOV2_PM, HOV2_NT, HOV3_AM, HOV3_MD, HOV3_PM, HOV3_NT, TOT_AM, TOT_MD, TOT_PM,
TOT_NT
     if(@p@=17)PRINT PRINTO=1, CSV=T, LIST= 'NHBW',   DA_AM, DA_MD, DA_PM, DA_NT, HOV2_AM, HOV2_MD, HOV2_PM, HOV2_NT, HOV3_AM, HOV3_MD, HOV3_PM, HOV3_NT, TOT_AM, TOT_MD, TOT_PM,
TOT_NT
     if(@p@=18)PRINT PRINTO=1, CSV=T, LIST= 'OBO ',   DA_AM, DA_MD, DA_PM, DA_NT, HOV2_AM, HOV2_MD, HOV2_PM, HOV2_NT, HOV3_AM, HOV3_MD, HOV3_PM, HOV3_NT, TOT_AM, TOT_MD, TOT_PM,
TOT_NT
   ENDIF
```

Validation_TOD(trips).s

```
ENDJLOOP
; AM 1-3
; MD 6-8
; PM 11-13
; NT 16-18

; Drive alone
DA_AM       = ROWSUM(1)    +  DA_AM
DA_MD       = ROWSUM(6)    +  DA_MD
DA_PM       = ROWSUM(11)   +  DA_PM
DA_NT       = ROWSUM(16)   +  DA_NT


; HOV2
HOV2_AM     = ROWSUM(2)    +  HOV2_AM
HOV2_MD     = ROWSUM(7)    +  HOV2_MD
HOV2_PM     = ROWSUM(12)   +  HOV2_PM
HOV2_NT     = ROWSUM(17)   +  HOV2_NT


  ; Drive alone
HOV3_AM     = ROWSUM(3)    +  HOV3_AM
HOV3_MD     = ROWSUM(8)    +  HOV3_MD
HOV3_PM     = ROWSUM(13)   +  HOV3_PM
HOV3_NT     = ROWSUM(18)   +  HOV3_NT


  ; Total alone
TOT_AM      = ROWSUM(1)    + ROWSUM(2)    + ROWSUM(3)    +  TOT_AM
TOT_MD      = ROWSUM(6)    + ROWSUM(7)    + ROWSUM(8)    +  TOT_MD
TOT_PM      = ROWSUM(11)   + ROWSUM(12)   + ROWSUM(13)   +  TOT_PM
TOT_NT      = ROWSUM(16)   + ROWSUM(17)   + ROWSUM(18)   +  TOT_NT
```

Validation_TOD(trips)_SurveyReg.s

```
; Maryland Statewide Travel Demand Model (MSTM)
;
; Script: Time of day validation
;
; About:
; This is just a code block script and is called from Validation_TOD-Survey.s

; Description:
; This script is not run as a standalone one rather called /read during the TG to write out some summaries
; Used only for validation purposes

; Authors:
; Amar Sarvepalli    - sarvepalli@pbworld.com - 02/22/2011

; Version 1.0


;=========================================================================

; TOD Validation
Zones = @lastSMZ@    ; Last Survey Zone

READ File = '..\stamp.log'

  PRINTO[1]= ..\@scenario@\Validation\TOD_Summary_SurveyRegion.CSV, APPEND = T
  JLOOP
   IF (I=ZONES & J = ZONES)
    if(@p@=1) PRINT PRINTO=1, CSV=T, LIST= 'MODE','------------Drive Alone--------','','','','------------HOV2--------','','','', '------------HOV3+--------','','','','---------
-TOTAL--------'
    if(@p@=1) PRINT PRINTO=1, CSV=T, LIST= 'Purpose','AM', 'MD', 'PM', 'NT',     'AM', 'MD', 'PM', 'NT',              'AM', 'MD', 'PM', 'NT',            'AM', 'MD', 'PM', 'NT'
    if(@p@=1 )PRINT PRINTO=1, CSV=T, LIST= 'HBW1',    DA_AM, DA_MD, DA_PM, DA_NT, HOV2_AM, HOV2_MD, HOV2_PM, HOV2_NT, HOV3_AM, HOV3_MD, HOV3_PM, HOV3_NT, TOT_AM, TOT_MD, TOT_PM,
TOT_NT
    if(@p@=2 )PRINT PRINTO=1, CSV=T, LIST= 'HBW2',    DA_AM, DA_MD, DA_PM, DA_NT, HOV2_AM, HOV2_MD, HOV2_PM, HOV2_NT, HOV3_AM, HOV3_MD, HOV3_PM, HOV3_NT, TOT_AM, TOT_MD, TOT_PM,
TOT_NT
    if(@p@=3 )PRINT PRINTO=1, CSV=T, LIST= 'HBW3',    DA_AM, DA_MD, DA_PM, DA_NT, HOV2_AM, HOV2_MD, HOV2_PM, HOV2_NT, HOV3_AM, HOV3_MD, HOV3_PM, HOV3_NT, TOT_AM, TOT_MD, TOT_PM,
TOT_NT
    if(@p@=4 )PRINT PRINTO=1, CSV=T, LIST= 'HBW4',    DA_AM, DA_MD, DA_PM, DA_NT, HOV2_AM, HOV2_MD, HOV2_PM, HOV2_NT, HOV3_AM, HOV3_MD, HOV3_PM, HOV3_NT, TOT_AM, TOT_MD, TOT_PM,
TOT_NT
    if(@p@=5 )PRINT PRINTO=1, CSV=T, LIST= 'HBW5',    DA_AM, DA_MD, DA_PM, DA_NT, HOV2_AM, HOV2_MD, HOV2_PM, HOV2_NT, HOV3_AM, HOV3_MD, HOV3_PM, HOV3_NT, TOT_AM, TOT_MD, TOT_PM,
TOT_NT
    if(@p@=6 )PRINT PRINTO=1, CSV=T, LIST= 'HBS1',    DA_AM, DA_MD, DA_PM, DA_NT, HOV2_AM, HOV2_MD, HOV2_PM, HOV2_NT, HOV3_AM, HOV3_MD, HOV3_PM, HOV3_NT, TOT_AM, TOT_MD, TOT_PM,
TOT_NT
    if(@p@=7 )PRINT PRINTO=1, CSV=T, LIST= 'HBS2',    DA_AM, DA_MD, DA_PM, DA_NT, HOV2_AM, HOV2_MD, HOV2_PM, HOV2_NT, HOV3_AM, HOV3_MD, HOV3_PM, HOV3_NT, TOT_AM, TOT_MD, TOT_PM,
TOT_NT
    if(@p@=8 )PRINT PRINTO=1, CSV=T, LIST= 'HBS3',    DA_AM, DA_MD, DA_PM, DA_NT, HOV2_AM, HOV2_MD, HOV2_PM, HOV2_NT, HOV3_AM, HOV3_MD, HOV3_PM, HOV3_NT, TOT_AM, TOT_MD, TOT_PM,
TOT_NT
    if(@p@=9 )PRINT PRINTO=1, CSV=T, LIST= 'HBS4',    DA_AM, DA_MD, DA_PM, DA_NT, HOV2_AM, HOV2_MD, HOV2_PM, HOV2_NT, HOV3_AM, HOV3_MD, HOV3_PM, HOV3_NT, TOT_AM, TOT_MD, TOT_PM,
TOT_NT
    if(@p@=10)PRINT PRINTO=1, CSV=T, LIST= 'HBS5',    DA_AM, DA_MD, DA_PM, DA_NT, HOV2_AM, HOV2_MD, HOV2_PM, HOV2_NT, HOV3_AM, HOV3_MD, HOV3_PM, HOV3_NT, TOT_AM, TOT_MD, TOT_PM,
TOT_NT
    if(@p@=11)PRINT PRINTO=1, CSV=T, LIST= 'HBO1',    DA_AM, DA_MD, DA_PM, DA_NT, HOV2_AM, HOV2_MD, HOV2_PM, HOV2_NT, HOV3_AM, HOV3_MD, HOV3_PM, HOV3_NT, TOT_AM, TOT_MD, TOT_PM,
TOT_NT
    if(@p@=12)PRINT PRINTO=1, CSV=T, LIST= 'HBO2',    DA_AM, DA_MD, DA_PM, DA_NT, HOV2_AM, HOV2_MD, HOV2_PM, HOV2_NT, HOV3_AM, HOV3_MD, HOV3_PM, HOV3_NT, TOT_AM, TOT_MD, TOT_PM,
TOT_NT
    if(@p@=13)PRINT PRINTO=1, CSV=T, LIST= 'HBO3',    DA_AM, DA_MD, DA_PM, DA_NT, HOV2_AM, HOV2_MD, HOV2_PM, HOV2_NT, HOV3_AM, HOV3_MD, HOV3_PM, HOV3_NT, TOT_AM, TOT_MD, TOT_PM,
TOT_NT
    if(@p@=14)PRINT PRINTO=1, CSV=T, LIST= 'HBO4',    DA_AM, DA_MD, DA_PM, DA_NT, HOV2_AM, HOV2_MD, HOV2_PM, HOV2_NT, HOV3_AM, HOV3_MD, HOV3_PM, HOV3_NT, TOT_AM, TOT_MD, TOT_PM,
TOT_NT
    if(@p@=15)PRINT PRINTO=1, CSV=T, LIST= 'HBO5',    DA_AM, DA_MD, DA_PM, DA_NT, HOV2_AM, HOV2_MD, HOV2_PM, HOV2_NT, HOV3_AM, HOV3_MD, HOV3_PM, HOV3_NT, TOT_AM, TOT_MD, TOT_PM,
TOT_NT
    if(@p@=16)PRINT PRINTO=1, CSV=T, LIST= 'HBSc',    DA_AM, DA_MD, DA_PM, DA_NT, HOV2_AM, HOV2_MD, HOV2_PM, HOV2_NT, HOV3_AM, HOV3_MD, HOV3_PM, HOV3_NT, TOT_AM, TOT_MD, TOT_PM,
TOT_NT
    if(@p@=17)PRINT PRINTO=1, CSV=T, LIST= 'NHBW',    DA_AM, DA_MD, DA_PM, DA_NT, HOV2_AM, HOV2_MD, HOV2_PM, HOV2_NT, HOV3_AM, HOV3_MD, HOV3_PM, HOV3_NT, TOT_AM, TOT_MD, TOT_PM,
TOT_NT
    if(@p@=18)PRINT PRINTO=1, CSV=T, LIST= 'OBO ',    DA_AM, DA_MD, DA_PM, DA_NT, HOV2_AM, HOV2_MD, HOV2_PM, HOV2_NT, HOV3_AM, HOV3_MD, HOV3_PM, HOV3_NT, TOT_AM, TOT_MD, TOT_PM,
TOT_NT
```

Validation_TOD(trips)_SurveyReg.s

```
  ENDIF
ENDJLOOP
; AM 1-3
; MD 6-8
; PM 11-13
; NT 16-18

; Drive alone
DA_AM      = ROWSUM(1)   +  DA_AM
DA_MD      = ROWSUM(6)   +  DA_MD
DA_PM      = ROWSUM(11)  +  DA_PM
DA_NT      = ROWSUM(16)  +  DA_NT

; HOV2
HOV2_AM    = ROWSUM(2)   +  HOV2_AM
HOV2_MD    = ROWSUM(7)   +  HOV2_MD
HOV2_PM    = ROWSUM(12)  +  HOV2_PM
HOV2_NT    = ROWSUM(17)  +  HOV2_NT

  ; Drive alone
HOV3_AM     = ROWSUM(3)   +  HOV3_AM
HOV3_MD     = ROWSUM(8)   +  HOV3_MD
HOV3_PM     = ROWSUM(13)  +  HOV3_PM
HOV3_NT     = ROWSUM(18)  +  HOV3_NT

  ; Total alone
TOT_AM      = ROWSUM(1)   + ROWSUM(2)   + ROWSUM(3)   +   TOT_AM
TOT_MD      = ROWSUM(6)   + ROWSUM(7)   + ROWSUM(8)   +   TOT_MD
TOT_PM      = ROWSUM(11)  + ROWSUM(12)  + ROWSUM(13)  +   TOT_PM
TOT_NT      = ROWSUM(16)  + ROWSUM(17)  + ROWSUM(18)  +   TOT_NT
```

Nettoshape.s

```
; Do not change filenames or add or remove FILEI/FILEO statements using an editor. Use Cube/Application Manager.
READ File = '..\stamp.log'

RUN PGM=NETWORK PRNFILE=NETCLEAN.PRN MSG='Clean Final Network'
FILEI LINKI[1] = ..\@scenario@\Outputs\MSTM_Veh_Dly.net

FILEO NETO = ..\@scenario@\Outputs\MSTM_Veh_Dly_Final.net,
EXCLUDE =  JOIN_COUNT, TARGET_FID, AREATYPE_O, YEAR, SMZ_OLD, AMRT, OPRT, PKCAP, OPCAP, TOLLEDRO_A, TOLLOP_OLD, TOLLPK_OLD, SPDCLASS, AVGCAR24, AVGTRK24, URBAN, FIPS_JUR,
NEW_LINK, MODI_BMC, MODI_COG, SPDP, FFSPEED, AMCAP, CAPCLASS, CONGTIME, TOLLEDROAD, TOLLPK, TOLLOP, CENT, MCITY, TOLLAREA, TOLLAREAPK, TOLLAREAOP, COMVEH, MEDHDT, HVYHDT,
REGTRCKS, REG_AUTOS, TOTAL_VOL, ASGNCSPD, INC1VEH, INC2VEH, INC3VEH, INC4VEH, INC5VEH

ENDRUN

RUN PGM=NETWORK PRNFILE=NETTOSHAPE.PRN MSG='Convert Net to Shape'
FILEI LINKI[1] = ..\@scenario@\Outputs\MSTM_Veh_Dly_Final.net
;FILEO NETO = ..\@scenario@\Exports\Networks.mdb\MSTM_Veh_Dly_Final
FILEO LINKO=  ..\@scenario@\Exports\@scenario@_Link.shp FORMAT=SHP
FILEO NODEO=  ..\@scenario@\Exports\@scenario@_Node.shp FORMAT=SHP


ENDRUN
```

Maryland_Summary.s

```
; Maryland Statewide Travel Demand Model (MSTM)
; Script: Model Summary
; Mark Radovic mradovic@sha.state.md.us
;=======================================================================
;Set Parameters:

READ File = '..\stamp.log'

MDzones    = 1179; Maryland only SMZs
RowSize    = 54  ; Number of Rows in the Table


;-----------------------------------------------------------------------------
;   VEHICLE TRIP TABLE CONSOLIDATION                                         ;
;                                                                            ;
; MSTMs multi-class assignment assigns 18 trip tables for 4 different time periods ;
; These trips are never summarized, ao this initial step summarizes them and writes ;
; them out to matrices.  These are then read in later on.                    ;
;                                                                            ;
; Given the number of matrices and calculations, the procedure had to be broken up ;
; into smaller steps.  Most of the trip table that are written out are deleted     ;
; at the end of the script                                                   ;
;-----------------------------------------------------------------------------
RUN PGM=MATRIX
  zones=@MDzones@    ; Maryland ONLY
 ; zones=@lastSMZ@   ; Halo Region

;SUMMARIZE ALL VEHICLE TRIPS (ALL Incomes, ALL Purposes, ALL Occupancies)
; 3 tables in each (SOV, HOV2, HOV3)
  MATI[1]  = ..\@scenario@\Outputs\Veh_HBW1_AM.trp
  MATI[2]  = ..\@scenario@\Outputs\Veh_HBW2_AM.trp
  MATI[3]  = ..\@scenario@\Outputs\Veh_HBW3_AM.trp
  MATI[4]  = ..\@scenario@\Outputs\Veh_HBW4_AM.trp
  MATI[5]  = ..\@scenario@\Outputs\Veh_HBW5_AM.trp

  MATI[6]  = ..\@scenario@\Outputs\Veh_HBS1_AM.trp
  MATI[7]  = ..\@scenario@\Outputs\Veh_HBS2_AM.trp
  MATI[8]  = ..\@scenario@\Outputs\Veh_HBS3_AM.trp
  MATI[9]  = ..\@scenario@\Outputs\Veh_HBS4_AM.trp
  MATI[10] = ..\@scenario@\Outputs\Veh_HBS5_AM.trp

  MATI[11] = ..\@scenario@\Outputs\Veh_HBO1_AM.trp
  MATI[12] = ..\@scenario@\Outputs\Veh_HBO2_AM.trp
  MATI[13] = ..\@scenario@\Outputs\Veh_HBO3_AM.trp
  MATI[14] = ..\@scenario@\Outputs\Veh_HBO4_AM.trp
  MATI[15] = ..\@scenario@\Outputs\Veh_HBO5_AM.trp

  MATI[16] = ..\@scenario@\Outputs\Veh_HBSc_AM.trp
  MATI[17] = ..\@scenario@\Outputs\Veh_NHBW_AM.trp
  MATI[18] = ..\@scenario@\Outputs\Veh_OBO_AM.trp

; 5 tables (commercial, Medium Trucks, Heavy trucks, Regional Trucks, Regional Autos)
  MATI[19] = ..\@scenario@\Outputs\Veh_Regional_AM.TRP

  MW[20] = MI.1.1 + MI.2.1 + MI.3.1 + MI.4.1 + MI.5.1 + MI.6.1 + MI.7.1 + MI.8.1 + MI.9.1 + MI.10.1 + MI.11.1 + MI.12.1 + MI.13.1 + MI.14.1 + MI.15.1 + MI.16.1 + MI.17.1 +
MI.18.1  ; ALL AM SOVS
  MW[21] = MI.1.2 + MI.2.2 + MI.3.2 + MI.4.2 + MI.5.2 + MI.6.2 + MI.7.2 + MI.8.2 + MI.9.2 + MI.10.2 + MI.11.2 + MI.12.2 + MI.13.2 + MI.14.2 + MI.15.2 + MI.16.2 + MI.17.2 +
MI.18.2  ; ALL AM HOV2
  MW[22] = MI.1.3 + MI.2.3 + MI.3.3 + MI.4.3 + MI.5.3 + MI.6.3 + MI.7.3 + MI.8.3 + MI.9.3 + MI.10.3 + MI.11.3 + MI.12.3 + MI.13.3 + MI.14.3 + MI.15.3 + MI.16.3 + MI.17.3 +
MI.18.3  ; ALL AM HOV3
  MW[23] = MI.19.1   ; ALL AM ComVehs
  MW[24] = MI.19.2   ; ALL AM Med. Trks
  MW[25] = MI.19.3   ; ALL AM Hvy Trks
  MW[26] = MI.19.4   ; ALL AM Reg. Trks
  MW[27] = MI.19.5   ; ALL AM Reg. Autos & EEs
```

Maryland_Summary.s

```
   MW[28] = MW[20] + MW[21] + MW[22] + MW[23] + MW[27]   ; ALL Autos
   MW[29] = MW[24] + MW[25] + MW[26]                      ; ALL Trucks
   MW[30] = MW[28] + MW[29]                               ; ALL Vehicles

   FILEO MATO[1] = "..\@scenario@\Outputs\AM_SOV.TRP"      ,MO=20,     NAME = AM_SOV
   FILEO MATO[2] = "..\@scenario@\Outputs\AM_HOV2.TRP"     ,MO=21,     NAME = AM_HOV2
   FILEO MATO[3] = "..\@scenario@\Outputs\AM_HOV3.TRP"     ,MO=22,     NAME = AM_HOV3
   FILEO MATO[4] = "..\@scenario@\Outputs\AM_ComVeh.TRP"   ,MO=23,     NAME = AM_ComVeh
   FILEO MATO[5] = "..\@scenario@\Outputs\AM_MedTrk.TRP"   ,MO=24,     NAME = AM_MedTrk
   FILEO MATO[6] = "..\@scenario@\Outputs\AM_HvyTrk.TRP"   ,MO=25,     NAME = AM_HvyTrk
   FILEO MATO[7] = "..\@scenario@\Outputs\AM_RegTrk.TRP"   ,MO=26,     NAME = AM_RegTrk
   FILEO MATO[8] = "..\@scenario@\Outputs\AM_RegAuto.TRP"  ,MO=27,     NAME = AM_RegAuto
   FILEO MATO[9] = "..\@scenario@\Outputs\AM_TotAutos.TRP" ,MO=28,     NAME = AM_TotAutos
   FILEO MATO[10]= "..\@scenario@\Outputs\AM_TotTrks.TRP"  ,MO=29,     NAME = AM_TotTrks
   FILEO MATO[11]= "..\@scenario@\Outputs\AM_TotVehs.TRP"  ,MO=30,     NAME = AM_TotVehs


ENDRUN

;       ===    MD    ========================================================================
RUN PGM=MATRIX
  zones=@MDzones@    ; Maryland ONLY

;SUMMARIZE ALL VEHICLE TRIPS (ALL Incomes, ALL Purposes, ALL Occupancies)
; 3 tables in each (SOV, HOV2, HOV3)
   MATI[1]  = ..\@scenario@\Outputs\Veh_HBW1_MD.trp
   MATI[2]  = ..\@scenario@\Outputs\Veh_HBW2_MD.trp
   MATI[3]  = ..\@scenario@\Outputs\Veh_HBW3_MD.trp
   MATI[4]  = ..\@scenario@\Outputs\Veh_HBW4_MD.trp
   MATI[5]  = ..\@scenario@\Outputs\Veh_HBW5_MD.trp

   MATI[6]  = ..\@scenario@\Outputs\Veh_HBS1_MD.trp
   MATI[7]  = ..\@scenario@\Outputs\Veh_HBS2_MD.trp
   MATI[8]  = ..\@scenario@\Outputs\Veh_HBS3_MD.trp
   MATI[9]  = ..\@scenario@\Outputs\Veh_HBS4_MD.trp
   MATI[10] = ..\@scenario@\Outputs\Veh_HBS5_MD.trp

   MATI[11] = ..\@scenario@\Outputs\Veh_HBO1_MD.trp
   MATI[12] = ..\@scenario@\Outputs\Veh_HBO2_MD.trp
   MATI[13] = ..\@scenario@\Outputs\Veh_HBO3_MD.trp
   MATI[14] = ..\@scenario@\Outputs\Veh_HBO4_MD.trp
   MATI[15] = ..\@scenario@\Outputs\Veh_HBO5_MD.trp

   MATI[16] = ..\@scenario@\Outputs\Veh_HBSc_MD.trp
   MATI[17] = ..\@scenario@\Outputs\Veh_NHBW_MD.trp
   MATI[18] = ..\@scenario@\Outputs\Veh_OBO_MD.trp

; 5 tables (commercial, Medium Trucks, Heavy trucks, Regional Trucks, Regional Autos)
   MATI[19] = ..\@scenario@\Outputs\Veh_Regional_MD.TRP

   MW[20] = MI.1.1 + MI.2.1 + MI.3.1 + MI.4.1 + MI.5.1 + MI.6.1 + MI.7.1 + MI.8.1 + MI.9.1 + MI.10.1 + MI.11.1 + MI.12.1 + MI.13.1 + MI.14.1 + MI.15.1 + MI.16.1 + MI.17.1 +
MI.18.1  ; ALL MD SOVS
   MW[21] = MI.1.2 + MI.2.2 + MI.3.2 + MI.4.2 + MI.5.2 + MI.6.2 + MI.7.2 + MI.8.2 + MI.9.2 + MI.10.2 + MI.11.2 + MI.12.2 + MI.13.2 + MI.14.2 + MI.15.2 + MI.16.2 + MI.17.2 +
MI.18.2  ; ALL MD HOV2
   MW[22] = MI.1.3 + MI.2.3 + MI.3.3 + MI.4.3 + MI.5.3 + MI.6.3 + MI.7.3 + MI.8.3 + MI.9.3 + MI.10.3 + MI.11.3 + MI.12.3 + MI.13.3 + MI.14.3 + MI.15.3 + MI.16.3 + MI.17.3 +
MI.18.3  ; ALL MD HOV3
   MW[23] = MI.19.1   ; ALL MD ComVehs
   MW[24] = MI.19.2   ; ALL MD Med. Trks
   MW[25] = MI.19.3   ; ALL MD Hvy Trks
   MW[26] = MI.19.4   ; ALL MD Reg. Trks
   MW[27] = MI.19.5   ; ALL MD Reg. Autos & EEs

   MW[28] = MW[20] + MW[21] + MW[22] + MW[23] + MW[27]   ; ALL Autos
   MW[29] = MW[24] + MW[25] + MW[26]                      ; ALL Trucks
   MW[30] = MW[28] + MW[29]                               ; ALL Vehicles
```

Maryland_Summary.s

```
   FILEO MATO[1] = "..\@scenario@\Outputs\MD_SOV.TRP"      ,MO=20,    NAME = MD_SOV
   FILEO MATO[2] = "..\@scenario@\Outputs\MD_HOV2.TRP"     ,MO=21,    NAME = MD_HOV2
   FILEO MATO[3] = "..\@scenario@\Outputs\MD_HOV3.TRP"     ,MO=22,    NAME = MD_HOV3
   FILEO MATO[4] = "..\@scenario@\Outputs\MD_ComVeh.TRP"   ,MO=23,    NAME = MD_ComVeh
   FILEO MATO[5] = "..\@scenario@\Outputs\MD_MedTrk.TRP"   ,MO=24,    NAME = MD_MedTrk
   FILEO MATO[6] = "..\@scenario@\Outputs\MD_HvyTrk.TRP"   ,MO=25,    NAME = MD_HvyTrk
   FILEO MATO[7] = "..\@scenario@\Outputs\MD_RegTrk.TRP"   ,MO=26,    NAME = MD_RegTrk
   FILEO MATO[8] = "..\@scenario@\Outputs\MD_RegAuto.TRP"  ,MO=27,    NAME = MD_RegAuto
   FILEO MATO[9] = "..\@scenario@\Outputs\MD_TotAutos.TRP" ,MO=28,    NAME = MD_TotAutos
   FILEO MATO[10]= "..\@scenario@\Outputs\MD_TotTrks.TRP"  ,MO=29,    NAME = MD_TotTrks
   FILEO MATO[11]= "..\@scenario@\Outputs\MD_TotVehs.TRP"  ,MO=30,    NAME = MD_TotVehs


