Metropolitan Washington Council of Governments

COG/TPB Travel Forecasting Model

Version 2.1/TP+, Release C

User's Guide

December 23, 2002

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The Metropolitan Washington Council of Governments (COG) and the National Capital Region Transportation Planning Board (TPB).

COG serves as the regional planning organization for the Washington metropolitan area. COG works toward solutions to regional problems, especially those related to regional growth, transportation, housing, human services, and the environment. The TPB is the designated Metropolitan Planning Organization (MPO) for transportation for the Washington region. Members of the TPB include representatives of local governments; state transportation agencies; the Maryland and Virginia General Assemblies; the Washington Metropolitan Area Transit Authority; and non-voting members from the Metropolitan Washington Airports Authority and federal agencies.

Credits

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Abstract: This report describes the application process of a travel-forecasting tool for the Washington, D.C. region known as the Version 2.1/TP+ model. This work represents a continuation of a multi-year models development plan that was formulated in FY-93 by the Travel Forecasting Subcommittee (TFS), a subcommittee of the TPB's Technical Committee. COG staff has been developing the Version 2.1/TP+ model during the past two years under the review of the TFS. The model contains features that have not been considered in previous travel models used at MWCOG such as time-period specific traffic assignments, non-work mode choice models, and zone level modeling procedures for the entire four-step process.

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Chapter 1. Overview

This report describes the application of the COG/TPB Travel Forecasting Model, Version 2.1/TP+, Release C. The model is microcomputer based and has been developed with the TP+ transportation planning software package (version 2.2.0). The model has been in development for the past two years as part of a continuing multi-year models development program established to improve travel forecasting practice for the Washington, D.C. region. The models development program at COG is overseen by the Travel Forecasting Subcommittee (TFS) of the Transportation Planning Board's (TPB) Technical Committee.

The Version 2.1/TP+ model is essentially a four-step planning tool consisting of trip generation, trip distribution, mode choice, and traffic assignment procedures. The model has been designed to operate on a roughly 7,000-square-mile study area referred to as the "expanded cordon" region. The modeled area is comprised of 2,191 Traffic Analysis Zones[1] (or TAZs). The area encompasses 22 of the region's major jurisdictions spanning the District of Columbia, Northern Virginia, suburban Maryland, and one county in West Virginia.

The Version 2.1/TP+ model has been adapted from the MINUTP-based Version 2 model developed by MWCOG in January 2000. The basic structure of the MINUTP Version 2 model was unaltered in the migration from MINUTP to TP+, with one exception; the recycling of restrained highway speeds back into trip distribution was undertaken for both work *and non-work* purposes. The speed feedback linkage in the earlier MINUTP application was applied for the work purpose only. COG has produced earlier TP+ model versions beginning with the first release in March 2002. The model described in this report reflects the third release, which includes several refinements. The refinements include, 1) the correction of network errors, 2) an improved process for developing walk- and drive-access links in transit network building, and 3) software improvements that stop the process when inputs are not appropriately provided. The last refinement was made clear recently when staff discovered an instance in the transit fare building process where a program continued to function even when one input file was not specified correctly. This model will most likely continue to be enhanced and improved in the future as it gets more rigorously tested by MWCOG and other interested users.

The Version 2.1/TP+ model is distinguished from prior models used at MWCOG in several key areas. First, the model simulates person travel for *all* modeled purposes, as opposed to the traditional combination of work person and non-work auto driver travel that has been simulated previously. Consequently, the Version 2 model is inclusive of both work and non-work mode choice models. The Version 2 model also provides for the estimation of HBW non-motorized (walking and bicycling) travel. Non-motorized travel is developed at the trip generation stage, however, and is not carried forth into subsequent modeling steps.

A second key feature of the model is the application of time-period-specific traffic assignments. MWCOG travel models (Version 1 and before) have traditionally produced total daily traffic

[1] Although the expanded cordon zone system is numbered from 1 to 2,191, the modeled area is presently comprised of 2,019 zones, including external stations. A number of 'unused' TAZ number ranges have been reserved to support future subzone work. For further details, consult the network documentation, "FY-2002 Network Documentation: Highway and Transit Network Development for Version 1 and 2.1/TP+ Models," October 4, 2002.

assignments ("24-hour assignments"). Past studies requiring link volumes by specific time periods, such as those relating to mobile emissions work, have relied on special post-processing procedures for deriving hourly traffic volumes from modeled 24-hour link volumes. The Version 2 model includes three explicit traffic assignment procedures corresponding to a three-hour AM peak period, a three-hour PM peak period, and the remaining off-peak hours.

The model also employs demographic submodels to allocate the total number of households in a given zone among 64 cross-classes defined by 4 income levels by 4 household size groupings by 4 vehicle availability groups. Demographic stratification considered in previous model sets (Version 1 and before) has been limited to only three cross-classes: three levels of vehicle ownership. Another novel feature of the vehicle availability model is the use of a transit accessibility variable in its formulation.

Finally, all modeling procedures in the Version 2.1/TP+ model are executed at the TAZ level. Prior model versions at MWCOG (Version 1 and before) have utilized a "dual" area system approach in travel modeling where trip generation and distribution procedures would be executed at the district level, while mode choice and traffic assignments would be applied at zone level. All modeling steps are uniformly applied at zone level, which not only provides greater geographic detail at each step, but also facilitates the inclusion of feedback linkages in the travel model, which is an important requirement.

Many of the modeling concepts used in the Version 2.1/TP+ model have been selected and/or adapted from developmental work undertaken by a team of consultants headed by Parsons Brinckerhoff (PB). PB's developmental work supported several MIS studies in the Washington region during the 1990s, most notably, the Dulles Corridor Transportation Study and the I-66 Corridor MIS. Although the Version 2.1/TP+ model is considerably simpler and more streamlined than that advanced by PB, COG was able to extract many useful concepts from PB's intensive project work. Furthermore, several FORTRAN routines developed as part of PB's prior work were adapted to serve the development and application of the Version 2 model. More recently, AECOM Consulting, Inc. shared with MWCOG a concept for applying the model using a combination of customized batch files, a standardized subdirectory structure, and the use of a generic file-naming convention. MWCOG ultimately adopted AECOM's model application approach.

A more in-depth overview of the Version 2 model is provided below, including a description of the model structure and the general application procedure. Next, computer hardware and software requirements are described. Chapters 2 through 12 describe in detail the primary computer programs used in the Version 2.1/TP+ application. The programs are either TP+ scripts and/or compiled Microsoft FORTRAN (version 5.1 and PowerStation) routines. Each chapter describes the input file formats and other support information associated with specific programs (or program groups), which constitute the 'building blocks' of the process. Chapter 13 provides a general 'checklist' procedure for preparing a model execution. The report also includes four appendices. Appendix A contains a listing of TP+ scripts used in the Version 2.1/TP+ model. Appendix B contains listings of control files that are used in conjunction with FORTRAN procedures that are used. Appendix C contains a listing of batch files that are used

to invoke each step of the model chain. Finally a detailed flowchart showing the relationship of inputs and output files to each computer step is provided in Appendix D.

It is important to point out that the Version 2.1/TP+ model requires information from MWCOG's Geographic Information System (GIS). The model relies on the GIS to produce two zonal files: 1) the proportion of each zone that is within a 'short walk' (< 1/3 miles) and/or a 'long walk' (1/3 – 1.0 miles) from transit service (AM and off-peak); 2) a list of transit stops that exist within one mile of each zone centroid, for each time period. Off-line GIS procedures at COG have been developed to furnish these data electronically. However, these procedures have not yet been documented.

1.1 Model Structure and Application

The conceptual structure of the Version 2.1/TP+ modeling process is shown graphically as Exhibit 1-1. The exhibit indicates the essential information elements that are generated from one step to the next. A more detailed discussion of the model structure follows.

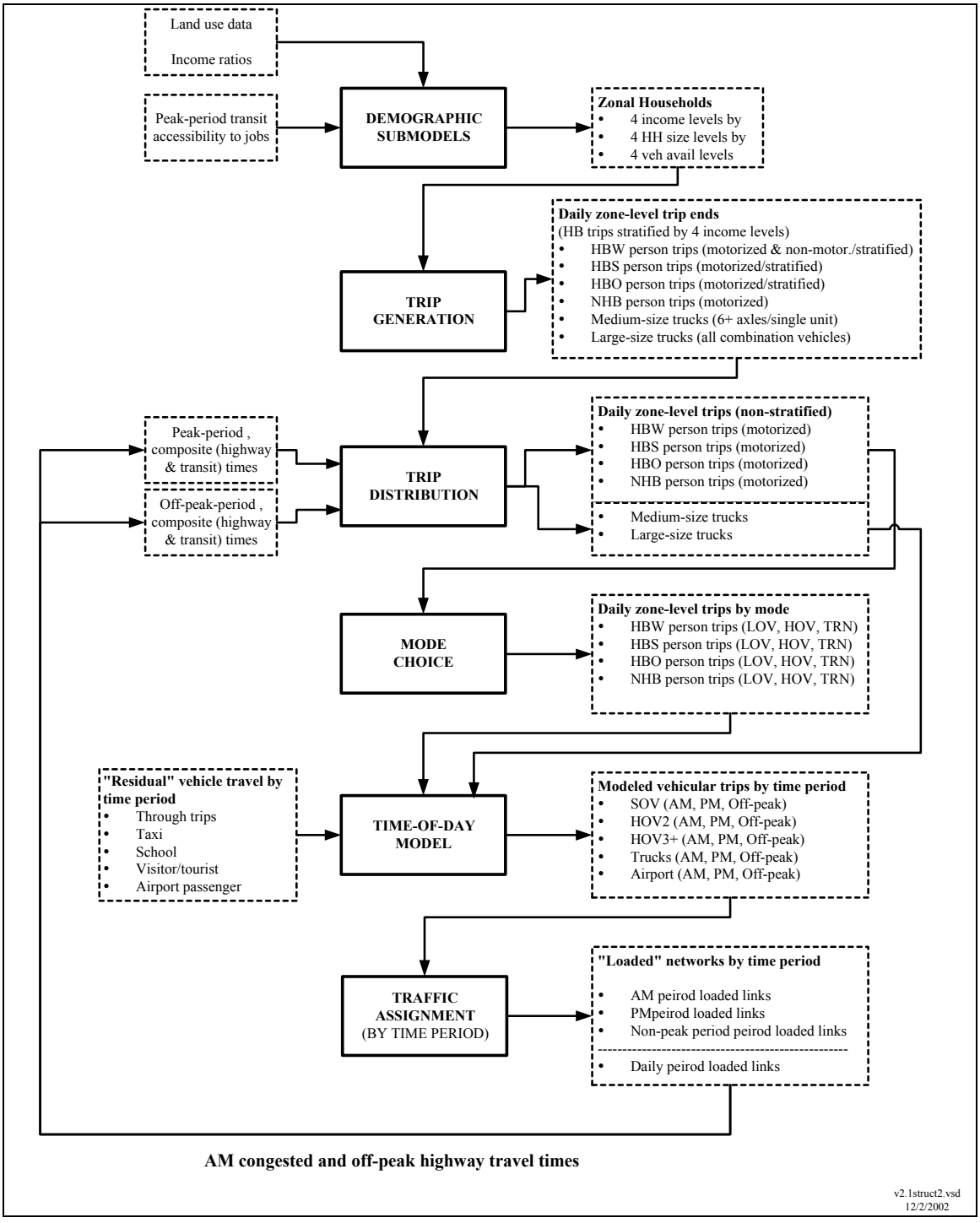
The Version 2 model requires three highway networks representing weekday operations occurring in the AM peak period (6:00-9:00 AM), the PM peak period (4:00-7:00 PM), and the off-peak period (comprised of the remaining 18 hours). Highway network coding reflects operational differences between the three periods. Examples of operational differences may include directionality changes (alternating one-way/two way operations), lane configuration changes, or vehicle prohibitions change (for example, facilities that are dedicated for HOV facilities during peak periods, but revert to general use operations during non-peak hours). The model also requires peak and off-peak transit networks. Transit networks are currently built 'over' highway network links and are designed to represent service conditions during two time periods, the AM peak-hour defined as 8:00-9:00 AM, and the off-peak defined as 10:00 AM-3:00 PM. Path-based transit fares are also developed for both time periods. Transit paths are categorized into two access markets: walk-access and drive access markets.

Land use inputs to the model are obtained through COG's Cooperative Land Use Forecasting process. The process results in traffic analysis zone (TAZ) level households, population, group quarters population, and employment by 4 categories (office, retail, industrial and other). The demographic models are first applied to allocate the total number of households among 64 cross-classes: 4 household income groups[2] by 4 household size groups (1, 2, 3, 4+) by 4 vehicle availability groups (0, 1, 2, and 3+ vehicles available). The apportionment is made at the TAZ level. Exhibit 1-1 indicates that AM peak-hour transit accessibility measures are used as part of the demographic (vehicle availability) submodels.

The modeled trip purposes are defined as home-based work (HBW), home-based shop (HBS), home-based other (HBO), and non-home based (NHB). Two truck types are modeled: medium size trucks (single unit, 6+ axles) and heavy trucks (all combination vehicles). The trip generation process involves the application of daily trip rates corresponding to households in each of the 64 cross-classes. The HBW trip rates reflect *both* motorized (e.g., transit, automobile) and non-motorized (e.g., bicycle, walk) person travel, while the trip rates for the remaining purposes reflect motorized travel only. The non-motorized component of HBW trip-ends generated at the trip generation step is subsequently extracted from the total trip-ends prior to trip distribution. Trip attractions are computed as a function of gross land use categories. External (X/I and I/X) productions and attractions are entered as an exogenous input, by purpose, into the trip generation process and are unaltered. External home-based and NHB travel relates to auto person travel only, i.e. transit travel is not represented in MWCOG's external trip tables. The trip generation process yields productions and attractions that are stratified by the 4 income levels for the home-based purposes.