ENDRUN

 ;      ===    PM     =========================================================================
RUN PGM=MATRIX
  zones=@MDzones@    ; Maryland ONLY
 ; zones=@lastSMZ@   ; Halo Region

;SUMMARIZE ALL VEHICLE TRIPS (ALL Incomes, ALL Purposes, ALL Occupancies)
; 3 tables in each (SOV, HOV2, HOV3)
  MATI[1]  = ..\@scenario@\Outputs\Veh_HBW1_PM.trp
  MATI[2]  = ..\@scenario@\Outputs\Veh_HBW2_PM.trp
  MATI[3]  = ..\@scenario@\Outputs\Veh_HBW3_PM.trp
  MATI[4]  = ..\@scenario@\Outputs\Veh_HBW4_PM.trp
  MATI[5]  = ..\@scenario@\Outputs\Veh_HBW5_PM.trp

  MATI[6]  = ..\@scenario@\Outputs\Veh_HBS1_PM.trp
  MATI[7]  = ..\@scenario@\Outputs\Veh_HBS2_PM.trp
  MATI[8]  = ..\@scenario@\Outputs\Veh_HBS3_PM.trp
  MATI[9]  = ..\@scenario@\Outputs\Veh_HBS4_PM.trp
  MATI[10] = ..\@scenario@\Outputs\Veh_HBS5_PM.trp

  MATI[11] = ..\@scenario@\Outputs\Veh_HBO1_PM.trp
  MATI[12] = ..\@scenario@\Outputs\Veh_HBO2_PM.trp
  MATI[13] = ..\@scenario@\Outputs\Veh_HBO3_PM.trp
  MATI[14] = ..\@scenario@\Outputs\Veh_HBO4_PM.trp
  MATI[15] = ..\@scenario@\Outputs\Veh_HBO5_PM.trp

  MATI[16] = ..\@scenario@\Outputs\Veh_HBSc_PM.trp
  MATI[17] = ..\@scenario@\Outputs\Veh_NHBW_PM.trp
  MATI[18] = ..\@scenario@\Outputs\Veh_OBO_PM.trp

; 5 tables (commercial, Medium Trucks, Heavy trucks, Regional Trucks, Regional Autos)
  MATI[19] = ..\@scenario@\Outputs\Veh_Regional_PM.TRP

  MW[20] = MI.1.1 + MI.2.1 + MI.3.1 + MI.4.1 + MI.5.1 + MI.6.1 + MI.7.1 + MI.8.1 + MI.9.1 + MI.10.1 + MI.11.1 + MI.12.1 + MI.13.1 + MI.14.1 + MI.15.1 + MI.16.1 + MI.17.1 +
MI.18.1  ; ALL PM SOVS
  MW[21] = MI.1.2 + MI.2.2 + MI.3.2 + MI.4.2 + MI.5.2 + MI.6.2 + MI.7.2 + MI.8.2 + MI.9.2 + MI.10.2 + MI.11.2 + MI.12.2 + MI.13.2 + MI.14.2 + MI.15.2 + MI.16.2 + MI.17.2 +
MI.18.2  ; ALL PM HOV2
  MW[22] = MI.1.3 + MI.2.3 + MI.3.3 + MI.4.3 + MI.5.3 + MI.6.3 + MI.7.3 + MI.8.3 + MI.9.3 + MI.10.3 + MI.11.3 + MI.12.3 + MI.13.3 + MI.14.3 + MI.15.3 + MI.16.3 + MI.17.3 +
MI.18.3  ; ALL PM HOV3
  MW[23] = MI.19.1   ; ALL PM ComVehs
  MW[24] = MI.19.2   ; ALL PM Med. Trks
  MW[25] = MI.19.3   ; ALL PM Hvy Trks
  MW[26] = MI.19.4   ; ALL PM Reg. Trks
  MW[27] = MI.19.5   ; ALL PM Reg. Autos & EEs

  MW[28] = MW[20] + MW[21] + MW[22] + MW[23] + MW[27]   ; ALL Autos
  MW[29] = MW[24] + MW[25] + MW[26]                     ; ALL Trucks
  MW[30] = MW[28] + MW[29]                              ; ALL Vehicles

  FILEO MATO[1] = "..\@scenario@\Outputs\PM_SOV.TRP"    ,MO=20,    NAME = PM_SOV
  FILEO MATO[2] = "..\@scenario@\Outputs\PM_HOV2.TRP"   ,MO=21,    NAME = PM_HOV2
  FILEO MATO[3] = "..\@scenario@\Outputs\PM_HOV3.TRP"   ,MO=22,    NAME = PM_HOV3
```

Maryland_Summary.s

```
    FILEO MATO[4] = "..\@scenario@\Outputs\PM_ComVeh.TRP"   ,MO=23,     NAME = PM_ComVeh
    FILEO MATO[5] = "..\@scenario@\Outputs\PM_MedTrk.TRP"   ,MO=24,     NAME = PM_MedTrk
    FILEO MATO[6] = "..\@scenario@\Outputs\PM_HvyTrk.TRP"   ,MO=25,     NAME = PM_HvyTrk
    FILEO MATO[7] = "..\@scenario@\Outputs\PM_RegTrk.TRP"   ,MO=26,     NAME = PM_RegTrk
    FILEO MATO[8] = "..\@scenario@\Outputs\PM_RegAuto.TRP"  ,MO=27,     NAME = PM_RegAuto
    FILEO MATO[9] = "..\@scenario@\Outputs\PM_TotAutos.TRP" ,MO=28,     NAME = PM_TotAutos
    FILEO MATO[10]= "..\@scenario@\Outputs\PM_TotTrks.TRP"  ,MO=29,     NAME = PM_TotTrks
    FILEO MATO[11]= "..\@scenario@\Outputs\PM_TotVehs.TRP"  ,MO=30,     NAME = PM_TotVehs


 ENDRUN

 ;       ===    NT      ===============================================================================
 RUN PGM=MATRIX
   zones=@MDzones@    ; Maryland ONLY
  ; zones=@lastSMZ@   ; Halo Region

 ;SUMMARIZE ALL VEHICLE TRIPS (ALL Incomes, ALL Purposes, ALL Occupancies)
 ; 3 tables in each (SOV, HOV2, HOV3)
   MATI[1]  = ..\@scenario@\Outputs\Veh_HBW1_NT.trp
   MATI[2]  = ..\@scenario@\Outputs\Veh_HBW2_NT.trp
   MATI[3]  = ..\@scenario@\Outputs\Veh_HBW3_NT.trp
   MATI[4]  = ..\@scenario@\Outputs\Veh_HBW4_NT.trp
   MATI[5]  = ..\@scenario@\Outputs\Veh_HBW5_NT.trp

   MATI[6]  = ..\@scenario@\Outputs\Veh_HBS1_NT.trp
   MATI[7]  = ..\@scenario@\Outputs\Veh_HBS2_NT.trp
   MATI[8]  = ..\@scenario@\Outputs\Veh_HBS3_NT.trp
   MATI[9]  = ..\@scenario@\Outputs\Veh_HBS4_NT.trp
   MATI[10] = ..\@scenario@\Outputs\Veh_HBS5_NT.trp

   MATI[11] = ..\@scenario@\Outputs\Veh_HBO1_NT.trp
   MATI[12] = ..\@scenario@\Outputs\Veh_HBO2_NT.trp
   MATI[13] = ..\@scenario@\Outputs\Veh_HBO3_NT.trp
   MATI[14] = ..\@scenario@\Outputs\Veh_HBO4_NT.trp
   MATI[15] = ..\@scenario@\Outputs\Veh_HBO5_NT.trp

   MATI[16] = ..\@scenario@\Outputs\Veh_HBSc_NT.trp
   MATI[17] = ..\@scenario@\Outputs\Veh_NHBW_NT.trp
   MATI[18] = ..\@scenario@\Outputs\Veh_OBO_NT.trp

 ; 5 tables (commercial, Medium Trucks, Heavy trucks, Regional Trucks, Regional Autos)
   MATI[19] = ..\@scenario@\Outputs\Veh_Regional_NT.TRP

   MW[20] = MI.1.1 + MI.2.1 + MI.3.1 + MI.4.1 + MI.5.1 + MI.6.1 + MI.7.1 + MI.8.1 + MI.9.1 + MI.10.1 + MI.11.1 + MI.12.1 + MI.13.1 + MI.14.1 + MI.15.1 + MI.16.1 + MI.17.1 +
 MI.18.1  ; ALL NT SOVS
   MW[21] = MI.1.2 + MI.2.2 + MI.3.2 + MI.4.2 + MI.5.2 + MI.6.2 + MI.7.2 + MI.8.2 + MI.9.2 + MI.10.2 + MI.11.2 + MI.12.2 + MI.13.2 + MI.14.2 + MI.15.2 + MI.16.2 + MI.17.2 +
 MI.18.2  ; ALL NT HOV2
   MW[22] = MI.1.3 + MI.2.3 + MI.3.3 + MI.4.3 + MI.5.3 + MI.6.3 + MI.7.3 + MI.8.3 + MI.9.3 + MI.10.3 + MI.11.3 + MI.12.3 + MI.13.3 + MI.14.3 + MI.15.3 + MI.16.3 + MI.17.3 +
 MI.18.3  ; ALL NT HOV3
   MW[23] = MI.19.1   ; ALL NT ComVehs
   MW[24] = MI.19.2   ; ALL NT Med. Trks
   MW[25] = MI.19.3   ; ALL NT Hvy Trks
   MW[26] = MI.19.4   ; ALL NT Reg. Trks
   MW[27] = MI.19.5   ; ALL NT Reg. Autos & EEs

   MW[28] = MW[20] + MW[21] + MW[22] + MW[23] + MW[27]   ; ALL Autos
   MW[29] = MW[24] + MW[25] + MW[26]                     ; ALL Trucks
   MW[30] = MW[28] + MW[29]                              ; ALL Vehicles

    FILEO MATO[1] = "..\@scenario@\Outputs\NT_SOV.TRP"     ,MO=20,     NAME = NT_SOV
    FILEO MATO[2] = "..\@scenario@\Outputs\NT_HOV2.TRP"    ,MO=21,     NAME = NT_HOV2
    FILEO MATO[3] = "..\@scenario@\Outputs\NT_HOV3.TRP"    ,MO=22,     NAME = NT_HOV3
    FILEO MATO[4] = "..\@scenario@\Outputs\NT_ComVeh.TRP"  ,MO=23,     NAME = NT_ComVeh
    FILEO MATO[5] = "..\@scenario@\Outputs\NT_MedTrk.TRP"  ,MO=24,     NAME = NT_MedTrk
    FILEO MATO[6] = "..\@scenario@\Outputs\NT_HvyTrk.TRP"  ,MO=25,     NAME = NT_HvyTrk
```

Maryland_Summary.s

```
    FILEO MATO[7] = "..\@scenario@\Outputs\NT_RegTrk.TRP"   ,MO=26,      NAME = NT_RegTrk
    FILEO MATO[8] = "..\@scenario@\Outputs\NT_RegAuto.TRP"  ,MO=27,      NAME = NT_RegAuto
    FILEO MATO[9] = "..\@scenario@\Outputs\NT_TotAutos.TRP" ,MO=28,      NAME = NT_TotAutos
    FILEO MATO[10]= "..\@scenario@\Outputs\NT_TotTrks.TRP"  ,MO=29,      NAME = NT_TotTrks
    FILEO MATO[11]= "..\@scenario@\Outputs\NT_TotVehs.TRP"  ,MO=30,      NAME = NT_TotVehs


ENDRUN

RUN PGM=MATRIX
  zones=@MDzones@    ; Maryland ONLY

   MATI[1]  = ..\@scenario@\Outputs\AM_SOV.trp
   MATI[2]  = ..\@scenario@\Outputs\MD_SOV.trp
   MATI[3]  = ..\@scenario@\Outputs\PM_SOV.trp
   MATI[4]  = ..\@scenario@\Outputs\NT_SOV.trp

   MATI[5]  = ..\@scenario@\Outputs\AM_HOV2.trp
   MATI[6]  = ..\@scenario@\Outputs\MD_HOV2.trp
   MATI[7]  = ..\@scenario@\Outputs\PM_HOV2.trp
   MATI[8]  = ..\@scenario@\Outputs\NT_HOV2.trp

   MATI[9]  = ..\@scenario@\Outputs\AM_HOV3.trp
   MATI[10] = ..\@scenario@\Outputs\MD_HOV3.trp
   MATI[11] = ..\@scenario@\Outputs\PM_HOV3.trp
   MATI[12] = ..\@scenario@\Outputs\NT_HOV3.trp

   MATI[13] = ..\@scenario@\Outputs\AM_ComVeh.trp
   MATI[14] = ..\@scenario@\Outputs\MD_ComVeh.trp
   MATI[15] = ..\@scenario@\Outputs\PM_ComVeh.trp
   MATI[16] = ..\@scenario@\Outputs\NT_ComVeh.trp

   MATI[17] = ..\@scenario@\Outputs\AM_MedTrk.trp
   MATI[18] = ..\@scenario@\Outputs\MD_MedTrk.trp
   MATI[19] = ..\@scenario@\Outputs\PM_MedTrk.trp
   MATI[20] = ..\@scenario@\Outputs\NT_MedTrk.trp

   MW[21] =  mi.1.1  + mi.2.1  + mi.3.1  + mi.4.1      ;Daily SOV
   MW[22] =  mi.5.1  + mi.6.1  + mi.7.1  + mi.8.1      ;Daily HOV2
   MW[23] =  mi.9.1  + mi.10.1 + mi.11.1 + mi.12.1     ;Daily HOV3
   MW[24] =  mi.13.1 + mi.14.1 + mi.15.1 + mi.16.1     ;Daily ComVeh
   MW[25] =  mi.17.1 + mi.18.1 + mi.19.1 + mi.20.1     ;Daily MTrk

    FILEO MATO[1] = "..\@scenario@\Outputs\Dly_SOVM.TRP"     ,MO=21,      NAME = Dly_SOV
    FILEO MATO[2] = "..\@scenario@\Outputs\Dly_HOV2M.TRP"    ,MO=22,      NAME = Dly_HOV2
    FILEO MATO[3] = "..\@scenario@\Outputs\Dly_HOV3M.TRP"    ,MO=23,      NAME = Dly_HOV3
    FILEO MATO[4] = "..\@scenario@\Outputs\Dly_ComVehM.TRP"  ,MO=24,      NAME = Dly_ComVeh
    FILEO MATO[5] = "..\@scenario@\Outputs\Dly_MedTrkM.TRP"  ,MO=25,      NAME = Dly_MedTrk

ENDRUN

RUN PGM=MATRIX
  zones=@MDzones@    ; Maryland ONLY
;  zones=@lastSMZ@   ; Halo Region
   MATI[1]  = ..\@scenario@\Outputs\AM_HvyTrk.trp
   MATI[2]  = ..\@scenario@\Outputs\MD_HvyTrk.trp
   MATI[3]  = ..\@scenario@\Outputs\PM_HvyTrk.trp
   MATI[4]  = ..\@scenario@\Outputs\NT_HvyTrk.trp

   MATI[5]  = ..\@scenario@\Outputs\AM_RegTrk.trp
   MATI[6]  = ..\@scenario@\Outputs\MD_RegTrk.trp
   MATI[7]  = ..\@scenario@\Outputs\PM_RegTrk.trp
   MATI[8]  = ..\@scenario@\Outputs\NT_RegTrk.trp

   MATI[9]  = ..\@scenario@\Outputs\AM_RegAuto.trp
```

Maryland_Summary.s

```
    MATI[10] = ..\@scenario@\Outputs\MD_RegAuto.trp
    MATI[11] = ..\@scenario@\Outputs\PM_RegAuto.trp
    MATI[12] = ..\@scenario@\Outputs\NT_RegAuto.trp

    MATI[13] = ..\@scenario@\Outputs\AM_TotAutos.trp
    MATI[14] = ..\@scenario@\Outputs\MD_TotAutos.trp
    MATI[15] = ..\@scenario@\Outputs\PM_TotAutos.trp
    MATI[16] = ..\@scenario@\Outputs\NT_TotAutos.trp

    MATI[17] = ..\@scenario@\Outputs\AM_TotTrks.trp
    MATI[18] = ..\@scenario@\Outputs\MD_TotTrks.trp
    MATI[19] = ..\@scenario@\Outputs\PM_TotTrks.trp
    MATI[20] = ..\@scenario@\Outputs\NT_TotTrks.trp

    MW[21] =  mi.1.1  + mi.2.1  + mi.3.1  + mi.4.1      ;Daily HTrk
    MW[22] =  mi.5.1  + mi.6.1  + mi.7.1  + mi.8.1      ;Daily RTrk
    MW[23] =  mi.9.1  + mi.10.1 + mi.11.1 + mi.12.1     ;Daily RegAutos
    MW[24] =  mi.13.1 + mi.14.1 + mi.15.1 + mi.16.1     ;Daily TotAutos
    MW[25] =  mi.17.1 + mi.18.1 + mi.19.1 + mi.20.1     ;Daily TotTrks

    FILEO MATO[1] = "..\@scenario@\Outputs\Dly_HvyTrkM.TRP"  ,MO=21,    NAME = Dly_HvyTrk
    FILEO MATO[2] = "..\@scenario@\Outputs\Dly_RegTrkM.TRP"  ,MO=22,    NAME = Dly_RegTrk
    FILEO MATO[3] = "..\@scenario@\Outputs\Dly_RegAutoM.TRP" ,MO=23,    NAME = Dly_RegAuto
    FILEO MATO[4] = "..\@scenario@\Outputs\Dly_TotAutosM.TRP",MO=24,    NAME = Dly_TotAutos
    FILEO MATO[5] = "..\@scenario@\Outputs\Dly_TotTrksM.TRP" ,MO=25,    NAME = Dly_TotTrks

ENDRUN
RUN PGM=MATRIX
;  zones=@MDzones@    ; Maryland ONLY
   zones=@lastSMZ@   ; Halo Region
   ;
   MATI[1] = ..\@scenario@\Outputs\AM_TotVehs.trp
   MATI[2] = ..\@scenario@\Outputs\MD_TotVehs.trp
   MATI[3] = ..\@scenario@\Outputs\PM_TotVehs.trp
   MATI[4] = ..\@scenario@\Outputs\NT_TotVehs.trp
     MW[5] =  mi.1.1 + mi.2.1 + mi.3.1 + mi.4.1   ;Daily TotVehs

   FILEO MATO[1] = "..\@scenario@\Outputs\Dly_TotVehsM.TRP"  ,MO=5,     NAME = Dly_TotVehs

ENDRUN

;FINALLY PUT ALL DAILT TRIPS INTO 1 FILE WITH 8 MATRICES FOR EACH VEHICLE TYPE
RUN PGM=MATRIX
   zones=@MDzones@     ; Maryland ONLY
;  zones=@lastSMZ@   ; Halo Region

   MATI[1]  = ..\@scenario@\Outputs\Dly_SOVM.TRP
   MATI[2]  = ..\@scenario@\Outputs\Dly_HOV2M.TRP
   MATI[3]  = ..\@scenario@\Outputs\Dly_HOV3M.TRP
   MATI[4]  = ..\@scenario@\Outputs\Dly_ComVehM.TRP
   MATI[5]  = ..\@scenario@\Outputs\Dly_MedTrkM.TRP
   MATI[6]  = ..\@scenario@\Outputs\Dly_HvyTrkM.TRP
   MATI[7]  = ..\@scenario@\Outputs\Dly_RegTrkM.TRP
   MATI[8]  = ..\@scenario@\Outputs\Dly_RegAutoM.TRP

   MW[9]  =  mi.1.1                                          ;Daily SOV
   MW[10] =  mi.2.1                                          ;Daily HOV2
   MW[11] =  mi.3.1                                          ;Daily HOV3
   MW[12] =  mi.4.1                                          ;Daily ComVeh
   MW[13] =  mi.5.1                                          ;Daily MTrk
   MW[14] =  mi.6.1                                          ;Daily HTrk
   MW[15] =  mi.7.1                                          ;Daily RTrk
   MW[16] =  mi.8.1                                          ;Daily RegAutos
   MW[17] =  mi.1.1 + mi.2.1 + mi.3.1 + mi.4.1 + mi.8.1      ;Daily TotAutos
   MW[18] =  mi.5.1 + mi.6.1 + mi.7.1                        ;Daily TotTrks
```

Maryland_Summary.s

```
     MW[19] =  mi.1.1 + mi.2.1 + mi.3.1 + mi.4.1 + mi.5.1 + mi.6.1 + mi.7.1 + mi.8.1 ;Daily Vehicles

FILEO MATO[1] = "..\@scenario@\Outputs\Dly_Assigned_VehsM.TRP"   ,MO=9-19, NAME = SOV, HOV2, HOV3, ComVeh, MedTrk, HvyTrk, RegTrk, RegAuto, TotAutos, TotTrks, TotVehs
ENDRUN

;  END VEHICLE TRIP TABLE CONSOLIDATION
;-------------------------------------------------------------------------------
;
;-------------------------------------------------------------------------------
;  VMT SUMMARY
;-------------------------------------------------------------------------------
RUN PGM=NETWORK

   NETI=..\@scenario@\Outputs\MSTM_Veh_Dly.net
     ;SWFT_____
     ;  1 = Interstate
     ;  2 = Freeway
     ;  3 = Expressway
     ;  4 = Major Arterial
     ;  5 = Minor Arterial
     ;  6 = Collector
     ;  7 = Unused
     ;  8 = Medium Speed Ramps
     ;  9 = High Speed Ramps
     ; 10 = Local Roads
     ; 11 = Centroid Connector

; SUMMARY OF ASSIGNED VEHS

IF (SWFT <= 11)                 ; DOES include centroid connectors
IF (FIPS > 24000 & FIPS <24511)    ; Maryland Only

        AM_VEHS = AM_AUTOS + AM_COMVEH + AM_sdSUT + AM_sdMUT + AM_sdMUT + AM_ldAUTO
        MD_VEHS = MD_AUTOS + MD_COMVEH + MD_sdSUT + MD_sdMUT + MD_sdMUT + MD_ldAUTO
        PM_VEHS = PM_AUTOS + PM_COMVEH + PM_sdSUT + PM_sdMUT + PM_sdMUT + PM_ldAUTO
        NT_VEHS = NT_AUTOS + NT_COMVEH + NT_sdSUT + NT_sdMUT + NT_sdMUT + NT_ldAUTO

        AM_TRKS = AM_sdSUT + AM_sdMUT + AM_sdMUT
        MD_TRKS = MD_sdSUT + MD_sdMUT + MD_sdMUT
        PM_TRKS = PM_sdSUT + PM_sdMUT + PM_sdMUT
        NT_TRKS = NT_sdSUT + NT_sdMUT + NT_sdMUT

        AM_AUTOS = AM_AUTOS + AM_COMVEH + AM_ldAUTO
        MD_AUTOS = MD_AUTOS + MD_COMVEH + MD_ldAUTO
        PM_AUTOS = PM_AUTOS + PM_COMVEH + PM_ldAUTO
        NT_AUTOS = NT_AUTOS + NT_COMVEH + NT_ldAUTO

        Tot_VMT =  (AUTO24 + TRUCK24) * DISTANCE
        ;Tot_VMT =  VMT24
        Auto_VMT =  Auto24 * Distance
        Trk_VMT = (sdSUT24 + sdMUT24 + ldTRK24) * Distance

        _Distance = _Distance + Distance
          _Autos = _Autos + (AUTO24 - (ldAUTO24 + COMMVEH24))
       _Regauto = _Regauto + ldAUTO24
        _ComVeh = _ComVeh + COMMVEH24
        _RegTrk = _Regtrk + ldTRK24
        _MedTrk = _MedTrk + sdSUT24
        _HvyTrk = _HvyTrk + sdMUT24
        _Vehs24 = _Vehs24 + VEHS24
     _TotAuto24 = _TotAuto24 + AUTO24
   _TotTruck24 = _TotTruck24 + TRUCK24
;      _TotTruck24 = _TotTruck24 + HDTRK24 + MEDHDTRK24 + REGTRK24

; VMT CALCULATIONS
```

Maryland_Summary.s

```
    _Tot_VMT =  _Tot_VMT + Tot_VMT
    _Auto_VMT = _Auto_VMT + Auto_VMT
    _Trk_VMT = _Trk_VMT + Trk_VMT


    IF (SWFT = 1 || SWFT = 8 || SWFT = 9)   ;Ramps are included in Interstate VMT
       _Int_VMT = _Int_VMT + Tot_VMT
    ENDIF

    IF (SWFT = 2)
       _Fwy_VMT = _Fwy_VMT + Tot_VMT
    ENDIF

    IF(SWFT = 3 )
       _Exp_VMT = _Exp_VMT + Tot_VMT
    ENDIF

    IF (SWFT = 4 )
       _Maj_VMT = _Maj_VMT + Tot_VMT
    ENDIF

    IF (SWFT = 5 )
       _Min_VMT = _Min_VMT + Tot_VMT
    ENDIF

    IF (SWFT = 6 )
       _Col_VMT = _Col_VMT + Tot_VMT
    ENDIF

;  IF (SWFT =8-9)
;     _Rmp_VMT = _Rmp_VMT + Tot_VMT
;  ENDIF

;  IF (SWFT = 10)
;     _Loc_VMT = _Loc_VMT + Tot_VMT
;  ENDIF
    IF (SWFT = 11)           ;Centroid Connectors Added to Locals
       _Cen_VMT = _Cen_VMT + Tot_VMT
    ENDIF


; VHT CALCULATIONS
    IF (CONGSPD_AM > 0 && CONGSPD_MD > 0 && CONGSPD_PM > 0 && CONGSPD_NT > 0 )
        VHT = AM_VEHS*(Distance/CONGSPD_AM)+ MD_VEHS*(Distance/CONGSPD_MD)+ PM_VEHS*(Distance/CONGSPD_PM)+ NT_VEHS*(Distance/CONGSPD_NT)
     _Tot_VHT = _Tot_VHT + VHT

     Auto_VHT =  AM_AUTOS*(Distance/CONGSPD_AM)+ MD_AUTOS*(Distance/CONGSPD_MD)+ PM_AUTOS*(Distance/CONGSPD_PM)+ NT_AUTOS*(Distance/CONGSPD_NT)
     _Auto_VHT = _Auto_VHT + Auto_VHT

      Trk_VHT =  AM_TRKS*(Distance/CONGSPD_AM)+ MD_TRKS*(Distance/CONGSPD_MD)+ PM_TRKS*(Distance/CONGSPD_PM)+ NT_TRKS*(Distance/CONGSPD_NT)
     _Trk_VHT = _Trk_VHT + Trk_VHT
    ENDIF

    IF (SWFT = 1 || SWFT = 8 || SWFT = 9)
       _Int_VHT = _Int_VHT + VHT
    ENDIF
    IF (SWFT = 2)
       _Fwy_VHT = _Fwy_VHT + VHT
    ENDIF
    IF (SWFT = 3 )
       _Exp_VHT = _Exp_VHT + VHT
    ENDIF
    IF (SWFT = 4 )
       _Maj_VHT = _Maj_VHT + VHT
```

Maryland_Summary.s

```
        ENDIF
        IF (SWFT = 5 )
            _Min_VHT = _Min_VHT + VHT
        ENDIF
        IF (SWFT = 6 )
            _Col_VHT = _Col_VHT + VHT
        ENDIF
        IF (SWFT =10 || SWFT = 11)
            _Cen_VHT = _Cen_VHT + VHT
        ENDIF

        ;  Save VMT to variable for export
        LOG PREFIX=HWYNET, VAR=_Tot_VMT, _Auto_VMT, _Trk_VMT, _Int_VMT, _Fwy_VMT, _Maj_VMT, _Min_VMT, _Col_VMT, _Exp_VMT, _Cen_VMT,
                           _Tot_VHT, _Auto_VHT, _Trk_VHT, _Int_VHT, _Fwy_VHT, _Maj_VHT, _Min_VHT, _Col_VHT, _Exp_VHT, _Cen_VHT,
                           _Autos, _Regauto, _Comveh, _Regtrk, _Medtrk, _Hvytrk, _TotAuto24, _TotTruck24, _Vehs24, _Distance
ENDIF
ENDIF
ENDRUN


   Tot_VMT = HWYNET._Tot_VMT
  Auto_VMT = HWYNET._Auto_VMT
   Trk_VMT = HWYNET._Trk_VMT
   Int_VMT = HWYNET._Int_VMT
   Fwy_VMT = HWYNET._Fwy_VMT
   Maj_VMT = HWYNET._Maj_VMT
   Min_VMT = HWYNET._Min_VMT
   Col_VMT = HWYNET._Col_VMT
   Exp_VMT = HWYNET._Exp_VMT
 ;Rmp_VMT = HWYNET._Rmp_VMT
   Cen_VMT = HWYNET._Cen_VMT

   Tot_VHT = HWYNET._Tot_VHT
   Int_VHT = HWYNET._Int_VHT
   Fwy_VHT = HWYNET._Fwy_VHT
   Exp_VHT = HWYNET._Exp_VHT
  Auto_VHT = HWYNET._Auto_VHT
   Trk_VHT = HWYNET._Trk_VHT
   Maj_VHT = HWYNET._Maj_VHT
   Min_VHT = HWYNET._Min_VHT
   Col_VHT = HWYNET._Col_VHT
 ;Rmp_VHT = HWYNET._Rmp_VHT
   Cen_VHT = HWYNET._Cen_VHT

  Distance = HWYNET._Distance
     Autos = HWYNET._Autos
    Regtrk = HWYNET._Regtrk
    Comveh = HWYNET._Comveh
   Regauto = HWYNET._Regauto
    Medtrk = HWYNET._Medtrk
    Hvytrk = HWYNET._Hvytrk
    Vehs24 = HWYNET._Vehs24
  TotAuto24 = HWYNET._TotAuto24
 TotTruck24 = HWYNET._TotTruck24

;ENDRUN

;-------------------------------------------------------------------------------
;  Motorized Person Trip and SOCIOECON DATA SUMMARY
;-------------------------------------------------------------------------------
RUN PGM=MATRIX
  zones=@MDzones@    ; Maryland ONLY
 ; zones=@lastSMZ@   ; Halo Region

;-------------------------------------------------------------------------------
```

Maryland_Summary.s

```
;  MOTORIZED PERSON TRIP SUMMARY
;--------------------------------------------------------------------------------
;            Model structure:
;                                        Person
;                 _____|_____
;                |                                     |
;             Auto                              Transit(b)
;            ___|___                     _____|_____
;           |       |                   |                     |
;         SR(b)    DA                 Walk                  PnR(b)
;         __|__               _____|_____    _____|_____
;        |     |             |       |      |     |  |      |      |     |
;      SR2   SR3+(b)       Bus   Rail(b) CR(b) Exp(b) Bus Rail(b) CR(b) Exp(b)
;
;
;
; Mode                           Modes to Summarize
; 1    Drive Alone              *  Drive Alone    (1)
; 2    Share Ride 2             *  Share Ride 2   (2)
; 3    Share Ride 3             *  Share Ride 3   (3)
; 4    Walk to Bus              *  Bus            (4+8)
; 5    Walk to Express Bus      *  Express Bus    (5+9)
; 6    Walk to Rail             *  Rail           (6+10)
; 7    Walk to Commuter Rail    *  Commuter Rail (7+11)
; 8    Drive to Bus
; 9    Drive to Express Bus
; 10   Drive to Rail
; 11   Drive to Commuter Rail
;

MATI[1]  = ..\@scenario@\Outputs\Mc_HBW1.Trp
MATI[2]  = ..\@scenario@\Outputs\Mc_HBW2.Trp
MATI[3]  = ..\@scenario@\Outputs\Mc_HBW3.Trp
MATI[4]  = ..\@scenario@\Outputs\Mc_HBW4.Trp
MATI[5]  = ..\@scenario@\Outputs\Mc_HBW5.Trp
;
MATI[6]  = ..\@scenario@\Outputs\Mc_HBS1.Trp
MATI[7]  = ..\@scenario@\Outputs\Mc_HBS2.Trp
MATI[8]  = ..\@scenario@\Outputs\Mc_HBS3.Trp
MATI[9]  = ..\@scenario@\Outputs\Mc_HBS4.Trp
MATI[10] = ..\@scenario@\Outputs\Mc_HBS5.Trp
;
MATI[11] = ..\@scenario@\Outputs\Mc_HBO1.Trp
MATI[12] = ..\@scenario@\Outputs\Mc_HBO2.Trp
MATI[13] = ..\@scenario@\Outputs\Mc_HBO3.Trp
MATI[14] = ..\@scenario@\Outputs\Mc_HBO4.Trp
MATI[15] = ..\@scenario@\Outputs\Mc_HBO5.Trp
;
MATI[16] = ..\@scenario@\Outputs\Mc_HBSc.Trp
MATI[17] = ..\@scenario@\Outputs\Mc_NHBW.Trp
MATI[18] = ..\@scenario@\Outputs\Mc_OBO.Trp
;
;Vehicle Trips
MATI[19]  = ..\@scenario@\Outputs\Dly_Assigned_VehsM.TRP


;COMBINE INCOME CLASSES FOR EACH PURPOSE BY SUB-MODE
;      |<--------------- HBW -------------->|<----------------- HBS ------------------>|<------------------ HBO ------------------->|<-HBSc ->|< -NHBW->|<-
OBO->|
;income     1        2        3        4        5        1        2        3        4        5        1        2        3        4        5
MW[20] = MI.1.1 + MI.2.1 + MI.3.1 + MI.4.1 + MI.5.1   + MI.6.1 + MI.7.1 + MI.8.1 + MI.9.1 + MI.10.1  + MI.11.1 + MI.12.1 + MI.13.1 + MI.14.1 + MI.15.1 + MI.16.1 + MI.17.1 +
MI.18.1 ; DA
MW[21] = MI.1.2 + MI.2.2 + MI.3.2 + MI.4.2 + MI.5.2   + MI.6.2 + MI.7.2 + MI.8.2 + MI.9.2 + MI.10.2  + MI.11.2 + MI.12.2 + MI.13.2 + MI.14.2 + MI.15.2 + MI.16.2 + MI.17.2 +
MI.18.2  ; SR2
MW[22] = MI.1.3 + MI.2.3 + MI.3.3 + MI.4.3 + MI.5.3   + MI.6.3 + MI.7.3 + MI.8.3 + MI.9.3 + MI.10.3  + MI.11.3 + MI.12.3 + MI.13.3 + MI.14.3 + MI.15.3 + MI.16.3 + MI.17.3 +
```

Maryland_Summary.s

```
MI.18.3  ; SR3
MW[23] = MI.1.4 + MI.2.4 + MI.3.4 + MI.4.4 + MI.5.4  + MI.6.4 + MI.7.4 + MI.8.4 + MI.9.4 + MI.10.4  + MI.11.4 + MI.12.4 + MI.13.4 + MI.14.4 + MI.15.4 + MI.16.4 + MI.17.4 +
MI.18.4  ; Wlk 2 Bus
MW[24] = MI.1.5 + MI.2.5 + MI.3.5 + MI.4.5 + MI.5.5  + MI.6.5 + MI.7.5 + MI.8.5 + MI.9.5 + MI.10.5  + MI.11.5 + MI.12.5 + MI.13.5 + MI.14.5 + MI.15.5 + MI.16.5 + MI.17.5 +
MI.18.5  ; Wlk 2 Exp Bus
MW[25] = MI.1.6 + MI.2.6 + MI.3.6 + MI.4.6 + MI.5.6  + MI.6.6 + MI.7.6 + MI.8.6 + MI.9.6 + MI.10.6  + MI.11.6 + MI.12.6 + MI.13.6 + MI.14.6 + MI.15.6 + MI.16.6 + MI.17.6 +
MI.18.6  ; Wlk 2 Rail
MW[26] = MI.1.7 + MI.2.7 + MI.3.7 + MI.4.7 + MI.5.7  + MI.6.7 + MI.7.7 + MI.8.7 + MI.9.7 + MI.10.7  + MI.11.7 + MI.12.7 + MI.13.7 + MI.14.7 + MI.15.7 + MI.16.7 + MI.17.7 +
MI.18.7  ; Wlk to Com Rail
MW[27] = MI.1.8 + MI.2.8 + MI.3.8 + MI.4.8 + MI.5.8  + MI.6.8 + MI.7.8 + MI.8.8 + MI.9.8 + MI.10.8  + MI.11.8 + MI.12.8 + MI.13.8 + MI.14.8 + MI.15.8 + MI.16.8 + MI.17.8 +
MI.18.8  ; Drv 2 Bus
MW[28] = MI.1.9 + MI.2.9 + MI.3.9 + MI.4.9 + MI.5.9  + MI.6.9 + MI.7.9 + MI.8.9 + MI.9.9 + MI.10.9  + MI.11.9 + MI.12.9 + MI.13.9 + MI.14.9 + MI.15.9 + MI.16.9 + MI.17.9 +
MI.18.9  ; Drv 2 Exp Bus
MW[29] = MI.1.10+ MI.2.10+ MI.3.10+ MI.4.10+ MI.5.10  + MI.6.10+ MI.7.10+ MI.8.10+ MI.9.10+ MI.10.10 + MI.11.10+ MI.12.10+ MI.13.10+ MI.14.10+ MI.15.10+ MI.16.10+ MI.17.10+
MI.18.10 ; Drv 2 Rail
MW[30] = MI.1.11+ MI.2.11+ MI.3.11+ MI.4.11+ MI.5.11  + MI.6.11+ MI.7.11+ MI.8.11+ MI.9.11+ MI.10.11 + MI.11.11+ MI.12.11+ MI.13.11+ MI.14.11+ MI.15.11+ MI.16.11+ MI.17.11+
MI.18.11 ; Drv 2 Com Rail

;COMBINE SUB-MODES
;       < Walk>    <Drive>
MW[40] = MW[23]  +  MW[27]    ; Bus
MW[41] = MW[24]  +  MW[28]    ; Express Bus
MW[42] = MW[25]  +  MW[29]    ; Rail
MW[43] = MW[26]  +  MW[30]    ; Commuter Rail

;          DA  +  SH2 + SH3 +  Bus + ExpBus+ Rail  + CRail
MW[44] = MW[20] + MW[21] + MW[22] + MW[40] + MW[41] + MW[42] + MW[43]    ; Total Motorized Person Trips
;  Vehicle trips

MW[45] = MI.19.1   ;SOV
MW[46] = MI.19.2   ;HOV2
MW[47] = MI.19.3   ;HOV3
MW[48] = MI.19.4   ;ComVeh
MW[49] = MI.19.5   ;MedTrk
MW[50] = MI.19.6   ;HvyTrk
MW[51] = MI.19.7   ;RegTrk
MW[52] = MI.19.8   ;RegAuto
MW[53] = MI.19.9   ;TotAutos
MW[54] = MI.19.10  ;TotTrks
MW[55] = MI.19.11  ;TotVehs
;
;-------------------------------------------------------------------------------
;  VEHICLE TRIP SUMMARY
;-------------------------------------------------------------------------------

   Tot_DA      = Tot_DA       + ROWSUM(20)
   Tot_SR2     = Tot_SR2      + ROWSUM(21)
   Tot_SR3     = Tot_SR3      + ROWSUM(22)
   Tot_Bus     = Tot_Bus      + ROWSUM(40)
   Tot_ExpBus  = Tot_ExpBus   + ROWSUM(41)
   Tot_Rail    = Tot_Rail     + ROWSUM(42)
   Tot_ComRail = Tot_ComRail  + ROWSUM(43)
   Tot_Persons = Tot_Persons  + ROWSUM(44)
;
   Tot_SOV     = Tot_SOV      + ROWSUM(45)
   Tot_HOV2    = Tot_HOV2     + ROWSUM(46)
   Tot_HOV3    = Tot_HOV3     + ROWSUM(47)
   Tot_CV      = Tot_CV       + ROWSUM(48)
   Tot_MTRK    = Tot_MTRK     + ROWSUM(49)
   Tot_HTRK    = Tot_HTRK     + ROWSUM(50)
   Tot_RTRK    = Tot_RTRK     + ROWSUM(51)
   Tot_RegAuto = Tot_RegAuto  + ROWSUM(52)
   Tot_AutoTrips= Tot_AutoTrips + ROWSUM(53)
   Tot_TrkTrips = Tot_TrkTrips  + ROWSUM(54)
   Tot_VehTrips = Tot_VehTrips  + ROWSUM(55)
```

Maryland_Summary.s

```
;-------------------------------------------------------------------------------
;   SOCIOECON DATA SUMMARY
;-------------------------------------------------------------------------------

FILEI ZDATI[1]= ..\@scenario@\Inputs\Activities.csv, Z=#1, ACRES=#2, HH00=#3, ENR=#4, RE00=#5, OFF00=#6, OTH00=#7, TOT00=#8

 TOT_HHs  = TOT_HHs +  ZI.1.HH00
 TOT_ENR  = TOT_ENR +  ZI.1.ENR
 TOT_RET  = TOT_RET +  ZI.1.RE00
 TOT_OFF  = TOT_OFF +  ZI.1.OFF00
 TOT_IND  = TOT_IND + (ZI.1.TOT00 - (ZI.1.RE00 + ZI.1.OFF00 + ZI.1.OTH00))
 TOT_OTH  = TOT_OTH +  ZI.1.OTH00
 TOT_EMP  = TOT_EMP +  ZI.1.TOT00


; Define total VMT and VMT by facility type:
  Total_VMT        = @Tot_VMT@
  Int_VMT          = @Int_VMT@
  Fwy_VMT          = @Fwy_VMT@
  Maj_VMT          = @Maj_VMT@
  Min_VMT          = @Min_VMT@
  Col_VMT          = @Col_VMT@
  Exp_VMT          = @Exp_VMT@
 ;Rmp_VMT          = @Rmp_VMT@
  Cen_VMT          = @Cen_VMT@
  Auto_VMT         = @Auto_VMT@
  Trk_VMT          = @Trk_VMT@

  Total_VHT        = @Tot_VHT@
  Fwy_VHT          = @Fwy_VHT@
  Int_VHT          = @Int_VHT@
  Maj_VHT          = @Maj_VHT@
  Min_VHT          = @Min_VHT@
  Col_VHT          = @Col_VHT@
  Exp_VHT          = @Exp_VHT@
 ;Rmp_VHT          = @Rmp_VHT@
  Cen_VHT          = @Cen_VHT@
  Auto_VHT         = @Auto_VHT@
  Trk_VHT          = @Trk_VHT@

  Distance         = @Distance@
  Autos            = @Autos@
  Comveh           = @Comveh@
  Regauto          = @Regauto@
  Regtrk           = @Regtrk@
  Medtrk           = @Medtrk@
  Hvytrk           = @Hvytrk@
  Vehs24           = @Vehs24@

  TotAuto24        = @TotAuto24@
  TotTruck24       = @TotTruck24@

; COMPUTE VMT-RELATED RATES:
;  IF (TOT_HHs > 0)  VMTperHH    = Total_VMT / TOT_HHs
;  IF (Vehs24  > 0)  VMTperTrip  = TOTAL_VMT / Vehs24




;-------------------------------------------------------------------------------
;  SET UP FOR PRINTING
;-------------------------------------------------------------------------------
;SOCIOECONOMIC SUMMARY   1
print form=20.0 list = ' 2 ',TOT_HHs           , FILE = SUMMARY.TXT
print form=20.0 list = ' 3 ',TOT_ENR           , FILE = SUMMARY.TXT
```

Maryland_Summary.s

```
print form=20.0 list = ' 4 ',TOT_EMP          , FILE = SUMMARY.TXT
print form=20.0 list = ' 5 ',TOT_RET          , FILE = SUMMARY.TXT
print form=20.0 list = ' 6 ',TOT_OFF          , FILE = SUMMARY.TXT
print form=20.0 list = ' 7 ',TOT_IND          , FILE = SUMMARY.TXT
print form=20.0 list = ' 8 ',TOT_OTH          , FILE = SUMMARY.TXT
;PERSON TRIP SUMMARY    9
print form=20.0 list = '10',Tot_Persons       , FILE = SUMMARY.TXT
print form=20.0 list = '11',Tot_DA            , FILE = SUMMARY.TXT
print form=20.0 list = '12',Tot_SR2           , FILE = SUMMARY.TXT
print form=20.0 list = '13',Tot_SR3           , FILE = SUMMARY.TXT
print form=20.0 list = '14',Tot_Bus           , FILE = SUMMARY.TXT
print form=20.0 list = '15',Tot_ExpBus        , FILE = SUMMARY.TXT
print form=20.0 list = '16',Tot_Rail          , FILE = SUMMARY.TXT
print form=20.0 list = '17',Tot_ComRail       , FILE = SUMMARY.TXT

;VEHICLE TRIP SUMMARY   18
print form=20.0 list = '19',Tot_VehTrips      , FILE = SUMMARY.TXT
print form=20.0 list = '20',Tot_AutoTrips     , FILE = SUMMARY.TXT
print form=20.0 list = '21',Tot_SOV           , FILE = SUMMARY.TXT
print form=20.0 list = '22',Tot_HOV2          , FILE = SUMMARY.TXT
print form=20.0 list = '23',Tot_HOV3          , FILE = SUMMARY.TXT
print form=20.0 list = '24',Tot_CV            , FILE = SUMMARY.TXT
print form=20.0 list = '25',Tot_RegAuto       , FILE = SUMMARY.TXT
print form=20.0 list = '26',Tot_TrkTrips      , FILE = SUMMARY.TXT
print form=20.0 list = '27',Tot_MTRK          , FILE = SUMMARY.TXT
print form=20.0 list = '28',Tot_HTRK          , FILE = SUMMARY.TXT
print form=20.0 list = '29',Tot_RTRK          , FILE = SUMMARY.TXT

;VMT SUMMARY            30
print form=20.0 list = '31',Total_VMT         , FILE = SUMMARY.TXT
print form=20.0 list = '32',Auto_VMT          , FILE = SUMMARY.TXT
print form=20.0 list = '33',Trk_VMT           , FILE = SUMMARY.TXT
;   by facility type    34
print form=20.0 list = '35',Int_VMT           , FILE = SUMMARY.TXT
print form=20.0 list = '36',Fwy_VMT           , FILE = SUMMARY.TXT
print form=20.0 list = '37',Exp_VMT           , FILE = SUMMARY.TXT
print form=20.0 list = '38',Maj_VMT           , FILE = SUMMARY.TXT
print form=20.0 list = '39',Min_VMT           , FILE = SUMMARY.TXT
print form=20.0 list = '40',Col_VMT           , FILE = SUMMARY.TXT
print form=20.0 list = '41',Cen_VMT           , FILE = SUMMARY.TXT
;VHT SUMMARY            42
print form=20.0 list = '43',Total_VHT         , FILE = SUMMARY.TXT
print form=20.0 list = '44',Auto_VHT          , FILE = SUMMARY.TXT
print form=20.0 list = '45',Trk_VHT           , FILE = SUMMARY.TXT
;    by facility type  46
print form=20.0 list = '47',Int_VHT           , FILE = SUMMARY.TXT
print form=20.0 list = '48',Fwy_VHT           , FILE = SUMMARY.TXT
print form=20.0 list = '49',Exp_VHT           , FILE = SUMMARY.TXT
print form=20.0 list = '50',Maj_VHT           , FILE = SUMMARY.TXT
print form=20.0 list = '51',Min_VHT           , FILE = SUMMARY.TXT
print form=20.0 list = '52',Col_VHT           , FILE = SUMMARY.TXT
print form=20.0 list = '53',Cen_VHT           , FILE = SUMMARY.TXT
;
;print form=20.2 list = '51',VMTperHH          , FILE = SUMMARY.TXT
;print form=20.2 list = '52',VMTperTrip        , FILE = SUMMARY.TXT

ENDRUN

;-------------------------------------------------------------------------------
;  PRINT HEADERS
;-------------------------------------------------------------------------------

 RUN PGM=MATRIX
ZONES=@RowSize@
```

Maryland_Summary.s

```
IF (I=1)

   Print Form=70.L list = '       ========================================================================''\n','\n',
                          '       ==    Maryland Statewide Transportation Model (MSTM) version 1.0     ==''\n','\n',
                          '       ==                   STATEWIDE SUMMARY REPORT                        ==''\n','\n',
                          '       ========================================================================''\n','\n',
                          '                              Scenario: @SCENARIO@                    ''\n','\n',

File=..\@Scenario@\@Scenario@_Summary.txt

 ENDIF

   ZDATI[1]  = SUMMARY.txt  , Z=#1, Col1Data  = #2

   ; Define Table Text for each row:
IF (I=  1) ROWLABLE='      SOCIOECONOMIC DATA SUMMARY                            '
IF (I=  2) ROWLABLE='       Total Households...........................................'
IF (I=  3) ROWLABLE='       Total Enrollment............................................'
IF (I=  4) ROWLABLE='       Total Employment............................................'
IF (I=  5) ROWLABLE='         Retail Employment.........................................'
IF (I=  6) ROWLABLE='         Office Employment.........................................'
IF (I=  7) ROWLABLE='         Industrial Employment.....................................'
IF (I=  8) ROWLABLE='         Other Employment..........................................'

IF (I=  9) ROWLABLE='      DAILY PERSON TRIP SUMMARY                             '
IF (I= 10) ROWLABLE='       Daily Total Person Trips...................................'
IF (I= 11) ROWLABLE='         Single-Occupant Auto Persons..............................'
IF (I= 12) ROWLABLE='         2-Occupant Auto Persons...................................'
IF (I= 13) ROWLABLE='         3-Occupant Auto Persons...................................'
IF (I= 14) ROWLABLE='         Bus Persons..............................................'
IF (I= 15) ROWLABLE='         Express Bus Persons.......................................'
IF (I= 16) ROWLABLE='         Rail Persons.............................................'
IF (I= 17) ROWLABLE='         Commuter Rail Persons....................................'

IF (I= 18) ROWLABLE='      DAILY VEHICLE TRIP SUMMARY                            '
IF (I= 19) ROWLABLE='       Total Daily Vehicles Assigned ............................'
IF (I= 20) ROWLABLE='        Total Daily Autos Assigned ..............................'
IF (I= 21) ROWLABLE='          Single-Occupant Vehicles..............................'
IF (I= 22) ROWLABLE='          High-Occupant Vehicles (2)............................'
IF (I= 23) ROWLABLE='          High-Occupant Vehicles (3+)...........................'
IF (I= 24) ROWLABLE='          Commercial Vehicles....................................'
IF (I= 25) ROWLABLE='          Regional Autos.........................................'
IF (I= 26) ROWLABLE='        Total Daily Trucks Assigned ............................'
IF (I= 27) ROWLABLE='          Single-Unit Trucks....................................'
IF (I= 28) ROWLABLE='          Multi-Unit Trucks.....................................'
IF (I= 29) ROWLABLE='          Regional Trucks.......................................'