[2] The income levels used approximate household income quartiles.

Exhibit 1-1 Version 2.1/TP+ Travel Model Structure



The trip distribution model utilizes the standard gravity model formulation. The measure of impedance used in the gravity model is a composite time function, which represents a blending of transit and highway travel times. AM peak service levels are used to formulate the HBW impedance, while off-peak service levels are used for the non-work models. The distribution step involves separate gravity model runs for 25 travel markets, given that home-based purposes are income stratified, and external automobile travel is modeled separately and is distinguished by interstate travel and non-interstate travel (See p. 5-1 of the calibration report for more details). However, the trip distribution process ultimately produces six daily trip tables corresponding to six person/truck purposes mentioned above.

The mode choice process is used to apportion total motorized person trips among auto driver, auto passenger, and transit modes. There are four separate models corresponding to each of the modeled purposes. The HBW model also distinguishes HOV auto trips that utilize special preferential facilities that have been explicitly coded into the highway network.

Subsequent to the mode choice step, the time-of-day model apportions daily auto driver trips among the three modeled time periods. The model applies temporal factors to the modeled trips on the basis of purpose, mode (SOV, carpool), and trip orientation (the home-to-non-home or the non-home-to-home direction). This step also includes provisions for apportioning daily residual travel[3] and truck travel among the three time periods. The time-of-day process ultimately produces three trip table files corresponding to the three time periods. Each file contains five vehicle trip files representing Single Occupant Vehicles (SOVs), 2-occupant vehicles (HOV2), 3 or more occupant vehicles (HOV3+), trucks, and airport passenger vehicles. The traffic assignment process involves separate executions for each of the three time periods. Each of the three runs employ a 10-iteration equilibrium assignment algorithm.

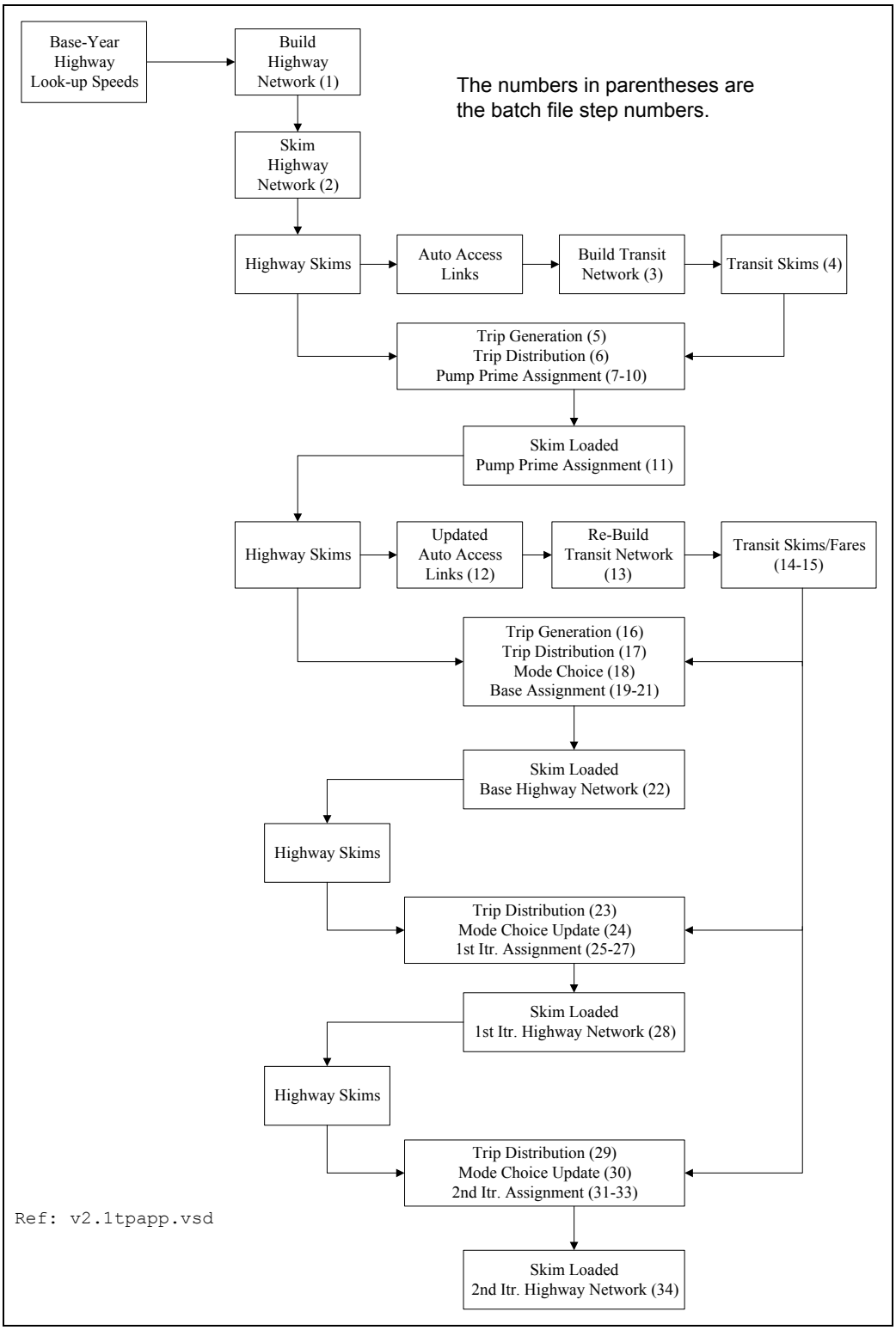
A graphic depiction of the Version 2.1 model application steps is shown as Exhibit 1-2. The highway network is built and initial AM peak and off-peak speeds table-lookup speeds are first inserted on each highway link. Restrained AM and off-peak highway network times are then developed from the highway network. The 'skimmed' highway times are used to develop zone–to-PNR lot links as part of the transit network. With the development of the transit network, trip generation and distribution is executed. The resulting person trips are converted to vehicle trips on the basis of default auto driver percentages, and assigned to the highway network. The initial traffic assignment is also known as the 'pump-prime' assignment.

The AM and Off-peak restrained highway times resulting from the initial highway assignment are next used to update the zone-to-PNR link speeds, whereupon the transit network is re-built and 'final' transit Level-of Service matrices are established. The highway and transit time skims are used as inputs to the mode choice model. The auto driver trips produced from the mode choice model are processed through the time-of-day model and the second, or 'Base', highway assignment step is executed.

[3] Residual travel, also referred to as 'miscellaneous' travel, represents special travel markets that are typically not well represented in home interview surveys; it is comprised of taxi, school, visitor/tourist, and airport passenger auto driver travel.

Subsequent to the base assignment, there are two additional feedback loops linking restrained highway speeds the work and non-work trip distribution process. These feedback loops are

Exhibit 1-2 Version 2.1/TP+ Forecast Application Process



known as the 'first' and 'second' iterations. The mode choice model is *not* executed during the first and second iteration loops. Instead, the base iteration transit trips developed from the mode choice model are held constant and subtracted from the current iteration person trips developed at the current iteration trip distribution, on an i/j basis. Vehicle trips are then computed by applying a vehicle occupancy rate to the residual person trips, on an i/j basis. The occupancy rate is computed from the initial mode choice model run.

The Version 2.1 model uses a successive volume averaging procedure at the link level to force convergence of link volumes, and hence, link highway speeds. Specifically, the link volumes resulting from the first iteration assignments are subsequently set to the average of the Base and first iteration volumes (or ½ of the base iteration volume plus ½ of the first iteration volume). After the second iteration assignment process, the 'final' link volume is set to 2/3 of the first iteration link volume, plus 1/3 of the second iteration link volume. The volume averaging is performed uniformly for each of the three time periods. A given model application culminates at the highway skimming of the second iteration traffic assignment.

1.2 Computer Hardware, Software, and Execution

The Version 2.1/TP+ model functions in a PC/Windows environment. An Intel-based microcomputer with a minimum 1 GHz processing speed, and a minimum 60 GB of hard disk storage capacity is recommended. MWCOG has developed the Version 2.1 model on PCs running the Windows 98 operating system. The model has not yet been tested using more recent Windows operating systems (e.g., Windows 2000 or Windows XP) that are now available on the market.

In addition to the requirement of TP+ software, there are a number of customized FORTRAN programs that are interspersed throughout the model chain. A list of program names is shown in Exhibit 1-3.

Exhibit 1-3 Summary of Version 2.1/TP+ Programs

(Required in addition to TP+ software)

Program Name	Size	Dtae
AREALKTP.EXE	29,232	12/3/02
ATYPETP.EXE	106,880	12/3/02
CGTGV2TP.EXE	397,968	12/3/02
CLOSESTP.EXE	201,596	12/3/02
CNTCONN2.EXE	128,512	5/23/96
COGMC.EXE	561,486	4/6/01
COGMCA1.EXE	232,468	12/4/02
EXTRTAB.EXE	24,663	7/26/01
GIS_PROC.EXE	48,258	12/6/02
HHSIZINC.EXE	54,894	6/19/00
MFARE1.EXE	59,748	6/28/92
MFARE1OP.EXE	55,176	1/22/99
MFARE2TP.EXE	355,882	4/6/01
MTXIJTP.EXE	74,561	12/4/02
NETSW2.EXE	109,568	4/16/01
NODESTB.EXE	105,472	4/9/01
PREFARTP.EXE	40,704	11/26/02
SORTLINE.EXE	45,056	11/9/01
STAPROTP.EXE	64,652	12/4/02
TGCHK.EXE	27,012	4/12/01
VEHAVTP.EXE	66,402	12/4/02
WLKLNKTP.EXE	122,704	11/26/02

COG has designed the Version 2.1/TP+ application as a series of standardized batch files that are executed from a DOS-Window, as opposed to a Windows 'point-and-click' program. The application relies on the use of: 1) a special subdirectory structure, 2) standardized batch files, and 3) a generic file naming system of input filenames, which are referenced in pre-established TP+ scripts and control files. An example subdirectory structure is graphically shown on Exhibit 1-4. The exhibit indicates that designated subdirectories are established for software files (*SOFTWARE*), control files (*CONTROLS*), TP+ scripts (*SCRIPTS*), and general parameter files

(*\SUPPORT*). Parameter files are those that do not change by alternative, such as K-factors, F-factors, and the like. Furthermore, subdirectories are established for model inputs and outputs associated with specific years/alternatives. As indicated on the exhibit, a given year is assigned its own subdirectory, where specific outputs and reports are written. Below each alternative subdirectory is an *\INPUTS* subdirectory where all necessary information needed to initiate a model run resides (e.g., land use network files, etc.).

The batch files reside in the top-level subdirectory (e.g., *\CGV2TP* on Exhibit 1.4). The batch files function to execute basic modeling steps and to read from and write to the appropriate subdirectories. The current model application consists of 34 batch files. The batch files may be executed one at a time, or alternatively, may be executed as a group of batch files. A listing of the batch filenames is shown as Exhibit 1-5. All batch files must be executed from the top-level subdirectory. The batch files make extensive use of "command line arguments" and "DOS environment variables." Command line arguments are character strings following the program name in the command that invokes the program. For example, when running a batch file called test.bat with the following command:

```
test.bat test1 37
```

there are two command line arguments ("test1" and "37") and these are referenced in the batch file as "%1" and "%2" (without the quotes).

DOS environment variables are variables whose character string is stored in the current environment area of memory. For example, the following command:

```
set purp=hbw
```

sets the environment variable "purp" equal to "hbw." This variable is referenced within a batch file as "%purp%" (without quotes). This value is usable within the batch file where it was set and from all child programs/batch files. To clear the value of an environment variable, one set the variable equal to nothing, i.e.:

```
set purp=
```

If one does not clear a DOS environment variable, it remains in effect (in memory) until the DOS session is terminated, usually at the closing of the DOS window.

Although it adds complexity to the process, the use of command line arguments and DOS environment variables allows one to economize on scripts and code, which should minimize the potential for error.

The 34 batch files are normally executed in sequence, from *Step01.PP_Highway_Build.bat* to *Step34.I2_Highway_Skims.bat.* Exhibit 1-5 also lists a batch file named *Step00.SetFactors.bat.* This batch file was executed previously to establish K-factors and time penalty files. It is not necessary to rerun this batch file unless K-factors and/or time penalties are updated. COG has recently also developed single batch files used to 'call' each of the standard 34 batch steps for a specific year, using one command. The batch files have been named *runall94.bat, runall00.bat,*

and *runall25.bat.* The batch files are used to execute the model for the years 1994, 2000, and 2025. Using our example subdirectory structure, an example line command for executing the first batch step for the year 1994 would be as follows:

C:\CGV2TP> **Step01.PP_Highway_Build.bat CG94**

Likewise, the command for executing the entire model set for the year 2025 would be as follows:

C:\CGV2TP> **RUNALL25 CG25**

All of the files in the *\INPUTS* subdirectory are assigned generic filenames. Consequently it is the subdirectory name, rather than the filename itself, that identifies the year / alternative associated with a specific file. Accordingly, it is incumbent on the analyst to make certain that the appropriate files are placed in the correct subdirectory. The advantage of using generic names is that the input and output filenames referenced in each TP+ script and control file do not need to be updated. A listing of the generic filenames used for modeling inputs are shown on Exhibit 1-6. Like modeling inputs, support files (residing in the *\SUPPORT* subdirectory) are assigned generic names. These are listed on Exhibit 1-7.