IF (I= 30) ROWLABLE='      DAILY VEHICLE MILES OF TRAVEL SUMMARY                 '
IF (I= 31) ROWLABLE='       Total Daily System VMT ...................................'
IF (I= 32) ROWLABLE='        Auto VMT ...............................................'
IF (I= 33) ROWLABLE='        Truck VMT ..............................................'
IF (I= 34) ROWLABLE='        Daily VMT by Facility Type                             '
IF (I= 35) ROWLABLE='          Interstate VMT........................................'
IF (I= 36) ROWLABLE='          Freeway VMT...........................................'
IF (I= 37) ROWLABLE='          Expressway VMT........................................'
IF (I= 38) ROWLABLE='          Major Arterial VMT....................................'
IF (I= 39) ROWLABLE='          Minor Arterial VMT....................................'
IF (I= 40) ROWLABLE='          Collector VMT.........................................'
IF (I= 41) ROWLABLE='          Local/Centroid Connector..............................'

IF (I= 42) ROWLABLE='      DAILY VEHICLE HOURS OF TRAVEL SUMMARY                 '
IF (I= 43) ROWLABLE='       Total Daily System VHT ...................................'
IF (I= 44) ROWLABLE='        Auto VHT ...............................................'
IF (I= 45) ROWLABLE='        Truck VHT ..............................................'
IF (I= 46) ROWLABLE='        Daily VHT by Facility Type                             '
```

Maryland_Summary.s

```
IF (I= 47) ROWLABLE='                Interstate VHT.....................................'
IF (I= 48) ROWLABLE='                Freeway VHT........................................'
IF (I= 49) ROWLABLE='                Expressway VHT.....................................'
IF (I= 50) ROWLABLE='                Major Arterial VHT.................................'
IF (I= 51) ROWLABLE='                Minor Arterial VHT.................................'
IF (I= 52) ROWLABLE='                Collector VHT......................................'
IF (I= 53) ROWLABLE='                Local/Centroid Connector...........................'
;
;IF (I= 51) ROWLABLE='        Daily VMT per Household...............'
;IF (I= 52) ROWLABLE='        VMT per Trip..........................'

;IF (I= 53) ROWLABLE='  '

; Now print out current data-- if a rate print 2 decimals, else print no decimals
;
;IF (I=51-50)
;    Print Form = 14.2csv list = RowLable,'.............',Col1Data,
;           File = ..\@Scenario@\@Scenario@_@Year@_Summary.txt
;ENDIF

;Print Socioeconimic Summaries
IF (I=2-8)
    Print Form = 10.0csv list = RowLable,Col1Data,
           File = ..\@Scenario@\@Scenario@_Summary.txt
ENDIF

;Print Daily Person Trip Summaries
IF (I=10-17)
    Print Form = 11.0csv list = RowLable,Col1Data,
           File = ..\@Scenario@\@Scenario@_Summary.txt
ENDIF

;Print Vehicle Trip Summaries
IF (I=19-29)
    Print Form = 11.0csv list = RowLable,Col1Data,
           File = ..\@Scenario@\@Scenario@_Summary.txt
ENDIF


;Print VMT Summaries
IF (I=31-33,35-41)
    Print Form = 12.0csv list = RowLable,Col1Data,
           File = ..\@Scenario@\@Scenario@_Summary.txt
ENDIF

;Print VHT Summaries
IF (I=43-45,47-53)
    Print Form = 10.0csv list = RowLable,Col1Data,
           File = ..\@Scenario@\@Scenario@_Summary.txt
ENDIF


;Add Spaces
IF (I=9,18,30,42)
    Print list = '\n',
           File = ..\@Scenario@\@Scenario@_Summary.txt
ENDIF

;Add Labels (not data following)
IF (I=1,9,18,30,34,42,46)
    Print Form = 15.0csv list = RowLable,
           File = ..\@Scenario@\@Scenario@_Summary.txt
ENDIF

;Add Footer
```

Maryland_Summary.s

```
IF (I=54)
  Print Form = 70.L list = '\n','\n','      == Start: @START_TIME@ on @START_DATE@ == End: @END_TIME@ on @END_Date@ ==''\n',
         File = ..\@Scenario@\@Scenario@_Summary.txt
ENDIF

ENDRUN
*del summary.txt
*del ..\@scenario@\Outputs\AM_SOV.TRP
*del ..\@scenario@\Outputs\AM_HOV2.TRP        ;AM_HOV2
*del ..\@scenario@\Outputs\AM_HOV3.TRP        ;AM_HOV3
*del ..\@scenario@\Outputs\AM_ComVeh.TRP      ;AM_ComVeh
*del ..\@scenario@\Outputs\AM_MedTrk.TRP      ;AM_MedTrk
*del ..\@scenario@\Outputs\AM_HvyTrk.TRP      ;AM_HvyTrk
*del ..\@scenario@\Outputs\AM_RegTrk.TRP      ;AM_RegTrk
*del ..\@scenario@\Outputs\AM_RegAuto.TRP     ;AM_RegAuto
*del ..\@scenario@\Outputs\AM_TotAutos.TRP    ;AM_TotAutos
*del ..\@scenario@\Outputs\AM_TotTrks.TRP     ;AM_TotTrks
*del ..\@scenario@\Outputs\AM_TotVehs.TRP     ;AM_TotVehs
*del ..\@scenario@\Outputs\PM_SOV.TRP         ;-----PM --------
*del ..\@scenario@\Outputs\PM_HOV2.TRP
*del ..\@scenario@\Outputs\PM_HOV3.TRP
*del ..\@scenario@\Outputs\PM_ComVeh.TRP
*del ..\@scenario@\Outputs\PM_MedTrk.TRP
*del ..\@scenario@\Outputs\PM_HvyTrk.TRP
*del ..\@scenario@\Outputs\PM_RegTrk.TRP
*del ..\@scenario@\Outputs\PM_RegAuto.TRP
*del ..\@scenario@\Outputs\PM_TotAutos.TRP
*del ..\@scenario@\Outputs\PM_TotTrks.TRP
*del ..\@scenario@\Outputs\PM_TotVehs.TRP
*del ..\@scenario@\Outputs\MD_SOV.TRP         ;-----MD--------
*del ..\@scenario@\Outputs\MD_HOV2.TRP
*del ..\@scenario@\Outputs\MD_HOV3.TRP
*del ..\@scenario@\Outputs\MD_ComVeh.TRP
*del ..\@scenario@\Outputs\MD_MedTrk.TRP
*del ..\@scenario@\Outputs\MD_HvyTrk.TRP
*del ..\@scenario@\Outputs\MD_RegTrk.TRP
*del ..\@scenario@\Outputs\MD_RegAuto.TRP
*del ..\@scenario@\Outputs\MD_TotAutos.TRP
*del ..\@scenario@\Outputs\MD_TotTrks.TRP
*del ..\@scenario@\Outputs\MD_TotVehs.TRP
*del ..\@scenario@\Outputs\NT_SOV.TRP         ;-----NT--------
*del ..\@scenario@\Outputs\NT_HOV2.TRP
*del ..\@scenario@\Outputs\NT_HOV3.TRP
*del ..\@scenario@\Outputs\NT_ComVeh.TRP
*del ..\@scenario@\Outputs\NT_MedTrk.TRP
*del ..\@scenario@\Outputs\NT_HvyTrk.TRP
*del ..\@scenario@\Outputs\NT_RegTrk.TRP
*del ..\@scenario@\Outputs\NT_RegAuto.TRP
*del ..\@scenario@\Outputs\NT_TotAutos.TRP
*del ..\@scenario@\Outputs\NT_TotTrks.TRP
*del ..\@scenario@\Outputs\NT_TotVehs.TRP
;*del ..\@scenario@\Outputs\Dly_SOV.TRP        ;-----Daily-------
;*del ..\@scenario@\Outputs\Dly_HOV2.TRP
;*del ..\@scenario@\Outputs\Dly_HOV3.TRP
;*del ..\@scenario@\Outputs\Dly_ComVeh.TRP
;*del ..\@scenario@\Outputs\Dly_MedTrk.TRP
;*del ..\@scenario@\Outputs\Dly_HvyTrk.TRP
;*del ..\@scenario@\Outputs\Dly_RegTrk.TRP
;*del ..\@scenario@\Outputs\Dly_RegAuto.TRP
;*del ..\@scenario@\Outputs\Dly_TotAutos.TRP
;*del ..\@scenario@\Outputs\Dly_TotTrks.TRP
;*del ..\@scenario@\Outputs\Dly_TotVehs.TRP
```

County_VMT_Summary.s

```
; Maryland Statewide Travel Demand Model (MSTM)
; Script: Model Summary
; Mark Radovic mradovic@sha.state.md.us
;=========================================================================
;Set Parameters:

READ File = '..\stamp.log'

MDzones    = 1179; Maryland only SMZs
RowSize    = 40  ; Number of Rows in the Table
;
;-------------------------------------------------------------------------------
;  VMT SUMMARY
;-------------------------------------------------------------------------------
RUN PGM=NETWORK PRNFILE='..\@scenario@\Outputs\Validation - Summarize VMT by County Step 1.PRN'  MSG='Validation - Summarize VMT by County'

NETI=..\@scenario@\Outputs\MSTM_Veh_Dly.net
    ;SWFT_____
    ;  1 = Interstate
    ;  2 = Freeway
    ;  3 = Expressway
    ;  4 = Major Arterial
    ;  5 = Minor Arterial
    ;  6 = Collector
    ;  7 = Unused
    ;  8 = Medium Speed Ramps
    ;  9 = High Speed Ramps
    ; 10 = Local Roads
    ; 11 = Centroid Connector

IF (SWFT <= 11)                  ; Includes centroid connectors
IF (FIPS > 24000 & FIPS <24511)   ; Maryland Only

   Tot_VMT =  ((AUTO24 + TRUCK24) * DISTANCE)
  _Tot_VMT =  _Tot_VMT + Tot_VMT

        IF (SWFT = 1 || SWFT = 8 || SWFT = 9) SWFT1 = 1   ; Ramps added to Interstates
        IF (SWFT = 2 || SWFT = 3)            SWFT1 = 2
        IF (SWFT = 4)                        SWFT1 = 3
        IF (SWFT = 5)                        SWFT1 = 4
        IF (SWFT = 6)                        SWFT1 = 5
        IF (SWFT = 10 || SWFT = 11)          SWFT1 = 6   ; Locals and Centroids added together
;
        IF (SWFT =  8 || SWFT = 9)           SWFT2 = 1   ; Calculate Ramps Only
        IF (SWFT =  11)                      SWFT2 = 2   ; Calculate Centroids Connectors Only

; Interstates for All Counties
        IF (SWFT1 = 1 & FIPS = 24001) _24001Int = round(_24001Int + Tot_VMT) ;      Allegheny
        IF (SWFT1 = 1 & FIPS = 24003) _24003Int = round(_24003Int + Tot_VMT) ;  Anne Arundel
        IF (SWFT1 = 1 & FIPS = 24005) _24005Int = round(_24005Int + Tot_VMT) ;     Baltimore
        IF (SWFT1 = 1 & FIPS = 24009) _24009Int = round(_24009Int + Tot_VMT) ;       Calvert
        IF (SWFT1 = 1 & FIPS = 24011) _24011Int = round(_24011Int + Tot_VMT) ;      Caroline
        IF (SWFT1 = 1 & FIPS = 24013) _24013Int = round(_24013Int + Tot_VMT) ;       Carroll
        IF (SWFT1 = 1 & FIPS = 24015) _24015Int = round(_24015Int + Tot_VMT) ;         Cecil
        IF (SWFT1 = 1 & FIPS = 24017) _24017Int = round(_24017Int + Tot_VMT) ;       Charles
        IF (SWFT1 = 1 & FIPS = 24019) _24019Int = round(_24019Int + Tot_VMT) ;    Dorchester
        IF (SWFT1 = 1 & FIPS = 24021) _24021Int = round(_24021Int + Tot_VMT) ;     Frederick
        IF (SWFT1 = 1 & FIPS = 24023) _24023Int = round(_24023Int + Tot_VMT) ;       Garrett
        IF (SWFT1 = 1 & FIPS = 24025) _24025Int = round(_24025Int + Tot_VMT) ;       Harford
        IF (SWFT1 = 1 & FIPS = 24027) _24027Int = round(_24027Int + Tot_VMT) ;        Howard
        IF (SWFT1 = 1 & FIPS = 24029) _24029Int = round(_24029Int + Tot_VMT) ;          Kent
        IF (SWFT1 = 1 & FIPS = 24031) _24031Int = round(_24031Int + Tot_VMT) ;    Montgomery
        IF (SWFT1 = 1 & FIPS = 24033) _24033Int = round(_24033Int + Tot_VMT) ; Prince Georges
        IF (SWFT1 = 1 & FIPS = 24035) _24035Int = round(_24035Int + Tot_VMT) ;   Queen Annes
        IF (SWFT1 = 1 & FIPS = 24037) _24037Int = round(_24037Int + Tot_VMT) ;     St. Marys
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        IF (SWFT1 = 1 & FIPS = 24039) _24039Int = round(_24039Int + Tot_VMT) ;        Somerset
        IF (SWFT1 = 1 & FIPS = 24041) _24041Int = round(_24041Int + Tot_VMT) ;          Talbot
        IF (SWFT1 = 1 & FIPS = 24043) _24043Int = round(_24043Int + Tot_VMT) ;      Washington
        IF (SWFT1 = 1 & FIPS = 24045) _24045Int = round(_24045Int + Tot_VMT) ;        Wicomico
        IF (SWFT1 = 1 & FIPS = 24047) _24047Int = round(_24047Int + Tot_VMT) ;       Worcester
        IF (SWFT1 = 1 & FIPS = 24510) _24510Int = round(_24510Int + Tot_VMT) ; Baltimore City


; Freeways/Expressways for All Counties
        IF (SWFT1 = 2 & FIPS = 24001) _24001Exp = _24001Exp + Tot_VMT        ;       Allegheny
        IF (SWFT1 = 2 & FIPS = 24003) _24003Exp = _24003Exp + Tot_VMT        ;   Anne Arundel
        IF (SWFT1 = 2 & FIPS = 24005) _24005Exp = _24005Exp + Tot_VMT        ;       Baltimore
        IF (SWFT1 = 2 & FIPS = 24009) _24009Exp = _24009Exp + Tot_VMT        ;         Calvert
        IF (SWFT1 = 2 & FIPS = 24011) _24011Exp = _24011Exp + Tot_VMT        ;        Caroline
        IF (SWFT1 = 2 & FIPS = 24013) _24013Exp = _24013Exp + Tot_VMT        ;         Carroll
        IF (SWFT1 = 2 & FIPS = 24015) _24015Exp = _24015Exp + Tot_VMT        ;           Cecil
        IF (SWFT1 = 2 & FIPS = 24017) _24017Exp = _24017Exp + Tot_VMT        ;         Charles
        IF (SWFT1 = 2 & FIPS = 24019) _24019Exp = _24019Exp + Tot_VMT        ;      Dorchester
        IF (SWFT1 = 2 & FIPS = 24021) _24021Exp = _24021Exp + Tot_VMT        ;       Frederick
        IF (SWFT1 = 2 & FIPS = 24023) _24023Exp = _24023Exp + Tot_VMT        ;         Garrett
        IF (SWFT1 = 2 & FIPS = 24025) _24025Exp = _24025Exp + Tot_VMT        ;         Harford
        IF (SWFT1 = 2 & FIPS = 24027) _24027Exp = _24027Exp + Tot_VMT        ;          Howard
        IF (SWFT1 = 2 & FIPS = 24029) _24029Exp = _24029Exp + Tot_VMT        ;            Kent
        IF (SWFT1 = 2 & FIPS = 24031) _24031Exp = _24031Exp + Tot_VMT        ;      Montgomery
        IF (SWFT1 = 2 & FIPS = 24033) _24033Exp = _24033Exp + Tot_VMT        ; Prince Georges
        IF (SWFT1 = 2 & FIPS = 24035) _24035Exp = _24035Exp + Tot_VMT        ;    Queen Annes
        IF (SWFT1 = 2 & FIPS = 24037) _24037Exp = _24037Exp + Tot_VMT        ;       St. Marys
        IF (SWFT1 = 2 & FIPS = 24039) _24039Exp = _24039Exp + Tot_VMT        ;        Somerset
        IF (SWFT1 = 2 & FIPS = 24041) _24041Exp = _24041Exp + Tot_VMT        ;          Talbot
        IF (SWFT1 = 2 & FIPS = 24043) _24043Exp = _24043Exp + Tot_VMT        ;      Washington
        IF (SWFT1 = 2 & FIPS = 24045) _24045Exp = _24045Exp + Tot_VMT        ;        Wicomico
        IF (SWFT1 = 2 & FIPS = 24047) _24047Exp = _24047Exp + Tot_VMT        ;       Worcester
        IF (SWFT1 = 2 & FIPS = 24510) _24510Exp = _24510Exp + Tot_VMT        ; Baltimore City


; Principal Arterials for All Counties
        IF (SWFT1 = 3 & FIPS = 24001) _24001ArtP = _24001ArtP + Tot_VMT        ;       Allegheny
        IF (SWFT1 = 3 & FIPS = 24003) _24003ArtP = _24003ArtP + Tot_VMT        ;   Anne Arundel
        IF (SWFT1 = 3 & FIPS = 24005) _24005ArtP = _24005ArtP + Tot_VMT        ;       Baltimore
        IF (SWFT1 = 3 & FIPS = 24009) _24009ArtP = _24009ArtP + Tot_VMT        ;         Calvert
        IF (SWFT1 = 3 & FIPS = 24011) _24011ArtP = _24011ArtP + Tot_VMT        ;        Caroline
        IF (SWFT1 = 3 & FIPS = 24013) _24013ArtP = _24013ArtP + Tot_VMT        ;         Carroll
        IF (SWFT1 = 3 & FIPS = 24015) _24015ArtP = _24015ArtP + Tot_VMT        ;           Cecil
        IF (SWFT1 = 3 & FIPS = 24017) _24017ArtP = _24017ArtP + Tot_VMT        ;         Charles
        IF (SWFT1 = 3 & FIPS = 24019) _24019ArtP = _24019ArtP + Tot_VMT        ;      Dorchester
        IF (SWFT1 = 3 & FIPS = 24021) _24021ArtP = _24021ArtP + Tot_VMT        ;       Frederick
        IF (SWFT1 = 3 & FIPS = 24023) _24023ArtP = _24023ArtP + Tot_VMT        ;         Garrett
        IF (SWFT1 = 3 & FIPS = 24025) _24025ArtP = _24025ArtP + Tot_VMT        ;         Harford
        IF (SWFT1 = 3 & FIPS = 24027) _24027ArtP = _24027ArtP + Tot_VMT        ;          Howard
        IF (SWFT1 = 3 & FIPS = 24029) _24029ArtP = _24029ArtP + Tot_VMT        ;            Kent
        IF (SWFT1 = 3 & FIPS = 24031) _24031ArtP = _24031ArtP + Tot_VMT        ;      Montgomery
        IF (SWFT1 = 3 & FIPS = 24033) _24033ArtP = _24033ArtP + Tot_VMT        ; Prince Georges
        IF (SWFT1 = 3 & FIPS = 24035) _24035ArtP = _24035ArtP + Tot_VMT        ;    Queen Annes
        IF (SWFT1 = 3 & FIPS = 24037) _24037ArtP = _24037ArtP + Tot_VMT        ;       St. Marys
        IF (SWFT1 = 3 & FIPS = 24039) _24039ArtP = _24039ArtP + Tot_VMT        ;        Somerset
        IF (SWFT1 = 3 & FIPS = 24041) _24041ArtP = _24041ArtP + Tot_VMT        ;          Talbot
        IF (SWFT1 = 3 & FIPS = 24043) _24043ArtP = _24043ArtP + Tot_VMT        ;      Washington
        IF (SWFT1 = 3 & FIPS = 24045) _24045ArtP = _24045ArtP + Tot_VMT        ;        Wicomico
        IF (SWFT1 = 3 & FIPS = 24047) _24047ArtP = _24047ArtP + Tot_VMT        ;       Worcester
        IF (SWFT1 = 3 & FIPS = 24510) _24510ArtP = _24510ArtP + Tot_VMT        ; Baltimore City


; Minor Arterials for All Counties
        IF (SWFT1 = 4 & FIPS = 24001) _24001ArtM = _24001ArtM + Tot_VMT        ;       Allegheny
        IF (SWFT1 = 4 & FIPS = 24003) _24003ArtM = _24003ArtM + Tot_VMT        ;   Anne Arundel
        IF (SWFT1 = 4 & FIPS = 24005) _24005ArtM = _24005ArtM + Tot_VMT        ;       Baltimore
        IF (SWFT1 = 4 & FIPS = 24009) _24009ArtM = _24009ArtM + Tot_VMT        ;         Calvert
        IF (SWFT1 = 4 & FIPS = 24011) _24011ArtM = _24011ArtM + Tot_VMT        ;        Caroline
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        IF (SWFT1 = 4 & FIPS = 24013) _24013ArtM = _24013ArtM + Tot_VMT        ;       Carroll
        IF (SWFT1 = 4 & FIPS = 24015) _24015ArtM = _24015ArtM + Tot_VMT        ;        Cecil
        IF (SWFT1 = 4 & FIPS = 24017) _24017ArtM = _24017ArtM + Tot_VMT        ;       Charles
        IF (SWFT1 = 4 & FIPS = 24019) _24019ArtM = _24019ArtM + Tot_VMT        ;     Dorchester
        IF (SWFT1 = 4 & FIPS = 24021) _24021ArtM = _24021ArtM + Tot_VMT        ;      Frederick
        IF (SWFT1 = 4 & FIPS = 24023) _24023ArtM = _24023ArtM + Tot_VMT        ;       Garrett
        IF (SWFT1 = 4 & FIPS = 24025) _24025ArtM = _24025ArtM + Tot_VMT        ;       Harford
        IF (SWFT1 = 4 & FIPS = 24027) _24027ArtM = _24027ArtM + Tot_VMT        ;        Howard
        IF (SWFT1 = 4 & FIPS = 24029) _24029ArtM = _24029ArtM + Tot_VMT        ;         Kent
        IF (SWFT1 = 4 & FIPS = 24031) _24031ArtM = _24031ArtM + Tot_VMT        ;     Montgomery
        IF (SWFT1 = 4 & FIPS = 24033) _24033ArtM = _24033ArtM + Tot_VMT        ; Prince Georges
        IF (SWFT1 = 4 & FIPS = 24035) _24035ArtM = _24035ArtM + Tot_VMT        ;   Queen Annes
        IF (SWFT1 = 4 & FIPS = 24037) _24037ArtM = _24037ArtM + Tot_VMT        ;     St. Marys
        IF (SWFT1 = 4 & FIPS = 24039) _24039ArtM = _24039ArtM + Tot_VMT        ;      Somerset
        IF (SWFT1 = 4 & FIPS = 24041) _24041ArtM = _24041ArtM + Tot_VMT        ;        Talbot
        IF (SWFT1 = 4 & FIPS = 24043) _24043ArtM = _24043ArtM + Tot_VMT        ;     Washington
        IF (SWFT1 = 4 & FIPS = 24045) _24045ArtM = _24045ArtM + Tot_VMT        ;      Wicomico
        IF (SWFT1 = 4 & FIPS = 24047) _24047ArtM = _24047ArtM + Tot_VMT        ;      Worcester
        IF (SWFT1 = 4 & FIPS = 24510) _24510ArtM = _24510ArtM + Tot_VMT        ; Baltimore City


; Collectors for All Counties
        IF (SWFT1 = 5 & FIPS = 24001) _24001Col = _24001Col + Tot_VMT          ;       Allegheny
        IF (SWFT1 = 5 & FIPS = 24003) _24003Col = _24003Col + Tot_VMT          ;    Anne Arundel
        IF (SWFT1 = 5 & FIPS = 24005) _24005Col = _24005Col + Tot_VMT          ;       Baltimore
        IF (SWFT1 = 5 & FIPS = 24009) _24009Col = _24009Col + Tot_VMT          ;        Calvert
        IF (SWFT1 = 5 & FIPS = 24011) _24011Col = _24011Col + Tot_VMT          ;       Caroline
        IF (SWFT1 = 5 & FIPS = 24013) _24013Col = _24013Col + Tot_VMT          ;        Carroll
        IF (SWFT1 = 5 & FIPS = 24015) _24015Col = _24015Col + Tot_VMT          ;         Cecil
        IF (SWFT1 = 5 & FIPS = 24017) _24017Col = _24017Col + Tot_VMT          ;        Charles
        IF (SWFT1 = 5 & FIPS = 24019) _24019Col = _24019Col + Tot_VMT          ;      Dorchester
        IF (SWFT1 = 5 & FIPS = 24021) _24021Col = _24021Col + Tot_VMT          ;       Frederick
        IF (SWFT1 = 5 & FIPS = 24023) _24023Col = _24023Col + Tot_VMT          ;        Garrett
        IF (SWFT1 = 5 & FIPS = 24025) _24025Col = _24025Col + Tot_VMT          ;        Harford
        IF (SWFT1 = 5 & FIPS = 24027) _24027Col = _24027Col + Tot_VMT          ;         Howard
        IF (SWFT1 = 5 & FIPS = 24029) _24029Col = _24029Col + Tot_VMT          ;          Kent
        IF (SWFT1 = 5 & FIPS = 24031) _24031Col = _24031Col + Tot_VMT          ;      Montgomery
        IF (SWFT1 = 5 & FIPS = 24033) _24033Col = _24033Col + Tot_VMT          ; Prince Georges
        IF (SWFT1 = 5 & FIPS = 24035) _24035Col = _24035Col + Tot_VMT          ;    Queen Annes
        IF (SWFT1 = 5 & FIPS = 24037) _24037Col = _24037Col + Tot_VMT          ;      St. Marys
        IF (SWFT1 = 5 & FIPS = 24039) _24039Col = _24039Col + Tot_VMT          ;       Somerset
        IF (SWFT1 = 5 & FIPS = 24041) _24041Col = _24041Col + Tot_VMT          ;         Talbot
        IF (SWFT1 = 5 & FIPS = 24043) _24043Col = _24043Col + Tot_VMT          ;      Washington
        IF (SWFT1 = 5 & FIPS = 24045) _24045Col = _24045Col + Tot_VMT          ;       Wicomico
        IF (SWFT1 = 5 & FIPS = 24047) _24047Col = _24047Col + Tot_VMT          ;       Worcester
        IF (SWFT1 = 5 & FIPS = 24510) _24510Col = _24510Col + Tot_VMT          ; Baltimore City