More specific program listings appear in appendices at the end of the report. Specifically TP+ script listings appear in Appendix A, control files are listed in Appendix B, batch files are listed in Appendix C, and a detailed flowchart of the process is given in Appendix D. Finally, a staff memorandum detailing the transit fare computation is provided in Appendix E.

Exhibit 1-4 Version 2.1/TP+ subdirectory structure for model execution

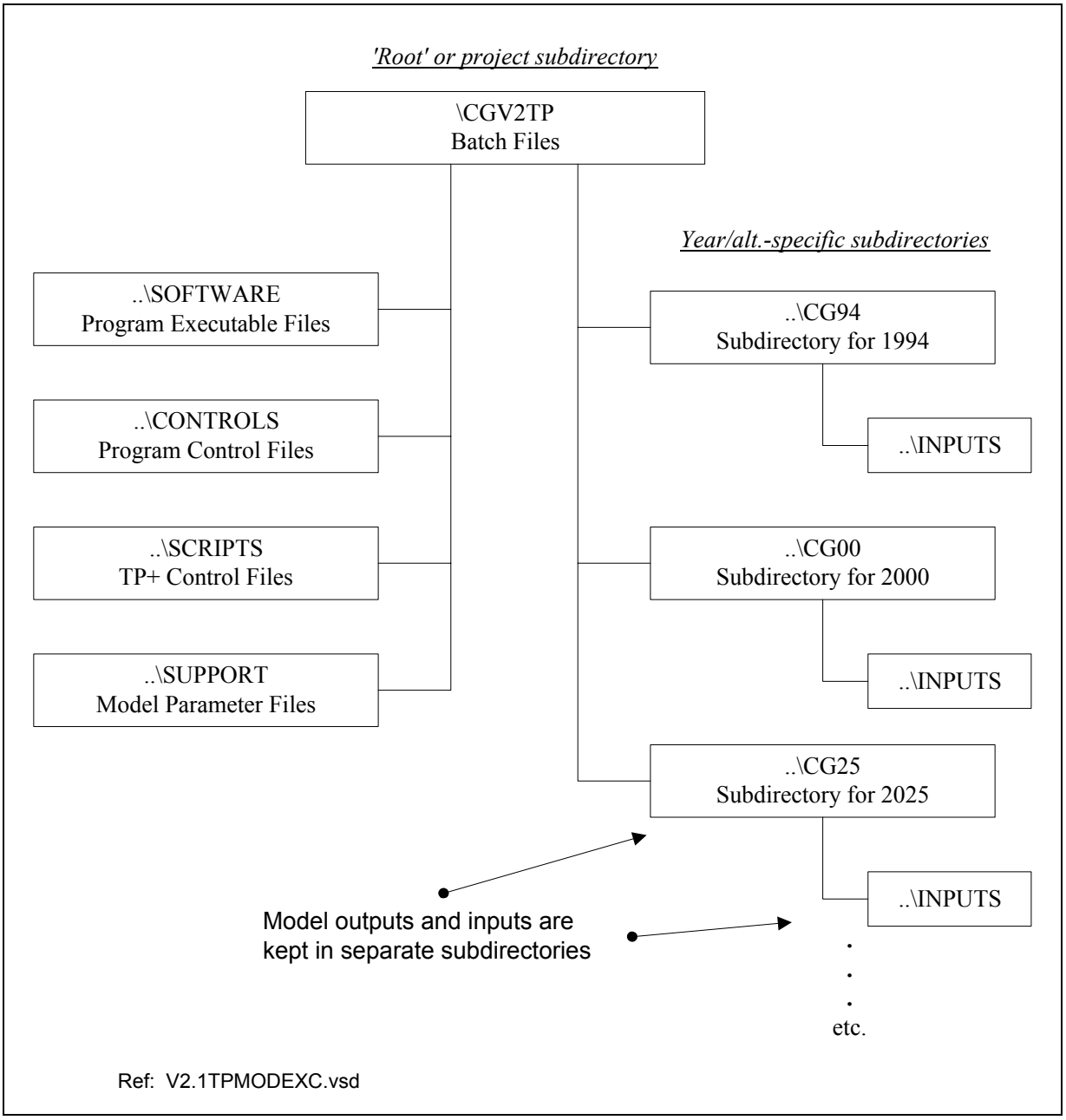


Exhibit 1-5 Summary of Version 2.1/TP+ Model Batch Files

Model Phase / Iteration	Batch File Description	Batch Filename
Pre-Modeling Steps/ Pump Prime Iteration	Establish Time/K-factors	Step00.SetFactors.bat
	Hwy. Network Building	Step01.PP_Highway_Build.bat
	Hwy. Skims, PNR links	Step02.PP_Highway_PNR.bat
	PP.Transit Network Preparation	Step03.PP_Transit_Prep.bat
	PP.Transit Skims	Step04.PP_Transit_Skim.bat
	PP. Trip Generation	Step05.PP_Trip_Generation.bat
	PP. Trip Distribution	Step06.PP_Trip_Distribution.bat
	PP.Auto Driver Estimation	Step07.PP_Auto_Drivers.bat
	Miscellaneous Time-of-Day	Step08.Misc_Time-of-Day.bat
	Time-of-Day Model	Step09.PP_Time-of-Day.bat
	Highway Assignment	Step10.PP_Highway_Assignment.bat
	Highway Skimming	Step11.PP_Highway_Skims.bat
Base Iteration	Base PNR Link Development	Step12.BS_Highway_PNR.bat
	Base Transit Network Preparation	Step13.BS_Transit_Prep.bat
	Base Transit Skims	Step14.BS_Transit_Skim.bat
	Transit Fares	Step15.Transit_Fare.bat
	Base Trip Generation	Step16.BS_Trip_Generation.bat
	Base Trip Distribution	Step17.BS_Trip_Distribution.bat
	Mode Choice Model	Step18.Mode_Choice.bat
	Base Auto Driver Estimation	Step19.BS_Auto_Driver.bat
	Base Time of Day Model	Step20.BS_Time-of-Day.bat
	Base Highway Assignment	Step21.BS_Highway_Assignment.bat
	Base Highway Skims	Step22.BS_Highway_Skims.bat
First Iteration	1st Iteration Trip Distribution	Step23.I1_Trip_Distribution.bat
	1st Iteration Mode Choice Update	Step24.I1_Mode_Choice_Update.bat
	1st Iteration Auto Driver Estimation	Step25.I1_Auto_Driver.bat
	1st Iteration Time of Day Model	Step26.I1_Time-of-Day.bat
	1st Iteration Highway Assignment	Step27.I1_Highway_Assignment.bat
	1st Iteration Highway Skims	Step28.I1_Highway_Skims.bat
Second Iteration	2nd Iteration Trip Distribution	Step29.I2_Trip_Distribution.bat
	2nd Iteration Mode Choice Update	Step30.I2_Mode_Choice_Update.bat
	2nd Iteration Auto Driver Estimation	Step31.I2_Auto_Driver.bat
	2nd Iteration Time of Day Model	Step32.I2_Time-of-Day.bat
	2nd Iteration Highway Assignment	Step33.I2_Highway_Assignment.bat
	2nd Iteration Highway Skims	Step34.I2_Highway_Skims.bat

Exhibit 1-6 List of 'Standard' Version 2.1/TP+ Input Filenames

	Filename	Description
1	AEXT.ASC	Zonal External Attractions
2	AIRPAX.ADR	Air Passenger Auto Dr. Trips
3	BUSFARAM.ASC	MFARE2 AM Bus Fare Zone Matrix
4	BUSFAROP.ASC	MFARE2 Off-Peak Fare Zone Matrix
5	GISWKAAM.ASC	GIS AM Zonal Transit Access File
6	GISWKAOP.ASC	GIS Off-Peak Zonal Transit Access File
7	GISWKLAM.ASC	GIS AM Walk Link File
8	GISWKLOP.ASC	GIS Off-Peak Walk Link File
9	HBOMC.OLD	Initial HBO Mode Choice Trips
10	HBSMC.OLD	Initial HBS Mode Choice Trips
11	HBWMC.OLD	Initial HBW Mode Choice Trips
12	LINK.ASC	Highway Links
13	MFARE1.A1A	MFARE1 A1 Deck
14	MODE1AM.TP	AM Mode 1 Transit Lines
15	MODE1OP.TP	Off-Pk Mode 1 Transit Lines
16	MODE2AM.TP	AM Mode 2 Transit Lines
17	MODE2OP.TP	Off-Pk Mode 2 Transit Lines
18	MODE3AM.TP	AM Mode 3 Transit Lines
19	MODE3OP.TP	Off-Pk Mode 3 Transit Lines
20	MODE4AM.TP	AM Mode 4 Transit Lines
21	MODE4OP.TP	Off-Pk Mode 4 Transit Lines
22	MODE6AM.TP	AM Mode 6 Transit Lines
23	MODE6OP.TP	Off-Pk Mode 6 Transit Lines
24	MODE7AM.TP	AM Mode 7 Transit Lines
25	MODE7OP.TP	Off-Pk Mode 7 Transit Lines
26	MODE8AM.TP	AM Mode 8 Transit Lines
27	MODE8OP.TP	Off-Pk Mode 8 Transit Lines
28	MODE9AM.TP	AM Mode 9 Transit Lines
29	MODE9OP.TP	Off-Pk Mode 9 Transit Lines
30	NHBMC.OLD	Initial NHB Mode Choice Trips
31	NODE.ASC	Highway Node File
32	PEXT.ASC	Zonal External Productions
33	RAIL_LNK.BSE	Rail Links
34	RIVERSTP.BNA	River Coordinate File
35	SCHL.ADR	School Auto Dr. Trips
36	STA_TPP.BSE	Rail Station/PNR File
37	TAXI.ADR	Taxi Auto Dr. Trips
38	TAZFRZN.ASC	TAZ/Bus Fare Zone Equivalency
39	TRNPEN.DAT	Metrorail Station Network Turn Penalty File
40	VISI.ADR	Visitor/Tourist Auto Dr. Trips
41	WALK_AM.OLD	Previously developed AM Walk Link File – *Optional*
42	WALK_OP.OLD	Previously developed Off-Pk Walk Link File – *Optional*
43	XXAUT.VTT	Through Auto Drivers
44	XXTRK.VTT	Through Trucks
45	ZONE.ASC	Zonal Land Use

Exhibit 1-7 Version 2.1/TP+ Support File List

	Filename	Description
1	TAZAMSPD.LKP	AM TAZ/Facility Type Highway Speed Lookup Table
2	TAZOPSPD.LKP	OP TAZ/Facility Type Highway Speed Lookup Table
3	AMSPD.LKP	AM Area/Facility Type Highway Speed Lookup Table
4	OPSPD.LKP	OP Area/Facility Type Highway Speed Lookup Table
5	ATYPV2.CSV	Area Type, Land Use Density Equivalency File
6	ADJZPAF7.UPW	Trip Generation Zonal Adjustment Files
7	ADJZPAF7.UPS	
8	ADJZPAF7.UPO	
9	ADJZPAF7.UPN	
10	ADJZNPAF.HTK	
11	ADJZNPAF.MTK	
12	HBWK.DAT	Binary K-Factors Files
13	HBSK.DAT	
14	HBOK.DAT	
15	NHBK.DAT	
16	MTKK.DAT	
17	HTKK.DAT	
18	HBWPEN.03	Superdistrict ASCII Time Penalty Files
19	HBSPEN.03	
20	HBOPEN.03	
21	NHBPEN.03	
22	HBWPEN.DAT	Zonal Binary Time Penalty Files
23	HBSPEN.DAT	
24	HBOPEN.DAT	
25	NHBPEN.DAT	
26	HBWV2.FFS	Friction Factor Files
27	HBSV2.FFS	
28	HBOV2.FFS	
29	N_TV2.FFS	
30	JURISV21.EQV	Superdistrict/Zone Equivalency File
31	MCCF_HBW.ASC	Mode Choice Car Occ. Superdistrict Adjustment Files
32	MCCF_HBS.ASC	
33	MCCF_HBO.ASC	
34	MCCF_NHB.ASC	
35	MCTF_HBW.ASC	Mode Choice Transit Pct. Superdistrict Adjustment Files
36	MCTF_HBS.ASC	
37	MCTF_HBO.ASC	
38	MCTF_NHB.ASC	
39	MC_FAC.ASC	
40	V2TODTPP.PAR	Time-of-Day Model Specifications

Chapter 2. Highway Network Building

Input(s):

1. Land Use File	(ASCII)
2. Node Coordinate File	(ASCII)
3. Link File	(ASCII)
4. Station/PNR lot File	(ASCII)
5. Metrorail/Commuter Rail Link File	(ASCII)

Output(s):

Unloaded Links File	(ASCII)
Highway Link File	(ASCII)
Freeway Link File	(ASCII)
AM, PM, Off-Peak Highway Network File	(Binary)
Highway Link File	(ASCII)
Freeway Link File	(ASCII)
TRNBUILD Station Node/Link Files	(ASCII)
Walk Link File, TRNBUILD Format	(ASCII)
TRNBUILD PNR Node/Link Files	(ASCII)
TRNBUILD Bus/Station Connect Link Files	(ASCII)
TRNBUILD PNR/Station Connect Link Files	(ASCII)
TRNBUILD Walk Network Link File	(ASCII)
MFARE1 A1 Deck File	(ASCII)
TAZ/PNR Equivalence table	(ASCII)
Highway and Transit Coordinate (XY) File	(ASCII)
Zonal Highway Terminal Time File	(ASCII)

Program File(s):

CLOSESTTP.EXE
ATYPETP.EXE
AREALKTP.EXE
STAPROTP.EXE
TP+

Control/Support File(s):

CLOSESTP.CTL, ATYPETP.CTL, STAPROTP.CTL (Control files for CLOSESTP, ATYPETP, and STAPROTP Programs)
HIGHWAY_BUILD.S (TP+ script file for network building)
ATYPV2.CSV (Parameter file used by the ATYPE program)
TAZAMSPD.LKP, TAZOPSPD.LKP, AMSPD.LKP, OPSPD.LKP (Initial highway speed lookup files used in highway Building)

Application Details:

The purpose of the highway network building process is to establish a single binary highway network containing link attributes corresponding to AM peak, PM peak, and off-peak time periods. The process requires a highway link file and a nodes file. The nodes file contains the x/y coordinate units of each highway node, based on the NAD83 system in whole feet. The procedure consists of three FORTRAN programs that are applied sequentially, and a TP+ script named HIGHWAY_BUILD.S. The CLOSESTTP program is first applied to determine the nearest zone centroid associated with each link in the highway network.[1] The ATYPETP program is applied next to determine the area type of each zone in the region. The control card descriptions of the CLOSESTP and ATYPETP programs are shown as Exhibits 2-2 and 2-3. The Version 2 model "area type" code is essentially an index ranging from 1 to 7, based on land use density. The density measure is defined jointly by population and employment densities for a one-mile 'floating' radius about each zone as shown on the table below:

Exhibit 2-1 Version 2 Highway Network Area Type Definitions

Relationship of Area Type Codes to Land Use Density

One-Mile 'Floating' Pop. Density (Pop/Sq mi.)	One-Mile 'Floating' Employment Density (Emp / Sq mi)						
	0-100	101-500	501-1,500	1,501-5,000	5,001-15,0000	15,001-35,000	35,001+
0-100	7	7	5	5	2	2	2
101-350	7	5	5	5	2	2	2
351-1,500	6	6	5	5	2	2	2
1,501-3,500	6	6	4	3	2	2	2
3,501-6,500	4	4	3	3	2	2	1
6,501-10,000	4	3	3	3	2	2	1
10,0001+	3	3	3	2	2	2	1

The AREALKTP program is finally used to merge the zonal area type to each highway link based on its associated zone. The program is used to insert the speed/capacity class codes onto each highway link. The classes are based on a two digit code ranging from 01 to 57, where the first digit represents the facility type (0-5)[2] and the second digit represents the area type (1-7), as computed by the ATYPETP program. The AREALKTP program does not require a control file to function.

The highway network building process is used to build ASCII link records into a binary network file. The script also performs other functions. It creates transit walk network links which are used in the transit network building process. The script also builds zonal highway terminal times. Highway terminal times vary from 2 to 8 minutes as a function of employment density.

[1] Each link is associated with one zone, but there is no guarantee that each zone is associated with a link.
[2] In future versions of the model, a new facility type code value of 6 will be used to represent ramps.

The STAPROTP program is used to create transit link and node files in TRNBUILD format, on the basis of two user-prepared files. Exhibit 2-4 describes the control cards that are required for the program. One input file, called a 'station' file, contains attributes associated with all base and future transit stations and PNR lots. The second file is a "rail link" file, which contains distances and speeds of all fixed guideway links pertaining to Metrorail and commuter rail systems. The program also creates a TAZ-PNR equivalence file that is used in the building of drive access links. Finally, the program also creates three files that support the fare (MFARE) development process, a Metrorail link and node file, and the zonal data file (the "A1 deck") for the MFARE1 and MFARE1OP programs.

Exhibits 2-5 through 2-9 are the input file format descriptions for the CLOSESTP, ATYPETP, and STAPROTP programs.

Exhibit 2-2 CLOSESTP Control Parameters

Type	***Name***	***Description***
&files	In_node	Highway coordinate (XY) file input name
	Out_node	Highway node/closest zone file output file
	In_link	Highway link input file
	Out_link	Highway link file output name
&specs	Max_zone	Maximum TAZ number
	Crd_fac	Number of coordinate units per mile

Exhibit 2-3 ATYPETP Control Parameters

Type	***Name***	***Description***
&files	Popemp	Land Use file input
	Zon_file	Highway Coordinate (XY) file input
	Areatype	Area Type parameter file
	Den_file	Zonal Density / Area type file output name
	Db_basfile	Zonal Density / Area type file output name, comma separated format
	Rpt_file	Report file listing
&specs	Max_zone	Maximum TAZ number
	Radius	Distance for land use, area accumulation in miles
	Num_class	Number of pop./emp. Classes modeled
&classes	Pclass	Population ranges for classes
	Eclass	Employment density ranges for classes

Exhibit 2-4 STAPROTP Control Parameters

Type	***Name***	***Description***
&files	Statf	Station file input
	Rlnkf	Rail link file input
	Metlnkm1	Metrorail Link file for MFARE1 process
	Metlnkf	Metrorail Link file in TRNBUILD format
	Comlnkf	Comm.Rail Link file in TRNBUILD format
	Metnodm1	Metrorail Node file for MFARE1 program
	Metnodf	Metrorail Node file in TRNBUILD format
	Comnodf	Comm. Rail Node file in TRNBUILD format
	Metpnrf	Metrorail PNR Node file in TRNBUILD format
	Compnrf	Comm. Rail PNR Node file in TRNBUILD format
	Buspnf	Bus PNR node file in TRNBUILD format
	Mpnlf	Metrorail/PNR Connect link file in TRNBUILD format
	Cpnrlf	Comm. Rail /PNR Connect link file in TRNBUILD format
	Bpnlf	Bus /PNR connect link file in TRNBUILD format
	Metblf	Metrorail/Bus connect link file in TRNBUILD format
	Comblf	Comm.Rail/Bus connect link file in TRNBUILD format
	Mf1a1	A1 deck for the MFARE1 program
	Tazpnrf	TAZ / PNR equivalience in MATRIX-ready format
	S_pxyf	Station/PNR XYS file

Input File Descriptions and Formats:

1. Land Use File

Exhibit 2-5 Land Use File Format Description

Columns	*Format*	*Field Description*
1- 4	I4	TAZ (1-2,191)
8- 15	I8	Households
16- 23	I8	Household Population
24- 31	I8	Group Quarters Population
32- 39	I8	Total Population
40- 47	I8	Total Employment
48- 55	I8	Industrial Employment
56- 63	I8	Retail Employment
64- 71	I8	Office Employment
72- 79	I8	Other Employment
80- 81	I2	Jurisdiction Code (0-23) *0/dc, 1/mtg, 2/pg, 3/alr/, 4/alx,5, ffx, 6/ldn, 7/ pw, 8/(unused), 9/ frd, 10/how, 11/aa, 12/chs, 13/(unused), 14/car, 15/cal, 16/stm, 17/ kg, 18/fbg, 19/stf, 20/spts, 21/fau, 22/clk, 23/jef*
83- 92	F10.4	Gross Land Area (in sq. miles)
94- 95	I2	Ratio of zonal HH median income to regional median HH income in tenths (i.e. 10 = 1.0), per 1990 CTPP.
97- 98	I2	Airline distance to the nearest external station in whole miles.

2. Node Coordinate File

Exhibit 2-6 Node Coordinate File Format Description

Columns	*Format*	*Field Description*
1- 6	I6	Highway Node Number
7- 14	I8	X-Coordinate (NAD83-based in whole feet)
15- 22	I8	Y-Coordinate (NAD83-based in whole feet)

3. Base Highway Link File

Exhibit 2-7 Base Highway Link File Format Description

Columns	***Format***	***Field Description***
1-5	I5	A node
6-10	I5	B node
13-17	F5.2	Link Distance (in whole miles with explicit decimal)
23-24	I2	Speed Class (unused, place marker field)
26-27	I2	Capacity Class (unused place marker field)
30-33	I4	Daily Ground Count in thousands
39-40	I2	Jurisdiction Code (0-23) *0/dc, 1/mtg, 2/pg, 3/alr/, 4/alx,5, ffx, 6/ldn, 7/ pw, 8/(unused), 9/ frd, 10/how, 11/aa, 12/chs, 13/(unused), 14/car, 15/cal, 16/stm, 17/ kg, 18/fbg, 19/stf, 20/spts, 21/fau, 22/clk, 23/jef*
51-52	I2	Screenline Code
54-55	I2	Link Facility Type Code (0-6) *0/centroids, 1/Freeways, 2/Major Art., 3/Minor Art, 4/ Collector, 5/ Expressway, 6/ Ramp (future use)*
61-64	I5	Toll Value in current year dollars
81-82	I2	AM Peak No. of Lanes
84-85	I2	AM Peak Limit Code (0-9)
87-88	I2	PM Peak No. of Lanes
90-91	I2	PM Peak Limit Code (0-9)
93-94	I2	Off-Peak No. of Lanes
96-97	I2	Off-Peak Limit Code (0-9)
99-102	I4	TAZ No.(unused, place marker field)

Notes:

- *The mode choice model requires that all costs be in 1980 dollars.*
- *Limit Codes are 0,1 = General Use, 2 = HOV2,3+ only, 3 = HOV 3+ Only, 4 = Truck Prohibited, 5 = Non-Airport Vehicles Prohibited, 6-8 = (unused), 9 = 'Transit Only' link (links used to more accurately depict coded transit routes, but are below the grain of the zone system; these links are not included in the highway assignment process).*

4. Consolidated Station / PNR lot file

Exhibit 2-8 Consolidated Station / PNR Lot File Format Description

Columns	*Format*	*Field Description*
1-5	I5	Sequence Number
10	A1	Mode Code (M/Metrorail, C/Commuter rail, B/Bus)
15	A1	Parking Available? (Y/N)
18	A1	Station Active? (Y/N)
21-44	A24	Station Name/PNR lot name
45-50	I6	Network Centroid (2251-2500)
51-55	I5	TAZ location of Station/PNR lot (1-2191)
56-60	I5	Rail Station Node (7301-7399, 7600-7733)
61-65	I5	Parking lot node
66-70	I5	1st Bus Node
71-75	I5	2nd Bus Node
76-80	I5	3rd Bus Node
81-85	I5	4th Bus Node
91-100	I10	X Coord.of Station / PNR lot (NAD83-based in ft.)
101-110	I10	Y Coord.of Station / PNR lot (NAD83-based in ft.)
111-140		(Unused)
141-145	I5	Year of Station/PNR lot Opening (unused)

5. Rail Link File

Exhibit 2-9 Rail Link File Format Description

Columns	*Format*	*Field Description*
1-5	I5	A Node
6-10	I5	B Node
15-19	I5	Distance in 1/100ths of miles
21-25	F5.2	Speed (mph)

Chapter 3. Auto Access Link Development

Input(s):

Built Highway Network File	(Binary)
TAZ, PNR Equivalency file	(ASCII)
Restrained Highway Skims	(Binary)

Output(s):

AM Peak/Off-Peak Auto Connect Link File, TRNBUILD Format	(ASCII)

Program File(s):

TP+

Control/Support File(s):

PUMP_PRIME_SKIMS.S
AUTO_ACCESS.S

Application Details:

The highway skim and PNR access link development process is used to create peak and off-peak drive access links, used later for transit network building, directly from skimmed highway times, by time period. Two TP+ scripts are used to accomplish this. PUMP_PRIME_SKIMS.S establishes initial highway skims by first building peak and off-peak highway skims on the basis of default, congested highway speeds. The program also utilizes a TAZ-PNR equivalence file and writes a text file containing link information for all zones origins to zone destinations which are representative of PNR lots, subject to the following conditions:

1) The airline distance from the zone to the PNR lot must be within 4.0 miles for DC, Arlington County, and Alexandria; within 5 miles for Montgomery, Fairfax, and Prince George's counties; and within 8 miles for all remaining jurisdictions.
2) Zone to PNR connections will not cross the Potomac River except for origin zones in Loudoun County and Jefferson County since the MARC system in Maryland does serve commuters from those jurisdictions.

The AUTO_ACCESS.S builds auto access links in a similar manner as the PUMP_PRIME.S script, except that the zone-to-PNR link speeds are updated based on the AM and Off-peak highway skims resulting from the initial (or 'pump prime') assignment.

Chapter 4. Pre-Transit Network Processing

Input(s):

1. Freeway Link File	(ASCII)
2. Rivers location file	(ASCII)
3. Peak & Off-Pk Transit line files, MINUTP/TRNPTH Format	(ASCII)
4. Peak/Off-Peak Transit Walk Area Files (GIS developed)	(ASCII)
5. Peak/Off-Peak Transit Walk Link Files GIS developed)	(ASCII)
6. Highway Link File	(ASCII)
7. XY File	(ASCII)
8. TAZ / Bus Fare zone Equivalency File	(ASCII)

Output(s):

Off-Peak Walk Link File, TRNBUILD Format	(ASCII)
Peak and Off-Peak Transit line files, TRNBUILD Format	(ASCII)
A2 Deck for MFARE Process	(ASCII)

Program File(s):

CNTCONN2.EXE
NETSW2.EXE
NODESTB.EXE
GIS_PROC.EXE
WLKLNKTP.EXE
PREFARTP.EXE
TP+

Control/Support File(s):

CNTCONN2 Control (CTL) files, NODESTB Control Files, NETSW2 Control (CTL) file, WLKLNKTP Control (CTL) files, PREFARTP Control (CTL File), UPDATE_WKLINKS.S (TP+ script)

Application Details:

The pre-transit skimming process involves a number of utility programs that create transit line files and transit walk access files used in AM-peak and off-peak transit network building, specifically the walk access links and transit line files. The process also creates a zonal file that is used in the MFARE2 process. The current procedure requires transit line files be provided in TRNPTH format. Two GIS-generated zone files are also needed: one which contains a measure of the area in long/short walk-to-transit areas, and another which relates each TAZ centroid to the nearest transit stop nodes within one mile.