; Centroid Connectors/Local Roads
        IF (SWFT1 = 6 & FIPS = 24001) _24001Cen = _24001Cen + Tot_VMT          ;       Allegheny
        IF (SWFT1 = 6 & FIPS = 24003) _24003Cen = _24003Cen + Tot_VMT          ;    Anne Arundel
        IF (SWFT1 = 6 & FIPS = 24005) _24005Cen = _24005Cen + Tot_VMT          ;       Baltimore
        IF (SWFT1 = 6 & FIPS = 24009) _24009Cen = _24009Cen + Tot_VMT          ;        Calvert
        IF (SWFT1 = 6 & FIPS = 24011) _24011Cen = _24011Cen + Tot_VMT          ;       Caroline
        IF (SWFT1 = 6 & FIPS = 24013) _24013Cen = _24013Cen + Tot_VMT          ;        Carroll
        IF (SWFT1 = 6 & FIPS = 24015) _24015Cen = _24015Cen + Tot_VMT          ;         Cecil
        IF (SWFT1 = 6 & FIPS = 24017) _24017Cen = _24017Cen + Tot_VMT          ;        Charles
        IF (SWFT1 = 6 & FIPS = 24019) _24019Cen = _24019Cen + Tot_VMT          ;      Dorchester
        IF (SWFT1 = 6 & FIPS = 24021) _24021Cen = _24021Cen + Tot_VMT          ;       Frederick
        IF (SWFT1 = 6 & FIPS = 24023) _24023Cen = _24023Cen + Tot_VMT          ;        Garrett
        IF (SWFT1 = 6 & FIPS = 24025) _24025Cen = _24025Cen + Tot_VMT          ;        Harford
        IF (SWFT1 = 6 & FIPS = 24027) _24027Cen = _24027Cen + Tot_VMT          ;         Howard
        IF (SWFT1 = 6 & FIPS = 24029) _24029Cen = _24029Cen + Tot_VMT          ;          Kent
        IF (SWFT1 = 6 & FIPS = 24031) _24031Cen = _24031Cen + Tot_VMT          ;      Montgomery
        IF (SWFT1 = 6 & FIPS = 24033) _24033Cen = _24033Cen + Tot_VMT          ; Prince Georges
        IF (SWFT1 = 6 & FIPS = 24035) _24035Cen = _24035Cen + Tot_VMT          ;    Queen Annes
        IF (SWFT1 = 6 & FIPS = 24037) _24037Cen = _24037Cen + Tot_VMT          ;      St. Marys
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        IF (SWFT1 = 6 & FIPS = 24039) _24039Cen = _24039Cen + Tot_VMT        ;        Somerset
        IF (SWFT1 = 6 & FIPS = 24041) _24041Cen = _24041Cen + Tot_VMT        ;          Talbot
        IF (SWFT1 = 6 & FIPS = 24043) _24043Cen = _24043Cen + Tot_VMT        ;      Washington
        IF (SWFT1 = 6 & FIPS = 24045) _24045Cen = _24045Cen + Tot_VMT        ;        Wicomico
        IF (SWFT1 = 6 & FIPS = 24047) _24047Cen = _24047Cen + Tot_VMT        ;       Worcester
        IF (SWFT1 = 6 & FIPS = 24510) _24510Cen = _24510Cen + Tot_VMT        ; Baltimore City


;Facility Type Totals
        IF ((FIPS > 24000 & FIPS < 24511) & SWFT1  = 1) _ALLInt  = _ALLInt  + Tot_VMT
        IF ((FIPS > 24000 & FIPS < 24511) & SWFT1  = 2) _ALLExp  = _ALLExp  + Tot_VMT
        IF ((FIPS > 24000 & FIPS < 24511) & SWFT1  = 3) _ALLArtP = _ALLArtP + Tot_VMT
        IF ((FIPS > 24000 & FIPS < 24511) & SWFT1  = 4) _ALLArtM = _ALLArtM + Tot_VMT
        IF ((FIPS > 24000 & FIPS < 24511) & SWFT1  = 5) _ALLCol  = _ALLCol  + Tot_VMT
        IF ((FIPS > 24000 & FIPS < 24511) & SWFT1  = 6) _ALLCen  = _ALLCen  + Tot_VMT
        IF ((FIPS > 24000 & FIPS < 24511) & SWFT1 <=6) _ALLTOT  = _ALLTOT  + Tot_VMT
        IF ((FIPS > 24000 & FIPS < 24511) & SWFT2  = 1) _ALLRmp  = _ALLRmp  + Tot_VMT   ;Ramps Only
        IF ((FIPS > 24000 & FIPS < 24511) & SWFT2  = 2) _CentOnly = _CentOnly + Tot_VMT  ;Centroid Connectors Only


;County Totals
        IF (FIPS = 24001 & SWFT1 <=6) _TOT24001 = _TOT24001 + Tot_VMT
        IF (FIPS = 24003 & SWFT1 <=6) _TOT24003 = _TOT24003 + Tot_VMT
        IF (FIPS = 24005 & SWFT1 <=6) _TOT24005 = _TOT24005 + Tot_VMT
        IF (FIPS = 24009 & SWFT1 <=6) _TOT24009 = _TOT24009 + Tot_VMT
        IF (FIPS = 24011 & SWFT1 <=6) _TOT24011 = _TOT24011 + Tot_VMT
        IF (FIPS = 24003 & SWFT1 <=6) _TOT24013 = _TOT24013 + Tot_VMT
        IF (FIPS = 24015 & SWFT1 <=6) _TOT24015 = _TOT24015 + Tot_VMT
        IF (FIPS = 24017 & SWFT1 <=6) _TOT24017 = _TOT24017 + Tot_VMT
        IF (FIPS = 24019 & SWFT1 <=6) _TOT24019 = _TOT24019 + Tot_VMT
        IF (FIPS = 24021 & SWFT1 <=6) _TOT24021 = _TOT24021 + Tot_VMT
        IF (FIPS = 24023 & SWFT1 <=6) _TOT24023 = _TOT24023 + Tot_VMT
        IF (FIPS = 24025 & SWFT1 <=6) _TOT24025 = _TOT24025 + Tot_VMT
        IF (FIPS = 24027 & SWFT1 <=6) _TOT24027 = _TOT24027 + Tot_VMT
        IF (FIPS = 24029 & SWFT1 <=6) _TOT24029 = _TOT24029 + Tot_VMT
        IF (FIPS = 24031 & SWFT1 <=6) _TOT24031 = _TOT24031 + Tot_VMT
        IF (FIPS = 24033 & SWFT1 <=6) _TOT24033 = _TOT24033 + Tot_VMT
        IF (FIPS = 24035 & SWFT1 <=6) _TOT24035 = _TOT24035 + Tot_VMT
        IF (FIPS = 24037 & SWFT1 <=6) _TOT24037 = _TOT24037 + Tot_VMT
        IF (FIPS = 24039 & SWFT1 <=6) _TOT24039 = _TOT24039 + Tot_VMT
        IF (FIPS = 24041 & SWFT1 <=6) _TOT24041 = _TOT24041 + Tot_VMT
        IF (FIPS = 24043 & SWFT1 <=6) _TOT24043 = _TOT24043 + Tot_VMT
        IF (FIPS = 24045 & SWFT1 <=6) _TOT24045 = _TOT24045 + Tot_VMT
        IF (FIPS = 24047 & SWFT1 <=6) _TOT24047 = _TOT24047 + Tot_VMT
        IF (FIPS = 24510 & SWFT1 <=6) _TOT24510 = _TOT24510 + Tot_VMT


    ;  Save VMT to variable for export
    LOG PREFIX=HWY,
    VAR=   _24001Int,_24001Exp,_24001ArtP,_24001ArtM,_24001Col,_24001Cen,
           _24003Int,_24003Exp,_24003ArtP,_24003ArtM,_24003Col,_24003Cen,
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           _24011Int,_24011Exp,_24011ArtP,_24011ArtM,_24011Col,_24011Cen,
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           _24015Int,_24015Exp,_24015ArtP,_24015ArtM,_24015Col,_24015Cen,
           _24017Int,_24017Exp,_24017ArtP,_24017ArtM,_24017Col,_24017Cen,
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           _24027Int,_24027Exp,_24027ArtP,_24027ArtM,_24027Col,_24027Cen,
           _24029Int,_24029Exp,_24029ArtP,_24029ArtM,_24029Col,_24029Cen,
           _24031Int,_24031Exp,_24031ArtP,_24031ArtM,_24031Col,_24031Cen,
           _24033Int,_24033Exp,_24033ArtP,_24033ArtM,_24033Col,_24033Cen
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    VAR=   _24035Int,_24035Exp,_24035ArtP,_24035ArtM,_24035Col,_24035Cen,
           _24037Int,_24037Exp,_24037ArtP,_24037ArtM,_24037Col,_24037Cen,
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            _24041Int,_24041Exp,_24041ArtP,_24041ArtM,_24041Col,_24041Cen,
            _24043Int,_24043Exp,_24043ArtP,_24043ArtM,_24043Col,_24043Cen,
            _24045Int,_24045Exp,_24045ArtP,_24045ArtM,_24045Col,_24045Cen,
            _24047Int,_24047Exp,_24047ArtP,_24047ArtM,_24047Col,_24047Cen,
            _24510Int,_24510Exp,_24510ArtP,_24510ArtM,_24510Col,_24510Cen,
            _ALLInt,_ALLExp,_ALLArtP,_ALLArtM,_ALLCol,_ALLCen,_ALLTOT,_ALLRmp,
            _TOT24001,_TOT24003,_TOT24005,_TOT24009,_TOT24011,_TOT24013,
            _TOT24015,_TOT24017,_TOT24019,_TOT24021,_TOT24023,_TOT24025,
            _TOT24027,_TOT24029,_TOT24031,_TOT24033,_TOT24035,_TOT24037,
            _TOT24039,_TOT24041,_TOT24043,_TOT24045,_TOT24047,_TOT24510,
            _CentOnly

ENDIF
ENDIF
ENDRUN

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 Int24005 = HWY._24005Int
 Int24009 = HWY._24009Int
 Int24011 = HWY._24011Int
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 Int24015 = HWY._24015Int
 Int24017 = HWY._24017Int
 Int24019 = HWY._24019Int
 Int24021 = HWY._24021Int
 Int24023 = HWY._24023Int
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 Int24037 = HWY2._24037Int
 Int24039 = HWY2._24039Int
 Int24041 = HWY2._24041Int
 Int24043 = HWY2._24043Int
 Int24045 = HWY2._24045Int
 Int24047 = HWY2._24047Int
 Int24510 = HWY2._24510Int

 Exp24001 = HWY._24001Exp
 Exp24003 = HWY._24003Exp
 Exp24005 = HWY._24005Exp
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 Exp24041 = HWY2._24041Exp
 Exp24043 = HWY2._24043Exp
 Exp24045 = HWY2._24045Exp
 Exp24047 = HWY2._24047Exp
```

County_VMT_Summary.s

```
Exp24510 = HWY2._24510Exp

ArtP24001 = HWY._24001ArtP
ArtP24003 = HWY._24003ArtP
ArtP24005 = HWY._24005ArtP
ArtP24009 = HWY._24009ArtP
ArtP24011 = HWY._24011ArtP
ArtP24013 = HWY._24013ArtP
ArtP24015 = HWY._24015ArtP
ArtP24017 = HWY._24017ArtP
ArtP24019 = HWY._24019ArtP
ArtP24021 = HWY._24021ArtP
ArtP24023 = HWY._24023ArtP
ArtP24025 = HWY._24025ArtP
ArtP24027 = HWY._24027ArtP
ArtP24029 = HWY._24029ArtP
ArtP24031 = HWY._24031ArtP
ArtP24033 = HWY._24033ArtP
ArtP24035 = HWY2._24035ArtP
ArtP24037 = HWY2._24037ArtP
ArtP24039 = HWY2._24039ArtP
ArtP24041 = HWY2._24041ArtP
ArtP24043 = HWY2._24043ArtP
ArtP24045 = HWY2._24045ArtP
ArtP24047 = HWY2._24047ArtP
ArtP24510 = HWY2._24510ArtP

ArtM24001 = HWY._24001ArtM
ArtM24003 = HWY._24003ArtM
ArtM24005 = HWY._24005ArtM
ArtM24009 = HWY._24009ArtM
ArtM24011 = HWY._24011ArtM
ArtM24013 = HWY._24013ArtM
ArtM24015 = HWY._24015ArtM
ArtM24017 = HWY._24017ArtM
ArtM24019 = HWY._24019ArtM
ArtM24021 = HWY._24021ArtM
ArtM24023 = HWY._24023ArtM
ArtM24025 = HWY._24025ArtM
ArtM24027 = HWY._24027ArtM
ArtM24029 = HWY._24029ArtM
ArtM24031 = HWY._24031ArtM
ArtM24033 = HWY._24033ArtM
ArtM24035 = HWY2._24035ArtM
ArtM24037 = HWY2._24037ArtM
ArtM24039 = HWY2._24039ArtM
ArtM24041 = HWY2._24041ArtM
ArtM24043 = HWY2._24043ArtM
ArtM24045 = HWY2._24045ArtM
ArtM24047 = HWY2._24047ArtM
ArtM24510 = HWY2._24510ArtM

Col24001 = HWY._24001Col
Col24003 = HWY._24003Col
Col24005 = HWY._24005Col
Col24009 = HWY._24009Col
Col24011 = HWY._24011Col
Col24013 = HWY._24013Col
Col24015 = HWY._24015Col
Col24017 = HWY._24017Col
Col24019 = HWY._24019Col
Col24021 = HWY._24021Col
Col24023 = HWY._24023Col
Col24025 = HWY._24025Col
Col24027 = HWY._24027Col
```

County_VMT_Summary.s

```
Col24029 = HWY._24029Col
Col24031 = HWY._24031Col
Col24033 = HWY._24033Col
Col24035 = HWY2._24035Col
Col24037 = HWY2._24037Col
Col24039 = HWY2._24039Col
Col24041 = HWY2._24041Col
Col24043 = HWY2._24043Col
Col24045 = HWY2._24045Col
Col24047 = HWY2._24047Col
Col24510 = HWY2._24510Col

Cen24001 = HWY._24001Cen
Cen24003 = HWY._24003Cen
Cen24005 = HWY._24005Cen
Cen24009 = HWY._24009Cen
Cen24011 = HWY._24011Cen
Cen24013 = HWY._24013Cen
Cen24015 = HWY._24015Cen
Cen24017 = HWY._24017Cen
Cen24019 = HWY._24019Cen
Cen24021 = HWY._24021Cen
Cen24023 = HWY._24023Cen
Cen24025 = HWY._24025Cen
Cen24027 = HWY._24027Cen
Cen24029 = HWY._24029Cen
Cen24031 = HWY._24031Cen
Cen24033 = HWY._24033Cen
Cen24035 = HWY2._24035Cen
Cen24037 = HWY2._24037Cen
Cen24039 = HWY2._24039Cen
Cen24041 = HWY2._24041Cen
Cen24043 = HWY2._24043Cen
Cen24045 = HWY2._24045Cen
Cen24047 = HWY2._24047Cen
Cen24510 = HWY2._24510Cen

  ALLInt = HWY2._ALLInt
  ALLExp = HWY2._ALLExp
 ALLArtP = HWY2._ALLArtP
 ALLArtM = HWY2._ALLArtM
  ALLCol = HWY2._ALLCol
  ALLCen = HWY2._ALLCen
  ALLTOT = HWY2._ALLTOT
  ALLRmp = HWY2._ALLRmp
 CentOnly = HWY2._CentOnly

TOT24001 = HWY2._TOT24001
TOT24003 = HWY2._TOT24003
TOT24005 = HWY2._TOT24005
TOT24009 = HWY2._TOT24009
TOT24011 = HWY2._TOT24011
TOT24013 = HWY2._TOT24013
TOT24015 = HWY2._TOT24015
TOT24017 = HWY2._TOT24017
TOT24019 = HWY2._TOT24019
TOT24021 = HWY2._TOT24021
TOT24023 = HWY2._TOT24023
TOT24025 = HWY2._TOT24025
TOT24027 = HWY2._TOT24027
TOT24029 = HWY2._TOT24029
TOT24031 = HWY2._TOT24031
TOT24033 = HWY2._TOT24033
TOT24035 = HWY2._TOT24035
TOT24037 = HWY2._TOT24037
```

County_VMT_Summary.s

```
TOT24039 = HWY2._TOT24039
TOT24041 = HWY2._TOT24041
TOT24043 = HWY2._TOT24043
TOT24045 = HWY2._TOT24045
TOT24047 = HWY2._TOT24047
TOT24510 = HWY2._TOT24510

RUN PGM=MATRIX PRNFILE='..\@scenario@\Outputs\Validation - Summarize VMT by County Step 2.PRN'  MSG='Validation - Summarize VMT by County'
  zones=@MDZones@

 Int24001 = @Int24001@
 Int24003 = @Int24003@
 Int24005 = @Int24005@
 Int24009 = @Int24009@
 Int24011 = @Int24011@
 Int24013 = @Int24013@
 Int24015 = @Int24015@
 Int24017 = @Int24017@
 Int24019 = @Int24019@
 Int24021 = @Int24021@
 Int24023 = @Int24023@
 Int24025 = @Int24025@
 Int24027 = @Int24027@
 Int24029 = @Int24029@
 Int24031 = @Int24031@
 Int24033 = @Int24033@
 Int24035 = @Int24035@
 Int24037 = @Int24037@
 Int24039 = @Int24039@
 Int24041 = @Int24041@
 Int24043 = @Int24043@
 Int24045 = @Int24045@
 Int24047 = @Int24047@
 Int24510 = @Int24510@

 Exp24001 = @Exp24001@
 Exp24003 = @Exp24003@
 Exp24005 = @Exp24005@
 Exp24009 = @Exp24009@
 Exp24011 = @Exp24011@
 Exp24013 = @Exp24013@
 Exp24015 = @Exp24015@
 Exp24017 = @Exp24017@
 Exp24019 = @Exp24019@
 Exp24021 = @Exp24021@
 Exp24023 = @Exp24023@
 Exp24025 = @Exp24025@
 Exp24027 = @Exp24027@
 Exp24029 = @Exp24029@
 Exp24031 = @Exp24031@
 Exp24033 = @Exp24033@
 Exp24035 = @Exp24035@
 Exp24037 = @Exp24037@
 Exp24039 = @Exp24039@
 Exp24041 = @Exp24041@
 Exp24043 = @Exp24043@
 Exp24045 = @Exp24045@
 Exp24047 = @Exp24047@
 Exp24510 = @Exp24510@

 ArtP24001 = @ArtP24001@
 ArtP24003 = @ArtP24003@
 ArtP24005 = @ArtP24005@
 ArtP24009 = @ArtP24009@
 ArtP24011 = @ArtP24011@
```

County_VMT_Summary.s

```
ArtP24013 = @ArtP24013@
ArtP24015 = @ArtP24015@
ArtP24017 = @ArtP24017@
ArtP24019 = @ArtP24019@
ArtP24021 = @ArtP24021@
ArtP24023 = @ArtP24023@
ArtP24025 = @ArtP24025@
ArtP24027 = @ArtP24027@
ArtP24029 = @ArtP24029@
ArtP24031 = @ArtP24031@
ArtP24033 = @ArtP24033@
ArtP24035 = @ArtP24035@
ArtP24037 = @ArtP24037@
ArtP24039 = @ArtP24039@
ArtP24041 = @ArtP24041@
ArtP24043 = @ArtP24043@
ArtP24045 = @ArtP24045@
ArtP24047 = @ArtP24047@
ArtP24510 = @ArtP24510@

ArtM24001 = @ArtM24001@
ArtM24003 = @ArtM24003@
ArtM24005 = @ArtM24005@
ArtM24009 = @ArtM24009@
ArtM24011 = @ArtM24011@
ArtM24013 = @ArtM24013@
ArtM24015 = @ArtM24015@
ArtM24017 = @ArtM24017@
ArtM24019 = @ArtM24019@
ArtM24021 = @ArtM24021@
ArtM24023 = @ArtM24023@
ArtM24025 = @ArtM24025@
ArtM24027 = @ArtM24027@
ArtM24029 = @ArtM24029@
ArtM24031 = @ArtM24031@
ArtM24033 = @ArtM24033@
ArtM24035 = @ArtM24035@
ArtM24037 = @ArtM24037@
ArtM24039 = @ArtM24039@
ArtM24041 = @ArtM24041@
ArtM24043 = @ArtM24043@
ArtM24045 = @ArtM24045@
ArtM24047 = @ArtM24047@
ArtM24510 = @ArtM24510@

 Col24001 = @Col24001@
 Col24003 = @Col24003@
 Col24005 = @Col24005@
 Col24009 = @Col24009@
 Col24011 = @Col24011@
 Col24013 = @Col24013@
 Col24015 = @Col24015@
 Col24017 = @Col24017@
 Col24019 = @Col24019@
 Col24021 = @Col24021@
 Col24023 = @Col24023@
 Col24025 = @Col24025@
 Col24027 = @Col24027@
 Col24029 = @Col24029@
 Col24031 = @Col24031@
 Col24033 = @Col24033@
 Col24035 = @Col24035@
 Col24037 = @Col24037@
 Col24039 = @Col24039@
 Col24041 = @Col24041@
```

County_VMT_Summary.s

```
Col24043 = @Col24043@
Col24045 = @Col24045@
Col24047 = @Col24047@
Col24510 = @Col24510@

Cen24001 = @Cen24001@
Cen24003 = @Cen24003@
Cen24005 = @Cen24005@
Cen24009 = @Cen24009@
Cen24011 = @Cen24011@
Cen24013 = @Cen24013@
Cen24015 = @Cen24015@
Cen24017 = @Cen24017@
Cen24019 = @Cen24019@
Cen24021 = @Cen24021@
Cen24023 = @Cen24023@
Cen24025 = @Cen24025@
Cen24027 = @Cen24027@
Cen24029 = @Cen24029@
Cen24031 = @Cen24031@
Cen24033 = @Cen24033@
Cen24035 = @Cen24035@
Cen24037 = @Cen24037@
Cen24039 = @Cen24039@
Cen24041 = @Cen24041@
Cen24043 = @Cen24043@
Cen24045 = @Cen24045@
Cen24047 = @Cen24047@
Cen24510 = @Cen24510@

   AllInt = @ALLInt@
   ALLExp = @ALLExp@
  ALLArtP = @ALLArtp@
  ALLArtM = @ALLArtM@
   ALLCol = @ALLCol@
   ALLCen = @ALLCen@
   ALLTOT = @ALLTOT@
   ALLRmp = @ALLRmp@
 CentOnly = @CentOnly@

TOT24001 = @TOT24001@
TOT24003 = @TOT24003@
TOT24005 = @TOT24005@
TOT24009 = @TOT24009@
TOT24011 = @TOT24011@
TOT24013 = @TOT24013@
TOT24015 = @TOT24015@
TOT24017 = @TOT24017@
TOT24019 = @TOT24019@
TOT24021 = @TOT24021@
TOT24023 = @TOT24023@
TOT24025 = @TOT24025@
TOT24027 = @TOT24027@
TOT24029 = @TOT24029@
TOT24031 = @TOT24031@
TOT24033 = @TOT24033@
TOT24035 = @TOT24035@
TOT24037 = @TOT24037@
TOT24039 = @TOT24039@
TOT24041 = @TOT24041@
TOT24043 = @TOT24043@
TOT24045 = @TOT24045@
TOT24047 = @TOT24047@
TOT24510 = @TOT24510@
```

County_VMT_Summary.s

```
;--------------------------------------------------------------------------------
;  SET UP FOR PRINTING
;--------------------------------------------------------------------------------

;Interstates By County
print form=12.0 list =  '5',Int24001  , FILE = SUMMARY1.TXT   ;      Allegheny
print form=12.0 list =  '6',Int24003  , FILE = SUMMARY1.TXT   ;    Anne Arundel
print form=12.0 list =  '7',Int24005  , FILE = SUMMARY1.TXT   ;      Baltimore
print form=12.0 list =  '8',Int24009  , FILE = SUMMARY1.TXT   ;      Calvert
print form=12.0 list =  '9',Int24011  , FILE = SUMMARY1.TXT   ;      Caroline
print form=12.0 list = '10',Int24013  , FILE = SUMMARY1.TXT   ;      Carroll
print form=12.0 list = '11',Int24015  , FILE = SUMMARY1.TXT   ;      Cecil
print form=12.0 list = '12',Int24017  , FILE = SUMMARY1.TXT   ;      Charles
print form=12.0 list = '13',Int24019  , FILE = SUMMARY1.TXT   ;      Dorchester
print form=12.0 list = '14',Int24021  , FILE = SUMMARY1.TXT   ;      Frederick
print form=12.0 list = '15',Int24023  , FILE = SUMMARY1.TXT   ;      Garrett
print form=12.0 list = '16',Int24025  , FILE = SUMMARY1.TXT   ;      Harford
print form=12.0 list = '17',Int24027  , FILE = SUMMARY1.TXT   ;      Howard
print form=12.0 list = '18',Int24029  , FILE = SUMMARY1.TXT   ;      Kent
print form=12.0 list = '19',Int24031  , FILE = SUMMARY1.TXT   ;      Montgomery
print form=12.0 list = '20',Int24033  , FILE = SUMMARY1.TXT   ;  Prince Georges
print form=12.0 list = '21',Int24035  , FILE = SUMMARY1.TXT   ;    Queen Annes
print form=12.0 list = '22',Int24037  , FILE = SUMMARY1.TXT   ;    St. Marys
print form=12.0 list = '23',Int24039  , FILE = SUMMARY1.TXT   ;      Somerset
print form=12.0 list = '24',Int24041  , FILE = SUMMARY1.TXT   ;      Talbot
print form=12.0 list = '25',Int24043  , FILE = SUMMARY1.TXT   ;      Washington
print form=12.0 list = '26',Int24045  , FILE = SUMMARY1.TXT   ;      Wicomico
print form=12.0 list = '27',Int24047  , FILE = SUMMARY1.TXT   ;      Worcester
print form=12.0 list = '28',Int24510  , FILE = SUMMARY1.TXT   ;  Baltimore City
print form=12.0 list = '30',ALLInt    , FILE = SUMMARY1.TXT   ;        TOTAL