Walk links are generally developed as follows. The NODESTP program is applied to write out all stop nodes associated with each transit line in a relatively 'neat' ASCII format. The CNTCONN2 program then uses the stop nodes file, a freeway node file, and a file containing the coordinates of water body alignments to generate zone-to-transit-stop links. The GIS_PROC program, next, reads the GIS walk area file, which contains a measure of the area in each zone that is in a 'short' and/or a 'long' walk shed to transit service. The program simply converts the area-based information into short and long walk area percentages. The sum of the short walk and long walk zonal percentages will always range from 0 to 100. If a zone contains, for example, 100% short walk area, by definition, the long walk area and the no-walk area of that zone must be 0%. The GIS walk percent file also contains the average short and long walk distances to transit service and the closest bus node and rail node to each zone, based purely on the zone's spatial disposition to the transit network. Finally, the WLKLNKTP program reads the GIS walk link file and the CNTCONN2 and GIS_PROC output files to construct the final walk access link file. Specifically, the program undertakes the following steps:

1) Walk access links to bus stops are extracted from the CNTCONN2 output file;
2) Walk access links to rail stations are extracted from the GIS walk link file;
3) Uniform walk access distances are computed for each TAZ based on the average short/long walk distances (weighted by the short/long walk area percents). Walk access links are uniformly assigned an average speed of 3 mph.

Two additional programs are used in the batch process. PREFARTP uses a zone file containing bus fare zone equivalents and inserts Metrorail walk percents from the GIS transit walk area file, thus creating the 'A2' zone file used in the fare development process. Secondly, the transit line files are converted from TRNPTH format to TRNBUILD format using a utility program named NETSW2.

If desired, the analyst may invoke a capability in the development of walk links to consider previously developed walk links from another alternative to be merged with those generated for the current working alternative. This capability was developed to better address walk access consistency between years/alternatives. The user must copy the pre-existing walk links file into the 'INPUTS' subdirectory of the current alternative and assign it the name WALK_??.OLD, where ?? refers to 'AM' or ' OP'. If these files are installed in the \INPUTS subdirectory then the UPDATE_WKLINKS.S script will be executed. The program performs the merging function.

Exhibits 4-1 through 4-5 are the control file descriptions used with the pre-transit network programs. Exhibits 4-6 through 4-8 show the file format descriptions of the input files used.

Exhibit 4-1 CNTCONN2 Control Parameters

Type	***Name***	***Description***
&files	Node_file	Highway and Transit XY file
	Lnk_file	Transit line/stop node file
	Xnod_file	Freeway node file
	Scr_file	River location file
	Out_file	Output walk link file
	Rpt_file	Output report file
&specs	Miles	Number of coordinate units per mile
	Max_zone	Maximum zone number
	Max_node	Maximum node number
	Max_walk	Maximum walk distance criterion
	Dev_fac	Directional Node Search adjustment
	Max_conn	Maximum number of walk links generated
	Mod_type	(set to 1)
	Nodesfmt	(set to T)
	Modes	Mode number for Walk Access Connection
	Tmespd	Walk Speed Assumption
	Dumdst	(set to F)
	Trnpth	(T/F) to generate TRNPTH walk file output
	Trnbld	(T/F) to generate TRNBUILD walk file output

Exhibit 4-2 NODESTB Control Parameters

Type	***Name***	***Description***
&files	Fline(1)	TRNPTH Line File 1
	Fline(2)	TRNPTH Line File 2
	Fline(3)	TRNPTH Line File 3
	Fline(4)	TRNPTH Line File 4
	Fline(5)	TRNPTH Line File 5
	Fline(6)	TRNPTH Line File 6
	Fline(7)	TRNPTH Line File 7
	Fline(8)	TRNPTH Line File 8
	Fnodes	Nodes output file name
	Frpt	Nodes report listing
&params	Period	(set to 0)
&options	STONLY	(Set to T)
	Plain	(Set to T)
&facils	(unused)	(unused)

Exhibit 4-3 NETSW2 Control Parameters

Type	***Name***	***Description***
N/A	1st Record	(No. of files to be converted)
	2nd Record	(1st TRNPTH Line input file)
	.	
	.	
	.	
	10th Record	(9th TRNPTH Line input file)

Exhibit 4-4 WLKLNKTP Control Parameters

Type	***Name***	***Description***
&FILES	gisslf	GIS-Short Walk, Long Walk File
	Cntconnf	CNTCONN2 Output file
	Gisconnf	GIS-TAZ to Transit stop node file
	Fwlkpctf	'final' walk access link file (TRNBUILD fmt.)
	Finwlkf	Final Walk Access link output file
&PARAMS	Railnr11	Minimum rail (Metrorail, Commuter rail) node number
	Railnr12	Maximum rail (Metrorail, Commuter rail) node number

Exhibit 4-5 PREFARTP Control Parameters

Type	***Name***	***Description***
&files	Gismetf	Transit walk area input file
	fwlkpctf	'final' walk percentage file
	Bfarezf	TAZ/Bus fare zone input file
	A2deckf	Output A2 deck output file (for MFARE2)

Input File Descriptions and Formats:

Exhibit 4-6 'Raw' GIS-Based Transit Walk Area File Format Description

Columns	*Format*	*Field Description*
4-8	I5	TAZ Number
9-17	I9	Total Land Area
24-30	I7	'short' walk area to rail (metrorail, commuter rail)
36-42	I7	'long' walk area to rail metrorail, commuter rail
49-55	I7	'short' walk area to non-rail transit
61-67	I7	'long' walk area to non-rail transit
73-81	I9	Non-walking area to ANY transit
85-91	I7	Avg 'Short' Walk Distance to Metrorail (in miles)
95-101	I7	Avg 'Long' Walk Distance to Metrorail (in miles)
106-112	I7	Avg 'Short' Walk Distance to Commuter Rail (in miles)
116-122	I7	Avg 'Long' Walk Distance to Commuter Rail (in miles)
127-133	I7	Avg 'Short' Walk Distance to Bus (in miles)
137-143	I7	Avg 'Long' Walk Distance to Bus (in miles)
149-155	I7	Avg'Short' Walk Distance to ANY Transit (in miles)
161-167	I7	Avg 'Long' Walk Distance to ANY Transit (in miles)
170-174	I5	Nearest Rail Station (Metrorail or Commuter Rail) w/in 1.0 mi
176-180	I5	Nearest Bus Stop Node w/in 1.0 mi

Note: area measurements are in square miles and do not include major bodies of water;
'short' references below are defined as within 1/3 mile;
'long' walk areas are those beyond 1/3 of a mile and within 1.0 mile

Exhibit 4-7 GIS-Walk Link File Format Description

Columns	*Format*	*Field Description*
1-5	I5	TAZ Number
6-10	I5	Transit Stop nodes within 1.0 mile
11-15	F5.2	Distance from TAZ centroid to stop node in miles

Exhibit 4-8 TAZ / Bus Fare Zone Equivalency File File Format Description

Columns	*Format*	*Field Description*
Zonal data		
1-4	I4	TAZ Number (or Station No.)
5-8	I4	Bus fare zone, 1st zone, 1st digit
9-12	I4	Bus fare zone, 1st zone, 2nd digit
13-16	I4	Bus fare zone, 2nd zone, 1st digit
17-20	I4	Bus fare zone, 2nd zone, 2nd digit
45-48	I4	Special transit service fare (cents)
49-50	I2	Jurisdiction code (0/DC, 1/MD, 2/VA Area 1 (Fairfax Co.), 3/VA Area 2 (non-Fairfax Co.)
Station data		
29-32	I4	Station Bus Fare Code 1st zone, 1st digit
33-36	I4	Station Bus Fare Code 1st zone, 2nd digit
37-40	I4	Station Bus Fare Code 2nd zone, 1st digit
41-44	I4	Station Bus Fare Code 2nd zone, 2nd digit

Chapter 5. Transit Skim File Development

Input(s):

1. Peak, Off-Peak Highway Networks	(Binary)
2. Peak, Off-Peak Transit Line Files, TRNBUILD Format	(ASCII)
3. Peak and Off-Peak Walk Access Links, TRNBUILD Format	(ASCII)
4. Peak/Off-Peak Drive Access Links, TRNBUILD Format	(ASCII)
5. Walk Connect Links, TRNBUILD Format	(ASCII)
6. Rail Links File, TRNBUILD Format	(ASCII)
7. Rail Node File, TRNBUILD Format	(ASCII)
8. PNR/Bus, Station connect links, TRNBUILD Format	(ASCII)
9. Station/Bus Fare connect links, TRNBUILD Format	(ASCII)

Output(s):

Peak/Off-Peak Walk Access Skims	(Binary)
Peak/Off-Peak Drive Access Skims	(Binary)
Peak/Off-Peak Walk Access Station-to-Station tables	(Binary)
Peak/Off-Peak Drive Access Station-to-Station tables	(Binary)
Transit Access file	(ASCII)

Program File(s):

TP+

Control/Support File(s):

TRANSIT_SKIMS.S

Application Details:

The transit skimming process is used to create transit level-of-service files to serve the mode choice model and to provide for the development of accessibility variables for the vehicle availability model. It also provides Metrorail on/off station information used in the creation of transit fares. Four TRNBUILD procedures are executed to produce walk-access and drive access skims for the AM-peak and off-peak periods. Each procedure requires several input files: a binary highway network, rail network links, transit line files, zone access links, walking links, and a variety of connection links.

There are 16 values used to represent the various travel modes in the TRNBUILD module, as shown below:

Mode number	Description
1 - 10	**Transit Modes:**
	1/Local Metrobus, 2/Express Metrobus, 3/Metrorail, 4/Commuter rail, 5/Unused,
	6/ Non-Metrobus Primary Local bus, 7 Non-Metrorail Primary Express Bus,
	8/ Secondary Local Bus, 9/ Secondary Express Bus
	Non-Transit Modes:
11	Drive access
12	Bus/rail walk connect
13	'Downtown' walk link
14	Unused
15	PNR/rail walk connect
16	Zonal walk access/egress link

Peak and off-peak transit bus line files are normally prepared by mode. They are coded directly over the highway networks. Transit service in the AM peak period is represented by the headways and run times in effect from 7-8 AM,[1] and transit service in the off-peak period is represented by the headways and run times in effect from 10 AM - 3 PM. Although the off-peak period covers 5 hours, the maximum headway coded on the transit line files is 60 minutes. Transit in-vehicle times are controlled by the RUNTIME parameter coded on each transit line. This means that bus running times are not computed on the basis of highway link-coded speeds over which lines are coded, but rather, are based on actual bus schedule times.

In transit pathbuilding, out-of-vehicle time is weighted at 2.5 times the in-vehicle time. The first two transfers are assigned perceived time penalties of 6 minutes; the third transfer is effectively disallowed as it is assigned a perceived time of 60.0 minutes. For cases where a given interchange is served by multiple bus lines, headways are combined for all lines that are within 5 minutes of the minimum time available.

Each skimming process results in three types of zonal skim files: the mode choice model skim file, the Metrorail on/off station file, and the total transit time file. The mode choice skim file contains six tables:

1) Walk transfer time
2) Drive access time
3) Initial wait time
4) Transfer wait time
5) Non-Metrorail In-Vehicle time
6) Metrorail In-Vehicle Time

Note that the walk time does not include zonal walk access/egress time, as that component is entered to the mode choice model as a zone variable. The Metrorail station file contains two

[1] This peak period definition is relaxed, however, to reflect earlier hourly periods for some express services that originate in the outer fringes of the study area.

files:

1) Metrorail Boarding Station No. (1-150)
2) Metrorail Alighting Station No. (1-150)

The third file contains a single table containing the total transit time, including zone walk access and egress time. The script also creates a file reflecting access to employment opportunities within 40 minutes via AM peak transit service. This measure is a variable that is used later in the vehicle availability model.

Chapter 6. Transit Fare Development

Input(s):

1. Metro Station Link File	(ASCII)
2. Metro Station XY File	(ASCII)
3. MFARE1 A1 (Coordinate) File	(ASCII)
4. Peak/Off-Peak Station-to-Station Tables	(Binary)
5. Peak / Off-Peak MFARE2 Bus Fare Matrix	(ASCII)
6. Peak /Off-Peak MFARE2 A2 File	(ASCII)

Output(s):

Peak/Off-Peak Transit Fare Files	(Binary)

Program File(s):

MFARE1.EXE, MFARE1OP.EXE, MFARE2TP.EXE, MTXIJTP.EXE, TP+

Control/Support File(s):

METRORAIL_SKIMS.S, MFARE1 Control Files, MFARE2 Control files, EXPORT_FARES.S

Application Details:

The MWCOG transit fare computation process, sometimes referred to as the *MFARE1/2* process, serves to compute transit fares used in the mode choice process. The process ultimately produces four total fare files representing walk/drive-access transit fares for the AM peak period, and walk/drive-access transit fares for the off-peak period.

The METRORAIL_SKIMS.S script is used to create Metrorail station-to-station distance skims. The skims are, then, entered to the MFARE1 and MFARE1OP programs, which calculate peak and off-peak Metrorail fares between station pairs. The peak and off-peak Metrorail fares are next entered to the MFARE2TP program which is used to calculate zone-to-zone transit fares. Exhibit 6-1 shows the control card parameters for the MFARE1/MFARE1OP programs. MTXIJTP is a utility program which may be run after the MFARE1 process to neatly format the computed station-to-station fares. The MTXIJTP program makes use of an ASCII file named 'MFARE1.A1' (created previously by the STAPROTP program) and does not require control cards.

The MFARE2TP program is executed four times. In addition to a file containing station-to-station fares, it requires a bus fare matrix indicating fares between large pre-defined superdistricts, a zone file containing bus fare zone equivalents (and Metrorail station-to-bus fare zone equivalents), and the zonal boarding/alighting file produced previously. The control card description of the MFARE2TP program is shown as Exhibit 6-2. The EXPORT_FARES.S script is used to format some selected interchanges for checking, and to write out the final four fare files. Each file contains a single table (total fare).

Input file format descriptions used in the MFARE1/2 processes are shown as Exhibits 6-3 through 6-6. Note that in the TAZ/ bus fare zone input file (see Exhibit 6-6), the walk percentages are inserted into the input file during the course of network building. The user should verify 1) that the walk percentages have, in fact, been properly inserted and 2) that the base fare zones corresponding to Metrorail stations are properly specified.

A more rigorous description of the MFARE2 fare computation is presented in Appendix E of this report (staff memorandum to the project file).

Exhibit 6-1 MFARE1 and MFARE1OP Control Parameters

Type	***Name***	***Description (MFARE1)***	***Description (MFARE1OP)***
&files	J1	Sta-Sta Distance Skim File	Sta-Sta Distance Skim File
	A1	Station Coordinate (XY) File	Station Coordinate (XY) File
	J2	Sta-Sta Fare Output File	Sta-Sta Fare Output File
	LIST	Report Output File	Report Output File
&param	ZONES	Number of Stations in System	Number of Stations in System
	UPARMS(1)	Boarding Fare in Cents	Boarding Fare in Cents
	UPARMS(2)	Secondary Fare Rate (cents/mi)	Secondary Fare increment; Amount added to base fare beyond the boarding distance (cents)
	UPARMS(3)	Maximum Fare in Cents	Maximum Fare in Cents
	UPARMS(4)	Speed for calculating rail distance	Speed for calculating rail distance
	UPARMS(5)	Distance type (see below)	Distance type (see below)
	UPARMS(7)	Boarding distance in miles	Boarding distance in miles
	UPARMS(8)	Secondary distance in miles	Secondary distance in miles
	UPARMS(9)	Fare rate (cents/mi) beyond the Secondary distance increment.	Amount added to base and secondary fare, beyond the secondary distance increment (cents).
	UPARMS(11)	Fare Discount for Station 1 (cents)	Fare Discount for Station 1 (cents)
	…	…	…
	UPARMS(160)	Fare Discount for Station 150 (cents)	Fare Discount for Station 150 (cents)

UPARMS (4) is an assumed speed value used to estimate rail distances for cases where the time (not distance) values are used in the J1 file. A value of 60 should be used if distance values (in whole miles) are used in the J1 file. Recent applications of this program have used distance values in 100ths of miles, and UPARMS(4) has been set to 0.60.

UPARMS(5) is set to 0 if a composite distance calculation is desired; a value of 1.0 indicates over the rail distances are used in the fare calculation.

Exhibit 6-2 MFARE2TP Control Parameters

Type	*Name*	*Description (MFARE2TP)*
&files	A1	Sta-Sta Fare Output Input File (From MFARE1)
	A2	TAZ / Bus Fare Equivalence Input File
	A3	Bus Fare Zone–to-Zone Matrix
	J1	Zone-to-Zone Metrorail Station Boarding/Alighting Matrices
	J2	Zonal Transit Fare Matrix Output
	LIST	MFARE2 Report file
&param	ZONES	Maximum Number of Zones
	UPARMS(1)	Number of Metrorail Stations
	UPARMS(2)	Fare Deflation Factor
	UPARMS(3)	(*not used*)
	UPARMS(4)	DC rail-to-bus discount
	UPARMS(5)	MD rail-to-bus discount
	UPARMS(6)	VA Area 1 rail-to-bus discount
	UPARMS(7)	VA Area 2 rail-to-bus discount
	UPARMS(8)	1.0 if component fares (bus only, rail, bus access, bus egress) fares are desired in the output (J2) file. A value of 0.0 will prompt the program to write the total fare only.

Input File Descriptions and Formats

Exhibit 6-3 Metrorail Station Link File Format Description

Columns	*Format*	*Field Description*
12-16	I5	Station A-node (either dummy station centroid connector or station-to-station link)
18-22	I5	Station B-node (either dummy station centroid connector or station-to-station link)
32-41	I4	Distance in miles
58-62	I5	Speed (mph)

Exhibit 6-4 Metrorail Station XY File Format Description

Columns	*Format*	*Field Description*
9-13	I5	Station Number (1-150)
19-26	I8	Station X Coordinate
32-39	I8	Station Y Coordinate

Exhibit 6-5 Bus Fare Matrix File Format Description

Columns	*Format*	*Field Description*
1-4	I4	Origin Bus Fare zone, 1st zone, 1st digit
5-8	I4	Origin Bus Fare zone, 1st zone, 2nd digit
9-12	I4	Destination Bus Fare zone, 1st zone, 1st digit
13-16	I4	Bus Fare from Origin Bus Fare Zone 11 to Destination zone, 11
17-20	I4	Bus Fare from Origin Bus Fare Zone 11 to Destination Zone 12
…	…	…
37-40	I4	Bus Fare from Origin Bus Fare Zone 11 to Destination Zone 17

Exhibit 6-6 TAZ / Bus Fare Zone Equivalency File Format Description

Columns	*Format*	*Field Description*
Zonal data		
1-4	I4	TAZ Number (or Station No.)
5-8	I4	Bus fare zone, 1st zone, 1st digit
9-12	I4	Bus fare zone, 1st zone, 2nd digit
13-16	I4	Bus fare zone, 2nd zone, 1st digit
17-20	I4	Bus fare zone, 2nd zone, 2nd digit
21-24	I4	Percent Walk (Households) to Rail Station in 1/10s (e.g. '1000' indicates 100%)
25-28	I4	Percent Walk (Employment) to Rail Station in 1/10s (e.g. '1000' indicates 100%)
45-48	I4	Special transit service fare (cents)
49-50	I2	Jurisdiction code (0/DC, 1/MD, 2/VA Area 1 (Fairfax Co.), 3/VA Area 2 (non-Fairfax Co.)
Station data		
29-32	I4	Station Bus Fare Code 1st zone, 1st digit
33-36	I4	Station Bus Fare Code 1st zone, 2nd digit
37-40	I4	Station Bus Fare Code 2nd zone, 1st digit
41-44	I4	Station Bus Fare Code 2nd zone, 2nd digit

Chapter 7. Demographic Submodels

Input(s):

1. Land Use File	(ASCII)
2. Zonal Area Type File	(ASCII)
3. Peak and Off-Peak Transit Walk Percent File	(ASCII)
4. Peak, Walk and Drive Access Transit Skims	(Binary)

Output(s):

Zonal HHs of Income Level 1, Stratified by Size and Vehicle Avail. Levels	(ASCII)
Zonal HHs of Income Level 2, Stratified by Size and Vehicle Avail. Levels	(ASCII)
Zonal HHs of Income Level 3, Stratified by Size and Vehicle Avail. Levels	(ASCII)
Zonal HHs of Income Level 4, Stratified by Size and Vehicle Avail. Levels	(ASCII)
HBW Zonal A1 Deck (for the Mode Choice Model)	(ASCII)
HBS Zonal A1 Deck (for the Mode Choice Model)	(ASCII)
HBO Zonal A1 Deck (for the Mode Choice Model)	(ASCII)
NHB Zonal A1 Deck (for the Mode Choice Model)	(ASCII)

Program File(s):

HHSIZINC.EXE
VEHAVTP.EXE
COGMCA1.EXE

Control/Support File(s):

VEHAVTP.CTL (Control file for VEHAVTP Program),
COGMCA1.CTL (Control file for COGMCA1 Program)

Application Details:

The demographic models are applied using two FORTRAN programs named HHSIZINC and VEHAVTP. They function in sequence to create four zonal household files, one for each of the four income groups, which are utilized in the trip generation model. Each file contains households stratified by 4 size groups by 4 vehicle availability groups.

The HHSIZINC program functions to apportion total households among 16 cross classes (4 size groups by 4 income groups) using CTPP-based distributions. Next, the VEHAVTP program uses the HHSIZINC output file and further apportions households in each of the 16 cross classes among 4 vehicle availability groups. Four income-based text files containing households by size and vehicle availability classes are created. The VEHAVTP program also writes a zonal file containing households by 3 vehicle availability groups (0,1, and 2+). The file is used by the COGMCA1 program, which is subsequently applied to automatically generate the zonal data file, known as the "A1 deck," used in the mode choice model. The COGMCA1 program generates four A1 files – one for each purpose – containing the household vehicle availability distributions, the zonal area, hard coded terminal times and parking costs, and a zonal 'land use

mix' variable.

Control card descriptions of the VEHAVTP and COGMCA1 programs are shown as Exhibits 7-1 and 7-2, respectively. Input file format descriptions for the above programs are shown in Exhibits 7-3 and 7-4.

Exhibit 7-1 VEHAVTP Control Parameters

Type	***Name***	***Description***
&param	*(coefficients values for the Vehicle Availability Model)*	
&files	*Input files*	
	Hhsizinc	Zonal HH stratified by size and income level (file output of HHSIZINC program)
	Zon_dat	Zonal area type file (file output of ATYPE program)
	Trn_acc	Transit Accessibility File / Access. To Emp. Within 40 minutes by AM peak transit service (file output of TRANSIT_SKIMS.S program)
	Output files	
	Hhi1_sv	Zonal Inc. 1 HH file (HH stratified by size, veh. availability Levels)
	Hhi2_sv	Zonal Inc. 2 HH file (HH stratified by size, veh. availability Levels)
	Hhi3_sv	Zonal Inc. 3 HH file (HH stratified by size, veh. availability Levels)
	Hhi4_sv	Zonal Inc. 4 HH file (HH stratified by size, veh. availability Levels)
	HH_va	Zonal File for Total HH by Veh Avail Levels (0, 1, 2+)

Exhibit 7-2 COGMCA1 Control Parameters

Type	***Name***	***Description (MFARE1)***
&files	*Input files*	
	Landusef	Land Use File
	Amshlgf	Peak transit walk area file (Output file from GIS_PROC program)
	Opshlgf	Off-Peak transit walk area file (Output file from GIS_PROC program)
	Carownf	Zonal File for Total HH by Veh Avail Levels (0, 1, 2+) (Output file from VEHAV program)
	Ouput files	
	Hbwa1v2	HBW Zonal A1 Deck for the Mode Choice Program
	Hbsa1v2	HBS Zonal A1 Deck for the Mode Choice Program
	Hboa1v2	HBO Zonal A1 Deck for the Mode Choice Program
	Nhba1v2	NHB Zonal A1 Deck for the Mode Choice Program

Input File Descriptions and Formats

1. Land Use File (See Chapter 2)

2. Zonal Area Type File

Exhibit 7-3 Zonal Area Type File Format Description

Columns	*Format*	*Field Description*
1-5	I5	TAZ
7-14	I8	X Coordinate of TAZ
15-22	I8	Y Coordinate of TAZ
23-28	F6.0	Total Population of TAZ
29-34	F6.0	Total Employment of TAZ
35-42	F8.4	Total Land Area of TAZ
43-49	F7.0	One-mile 'Floating' Population Density of TAZ
50-56	F7.0	One-mile 'Floating' Employment Density of TAZ
59-59	I1	Area Type Code (1-7)

3. Transit Walk Area Percentage File

Exhibit 7-4 Transit Walk Area Percentage File Format Description

Columns	*Format*	*Field Description*
1-5	I5	TAZ
6-10	I5	Percentage of TAZ in Short-Walk Transit Service Area
11-15	I5	Percentage of TAZ in Long-Walk Transit Service Area
16-20	I5	Percentage of TAZ in Short and Long Transit Service Area
23-27	F5.2	Avg. short walk distance to Transit (in mi) / (ranging from 0 – 0.33)
28-32	F5.2	Avg. long walk distance to Transit (in mi) / (ranging from 0.34 – 1.00)
34-37	F4.1	Avg. short walk time to Transit (in min.) / (ranging from 0 – 6.66)
39-42	F4.1	Avg. long walk time to Transit (in min.) / (ranging from 6.67 – 20.00)
45-49	I5	Nearest (GIS-based) Metrorail Station Node
50-54	I5	Nearest (GIS-based) Bus Node
60-69	F10.5	Land Area of TAZ

Chapter 8. Trip Generation

Input(s):

1. Land Use File	(ASCII)
2. Zonal HHs of Income Level 1, Stratified by Size and Vehicle Avail. Levels	(ASCII)
3. Zonal HHs of Income Level 2, Stratified by Size and Vehicle Avail. Levels	(ASCII)
4. Zonal HHs of Income Level 3, Stratified by Size and Vehicle Avail. Levels	(ASCII)
5. Zonal HHs of Income Level 4, Stratified by Size and Vehicle Avail. Levels	(ASCII)
6. Zonal Adjustment File (Purpose-Specific)	(ASCII)
7. External Production File	(ASCII)
8. External Attraction File	(ASCII)
9. Zonal Area Type File	(ASCII)

Output(s):

Trip – End (P/A) Files	(ASCII / TP+ Format)
HBW Non-Motorized Trip-Ends	(ASCII)

Program File(s):

CGTGV2TP.EXE

Control/Support File(s):

Purpose-Specific Control files for CGTGV2TP Program
HBW_TG.CTL, HBS_TG.CTL, HBO_TG.CTL, NHB_TG.CTL, MTK_TG.CTL,
HTK_TG.CTL

Application Details:

The trip generation process functions to generate trip-end (production and attraction) files corresponding to six purposes. The home-based trip-end files are stratified by income level. The program also writes non-stratified trip-end files for the home-based purposes as well. The trip generation process is applied separately for each of the six modeled purposes. The user identifies the specific purpose in a given run using the &Tpurp parameter.