;Freeways/Expressways By County
print form=12.0 list =  '5',Exp24001  , FILE = SUMMARY2.TXT   ;      Allegheny
print form=12.0 list =  '6',Exp24003  , FILE = SUMMARY2.TXT   ;    Anne Arundel
print form=12.0 list =  '7',Exp24005  , FILE = SUMMARY2.TXT   ;      Baltimore
print form=12.0 list =  '8',Exp24009  , FILE = SUMMARY2.TXT   ;      Calvert
print form=12.0 list =  '9',Exp24011  , FILE = SUMMARY2.TXT   ;      Caroline
print form=12.0 list = '10',Exp24013  , FILE = SUMMARY2.TXT   ;      Carroll
print form=12.0 list = '11',Exp24015  , FILE = SUMMARY2.TXT   ;      Cecil
print form=12.0 list = '12',Exp24017  , FILE = SUMMARY2.TXT   ;      Charles
print form=12.0 list = '13',Exp24019  , FILE = SUMMARY2.TXT   ;      Dorchester
print form=12.0 list = '14',Exp24021  , FILE = SUMMARY2.TXT   ;      Frederick
print form=12.0 list = '15',Exp24023  , FILE = SUMMARY2.TXT   ;      Garrett
print form=12.0 list = '16',Exp24025  , FILE = SUMMARY2.TXT   ;      Harford
print form=12.0 list = '17',Exp24027  , FILE = SUMMARY2.TXT   ;      Howard
print form=12.0 list = '18',Exp24029  , FILE = SUMMARY2.TXT   ;      Kent
print form=12.0 list = '19',Exp24031  , FILE = SUMMARY2.TXT   ;      Montgomery
print form=12.0 list = '20',Exp24033  , FILE = SUMMARY2.TXT   ;  Prince Georges
print form=12.0 list = '21',Exp24035  , FILE = SUMMARY2.TXT   ;    Queen Annes
print form=12.0 list = '22',Exp24037  , FILE = SUMMARY2.TXT   ;    St. Marys
print form=12.0 list = '23',Exp24039  , FILE = SUMMARY2.TXT   ;      Somerset
print form=12.0 list = '24',Exp24041  , FILE = SUMMARY2.TXT   ;      Talbot
print form=12.0 list = '25',Exp24043  , FILE = SUMMARY2.TXT   ;      Washington
print form=12.0 list = '26',Exp24045  , FILE = SUMMARY2.TXT   ;      Wicomico
print form=12.0 list = '27',Exp24047  , FILE = SUMMARY2.TXT   ;      Worcester
print form=12.0 list = '28',Exp24510  , FILE = SUMMARY2.TXT   ;  Baltimore City
print form=12.0 list = '30',ALLExp    , FILE = SUMMARY2.TXT   ;        TOTAL

;Principal Arterials By County
print form=12.0 list =  '5',ArtP24001 , FILE = SUMMARY3.TXT   ;      Allegheny
print form=12.0 list =  '6',ArtP24003 , FILE = SUMMARY3.TXT   ;    Anne Arundel
print form=12.0 list =  '7',ArtP24005 , FILE = SUMMARY3.TXT   ;      Baltimore
print form=12.0 list =  '8',ArtP24009 , FILE = SUMMARY3.TXT   ;      Calvert
print form=12.0 list =  '9',ArtP24011 , FILE = SUMMARY3.TXT   ;      Caroline
print form=12.0 list = '10',ArtP24013 , FILE = SUMMARY3.TXT   ;      Carroll
```

County_VMT_Summary.s

```
print form=12.0 list = '11',ArtP24015 , FILE = SUMMARY3.TXT   ;          Cecil
print form=12.0 list = '12',ArtP24017 , FILE = SUMMARY3.TXT   ;        Charles
print form=12.0 list = '13',ArtP24019 , FILE = SUMMARY3.TXT   ;      Dorchester
print form=12.0 list = '14',ArtP24021 , FILE = SUMMARY3.TXT   ;       Frederick
print form=12.0 list = '15',ArtP24023 , FILE = SUMMARY3.TXT   ;         Garrett
print form=12.0 list = '16',ArtP24025 , FILE = SUMMARY3.TXT   ;         Harford
print form=12.0 list = '17',ArtP24027 , FILE = SUMMARY3.TXT   ;          Howard
print form=12.0 list = '18',ArtP24029 , FILE = SUMMARY3.TXT   ;            Kent
print form=12.0 list = '19',ArtP24031 , FILE = SUMMARY3.TXT   ;      Montgomery
print form=12.0 list = '20',ArtP24033 , FILE = SUMMARY3.TXT   ;  Prince Georges
print form=12.0 list = '21',ArtP24035 , FILE = SUMMARY3.TXT   ;    Queen Annes
print form=12.0 list = '22',ArtP24037 , FILE = SUMMARY3.TXT   ;      St. Marys
print form=12.0 list = '23',ArtP24039 , FILE = SUMMARY3.TXT   ;        Somerset
print form=12.0 list = '24',ArtP24041 , FILE = SUMMARY3.TXT   ;          Talbot
print form=12.0 list = '25',ArtP24043 , FILE = SUMMARY3.TXT   ;      Washington
print form=12.0 list = '26',ArtP24045 , FILE = SUMMARY3.TXT   ;        Wicomico
print form=12.0 list = '27',ArtP24047 , FILE = SUMMARY3.TXT   ;       Worcester
print form=12.0 list = '28',ArtP24510 , FILE = SUMMARY3.TXT   ;  Baltimore City
print form=12.0 list = '30',ALLArtP   , FILE = SUMMARY3.TXT   ;           TOTAL

;Minor Arterials By County
print form=12.0 list =  '5',ArtM24001 , FILE = SUMMARY4.TXT   ;       Allegheny
print form=12.0 list =  '6',ArtM24003 , FILE = SUMMARY4.TXT   ;    Anne Arundel
print form=12.0 list =  '7',ArtM24005 , FILE = SUMMARY4.TXT   ;       Baltimore
print form=12.0 list =  '8',ArtM24009 , FILE = SUMMARY4.TXT   ;         Calvert
print form=12.0 list =  '9',ArtM24011 , FILE = SUMMARY4.TXT   ;        Caroline
print form=12.0 list = '10',ArtM24013 , FILE = SUMMARY4.TXT   ;         Carroll
print form=12.0 list = '11',ArtM24015 , FILE = SUMMARY4.TXT   ;          Cecil
print form=12.0 list = '12',ArtM24017 , FILE = SUMMARY4.TXT   ;        Charles
print form=12.0 list = '13',ArtM24019 , FILE = SUMMARY4.TXT   ;      Dorchester
print form=12.0 list = '14',ArtM24021 , FILE = SUMMARY4.TXT   ;       Frederick
print form=12.0 list = '15',ArtM24023 , FILE = SUMMARY4.TXT   ;         Garrett
print form=12.0 list = '16',ArtM24025 , FILE = SUMMARY4.TXT   ;         Harford
print form=12.0 list = '17',ArtM24027 , FILE = SUMMARY4.TXT   ;          Howard
print form=12.0 list = '18',ArtM24029 , FILE = SUMMARY4.TXT   ;            Kent
print form=12.0 list = '19',ArtM24031 , FILE = SUMMARY4.TXT   ;      Montgomery
print form=12.0 list = '20',ArtM24033 , FILE = SUMMARY4.TXT   ;  Prince Georges
print form=12.0 list = '21',ArtM24035 , FILE = SUMMARY4.TXT   ;    Queen Annes
print form=12.0 list = '22',ArtM24037 , FILE = SUMMARY4.TXT   ;      St. Marys
print form=12.0 list = '23',ArtM24039 , FILE = SUMMARY4.TXT   ;        Somerset
print form=12.0 list = '24',ArtM24041 , FILE = SUMMARY4.TXT   ;          Talbot
print form=12.0 list = '25',ArtM24043 , FILE = SUMMARY4.TXT   ;      Washington
print form=12.0 list = '26',ArtM24045 , FILE = SUMMARY4.TXT   ;        Wicomico
print form=12.0 list = '27',ArtM24047 , FILE = SUMMARY4.TXT   ;       Worcester
print form=12.0 list = '28',ArtM24510 , FILE = SUMMARY4.TXT   ;  Baltimore City
print form=12.0 list = '30',ALLArtM   , FILE = SUMMARY4.TXT   ;           TOTAL

;Collectors By County
print form=12.0 list =  '5',Col24001  , FILE = SUMMARY5.TXT   ;       Allegheny
print form=12.0 list =  '6',Col24003  , FILE = SUMMARY5.TXT   ;    Anne Arundel
print form=12.0 list =  '7',Col24005  , FILE = SUMMARY5.TXT   ;       Baltimore
print form=15.0 list =  '8',Col24009  , FILE = SUMMARY5.TXT   ;         Calvert
print form=12.0 list =  '9',Col24011  , FILE = SUMMARY5.TXT   ;        Caroline
print form=12.0 list = '10',Col24013  , FILE = SUMMARY5.TXT   ;         Carroll
print form=12.0 list = '11',Col24015  , FILE = SUMMARY5.TXT   ;          Cecil
print form=12.0 list = '12',Col24017  , FILE = SUMMARY5.TXT   ;        Charles
print form=12.0 list = '13',Col24019  , FILE = SUMMARY5.TXT   ;      Dorchester
print form=12.0 list = '14',Col24021  , FILE = SUMMARY5.TXT   ;       Frederick
print form=12.0 list = '15',Col24023  , FILE = SUMMARY5.TXT   ;         Garrett
print form=12.0 list = '16',Col24025  , FILE = SUMMARY5.TXT   ;         Harford
print form=12.0 list = '17',Col24027  , FILE = SUMMARY5.TXT   ;          Howard
print form=12.0 list = '18',Col24029  , FILE = SUMMARY5.TXT   ;            Kent
print form=12.0 list = '19',Col24031  , FILE = SUMMARY5.TXT   ;      Montgomery
print form=12.0 list = '20',Col24033  , FILE = SUMMARY5.TXT   ;  Prince Georges
print form=12.0 list = '21',Col24035  , FILE = SUMMARY5.TXT   ;    Queen Annes
```

County_VMT_Summary.s

```
print form=12.0 list = '22',Col24037  , FILE = SUMMARY5.TXT  ;        St. Marys
print form=12.0 list = '23',Col24039  , FILE = SUMMARY5.TXT  ;         Somerset
print form=12.0 list = '24',Col24041  , FILE = SUMMARY5.TXT  ;           Talbot
print form=12.0 list = '25',Col24043  , FILE = SUMMARY5.TXT  ;       Washington
print form=12.0 list = '26',Col24045  , FILE = SUMMARY5.TXT  ;         Wicomico
print form=12.0 list = '27',Col24047  , FILE = SUMMARY5.TXT  ;        Worcester
print form=12.0 list = '28',Col24510  , FILE = SUMMARY5.TXT  ;   Baltimore City
print form=12.0 list = '30',ALLCol    , FILE = SUMMARY5.TXT  ;            TOTAL

;Locals/Centroids By County
print form=12.0 list =  '5',Cen24001  , FILE = SUMMARY6.TXT  ;        Allegheny
print form=12.0 list =  '6',Cen24003  , FILE = SUMMARY6.TXT  ;     Anne Arundel
print form=12.0 list =  '7',Cen24005  , FILE = SUMMARY6.TXT  ;        Baltimore
print form=12.0 list =  '8',Cen24009  , FILE = SUMMARY6.TXT  ;          Calvert
print form=12.0 list =  '9',Cen24011  , FILE = SUMMARY6.TXT  ;         Caroline
print form=12.0 list = '10',Cen24013  , FILE = SUMMARY6.TXT  ;          Carroll
print form=12.0 list = '11',Cen24015  , FILE = SUMMARY6.TXT  ;            Cecil
print form=12.0 list = '12',Cen24017  , FILE = SUMMARY6.TXT  ;          Charles
print form=12.0 list = '13',Cen24019  , FILE = SUMMARY6.TXT  ;       Dorchester
print form=12.0 list = '14',Cen24021  , FILE = SUMMARY6.TXT  ;        Frederick
print form=12.0 list = '15',Cen24023  , FILE = SUMMARY6.TXT  ;          Garrett
print form=12.0 list = '16',Cen24025  , FILE = SUMMARY6.TXT  ;          Harford
print form=12.0 list = '17',Cen24027  , FILE = SUMMARY6.TXT  ;           Howard
print form=12.0 list = '18',Cen24029  , FILE = SUMMARY6.TXT  ;             Kent
print form=12.0 list = '19',Cen24031  , FILE = SUMMARY6.TXT  ;       Montgomery
print form=12.0 list = '20',Cen24033  , FILE = SUMMARY6.TXT  ;   Prince Georges
print form=12.0 list = '21',Cen24035  , FILE = SUMMARY6.TXT  ;      Queen Annes
print form=12.0 list = '22',Cen24037  , FILE = SUMMARY6.TXT  ;        St. Marys
print form=12.0 list = '23',Cen24039  , FILE = SUMMARY6.TXT  ;         Somerset
print form=12.0 list = '24',Cen24041  , FILE = SUMMARY6.TXT  ;           Talbot
print form=12.0 list = '25',Cen24043  , FILE = SUMMARY6.TXT  ;       Washington
print form=12.0 list = '26',Cen24045  , FILE = SUMMARY6.TXT  ;         Wicomico
print form=12.0 list = '27',Cen24047  , FILE = SUMMARY6.TXT  ;        Worcester
print form=12.0 list = '28',Cen24510  , FILE = SUMMARY6.TXT  ;   Baltimore City
print form=12.0 list = '30',ALLCen    , FILE = SUMMARY6.TXT  ;            TOTAL


;TOTALS By County
print form=14.0 list =  '5',TOT24001  , FILE = SUMMARY7.TXT  ;        Allegheny
print form=14.0 list =  '6',TOT24003  , FILE = SUMMARY7.TXT  ;     Anne Arundel
print form=14.0 list =  '7',TOT24005  , FILE = SUMMARY7.TXT  ;        Baltimore
print form=14.0 list =  '8',TOT24009  , FILE = SUMMARY7.TXT  ;          Calvert
print form=14.0 list =  '9',TOT24011  , FILE = SUMMARY7.TXT  ;         Caroline
print form=14.0 list = '10',TOT24013  , FILE = SUMMARY7.TXT  ;          Carroll
print form=14.0 list = '11',TOT24015  , FILE = SUMMARY7.TXT  ;            Cecil
print form=14.0 list = '12',TOT24017  , FILE = SUMMARY7.TXT  ;          Charles
print form=14.0 list = '13',TOT24019  , FILE = SUMMARY7.TXT  ;       Dorchester
print form=14.0 list = '14',TOT24021  , FILE = SUMMARY7.TXT  ;        Frederick
print form=14.0 list = '15',TOT24023  , FILE = SUMMARY7.TXT  ;          Garrett
print form=14.0 list = '16',TOT24025  , FILE = SUMMARY7.TXT  ;          Harford
print form=14.0 list = '17',TOT24027  , FILE = SUMMARY7.TXT  ;           Howard
print form=14.0 list = '18',TOT24029  , FILE = SUMMARY7.TXT  ;             Kent
print form=14.0 list = '19',TOT24031  , FILE = SUMMARY7.TXT  ;       Montgomery
print form=14.0 list = '20',TOT24033  , FILE = SUMMARY7.TXT  ;   Prince Georges
print form=14.0 list = '21',TOT24035  , FILE = SUMMARY7.TXT  ;      Queen Annes
print form=14.0 list = '22',TOT24037  , FILE = SUMMARY7.TXT  ;        St. Marys
print form=14.0 list = '23',TOT24039  , FILE = SUMMARY7.TXT  ;         Somerset
print form=14.0 list = '24',TOT24041  , FILE = SUMMARY7.TXT  ;           Talbot
print form=14.0 list = '25',TOT24043  , FILE = SUMMARY7.TXT  ;       Washington
print form=14.0 list = '26',TOT24045  , FILE = SUMMARY7.TXT  ;         Wicomico
print form=14.0 list = '27',TOT24047  , FILE = SUMMARY7.TXT  ;        Worcester
print form=14.0 list = '28',TOT24510  , FILE = SUMMARY7.TXT  ;   Baltimore City
print form=14.0 list = '30',ALLTOT    , FILE = SUMMARY7.TXT  ;            TOTAL

;Print Note About Ramps & Centroid Connectors
```

County_VMT_Summary.s

```
print form=12.0 list = '31',ALLRmp    , FILE = SUMMARY8.TXT  ; Ramps Only
print form=12.0 list = '32',CentOnly  , FILE = SUMMARY9.TXT  ; Centroid Connectors Only
ENDRUN

;-------------------------------------------------------------------------------
;  PRINT HEADERS
;-------------------------------------------------------------------------------

 RUN PGM=MATRIX PRNFILE='..\@scenario@\Outputs\Validation - Summarize VMT by County Step 3.PRN'  MSG='Validation - Summarize VMT by County'
ZONES=@RowSize@

 IF (I = 1)

   Print Form=90.L list = '\n',
                         ' ====================================================================================================''\n','\n',
                         ' ==                        Maryland Statewide Transportation Model (MSTM) version 1.0                ==''\n','\n',
                         ' ==                             STATEWIDE AVERAGE WEEKDAY VMT SUMMARY REPORT                         ==''\n','\n',
                         ' ====================================================================================================''\n','\n','\n',
                         '                                                              Scenario: @SCENARIO@ / @ITERS@ / @MaxIterns@ ''\n','\n','\n','\n','\n',
                         '                             Freeway/    Principal     Minor                  Local/          ''\n','\n',
                         '           County   Interstate  Expressway   Arterial    Arterial   Collector   Centroid      TOTAL ''\n','\n',
                         ' ====================================================================================================''\n','\n',

 File=..\@Scenario@\@Scenario@_VMT_Summary.txt

 ENDIF

 ZDATI[1]  = SUMMARY1.txt  , Z=#1, Col1Data  = #2
 ZDATI[2]  = SUMMARY2.txt  , Z=#1, Col2Data  = #2
 ZDATI[3]  = SUMMARY3.txt  , Z=#1, Col3Data  = #2
 ZDATI[4]  = SUMMARY4.txt  , Z=#1, Col4Data  = #2
 ZDATI[5]  = SUMMARY5.txt  , Z=#1, Col5Data  = #2
 ZDATI[6]  = SUMMARY6.txt  , Z=#1, Col6Data  = #2
 ZDATI[7]  = SUMMARY7.txt  , Z=#1, Col7Data  = #2
 ZDATI[8]  = SUMMARY8.txt  , Z=#1, Col8Data  = #2
 ZDATI[9]  = SUMMARY9.txt  , Z=#1, Col9Data  = #2

 ; Define Table Text for each row:
IF (I = 5) ROWLABLE='        Alleghany'
IF (I = 6) ROWLABLE='     Anne Arundel'
IF (I = 7) ROWLABLE='        Baltimore'
IF (I = 8) ROWLABLE='          Calvert'
IF (I = 9) ROWLABLE='         Caroline'
IF (I =10) ROWLABLE='          Carroll'
IF (I =11) ROWLABLE='            Cecil'
IF (I =12) ROWLABLE='          Charles'
IF (I =13) ROWLABLE='        Dorchester'
IF (I =14) ROWLABLE='        Frederick'
IF (I =15) ROWLABLE='          Garrett'
IF (I =16) ROWLABLE='          Harford'
IF (I =17) ROWLABLE='           Howard'
IF (I =18) ROWLABLE='             Kent'
IF (I =19) ROWLABLE='       Montgomery'
IF (I =20) ROWLABLE='  Prince Georges'
IF (I =21) ROWLABLE='     Queen Annes'
IF (I =22) ROWLABLE='       St. Marys'
IF (I =23) ROWLABLE='         Somerset'
IF (I =24) ROWLABLE='           Talbot'
IF (I =25) ROWLABLE='       Washington'
IF (I =26) ROWLABLE='         Wicomico'
IF (I =27) ROWLABLE='         Worcester'
IF (I =28) ROWLABLE='  Baltimore City'
IF (I =29) ROWLABLE=''
IF (I =30) ROWLABLE='            TOTAL'
IF (I =31) ROWLABLE='  NOTES: The interstate VMT includes the following ramp VMT:'
```

County_VMT_Summary.s

```
IF (I =32) ROWLABLE=''


;Print Vehicle Trip Summaries
IF (I=29)
    Print Form=90.L list = ' ===================================================================================================================''\n','\n',
        File = ..\@Scenario@\@Scenario@_VMT_Summary.txt
ENDIF
IF (I=32)
    Print Form=90.L list = '            Collector, Local and Centroid Connector VMT have not been validated',
        File = ..\@Scenario@\@Scenario@_VMT_Summary.txt
ENDIF
IF (I=5-28,30)
    Print Form = 13.0csv list = RowLable,Col1Data,Col2Data,Col3Data,Col4Data,Col5Data,Col6Data,Col7Data,
        File = ..\@Scenario@\@Scenario@_VMT_Summary.txt
ENDIF

;Ramp Volume Note
IF (I=31)
    Print Form = 10.0csv list = RowLable,Col8Data,
        File = ..\@Scenario@\@Scenario@_VMT_Summary.txt
ENDIF

;Add 3 Spaces
IF (I=30)
    Print list = '\n','\n','\n',
        File = ..\@Scenario@\@Scenario@_VMT_Summary.txt
ENDIF
ENDRUN

*del summary1.txt
*del summary2.txt
*del summary3.txt
*del summary4.txt
*del summary5.txt
*del summary6.txt
*del summary7.txt
*del summary8.txt
*del summary9.txt
```

County_VHT_Summary.s

```
; Maryland Statewide Travel Demand Model (MSTM)
; Script: Model Summary
; Mark Radovic mradovic@sha.state.md.us
;========================================================================
;Set Parameters:

READ File = '..\stamp.log'

MDzones    = 1179; Maryland only SMZs
RowSize    = 40  ; Number of Rows in the Table
;
;------------------------------------------------------------------------
;  VHT SUMMARY
;------------------------------------------------------------------------
RUN PGM=NETWORK

NETI=..\@scenario@\Outputs\MSTM_Veh_Dly.net
      ;SWFT_____
      ;  1 = Interstate
      ;  2 = Freeway
      ;  3 = Expressway
      ;  4 = Major Arterial
      ;  5 = Minor Arterial
      ;  6 = Collector
      ;  7 = Unused
      ;  8 = Medium Speed Ramps
      ;  9 = High Speed Ramps
      ; 10 = Local Roads
      ; 11 = Centroid Connector

IF (SWFT <= 11)                 ; Includes centroid connectors
IF (FIPS > 24000 & FIPS <24511)    ; Maryland Only

; VHT CALCULATIONS

        AM_VEHS = AM_AUTOS + AM_COMVEH + AM_sdSUT + AM_sdMUT + AM_ldTRK + AM_ldAUTO
        MD_VEHS = MD_AUTOS + MD_COMVEH + MD_sdSUT + MD_sdMUT + MD_ldTRK + MD_ldAUTO
        PM_VEHS = PM_AUTOS + PM_COMVEH + PM_sdSUT + PM_sdMUT + PM_ldTRK + PM_ldAUTO
        NT_VEHS = NT_AUTOS + NT_COMVEH + NT_sdSUT + NT_sdMUT + NT_ldTRK + NT_ldAUTO

        IF (CONGSPD_AM > 0 && CONGSPD_MD > 0 && CONGSPD_PM > 0 && CONGSPD_NT > 0 )
          Tot_VHT = AM_VEHS*(Distance/CONGSPD_AM)+ MD_VEHS*(Distance/CONGSPD_MD)+ PM_VEHS*(Distance/CONGSPD_PM)+ NT_VEHS*(Distance/CONGSPD_NT)
          _Tot_VHT = _Tot_VHT + Tot_VHT
        ENDIF


        IF (SWFT = 1 || SWFT = 8 || SWFT = 9) SWFT1 = 1   ; Ramps added to Interstates
        IF (SWFT = 2 || SWFT = 3)             SWFT1 = 2
        IF (SWFT = 4)                         SWFT1 = 3
        IF (SWFT = 5)                         SWFT1 = 4
        IF (SWFT = 6)                         SWFT1 = 5
        IF (SWFT = 10 || SWFT = 11)           SWFT1 = 6   ; Locals and Centroids added together
;
        IF (SWFT =  8 || SWFT = 9)            SWFT2 = 1   ; Calculate Ramps Only

; Interstates for All Counties
        IF (SWFT1 = 1 & FIPS = 24001) _24001Int = round(_24001Int + Tot_VHT) ;     Allegheny
        IF (SWFT1 = 1 & FIPS = 24003) _24003Int = round(_24003Int + Tot_VHT) ;   Anne Arundel
        IF (SWFT1 = 1 & FIPS = 24005) _24005Int = round(_24005Int + Tot_VHT) ;     Baltimore
        IF (SWFT1 = 1 & FIPS = 24009) _24009Int = round(_24009Int + Tot_VHT) ;     Calvert
        IF (SWFT1 = 1 & FIPS = 24011) _24011Int = round(_24011Int + Tot_VHT) ;     Caroline
        IF (SWFT1 = 1 & FIPS = 24013) _24013Int = round(_24013Int + Tot_VHT) ;     Carroll
        IF (SWFT1 = 1 & FIPS = 24015) _24015Int = round(_24015Int + Tot_VHT) ;     Cecil
        IF (SWFT1 = 1 & FIPS = 24017) _24017Int = round(_24017Int + Tot_VHT) ;     Charles
        IF (SWFT1 = 1 & FIPS = 24019) _24019Int = round(_24019Int + Tot_VHT) ;     Dorchester
```

County_VHT_Summary.s