The program reads a general land use file and four (income-based) files which are generated by the demographic modeling process. The program also reads a file containing the area type of each zone and zonal file containing aggregate adjustment factors. Finally, an external production file and an external attraction file containing external productions and attractions by purpose are required.

The trip generation procedure processes one purpose at a time. The computation procedure is comprised of the following steps:

1) Initial internal zonal attractions are computed, based on the modeled rates. Total attractions are accumulated. If the purpose is NHB, Medium Truck, or Heavy Truck, then the internal productions are set equal to the computed attractions.
2) Internal trip productions are computed based on the modeled trip rates, and if used, adjustment factors. The I-X residential trip productions are computed and extracted from the total productions. The HBW non-motorized trip productions are computed and removed from the total productions. Total internal productions (and non-motorized productions for the HBW purpose) are accumulated.
3) Non-motorized HBW attractions are computed, and scaled to match the non-motorized production total from above.
4) External productions and attractions are read in at the external station level.
5) A scaling factor for internal attractions is computed, as follows:

SFIA = ((IP +EP) – EA) / IA

Where:

SFIA = Scaling factor applied to internal attractions
IP = Total Internal Productions
EP = Total External Productions
EA = Total External Attractions
IA = Total Internal Attractions

6) The scaling factor is applied to internal attractions.
7) Total Home-based attractions are disaggregated by income level.
8) Final trip-ends (Ps and As) are written out. For the home based purposes, income stratified trip-ends (internal Ps, As only) and total trip-ends (internal and external Ps and As) are written. Only total trip-ends (internal and external Ps and As) are written for the NHB and truck purposes.

The control file description of the CGTGV2TP program is shown as Exhibit 8-1. File format descriptions are shown as Exhibits 8-2-through 8-4.

Exhibit 8-1 CGTGV2TP Control Parameters

Type	***Name***	***Description***
&tpurp	Purp	Trip Purpose Indicator (HBW/HBS/HBO/NHB/MTK/HTK)
&param	Zones	Highest TAZ number
	Lastizn	Highest internal TAZ number
	Dcclo	Lowest TAZ number for DC 'Core'
	Dcchi	Highest TAZ number for DC 'Core'
	Dcnlo	Lowest TAZ number for DC non-'Core'
	Dcnhi	Highest TAZ number for DC non-'Core'
	Vaclo	Lowest TAZ number for VA 'Core'
	Vachi	Highest TAZ number for VA 'Core'
	Va10lo	Lowest TAZ number for VA non-'Core'
	Va10hi	Highest TAZ number for VA non-'Core'
&files	Input files	
	Zhhi1sv	Income Group 1 HH file
	Zhhi2sv	Income Group 2 HH file
	Zhhi3sv	Income Group 3 HH file
	Zhhi4sv	Income Group 4 HH file
	Zonelu	Zonal Land Use File
	Ext_ps	External Production file
	Ext_as	External Attraction file
	Basezn	Zonal Area Type file
	Znmod	Zone-Income Production/Attraction Adjustment factor file
	Output files	
	Outf1	Income Group 1 Production/Attraction file
	Outf2	Income Group 2 Production/Attraction file
	Outf3	Income Group 3 Production/Attraction file
	Outf4	Income Group 4 Production/Attraction file
	Outf5	Non-Stratified (Total) Production/Attraction file
&prates	Production Rates - 4 Income groups (across) by HH Size, Veh. Av. Groups (down)	
&arates	Residential Attraction Rates – 10 Land Use groups (across) by 7 Area groups (down)	
	Truck Attraction Rates – 5 Land Use groups (across) by 4 Location groups (down)	
&juradj	Jurisdictional adjustment factors	
&puradj	Global Production Adjustment factor	

Input File Descriptions and Formats

1. Land Use File (See Chapter 2)

2. Zonal HH File, Income Stratified

Exhibit 8-2 Zonal HH File Format Description

Columns	*Format*	*Field Description*
1-4	I4	TAZ
5-10	F6.0	HH in Size group 1, Veh. Availability. Group 1
11-16	F6.0	HH in Size group 1, Veh. Availability. Group 2
17-22	F6.0	HH in Size group 1, Veh. Availability. Group 3
23-28	F6.0	HH in Size group 1, Veh. Availability. Group 4
29-34	F6.0	HH in Size group 2, Veh. Availability. Group 1
35-40	F6.0	HH in Size group 2, Veh. Availability. Group 2
…	…	…
95-100	F6.0	HH in Size group 4, Veh. Availability. Group 4

3. Zonal Adjustment File (Purpose-Specific)

Exhibit 8-3 Zonal Adjustment File Format Description

Columns	*Format*	*Field Description*
1-5	I5	TAZ
6-10	F5.2	Income group 1 production adjustment factor
11-15	F5.2	Income group 2 production adjustment factor
16-20	F5.2	Income group 3 production adjustment factor
21-25	F5.2	Income group 4 production adjustment factor
26-30	F5.2	Income group 1 attraction adjustment factor
31-35	F5.2	Income group 2 attraction adjustment factor
36-40	F5.2	Income group 3 attraction adjustment factor
41-45	F5.2	Income group 4 attraction adjustment factor
46-80		(unused)

4. External Production / Attraction File

Exhibit 8-4 External Production / Attraction File

Columns	***Format***	***Field Description***
1-4	I4	TAZ
6-12	I7	HBW Daily External Auto Person Trip Ps/As
14-20	I7	HBS Daily External Auto Person Trip Ps/As
22-28	I7	HBO Daily External Auto Person Trip Ps/As
30-36	I7	NHB Daily External Auto Person Trip Ps/As
38-44	I7	Daily External Medium Truck Trips Ps/As
46-52	I7	Daily External Heavy Truck Trips Ps/As

5. Zonal Area Type File (See Chapter 7)

Chapter 9. Trip Distribution

Input(s):

1. Trip-end (P/A) Files	(ASCII)
2. SOV Peak, Off-Peak Highway Skims	(Binary)
3. Peak Transit Walk Access Skims	(Binary)
4. Off-Peak Transit Walk Access Skims	(Binary)
5. Peak Transit Drive Access Skims	(Binary)
6. Off-Peak Transit Drive Access Skims	(Binary)
7. Land Use File	(ASCII)
8. Highway Terminal Time File	(ASCII)
9. F-Factor Files	(ASCII)
10. K-Factor Files	(Binary)
11. Time penalty Files	(Binary)

Output(s):

6 Trip Tables (HBW, HBS, HBO, NHB, Med Truck, Heavy Truck)	(Binary)

Program File(s):

TP+, EXTRTAB.EXE

Control/Support File(s):

TRIP_DISTRIBUTION.S

Application Details:

The trip distribution process is a TP+ script used to apply the trip distribution process for all iterations. The following procedure is used:

1. Terminal times are added to the highway network times (both peak and off-peak).

2. Composite impedances are developed by purpose.

3. Trip distribution models are run for 25 markets. The three HB purposes use separate models for 4 internal income strata, and two external models for interstate, arterial facilities. The NHB purpose involves a single internal model and two external models as before. Finally the two truck purposes each use separate internal and external models.

The script writes out total HBW, HBS, HBO, and NHB person trips to separate files, in MINUTP format. This is a requirement for running the mode choice model. It also contains a summary routine in which person trips are summarized at jurisdiction level. The trip distribution

process also includes a utility program, EXTRTAB.EXE. This is a commonly used program throughout the Version 2.1/TP+ process where MATRIX scripts are used. The program is used to read a TP+ report listing, and to extract out portions of the listing where special summaries exist. This saves time that would ordinarily be spent searching through the report file for key sections. In many cases the TP+ report files are quite voluminous.

Chapter 10. Mode Choice

Input(s):

1. Daily Person Trip Table	(MINUTP Binary)
2.Walk Access Transit Skims	(MINUTP Binary)
3. Drive Access Transit Skims	(MINUTP Binary)
4.Walk Access Transit Fares	(MINUTP Binary)
5. Drive Access Transit Fares	(MINUTP Binary)
6. SOV Highway Skims	(MINUTP Binary)
7. HOV2 Highway Skims	(MINUTP Binary)
8. HOV 3+ Highway Skims	(MINUTP Binary)
9. Zonal (A1) File	(ASCII)
10. Transit Percentage Adjustment File	(ASCII)
11. Car Occ. Adjustment Files	(ASCII)
12. Non-work Transit Factors File (unused)	(ASCII)

Output(s):

LOV Auto Driver, LOV Auto Person, Walk Access Transit Trips, Drive Access Transit Trips, HOV Auto Driver Trips, HOV Auto Person Trips	(MINUTP Binary)

Program File(s):

COGMC.EXE, EXTRTAB.EXE

Control/Support File(s):

(Mode Choice Control Files) HBWMC.SET, HBSMC.SET, HBOMC.SET, NHBMC.SET, MCTF_HBW.ASC, MCTF_HBS.ASC, MCTF_HBO.ASC, MCTF_NHB.ASC, MCCF_HBW.ASC, MCCF_HBS.ASC, MCCF_HBO.ASC, MCCF_NHB.ASC, MC_FAC.ASC MC_SUMMARY.S, MC_UPDATE.S, AdR_UPDATE.S

Application Details:

The mode choice model is run separately for each purpose. Each run requires:

- LOV and HOV highway skims;
- Walk access and drive access transit skims;
- Walk access and drive access transit fares;
- A zone file containing short/long walk area percentages, parking costs, and households by vehicle availability levels

- Transit and car occupancy adjustment factors, at the jurisdiction interchange level

The program generally writes out binary files containing trip tables by mode. The files include LOV auto driver trips, LOV auto person trips, walk access transit trips, drive access transit trips, HOV auto drivers and HOV auto persons. At present HOV trips are generated for the HBW purpose only. It is important to point out that the HOV trips generated by the mode choice model *are only those that utilize HOV-dedicated lanes for a substantial portion of the trip*. The model allocates the remaining carpool traffic in the LOV trips. The ADR_UPDATE.S script is used after the mode choice process to disaggregate LOV trips among 1, 2, and 3+ occupant levels

The current mode choice program version requires that the user specify all parameters explicitly in the control cards. The calibrated model parameters, for each purpose, are listed below.

It has been noted that some non-work intrazonal person trip interchanges resulting from the trip distribution process have been found to exceed 32,767. This value is larger than what the current mode choice program can currently accommodate. These cases represent a small number of interchanges and do not impact transit estimation at all. The summary program MC_SUMMARY addresses this potential problem and updates the mode choice output files. The program sets these person trips to LOV persons and auto drivers (using an assumed average occupancy), in such a manner that no person trips are lost.

The MC_UPDATE.S program serve the mode choice function for the first and second iteration passes. The program essentially maintains transit and HOV trips from the mode choice model and applies LOV auto driver percentages (again, from the mode choice model) to the residual person trips.

Input file format descriptions for the mode choice model are shown as Exhibits 10-1 and 10-2. A summary of user-defined parameters (UPARMS) is shown as Exhibits 10-3 and 10-4.

Input File Descriptions and Formats

Exhibit 10-1 Zonal (A1) File Format Description

Columns	*Format*	*Field Description*
1-5	I5	TAZ number
6-11	I6	Households with 0 Vehicles Available
12-17	I6	Households with 1 Vehicle Available
18-23	I6	Households with 2+ Vehicles Available
24-27	I4	Percent Short (0.00-0.33 mi) Walk to Transit
28-31	I4	Percent Long (0.34-1.00 mi) Walk to Transit
32-38	I7	Total Employment (normally unspecified for Version 2 application)
39-46	F8.4	Land Area in Sq. Miles
47-51	I5	Daily / Hourly Parking Cost in 1980 cents
52-54	I3	Attraction Zone Highway Terminal Time in minutes
55-58	I4	Average Short Walk Access Time in minutes
59-62	I4	Average Long Walk Access Time in minutes
63-69	I7	Land Use 'Mix' Measure, defined as: (HHPD*NEMPD) / (HHPD+NEMPD) Where: HHPD = HH Population density (pop/sq mi) NEMPD = Employment density, where employment has been Normalized to HH Population.