```
        IF (SWFT1 = 1 & FIPS = 24021) _24021Int = round(_24021Int + Tot_VHT)  ;       Frederick
        IF (SWFT1 = 1 & FIPS = 24023) _24023Int = round(_24023Int + Tot_VHT)  ;         Garrett
        IF (SWFT1 = 1 & FIPS = 24025) _24025Int = round(_24025Int + Tot_VHT)  ;         Harford
        IF (SWFT1 = 1 & FIPS = 24027) _24027Int = round(_24027Int + Tot_VHT)  ;          Howard
        IF (SWFT1 = 1 & FIPS = 24029) _24029Int = round(_24029Int + Tot_VHT)  ;            Kent
        IF (SWFT1 = 1 & FIPS = 24031) _24031Int = round(_24031Int + Tot_VHT)  ;      Montgomery
        IF (SWFT1 = 1 & FIPS = 24033) _24033Int = round(_24033Int + Tot_VHT)  ; Prince Georges
        IF (SWFT1 = 1 & FIPS = 24035) _24035Int = round(_24035Int + Tot_VHT)  ;    Queen Annes
        IF (SWFT1 = 1 & FIPS = 24037) _24037Int = round(_24037Int + Tot_VHT)  ;       St. Marys
        IF (SWFT1 = 1 & FIPS = 24039) _24039Int = round(_24039Int + Tot_VHT)  ;        Somerset
        IF (SWFT1 = 1 & FIPS = 24041) _24041Int = round(_24041Int + Tot_VHT)  ;          Talbot
        IF (SWFT1 = 1 & FIPS = 24043) _24043Int = round(_24043Int + Tot_VHT)  ;      Washington
        IF (SWFT1 = 1 & FIPS = 24045) _24045Int = round(_24045Int + Tot_VHT)  ;        Wicomico
        IF (SWFT1 = 1 & FIPS = 24047) _24047Int = round(_24047Int + Tot_VHT)  ;       Worcester
        IF (SWFT1 = 1 & FIPS = 24510) _24510Int = round(_24510Int + Tot_VHT)  ; Baltimore City


; Freeways/Expressways for All Counties
        IF (SWFT1 = 2 & FIPS = 24001) _24001Exp = _24001Exp + Tot_VHT         ;       Allegheny
        IF (SWFT1 = 2 & FIPS = 24003) _24003Exp = _24003Exp + Tot_VHT         ;    Anne Arundel
        IF (SWFT1 = 2 & FIPS = 24005) _24005Exp = _24005Exp + Tot_VHT         ;       Baltimore
        IF (SWFT1 = 2 & FIPS = 24009) _24009Exp = _24009Exp + Tot_VHT         ;          Calvert
        IF (SWFT1 = 2 & FIPS = 24011) _24011Exp = _24011Exp + Tot_VHT         ;        Caroline
        IF (SWFT1 = 2 & FIPS = 24013) _24013Exp = _24013Exp + Tot_VHT         ;          Carroll
        IF (SWFT1 = 2 & FIPS = 24015) _24015Exp = _24015Exp + Tot_VHT         ;           Cecil
        IF (SWFT1 = 2 & FIPS = 24017) _24017Exp = _24017Exp + Tot_VHT         ;          Charles
        IF (SWFT1 = 2 & FIPS = 24019) _24019Exp = _24019Exp + Tot_VHT         ;       Dorchester
        IF (SWFT1 = 2 & FIPS = 24021) _24021Exp = _24021Exp + Tot_VHT         ;        Frederick
        IF (SWFT1 = 2 & FIPS = 24023) _24023Exp = _24023Exp + Tot_VHT         ;          Garrett
        IF (SWFT1 = 2 & FIPS = 24025) _24025Exp = _24025Exp + Tot_VHT         ;          Harford
        IF (SWFT1 = 2 & FIPS = 24027) _24027Exp = _24027Exp + Tot_VHT         ;           Howard
        IF (SWFT1 = 2 & FIPS = 24029) _24029Exp = _24029Exp + Tot_VHT         ;             Kent
        IF (SWFT1 = 2 & FIPS = 24031) _24031Exp = _24031Exp + Tot_VHT         ;       Montgomery
        IF (SWFT1 = 2 & FIPS = 24033) _24033Exp = _24033Exp + Tot_VHT         ; Prince Georges
        IF (SWFT1 = 2 & FIPS = 24035) _24035Exp = _24035Exp + Tot_VHT         ;     Queen Annes
        IF (SWFT1 = 2 & FIPS = 24037) _24037Exp = _24037Exp + Tot_VHT         ;        St. Marys
        IF (SWFT1 = 2 & FIPS = 24039) _24039Exp = _24039Exp + Tot_VHT         ;         Somerset
        IF (SWFT1 = 2 & FIPS = 24041) _24041Exp = _24041Exp + Tot_VHT         ;           Talbot
        IF (SWFT1 = 2 & FIPS = 24043) _24043Exp = _24043Exp + Tot_VHT         ;       Washington
        IF (SWFT1 = 2 & FIPS = 24045) _24045Exp = _24045Exp + Tot_VHT         ;         Wicomico
        IF (SWFT1 = 2 & FIPS = 24047) _24047Exp = _24047Exp + Tot_VHT         ;        Worcester
        IF (SWFT1 = 2 & FIPS = 24510) _24510Exp = _24510Exp + Tot_VHT         ; Baltimore City


; Principal Arterials for All Counties
        IF (SWFT1 = 3 & FIPS = 24001) _24001ArtP = _24001ArtP + Tot_VHT       ;       Allegheny
        IF (SWFT1 = 3 & FIPS = 24003) _24003ArtP = _24003ArtP + Tot_VHT       ;    Anne Arundel
        IF (SWFT1 = 3 & FIPS = 24005) _24005ArtP = _24005ArtP + Tot_VHT       ;       Baltimore
        IF (SWFT1 = 3 & FIPS = 24009) _24009ArtP = _24009ArtP + Tot_VHT       ;          Calvert
        IF (SWFT1 = 3 & FIPS = 24011) _24011ArtP = _24011ArtP + Tot_VHT       ;        Caroline
        IF (SWFT1 = 3 & FIPS = 24013) _24013ArtP = _24013ArtP + Tot_VHT       ;          Carroll
        IF (SWFT1 = 3 & FIPS = 24015) _24015ArtP = _24015ArtP + Tot_VHT       ;           Cecil
        IF (SWFT1 = 3 & FIPS = 24017) _24017ArtP = _24017ArtP + Tot_VHT       ;          Charles
        IF (SWFT1 = 3 & FIPS = 24019) _24019ArtP = _24019ArtP + Tot_VHT       ;       Dorchester
        IF (SWFT1 = 3 & FIPS = 24021) _24021ArtP = _24021ArtP + Tot_VHT       ;        Frederick
        IF (SWFT1 = 3 & FIPS = 24023) _24023ArtP = _24023ArtP + Tot_VHT       ;          Garrett
        IF (SWFT1 = 3 & FIPS = 24025) _24025ArtP = _24025ArtP + Tot_VHT       ;          Harford
        IF (SWFT1 = 3 & FIPS = 24027) _24027ArtP = _24027ArtP + Tot_VHT       ;           Howard
        IF (SWFT1 = 3 & FIPS = 24029) _24029ArtP = _24029ArtP + Tot_VHT       ;             Kent
        IF (SWFT1 = 3 & FIPS = 24031) _24031ArtP = _24031ArtP + Tot_VHT       ;       Montgomery
        IF (SWFT1 = 3 & FIPS = 24033) _24033ArtP = _24033ArtP + Tot_VHT       ; Prince Georges
        IF (SWFT1 = 3 & FIPS = 24035) _24035ArtP = _24035ArtP + Tot_VHT       ;     Queen Annes
        IF (SWFT1 = 3 & FIPS = 24037) _24037ArtP = _24037ArtP + Tot_VHT       ;        St. Marys
        IF (SWFT1 = 3 & FIPS = 24039) _24039ArtP = _24039ArtP + Tot_VHT       ;         Somerset
        IF (SWFT1 = 3 & FIPS = 24041) _24041ArtP = _24041ArtP + Tot_VHT       ;           Talbot
        IF (SWFT1 = 3 & FIPS = 24043) _24043ArtP = _24043ArtP + Tot_VHT       ;       Washington
        IF (SWFT1 = 3 & FIPS = 24045) _24045ArtP = _24045ArtP + Tot_VHT       ;         Wicomico
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County_VHT_Summary.s

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        IF (SWFT1 = 3 & FIPS = 24047) _24047ArtP = _24047ArtP + Tot_VHT        ;        Worcester
        IF (SWFT1 = 3 & FIPS = 24510) _24510ArtP = _24510ArtP + Tot_VHT        ;    Baltimore City


; Minor Arterials for All Counties
        IF (SWFT1 = 4 & FIPS = 24001) _24001ArtM = _24001ArtM + Tot_VHT        ;        Allegheny
        IF (SWFT1 = 4 & FIPS = 24003) _24003ArtM = _24003ArtM + Tot_VHT        ;      Anne Arundel
        IF (SWFT1 = 4 & FIPS = 24005) _24005ArtM = _24005ArtM + Tot_VHT        ;        Baltimore
        IF (SWFT1 = 4 & FIPS = 24009) _24009ArtM = _24009ArtM + Tot_VHT        ;         Calvert
        IF (SWFT1 = 4 & FIPS = 24011) _24011ArtM = _24011ArtM + Tot_VHT        ;        Caroline
        IF (SWFT1 = 4 & FIPS = 24013) _24013ArtM = _24013ArtM + Tot_VHT        ;         Carroll
        IF (SWFT1 = 4 & FIPS = 24015) _24015ArtM = _24015ArtM + Tot_VHT        ;          Cecil
        IF (SWFT1 = 4 & FIPS = 24017) _24017ArtM = _24017ArtM + Tot_VHT        ;         Charles
        IF (SWFT1 = 4 & FIPS = 24019) _24019ArtM = _24019ArtM + Tot_VHT        ;       Dorchester
        IF (SWFT1 = 4 & FIPS = 24021) _24021ArtM = _24021ArtM + Tot_VHT        ;        Frederick
        IF (SWFT1 = 4 & FIPS = 24023) _24023ArtM = _24023ArtM + Tot_VHT        ;         Garrett
        IF (SWFT1 = 4 & FIPS = 24025) _24025ArtM = _24025ArtM + Tot_VHT        ;         Harford
        IF (SWFT1 = 4 & FIPS = 24027) _24027ArtM = _24027ArtM + Tot_VHT        ;         Howard
        IF (SWFT1 = 4 & FIPS = 24029) _24029ArtM = _24029ArtM + Tot_VHT        ;           Kent
        IF (SWFT1 = 4 & FIPS = 24031) _24031ArtM = _24031ArtM + Tot_VHT        ;      Montgomery
        IF (SWFT1 = 4 & FIPS = 24033) _24033ArtM = _24033ArtM + Tot_VHT        ; Prince Georges
        IF (SWFT1 = 4 & FIPS = 24035) _24035ArtM = _24035ArtM + Tot_VHT        ;     Queen Annes
        IF (SWFT1 = 4 & FIPS = 24037) _24037ArtM = _24037ArtM + Tot_VHT        ;       St. Marys
        IF (SWFT1 = 4 & FIPS = 24039) _24039ArtM = _24039ArtM + Tot_VHT        ;        Somerset
        IF (SWFT1 = 4 & FIPS = 24041) _24041ArtM = _24041ArtM + Tot_VHT        ;          Talbot
        IF (SWFT1 = 4 & FIPS = 24043) _24043ArtM = _24043ArtM + Tot_VHT        ;       Washington
        IF (SWFT1 = 4 & FIPS = 24045) _24045ArtM = _24045ArtM + Tot_VHT        ;        Wicomico
        IF (SWFT1 = 4 & FIPS = 24047) _24047ArtM = _24047ArtM + Tot_VHT        ;        Worcester
        IF (SWFT1 = 4 & FIPS = 24510) _24510ArtM = _24510ArtM + Tot_VHT        ;    Baltimore City


; Collectors for All Counties
        IF (SWFT1 = 5 & FIPS = 24001) _24001Col = _24001Col + Tot_VHT        ;        Allegheny
        IF (SWFT1 = 5 & FIPS = 24003) _24003Col = _24003Col + Tot_VHT        ;      Anne Arundel
        IF (SWFT1 = 5 & FIPS = 24005) _24005Col = _24005Col + Tot_VHT        ;        Baltimore
        IF (SWFT1 = 5 & FIPS = 24009) _24009Col = _24009Col + Tot_VHT        ;         Calvert
        IF (SWFT1 = 5 & FIPS = 24011) _24011Col = _24011Col + Tot_VHT        ;        Caroline
        IF (SWFT1 = 5 & FIPS = 24013) _24013Col = _24013Col + Tot_VHT        ;         Carroll
        IF (SWFT1 = 5 & FIPS = 24015) _24015Col = _24015Col + Tot_VHT        ;          Cecil
        IF (SWFT1 = 5 & FIPS = 24017) _24017Col = _24017Col + Tot_VHT        ;         Charles
        IF (SWFT1 = 5 & FIPS = 24019) _24019Col = _24019Col + Tot_VHT        ;       Dorchester
        IF (SWFT1 = 5 & FIPS = 24021) _24021Col = _24021Col + Tot_VHT        ;        Frederick
        IF (SWFT1 = 5 & FIPS = 24023) _24023Col = _24023Col + Tot_VHT        ;         Garrett
        IF (SWFT1 = 5 & FIPS = 24025) _24025Col = _24025Col + Tot_VHT        ;         Harford
        IF (SWFT1 = 5 & FIPS = 24027) _24027Col = _24027Col + Tot_VHT        ;         Howard
        IF (SWFT1 = 5 & FIPS = 24029) _24029Col = _24029Col + Tot_VHT        ;           Kent
        IF (SWFT1 = 5 & FIPS = 24031) _24031Col = _24031Col + Tot_VHT        ;      Montgomery
        IF (SWFT1 = 5 & FIPS = 24033) _24033Col = _24033Col + Tot_VHT        ; Prince Georges
        IF (SWFT1 = 5 & FIPS = 24035) _24035Col = _24035Col + Tot_VHT        ;     Queen Annes
        IF (SWFT1 = 5 & FIPS = 24037) _24037Col = _24037Col + Tot_VHT        ;       St. Marys
        IF (SWFT1 = 5 & FIPS = 24039) _24039Col = _24039Col + Tot_VHT        ;        Somerset
        IF (SWFT1 = 5 & FIPS = 24041) _24041Col = _24041Col + Tot_VHT        ;          Talbot
        IF (SWFT1 = 5 & FIPS = 24043) _24043Col = _24043Col + Tot_VHT        ;       Washington
        IF (SWFT1 = 5 & FIPS = 24045) _24045Col = _24045Col + Tot_VHT        ;        Wicomico
        IF (SWFT1 = 5 & FIPS = 24047) _24047Col = _24047Col + Tot_VHT        ;        Worcester
        IF (SWFT1 = 5 & FIPS = 24510) _24510Col = _24510Col + Tot_VHT        ;    Baltimore City


; Centroid Connectors/Local Roads
        IF (SWFT1 = 6 & FIPS = 24001) _24001Cen = _24001Cen + Tot_VHT        ;        Allegheny
        IF (SWFT1 = 6 & FIPS = 24003) _24003Cen = _24003Cen + Tot_VHT        ;      Anne Arundel
        IF (SWFT1 = 6 & FIPS = 24005) _24005Cen = _24005Cen + Tot_VHT        ;        Baltimore
        IF (SWFT1 = 6 & FIPS = 24009) _24009Cen = _24009Cen + Tot_VHT        ;         Calvert
        IF (SWFT1 = 6 & FIPS = 24011) _24011Cen = _24011Cen + Tot_VHT        ;        Caroline
        IF (SWFT1 = 6 & FIPS = 24013) _24013Cen = _24013Cen + Tot_VHT        ;         Carroll
        IF (SWFT1 = 6 & FIPS = 24015) _24015Cen = _24015Cen + Tot_VHT        ;          Cecil
        IF (SWFT1 = 6 & FIPS = 24017) _24017Cen = _24017Cen + Tot_VHT        ;         Charles
        IF (SWFT1 = 6 & FIPS = 24019) _24019Cen = _24019Cen + Tot_VHT        ;       Dorchester
```

County_VHT_Summary.s

```
        IF (SWFT1 = 6 & FIPS = 24021) _24021Cen = _24021Cen + Tot_VHT          ;         Frederick
        IF (SWFT1 = 6 & FIPS = 24023) _24023Cen = _24023Cen + Tot_VHT          ;           Garrett
        IF (SWFT1 = 6 & FIPS = 24025) _24025Cen = _24025Cen + Tot_VHT          ;           Harford
        IF (SWFT1 = 6 & FIPS = 24027) _24027Cen = _24027Cen + Tot_VHT          ;            Howard
        IF (SWFT1 = 6 & FIPS = 24029) _24029Cen = _24029Cen + Tot_VHT          ;              Kent
        IF (SWFT1 = 6 & FIPS = 24031) _24031Cen = _24031Cen + Tot_VHT          ;        Montgomery
        IF (SWFT1 = 6 & FIPS = 24033) _24033Cen = _24033Cen + Tot_VHT          ; Prince Georges
        IF (SWFT1 = 6 & FIPS = 24035) _24035Cen = _24035Cen + Tot_VHT          ;      Queen Annes
        IF (SWFT1 = 6 & FIPS = 24037) _24037Cen = _24037Cen + Tot_VHT          ;         St. Marys
        IF (SWFT1 = 6 & FIPS = 24039) _24039Cen = _24039Cen + Tot_VHT          ;          Somerset
        IF (SWFT1 = 6 & FIPS = 24041) _24041Cen = _24041Cen + Tot_VHT          ;            Talbot
        IF (SWFT1 = 6 & FIPS = 24043) _24043Cen = _24043Cen + Tot_VHT          ;        Washington
        IF (SWFT1 = 6 & FIPS = 24045) _24045Cen = _24045Cen + Tot_VHT          ;          Wicomico
        IF (SWFT1 = 6 & FIPS = 24047) _24047Cen = _24047Cen + Tot_VHT          ;         Worcester
        IF (SWFT1 = 6 & FIPS = 24510) _24510Cen = _24510Cen + Tot_VHT          ; Baltimore City


;Facility Type Totals
        IF ((FIPS > 24000 & FIPS < 24511) & SWFT1  = 1) _ALLInt = _ALLInt + Tot_VHT
        IF ((FIPS > 24000 & FIPS < 24511) & SWFT1  = 2) _ALLExp = _ALLExp + Tot_VHT
        IF ((FIPS > 24000 & FIPS < 24511) & SWFT1  = 3) _ALLArtP = _ALLArtP + Tot_VHT
        IF ((FIPS > 24000 & FIPS < 24511) & SWFT1  = 4) _ALLArtM = _ALLArtM + Tot_VHT
        IF ((FIPS > 24000 & FIPS < 24511) & SWFT1  = 5) _ALLCol  = _ALLCol  + Tot_VHT
        IF ((FIPS > 24000 & FIPS < 24511) & SWFT1  = 6) _ALLCen  = _ALLCen  + Tot_VHT
        IF ((FIPS > 24000 & FIPS < 24511) & SWFT1 <=6) _ALLTOT  = _ALLTOT  + Tot_VHT
        IF ((FIPS > 24000 & FIPS < 24511) & SWFT2  = 1) _ALLRmp  = _ALLRmp  + Tot_VHT   ;Ramps Only


;County Totals
        IF (FIPS = 24001 & SWFT1 <=6) _TOT24001 = _TOT24001 + Tot_VHT
        IF (FIPS = 24003 & SWFT1 <=6) _TOT24003 = _TOT24003 + Tot_VHT
        IF (FIPS = 24005 & SWFT1 <=6) _TOT24005 = _TOT24005 + Tot_VHT
        IF (FIPS = 24009 & SWFT1 <=6) _TOT24009 = _TOT24009 + Tot_VHT
        IF (FIPS = 24011 & SWFT1 <=6) _TOT24011 = _TOT24011 + Tot_VHT
        IF (FIPS = 24003 & SWFT1 <=6) _TOT24013 = _TOT24013 + Tot_VHT
        IF (FIPS = 24015 & SWFT1 <=6) _TOT24015 = _TOT24015 + Tot_VHT
        IF (FIPS = 24017 & SWFT1 <=6) _TOT24017 = _TOT24017 + Tot_VHT
        IF (FIPS = 24019 & SWFT1 <=6) _TOT24019 = _TOT24019 + Tot_VHT
        IF (FIPS = 24021 & SWFT1 <=6) _TOT24021 = _TOT24021 + Tot_VHT
        IF (FIPS = 24023 & SWFT1 <=6) _TOT24023 = _TOT24023 + Tot_VHT
        IF (FIPS = 24025 & SWFT1 <=6) _TOT24025 = _TOT24025 + Tot_VHT
        IF (FIPS = 24027 & SWFT1 <=6) _TOT24027 = _TOT24027 + Tot_VHT
        IF (FIPS = 24029 & SWFT1 <=6) _TOT24029 = _TOT24029 + Tot_VHT
        IF (FIPS = 24031 & SWFT1 <=6) _TOT24031 = _TOT24031 + Tot_VHT
        IF (FIPS = 24033 & SWFT1 <=6) _TOT24033 = _TOT24033 + Tot_VHT
        IF (FIPS = 24035 & SWFT1 <=6) _TOT24035 = _TOT24035 + Tot_VHT
        IF (FIPS = 24037 & SWFT1 <=6) _TOT24037 = _TOT24037 + Tot_VHT
        IF (FIPS = 24039 & SWFT1 <=6) _TOT24039 = _TOT24039 + Tot_VHT
        IF (FIPS = 24041 & SWFT1 <=6) _TOT24041 = _TOT24041 + Tot_VHT
        IF (FIPS = 24043 & SWFT1 <=6) _TOT24043 = _TOT24043 + Tot_VHT
        IF (FIPS = 24045 & SWFT1 <=6) _TOT24045 = _TOT24045 + Tot_VHT
        IF (FIPS = 24047 & SWFT1 <=6) _TOT24047 = _TOT24047 + Tot_VHT
        IF (FIPS = 24510 & SWFT1 <=6) _TOT24510 = _TOT24510 + Tot_VHT


   ;  Save VHT to variable for export
   LOG PREFIX=HWY,
   VAR= _24001Int,_24001Exp,_24001ArtP,_24001ArtM,_24001Col,_24001Cen,
        _24003Int,_24003Exp,_24003ArtP,_24003ArtM,_24003Col,_24003Cen,
        _24005Int,_24005Exp,_24005ArtP,_24005ArtM,_24005Col,_24005Cen,
        _24009Int,_24009Exp,_24009ArtP,_24009ArtM,_24009Col,_24009Cen,
        _24011Int,_24011Exp,_24011ArtP,_24011ArtM,_24011Col,_24011Cen,
        _24013Int,_24013Exp,_24013ArtP,_24013ArtM,_24013Col,_24013Cen,
        _24015Int,_24015Exp,_24015ArtP,_24015ArtM,_24015Col,_24015Cen,
        _24017Int,_24017Exp,_24017ArtP,_24017ArtM,_24017Col,_24017Cen,
        _24019Int,_24019Exp,_24019ArtP,_24019ArtM,_24019Col,_24019Cen,
        _24021Int,_24021Exp,_24021ArtP,_24021ArtM,_24021Col,_24021Cen,
        _24023Int,_24023Exp,_24023ArtP,_24023ArtM,_24023Col,_24023Cen,
```

County_VHT_Summary.s

```
            _24025Int,_24025Exp,_24025ArtP,_24025ArtM,_24025Col,_24025Cen,
            _24027Int,_24027Exp,_24027ArtP,_24027ArtM,_24027Col,_24027Cen,
            _24029Int,_24029Exp,_24029ArtP,_24029ArtM,_24029Col,_24029Cen,
            _24031Int,_24031Exp,_24031ArtP,_24031ArtM,_24031Col,_24031Cen,
            _24033Int,_24033Exp,_24033ArtP,_24033ArtM,_24033Col,_24033Cen
       LOG PREFIX=HWY2,
       VAR=  _24035Int,_24035Exp,_24035ArtP,_24035ArtM,_24035Col,_24035Cen,
            _24037Int,_24037Exp,_24037ArtP,_24037ArtM,_24037Col,_24037Cen,
            _24039Int,_24039Exp,_24039ArtP,_24039ArtM,_24039Col,_24039Cen,
            _24041Int,_24041Exp,_24041ArtP,_24041ArtM,_24041Col,_24041Cen,
            _24043Int,_24043Exp,_24043ArtP,_24043ArtM,_24043Col,_24043Cen,
            _24045Int,_24045Exp,_24045ArtP,_24045ArtM,_24045Col,_24045Cen,
            _24047Int,_24047Exp,_24047ArtP,_24047ArtM,_24047Col,_24047Cen,
            _24510Int,_24510Exp,_24510ArtP,_24510ArtM,_24510Col,_24510Cen,
            _ALLInt,_ALLExp,_ALLArtP,_ALLArtM,_ALLCol,_ALLCen,_ALLTOT,_ALLRmp,
            _TOT24001,_TOT24003,_TOT24005,_TOT24009,_TOT24011,_TOT24013,
            _TOT24015,_TOT24017,_TOT24019,_TOT24021,_TOT24023,_TOT24025,
            _TOT24027,_TOT24029,_TOT24031,_TOT24033,_TOT24035,_TOT24037,
            _TOT24039,_TOT24041,_TOT24043,_TOT24045,_TOT24047,_TOT24510

ENDIF
ENDIF
ENDRUN

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 Int24003 = HWY._24003Int
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 Exp24013 = HWY._24013Exp
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 Exp24027 = HWY._24027Exp
 Exp24029 = HWY._24029Exp
 Exp24031 = HWY._24031Exp
 Exp24033 = HWY._24033Exp
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County_VHT_Summary.s

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Exp24039 = HWY2._24039Exp
Exp24041 = HWY2._24041Exp
Exp24043 = HWY2._24043Exp
Exp24045 = HWY2._24045Exp
Exp24047 = HWY2._24047Exp
Exp24510 = HWY2._24510Exp

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ArtP24039 = HWY2._24039ArtP
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ArtP24043 = HWY2._24043ArtP
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County_VHT_Summary.s

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Col24045 = HWY2._24045Col
Col24047 = HWY2._24047Col
Col24510 = HWY2._24510Col

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Cen24013 = HWY._24013Cen
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Cen24039 = HWY2._24039Cen
Cen24041 = HWY2._24041Cen
Cen24043 = HWY2._24043Cen
Cen24045 = HWY2._24045Cen
Cen24047 = HWY2._24047Cen
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TOT24011 = HWY2._TOT24011
TOT24013 = HWY2._TOT24013
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TOT24021 = HWY2._TOT24021
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TOT24025 = HWY2._TOT24025
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County_VHT_Summary.s

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TOT24039 = HWY2._TOT24039
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TOT24045 = HWY2._TOT24045
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County_VHT_Summary.s

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ArtP24037 = @ArtP24037@
ArtP24039 = @ArtP24039@
ArtP24041 = @ArtP24041@
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ArtP24045 = @ArtP24045@
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ArtP24510 = @ArtP24510@

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County_VHT_Summary.s

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Cen24047 = @Cen24047@
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 ALLArtM = @ALLArtM@
  ALLCol = @ALLCol@
  ALLCen = @ALLCen@
  ALLTOT = @ALLTOT@
  ALLRmp = @ALLRmp@

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TOT24037 = @TOT24037@
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County_VHT_Summary.s

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 TOT24510 = @TOT24510@


;-------------------------------------------------------------------------------
;  SET UP FOR PRINTING
;-------------------------------------------------------------------------------

;Interstates By County
print form=12.0 list =  '5',Int24001  , FILE = SUMMARY1.TXT   ;       Allegheny
print form=12.0 list =  '6',Int24003  , FILE = SUMMARY1.TXT   ;     Anne Arundel
print form=12.0 list =  '7',Int24005  , FILE = SUMMARY1.TXT   ;       Baltimore
print form=12.0 list =  '8',Int24009  , FILE = SUMMARY1.TXT   ;        Calvert
print form=12.0 list =  '9',Int24011  , FILE = SUMMARY1.TXT   ;        Caroline
print form=12.0 list = '10',Int24013  , FILE = SUMMARY1.TXT   ;        Carroll
print form=12.0 list = '11',Int24015  , FILE = SUMMARY1.TXT   ;         Cecil
print form=12.0 list = '12',Int24017  , FILE = SUMMARY1.TXT   ;        Charles
print form=12.0 list = '13',Int24019  , FILE = SUMMARY1.TXT   ;       Dorchester
print form=12.0 list = '14',Int24021  , FILE = SUMMARY1.TXT   ;       Frederick
print form=12.0 list = '15',Int24023  , FILE = SUMMARY1.TXT   ;        Garrett
print form=12.0 list = '16',Int24025  , FILE = SUMMARY1.TXT   ;        Harford
print form=12.0 list = '17',Int24027  , FILE = SUMMARY1.TXT   ;        Howard
print form=12.0 list = '18',Int24029  , FILE = SUMMARY1.TXT   ;         Kent
print form=12.0 list = '19',Int24031  , FILE = SUMMARY1.TXT   ;       Montgomery
print form=12.0 list = '20',Int24033  , FILE = SUMMARY1.TXT   ; Prince Georges
print form=12.0 list = '21',Int24035  , FILE = SUMMARY1.TXT   ;     Queen Annes
print form=12.0 list = '22',Int24037  , FILE = SUMMARY1.TXT   ;       St. Marys
print form=12.0 list = '23',Int24039  , FILE = SUMMARY1.TXT   ;        Somerset
print form=12.0 list = '24',Int24041  , FILE = SUMMARY1.TXT   ;         Talbot
print form=12.0 list = '25',Int24043  , FILE = SUMMARY1.TXT   ;       Washington
print form=12.0 list = '26',Int24045  , FILE = SUMMARY1.TXT   ;        Wicomico
print form=12.0 list = '27',Int24047  , FILE = SUMMARY1.TXT   ;        Worcester
print form=12.0 list = '28',Int24510  , FILE = SUMMARY1.TXT   ; Baltimore City
print form=12.0 list = '30',ALLInt    , FILE = SUMMARY1.TXT   ;         TOTAL

;Freeways/Expressways By County
print form=12.0 list =  '5',Exp24001  , FILE = SUMMARY2.TXT   ;       Allegheny
print form=12.0 list =  '6',Exp24003  , FILE = SUMMARY2.TXT   ;     Anne Arundel
print form=12.0 list =  '7',Exp24005  , FILE = SUMMARY2.TXT   ;       Baltimore
print form=12.0 list =  '8',Exp24009  , FILE = SUMMARY2.TXT   ;        Calvert
print form=12.0 list =  '9',Exp24011  , FILE = SUMMARY2.TXT   ;        Caroline
print form=12.0 list = '10',Exp24013  , FILE = SUMMARY2.TXT   ;        Carroll
print form=12.0 list = '11',Exp24015  , FILE = SUMMARY2.TXT   ;         Cecil
print form=12.0 list = '12',Exp24017  , FILE = SUMMARY2.TXT   ;        Charles
print form=12.0 list = '13',Exp24019  , FILE = SUMMARY2.TXT   ;       Dorchester
print form=12.0 list = '14',Exp24021  , FILE = SUMMARY2.TXT   ;       Frederick
print form=12.0 list = '15',Exp24023  , FILE = SUMMARY2.TXT   ;        Garrett
print form=12.0 list = '16',Exp24025  , FILE = SUMMARY2.TXT   ;        Harford
print form=12.0 list = '17',Exp24027  , FILE = SUMMARY2.TXT   ;        Howard
print form=12.0 list = '18',Exp24029  , FILE = SUMMARY2.TXT   ;         Kent
print form=12.0 list = '19',Exp24031  , FILE = SUMMARY2.TXT   ;       Montgomery
print form=12.0 list = '20',Exp24033  , FILE = SUMMARY2.TXT   ; Prince Georges
print form=12.0 list = '21',Exp24035  , FILE = SUMMARY2.TXT   ;     Queen Annes
print form=12.0 list = '22',Exp24037  , FILE = SUMMARY2.TXT   ;       St. Marys
print form=12.0 list = '23',Exp24039  , FILE = SUMMARY2.TXT   ;        Somerset
print form=12.0 list = '24',Exp24041  , FILE = SUMMARY2.TXT   ;         Talbot
print form=12.0 list = '25',Exp24043  , FILE = SUMMARY2.TXT   ;       Washington
print form=12.0 list = '26',Exp24045  , FILE = SUMMARY2.TXT   ;        Wicomico
print form=12.0 list = '27',Exp24047  , FILE = SUMMARY2.TXT   ;        Worcester
print form=12.0 list = '28',Exp24510  , FILE = SUMMARY2.TXT   ; Baltimore City
print form=12.0 list = '30',ALLExp    , FILE = SUMMARY2.TXT   ;         TOTAL

;Principal Arterials By County
print form=12.0 list =  '5',ArtP24001 , FILE = SUMMARY3.TXT   ;       Allegheny
```

County_VHT_Summary.s

```
print form=12.0 list =  '6',ArtP24003 , FILE = SUMMARY3.TXT  ;     Anne Arundel
print form=12.0 list =  '7',ArtP24005 , FILE = SUMMARY3.TXT  ;        Baltimore
print form=12.0 list =  '8',ArtP24009 , FILE = SUMMARY3.TXT  ;          Calvert
print form=12.0 list =  '9',ArtP24011 , FILE = SUMMARY3.TXT  ;         Caroline
print form=12.0 list = '10',ArtP24013 , FILE = SUMMARY3.TXT  ;          Carroll
print form=12.0 list = '11',ArtP24015 , FILE = SUMMARY3.TXT  ;            Cecil
print form=12.0 list = '12',ArtP24017 , FILE = SUMMARY3.TXT  ;          Charles
print form=12.0 list = '13',ArtP24019 , FILE = SUMMARY3.TXT  ;       Dorchester
print form=12.0 list = '14',ArtP24021 , FILE = SUMMARY3.TXT  ;        Frederick
print form=12.0 list = '15',ArtP24023 , FILE = SUMMARY3.TXT  ;          Garrett
print form=12.0 list = '16',ArtP24025 , FILE = SUMMARY3.TXT  ;          Harford
print form=12.0 list = '17',ArtP24027 , FILE = SUMMARY3.TXT  ;          Howard
print form=12.0 list = '18',ArtP24029 , FILE = SUMMARY3.TXT  ;            Kent
print form=12.0 list = '19',ArtP24031 , FILE = SUMMARY3.TXT  ;       Montgomery
print form=12.0 list = '20',ArtP24033 , FILE = SUMMARY3.TXT  ;  Prince Georges
print form=12.0 list = '21',ArtP24035 , FILE = SUMMARY3.TXT  ;      Queen Annes
print form=12.0 list = '22',ArtP24037 , FILE = SUMMARY3.TXT  ;        St. Marys
print form=12.0 list = '23',ArtP24039 , FILE = SUMMARY3.TXT  ;         Somerset
print form=12.0 list = '24',ArtP24041 , FILE = SUMMARY3.TXT  ;           Talbot
print form=12.0 list = '25',ArtP24043 , FILE = SUMMARY3.TXT  ;       Washington
print form=12.0 list = '26',ArtP24045 , FILE = SUMMARY3.TXT  ;         Wicomico
print form=12.0 list = '27',ArtP24047 , FILE = SUMMARY3.TXT  ;        Worcester
print form=12.0 list = '28',ArtP24510 , FILE = SUMMARY3.TXT  ;   Baltimore City
print form=12.0 list = '30',ALLArtP   , FILE = SUMMARY3.TXT  ;           TOTAL

;Minor Arterials By County
print form=12.0 list =  '5',ArtM24001 , FILE = SUMMARY4.TXT  ;       Allegheny
print form=12.0 list =  '6',ArtM24003 , FILE = SUMMARY4.TXT  ;     Anne Arundel
print form=12.0 list =  '7',ArtM24005 , FILE = SUMMARY4.TXT  ;        Baltimore
print form=12.0 list =  '8',ArtM24009 , FILE = SUMMARY4.TXT  ;          Calvert
print form=12.0 list =  '9',ArtM24011 , FILE = SUMMARY4.TXT  ;         Caroline
print form=12.0 list = '10',ArtM24013 , FILE = SUMMARY4.TXT  ;          Carroll
print form=12.0 list = '11',ArtM24015 , FILE = SUMMARY4.TXT  ;            Cecil
print form=12.0 list = '12',ArtM24017 , FILE = SUMMARY4.TXT  ;          Charles
print form=12.0 list = '13',ArtM24019 , FILE = SUMMARY4.TXT  ;       Dorchester
print form=12.0 list = '14',ArtM24021 , FILE = SUMMARY4.TXT  ;        Frederick
print form=12.0 list = '15',ArtM24023 , FILE = SUMMARY4.TXT  ;          Garrett
print form=12.0 list = '16',ArtM24025 , FILE = SUMMARY4.TXT  ;          Harford
print form=12.0 list = '17',ArtM24027 , FILE = SUMMARY4.TXT  ;          Howard
print form=12.0 list = '18',ArtM24029 , FILE = SUMMARY4.TXT  ;            Kent
print form=12.0 list = '19',ArtM24031 , FILE = SUMMARY4.TXT  ;       Montgomery
print form=12.0 list = '20',ArtM24033 , FILE = SUMMARY4.TXT  ;  Prince Georges
print form=12.0 list = '21',ArtM24035 , FILE = SUMMARY4.TXT  ;      Queen Annes
print form=12.0 list = '22',ArtM24037 , FILE = SUMMARY4.TXT  ;        St. Marys
print form=12.0 list = '23',ArtM24039 , FILE = SUMMARY4.TXT  ;         Somerset
print form=12.0 list = '24',ArtM24041 , FILE = SUMMARY4.TXT  ;           Talbot
print form=12.0 list = '25',ArtM24043 , FILE = SUMMARY4.TXT  ;       Washington
print form=12.0 list = '26',ArtM24045 , FILE = SUMMARY4.TXT  ;         Wicomico
print form=12.0 list = '27',ArtM24047 , FILE = SUMMARY4.TXT  ;        Worcester
print form=12.0 list = '28',ArtM24510 , FILE = SUMMARY4.TXT  ;   Baltimore City
print form=12.0 list = '30',ALLArtM   , FILE = SUMMARY4.TXT  ;           TOTAL

;Collectors By County
print form=12.0 list =  '5',Col24001  , FILE = SUMMARY5.TXT  ;       Allegheny
print form=12.0 list =  '6',Col24003  , FILE = SUMMARY5.TXT  ;     Anne Arundel
print form=12.0 list =  '7',Col24005  , FILE = SUMMARY5.TXT  ;        Baltimore
print form=15.0 list =  '8',Col24009  , FILE = SUMMARY5.TXT  ;          Calvert
print form=12.0 list =  '9',Col24011  , FILE = SUMMARY5.TXT  ;         Caroline
print form=12.0 list = '10',Col24013  , FILE = SUMMARY5.TXT  ;          Carroll
print form=12.0 list = '11',Col24015  , FILE = SUMMARY5.TXT  ;            Cecil
print form=12.0 list = '12',Col24017  , FILE = SUMMARY5.TXT  ;          Charles
print form=12.0 list = '13',Col24019  , FILE = SUMMARY5.TXT  ;       Dorchester
print form=12.0 list = '14',Col24021  , FILE = SUMMARY5.TXT  ;        Frederick
print form=12.0 list = '15',Col24023  , FILE = SUMMARY5.TXT  ;          Garrett
print form=12.0 list = '16',Col24025  , FILE = SUMMARY5.TXT  ;          Harford
```

County_VHT_Summary.s

```
print form=12.0 list = '17',Col24027  , FILE = SUMMARY5.TXT  ;         Howard
print form=12.0 list = '18',Col24029  , FILE = SUMMARY5.TXT  ;           Kent
print form=12.0 list = '19',Col24031  , FILE = SUMMARY5.TXT  ;     Montgomery
print form=12.0 list = '20',Col24033  , FILE = SUMMARY5.TXT  ; Prince Georges
print form=12.0 list = '21',Col24035  , FILE = SUMMARY5.TXT  ;    Queen Annes
print form=12.0 list = '22',Col24037  , FILE = SUMMARY5.TXT  ;      St. Marys
print form=12.0 list = '23',Col24039  , FILE = SUMMARY5.TXT  ;       Somerset
print form=12.0 list = '24',Col24041  , FILE = SUMMARY5.TXT  ;         Talbot
print form=12.0 list = '25',Col24043  , FILE = SUMMARY5.TXT  ;     Washington
print form=12.0 list = '26',Col24045  , FILE = SUMMARY5.TXT  ;       Wicomico
print form=12.0 list = '27',Col24047  , FILE = SUMMARY5.TXT  ;      Worcester
print form=12.0 list = '28',Col24510  , FILE = SUMMARY5.TXT  ; Baltimore City
print form=12.0 list = '30',ALLCol     , FILE = SUMMARY5.TXT  ;          TOTAL

;Locals/Centroids By County
print form=12.0 list =  '5',Cen24001  , FILE = SUMMARY6.TXT  ;      Allegheny
print form=12.0 list =  '6',Cen24003  , FILE = SUMMARY6.TXT  ;   Anne Arundel
print form=12.0 list =  '7',Cen24005  , FILE = SUMMARY6.TXT  ;      Baltimore
print form=12.0 list =  '8',Cen24009  , FILE = SUMMARY6.TXT  ;        Calvert
print form=12.0 list =  '9',Cen24011  , FILE = SUMMARY6.TXT  ;       Caroline
print form=12.0 list = '10',Cen24013  , FILE = SUMMARY6.TXT  ;        Carroll
print form=12.0 list = '11',Cen24015  , FILE = SUMMARY6.TXT  ;          Cecil
print form=12.0 list = '12',Cen24017  , FILE = SUMMARY6.TXT  ;        Charles
print form=12.0 list = '13',Cen24019  , FILE = SUMMARY6.TXT  ;      Dorchester
print form=12.0 list = '14',Cen24021  , FILE = SUMMARY6.TXT  ;      Frederick
print form=12.0 list = '15',Cen24023  , FILE = SUMMARY6.TXT  ;        Garrett
print form=12.0 list = '16',Cen24025  , FILE = SUMMARY6.TXT  ;        Harford
print form=12.0 list = '17',Cen24027  , FILE = SUMMARY6.TXT  ;         Howard
print form=12.0 list = '18',Cen24029  , FILE = SUMMARY6.TXT  ;           Kent
print form=12.0 list = '19',Cen24031  , FILE = SUMMARY6.TXT  ;     Montgomery
print form=12.0 list = '20',Cen24033  , FILE = SUMMARY6.TXT  ; Prince Georges
print form=12.0 list = '21',Cen24035  , FILE = SUMMARY6.TXT  ;    Queen Annes
print form=12.0 list = '22',Cen24037  , FILE = SUMMARY6.TXT  ;      St. Marys
print form=12.0 list = '23',Cen24039  , FILE = SUMMARY6.TXT  ;       Somerset
print form=12.0 list = '24',Cen24041  , FILE = SUMMARY6.TXT  ;         Talbot
print form=12.0 list = '25',Cen24043  , FILE = SUMMARY6.TXT  ;     Washington
print form=12.0 list = '26',Cen24045  , FILE = SUMMARY6.TXT  ;       Wicomico
print form=12.0 list = '27',Cen24047  , FILE = SUMMARY6.TXT  ;      Worcester
print form=12.0 list = '28',Cen24510  , FILE = SUMMARY6.TXT  ; Baltimore City
print form=12.0 list = '30',ALLCen     , FILE = SUMMARY6.TXT  ;          TOTAL


;TOTALS By County
print form=14.0 list =  '5',TOT24001  , FILE = SUMMARY7.TXT  ;      Allegheny
print form=14.0 list =  '6',TOT24003  , FILE = SUMMARY7.TXT  ;   Anne Arundel
print form=14.0 list =  '7',TOT24005  , FILE = SUMMARY7.TXT  ;      Baltimore
print form=14.0 list =  '8',TOT24009  , FILE = SUMMARY7.TXT  ;        Calvert
print form=14.0 list =  '9',TOT24011  , FILE = SUMMARY7.TXT  ;       Caroline
print form=14.0 list = '10',TOT24013  , FILE = SUMMARY7.TXT  ;        Carroll
print form=14.0 list = '11',TOT24015  , FILE = SUMMARY7.TXT  ;          Cecil
print form=14.0 list = '12',TOT24017  , FILE = SUMMARY7.TXT  ;        Charles
print form=14.0 list = '13',TOT24019  , FILE = SUMMARY7.TXT  ;      Dorchester
print form=14.0 list = '14',TOT24021  , FILE = SUMMARY7.TXT  ;      Frederick
print form=14.0 list = '15',TOT24023  , FILE = SUMMARY7.TXT  ;        Garrett
print form=14.0 list = '16',TOT24025  , FILE = SUMMARY7.TXT  ;        Harford
print form=14.0 list = '17',TOT24027  , FILE = SUMMARY7.TXT  ;         Howard
print form=14.0 list = '18',TOT24029  , FILE = SUMMARY7.TXT  ;           Kent
print form=14.0 list = '19',TOT24031  , FILE = SUMMARY7.TXT  ;     Montgomery
print form=14.0 list = '20',TOT24033  , FILE = SUMMARY7.TXT  ; Prince Georges
print form=14.0 list = '21',TOT24035  , FILE = SUMMARY7.TXT  ;    Queen Annes
print form=14.0 list = '22',TOT24037  , FILE = SUMMARY7.TXT  ;      St. Marys
print form=14.0 list = '23',TOT24039  , FILE = SUMMARY7.TXT  ;       Somerset
print form=14.0 list = '24',TOT24041  , FILE = SUMMARY7.TXT  ;         Talbot
print form=14.0 list = '25',TOT24043  , FILE = SUMMARY7.TXT  ;     Washington
print form=14.0 list = '26',TOT24045  , FILE = SUMMARY7.TXT  ;       Wicomico
```

County_VHT_Summary.s

```
print form=14.0 list = '27',TOT24047  , FILE = SUMMARY7.TXT   ;      Worcester
print form=14.0 list = '28',TOT24510  , FILE = SUMMARY7.TXT   ;  Baltimore City
print form=14.0 list = '30',ALLTOT    , FILE = SUMMARY7.TXT   ;          TOTAL

;Print Note About Ramps
print form=12.0 list = '31',ALLRmp    , FILE = SUMMARY8.TXT   ;          TOTAL

ENDRUN

;------------------------------------------------------------------------------
;  PRINT HEADERS
;------------------------------------------------------------------------------

 RUN PGM=MATRIX
ZONES=@RowSize@

 IF (I = 1)

   Print Form=90.L list = '\n',
                          ' =================================================================================================================''\n','\n',
                          ' ==                           Maryland Statewide Transportation Model (MSTM) version 1.0                        ==''\n','\n',
                          ' ==                             STATEWIDE AVERAGE WEEKDAY VHT SUMMARY REPORT                                    ==''\n','\n',
                          ' =================================================================================================================''\n','\n','\n',
                          '                                                        Scenario: @SCENARIO@ / @ITERS@ / @MaxIterns@ ''\n','\n','\n','\n','\n',
                          '                                    Freeway/     Principal      Minor                 Local/              ''\n','\n','\n',
                          '            County    Interstate   Expressway     Arterial     Arterial    Collector    Centroid      TOTAL ''\n','\n',
                          ' =================================================================================================================''\n','\n',

 File=..\@Scenario@\@Scenario@_VHT_Summary.txt

 ENDIF

  ZDATI[1]  = SUMMARY1.txt  , Z=#1, Col1Data  = #2
  ZDATI[2]  = SUMMARY2.txt  , Z=#1, Col2Data  = #2
  ZDATI[3]  = SUMMARY3.txt  , Z=#1, Col3Data  = #2
  ZDATI[4]  = SUMMARY4.txt  , Z=#1, Col4Data  = #2
  ZDATI[5]  = SUMMARY5.txt  , Z=#1, Col5Data  = #2
  ZDATI[6]  = SUMMARY6.txt  , Z=#1, Col6Data  = #2
  ZDATI[7]  = SUMMARY7.txt  , Z=#1, Col7Data  = #2
  ZDATI[8]  = SUMMARY8.txt  , Z=#1, Col8Data  = #2

  ; Define Table Text for each row:
IF (I = 5) ROWLABLE='       Alleghany'
IF (I = 6) ROWLABLE='    Anne Arundel'
IF (I = 7) ROWLABLE='       Baltimore'
IF (I = 8) ROWLABLE='         Calvert'
IF (I = 9) ROWLABLE='        Caroline'
IF (I =10) ROWLABLE='         Carroll'
IF (I =11) ROWLABLE='           Cecil'
IF (I =12) ROWLABLE='         Charles'
IF (I =13) ROWLABLE='      Dorchester'
IF (I =14) ROWLABLE='       Frederick'
IF (I =15) ROWLABLE='         Garrett'
IF (I =16) ROWLABLE='         Harford'
IF (I =17) ROWLABLE='          Howard'
IF (I =18) ROWLABLE='            Kent'
IF (I =19) ROWLABLE='      Montgomery'
IF (I =20) ROWLABLE='  Prince Georges'
IF (I =21) ROWLABLE='     Queen Annes'
IF (I =22) ROWLABLE='       St. Marys'
IF (I =23) ROWLABLE='        Somerset'
IF (I =24) ROWLABLE='          Talbot'
IF (I =25) ROWLABLE='      Washington'
IF (I =26) ROWLABLE='        Wicomico'
IF (I =27) ROWLABLE='       Worcester'
```

County_VHT_Summary.s

```
IF (I =28) ROWLABLE='  Baltimore City'
IF (I =29) ROWLABLE=''
IF (I =30) ROWLABLE='         TOTAL'
IF (I =31) ROWLABLE='  NOTES: The interstate VHT includes the following ramp VHT:'
IF (I =32) ROWLABLE=''
;Print Vehicle Trip Summaries
IF (I=29)
    Print Form=90.L list = ' ====================================================================================================================='\n','\n',
        File = ..\@Scenario@\@Scenario@_VHT_Summary.txt
ENDIF
IF (I=32)
    Print Form=90.L list = '          Collector, Local and Centroid Connector VHT have not been validated',
        File = ..\@Scenario@\@Scenario@_VHT_Summary.txt
ENDIF
IF (I=5-28,30)
    Print Form = 13.0csv list = RowLable,Col1Data,Col2Data,Col3Data,Col4Data,Col5Data,Col6Data,Col7Data,
        File = ..\@Scenario@\@Scenario@_VHT_Summary.txt
ENDIF

;Ramp Volume Note
IF (I=31)
    Print Form = 10.0csv list = RowLable,Col8Data,
        File = ..\@Scenario@\@Scenario@_VHT_Summary.txt
ENDIF

;Add 3 Spaces
IF (I=30)
    Print list = '\n','\n','\n',
        File = ..\@Scenario@\@Scenario@_VHT_Summary.txt
ENDIF
ENDRUN

*del summary1.txt
*del summary2.txt
*del summary3.txt
*del summary4.txt
*del summary5.txt
*del summary6.txt
*del summary7.txt
*del summary8.txt
```