Exhibit 10-2 Transit and Car Occupancy Adjustment Factor File Format Description

Columns	*Format*	*Field Description*
1-5	I5	Origin District Code (1-20)
6-12	F7.4	Factor for Destination District 1
13-19	F7.4	Factor for Destination District 2
20-26	F7.4	Factor for Destination District 3
…	…	…
139-145	F7.4	Factor for Destination District 20

Exhibit 10-3 Mode Choice Parameter Listing, Values which may be changed by user

COG/TPB Model, Version 2.1, Release C

Keyword	Type	Purpose				
		HBW	HBS	HBO	NHB	Description
ZONES	I	2191	2191	2191	2191	Highest zone number for matrices
UPARMS(1)	I	2	0	0	0	Carpool occupancy criterion A. 0 or 1 means that no special HOV roadways are available. Otherwise, value must lie between 2 and 4 inclusive.
UPARMS(2)	R	0	0	0	0	Proportion of intrazonal trips which use transit
UPARMS(3)	R	1	1	1	1	Proportion of intrazonal trips which are auto drivers
UPARMS(4)	R	0	0	0	0	Proportion of internal/external trips which use transit
UPARMS(5)	R	0.87	0.61	0.62	0.78	Proportion of internal/external auto person trips that are auto driver
UPARMS(6)	I	3	0	0	0	Carpool occupancy criterion B. 0 or 1 means that there is no second type of HOV roadway. Otherwise, value must lie between 2 and 4 inclusive and must exceed UPARMS(1)
UPARMS(10)	R	1	1	1	1	Factor to scale input highway and HOV travel times to whole minutes
UPARMS(11)	R	0.1	0.1	0.1	0.1	Factor to scale input highway and HOV distances to whole minutes
UPARMS(12)	R	5.3	5.3	5.3	5.3	Auto operating cost in cents per mile (1980 dollars)
UPARMS(13)	R	82.5	82.5	82.5	82.5	Consumer price index (CPI-U), all items, urban consumers, for June 1980 (base: 1982-84 = 100)
UPARMS(14)	R	82.5	82.5	82.5	82.5	Forecast year consumer price index (CPI-U)
UPARMS(16)	I	2	2	2	2	Apply sub-model to estimate daily parking cost? (1=yes, 2=no)
UPARMS(17)	I	2	2	2	2	Apply sub-model to estimate highway terminal times? (1=yes, 2=no)
UPARMS(18)	I	7	7	7	7	Mode choice model application option: 5 = Apply work and non-work models, non-work input is person trips; 6 = Apply work and non-work models, non-work input is vehicle trips; 7 = Apply work and non-work models, non-work input is vehicle trips
UPARMS(19)	I	2	2	2	2	Print input zonal data report? (1=yes, 2=no)
UPARMS(20)	I	1	1	1	1	Print transformed zonal data report? (1=yes, 2=no)
UPARMS(21)	I	1	1	1	1	"Dry run" option: 1 = Full program run 2 = Read and print parameters only 3 = Read/print parameters and read/print zonal data only (MODAS & MODBS)
UPARMS(22)	R	0.9	0.27	0.75	1	Average daily work person trips per household for 0-auto households

Keyword	Type	Purpose				
		HBW	HBS	HBO	NHB	Description
UPARMS(23)	R	1.25	0.72	1.81	0	Average daily work person trips per household for 1-auto households (value not used for NHB model)
UPARMS(24)	R	2.15	1.11	3.71	0	Average daily work person trips per household for 2+auto households (value not used for NHB model)
UPARMS(26)	R	2.845	2.845	2.845	2.845	Average daily non-work person trips per household for 0-auto households
UPARMS(27)	R	3.703	3.703	3.703	0	Average daily non-work person trips per household for 1-auto households (value not used for NHB model)
UPARMS(28)	R	4.732	4.732	4.732	0	Average daily non-work person trips per household for 2+auto households (value not used for NHB model)
UPARMS(30)	I	1	1	1	1	Print system variable frequency average variable value, and trips by access area reports? (1=yes, 2=no)

Ref: mc_uparms_v2_1c.xls

Type: I = integers; R = decimal value; L = logical (true or false)

Exhibit 10-4 Mode Choice Parameter Listing, Values which should not be changed by user

COG/TPB Model, Version 2.1, Release C

Keyword	Type	Purpose				Description
		HBW	HBS	HBO	NHB	
UPARMS(15)	R	4.55	4.36	4.36	4.38	Average auto occupancy for the 4+person-per-automobile integer occupancy mode
UPARMS(31)	R	0.05319	0.02168	0.02322	0.0286	Coefficient on transit walk time
UPARMS(32)	R	0.05319	0.02168	0.02322	0.0286	Coefficient on transit initial wait time ("wait 1")
UPARMS(33)	R	0.05319	0.02168	0.02322	0.0286	Coefficient on transfer time ("wait 2")
UPARMS(34)	R	0.03556	0.02168	0.02322	0.0286	Coefficient on transit non-Metrorail IVTT
UPARMS(35)	R	0.03556	0.02168	0.02322	0.0286	Coefficient on transit Metrorail IVTT
UPARMS(36)	R	0	-3.752E-05	-3.196E-05	-1.126E-05	Drive alone coefficient on land-use mix index variable at production zone
UPARMS(37)	R	1.825E-05	-1.955E-05	-1.694E-05	-1.304E-05	Drive alone coefficient on land-use mix index variable at attraction zone
UPARMS(38)	R	0	0	0	0	Group ride coefficient on land-use mix index variable at production zone
UPARMS(39)	R	0	0	0	0	Group ride coefficient on land-use mix index variable at attraction zone
UPARMS(40)	R	0.00766	0.00758	0	0	Coefficient on transit fare
UPARMS(41)	R	0	0	0	0	Natural log of highway cost for CP2, CP3, and CP4+ in the carpool occupancy model
UPARMS(42)	R	0.03556	0.02168	0.02322	0.0286	Coefficient on transit auto-connect time
UPARMS(43)	R	2.4455	3.827	2.9106	0.9594	Transit auto-connect bias coefficient for 0-auto households
UPARMS(44)	R	0.4766	0.3546	0.4	0	Transit auto-connect bias coefficient for 1-auto households
UPARMS(45)	R	0.1947	-0.8	0.1619	0	Transit auto-connect bias coefficient for 2+auto households
UPARMS(46)	R	-1.390E-05	0	-3.777E-05	0	Transit coefficient on land-use mix index variable at production zone
UPARMS(47)	R	0.03556	0.02168	0.02322	0.0286	Coefficient on drive alone highway terminal (excess) time
UPARMS(48)	R	0.03556	0.02168	0.02322	0.0286	Coefficient on drive alone highway IVTT
UPARMS(49)	R	0.00766	0.00758	0	0	Coefficient on drive alone highway operating cost
UPARMS(50)	R	0.00766	0.00758	0	0	Coefficient on drive alone highway parking cost
UPARMS(51)	R	0.00766	0.00758	0	0	Coefficient on drive alone highway toll

Keyword	Type	Purpose				Description
		HBW	HBS	HBO	NHB	
UPARMS(52)	R	0	0	0	0	Coefficient on drive alone highway distance
UPARMS(53)	R	3.8787	3.754	3.3764	-1.74	Drive alone bias coefficient for 0-auto households
UPARMS(54)	R	-0.1387	-1.7629	-1.0058	0	Drive alone bias coefficient for 1-auto households
UPARMS(55)	R	-1.1138	-2.9904	-1.3659	0	Drive alone bias coefficient for 2+ auto households
UPARMS(56)	R	0	-3.269E-05	-1.941E-05	-2.156E-05	Transit coefficient on land-use mix index variable at attraction zone
UPARMS(57)	R	0.03556	0.02168	0.02322	0.0286	Coefficient on group ride highway terminal (excess) time
UPARMS(58)	R	0.03556	0.02168	0.02322	0.0286	Coefficient on group ride highway IVTT
UPARMS(59)	R	0.00766	0.00758	0	0	Coefficient on group ride highway operating cost
UPARMS(60)	R	0.00766	0.00758	0	0	Coefficient on group ride highway parking cost
UPARMS(61)	R	0.00766	0.00758	0	0	Coefficient on group ride highway toll
UPARMS(62)	R	0	0	0	0	Coefficient on group ride highway distance
UPARMS(63)	R	3.647	1.5111	2.0908	-0.88	Group ride bias coefficient for 0-auto households
UPARMS(64)	R	1.3654	-1.4377	-0.6236	0	Group ride bias coefficient for 1-auto households
UPARMS(65)	R	0.8698	-2.6864	-1.2312	0	Group ride bias coefficient for 2+ auto households
UPARMS(66)	R	0	0	0.65329	0.7683	Natural log of highway cost for drive alone and group ride in the mode choice model
UPARMS(67)	R	0	0.45633	0.6853	0.00573	Coefficient on 2 persons: Auto highway terminal (excess) time
UPARMS(68)	R	0	0.45633	0.6853	0.00573	Coefficient on 2 persons: Auto highway IVTT
UPARMS(69)	R	0.01388	0	0	0	Coefficient on 2 persons: Auto highway operating cost
UPARMS(70)	R	0.0419	0	0	0	Coefficient on 2 persons: Auto parking cost
UPARMS(71)	R	0.05371	0	0	0	Coefficient on 2 persons: Auto highway toll
UPARMS(72)	R	0	0	0	0.00151	Coefficient on 2 persons: Auto highway distance
UPARMS(73)	R	0	0.45633	0.6853	0.00573	Coefficient on 3 persons: Auto highway terminal (excess) time
UPARMS(74)	R	0	0.45633	0.6853	0.00573	Coefficient on 3 persons: Auto highway IVTT
UPARMS(75)	R	0.01388	0	0	0	Coefficient on 3 persons: Auto highway operating cost
UPARMS(76)	R	0.0419	0	0	0	Coefficient on 3 persons: Auto parking cost
UPARMS(77)	R	0.05371	0	0	0	Coefficient on 3 persons: Auto highway toll

Keyword	Type	Purpose				Description
		HBW	HBS	HBO	NHB	
UPARMS(78)	R	0	0	0	0.00151	Coefficient on 3 persons: Auto highway distance
UPARMS(79)	R	0	0	0	0.97305	3-person auto bias coefficient for 0-auto households
UPARMS(80)	R	1.45273	0.92201	0.31756	0	3-person auto bias coefficient for 1-auto households
UPARMS(81)	R	1.87733	0.48966	0.15151	0	3-person auto bias coefficient for 2+ auto households
UPARMS(82)	R	0	0	0.65329	0.7683	Natural log of transit fare for transit mode in the mode choice model
UPARMS(83)	R	0	0.45633	0.6853	0.00573	Coefficient on 4+ persons: Auto highway terminal (excess) time
UPARMS(84)	R	0	0.45633	0.6853	0.00573	Coefficient on 4+ persons: Auto highway IVTT
UPARMS(85)	R	0.01388	0	0	0	Coefficient on 4+ persons: Auto highway operating cost
UPARMS(86)	R	0.0419	0	0	0	Coefficient on 4+ persons: Auto parking cost
UPARMS(87)	R	0.05371	0	0	0	Coefficient on 4+ persons: Auto highway toll
UPARMS(88)	R	0	0	0	0	Coefficient on 4+ persons: Auto highway distance
UPARMS(89)	R	0	0	0	1.42742	4+person auto bias coefficient for 0-auto households
UPARMS(90)	R	3.03413	1.51854	0	0	4+person auto bias coefficient for 1-auto households
UPARMS(91)	R	2.56171	0.84071	-0.21854	0	4+person auto bias coefficient for 2+ auto households
UPARMS(92)	R	0	0	-0.42569	-0.65963	Transit bias coefficient for short walk to short (or single) walk access market
UPARMS(93)	R	0	0	0	0	Transit bias coefficient for short (or single) walk to long walk access market
UPARMS(94)	R	0	0	0	0	Transit bias coefficient for long walk to short (or single) walk access market
UPARMS(95)	I	3	3	3	1	Number of socio-economic stratifications in the model
UPARMS(96)	R	0	0	0	0	Transit bias coefficient for long walk to long walk access market
UPARMS(97)	R	0	0	0	0	Transit bias coefficient for drive access to short (or single) walk access market
UPARMS(98)	R	-0.05001	0	0	0	Coefficient on HOV highway time savings (compared to normal highway network) for 3- & 4+occ.
UPARMS(99)	R	-0.85678	-0.97516	-0.8891	-1.84313	Metrorail bias coefficient (applies if Metrorail is more than 25% of total transit run time)
UPARMS(100)	R	0	0	0	0	Transit bias coefficient for drive access to long walk access market

Keyword	Type	Purpose				Description
		HBW	HBS	HBO	NHB	
OrigSLWalk	L	t	t	t	t	If True, apply short/long walk methodology at the production (origin) end, else apply single walk methodology.
DestSLWalk	L	t	t	t	t	If True, apply short/long walk methodology at the attraction (destination) end, else apply single walk methodology.
UseShort	L	t	t	t	t	If True, use the short walk percentages and walk times as the "single" walk values, else use the long walk percentages and walk times.

Ref: mc_uparms_v2_1c.xls

Type: I = integers; R = decimal value; L = logical (true or false)

Chapter 11. Time-of-Day Processing

Input(s):

1. Daily Auto Driver trips, by Occupancy levels	(Binary)
2. Daily Miscellaneous and Truck Trips	(Binary)
3. Time of Day Percent File by purpose, mode, and direction	(ASCII/TP+ script)

Output(s):

Trip Tables by Time Period	(Binary)
Auto Driver Trips by Purpose and Occupancy level	(Binary)

Program File(s):

TP+, EXTRTAB.EXE

Control/Support File(s):

TIME-OF-DAY.S, MISC_TIME-OF-DAY.S, V2TODTPP.PAR

Application Details:

The TIME-OF-DAY and MISC_TIME-OF-DAY scripts are used to apportion modeled auto driver trips and non-modeled vehicle trips among the three time periods. Each program applies the percentages to each trip table on the basis of purpose, occupancy level, and direction. The time of day factors exist on a parameter file that is 'called' into the TP+ scripts. The parameter file is named V2TODTPP.PAR. A listing of the parameter file is shown below:

```
;|\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\|
;|////////////////////////////////////////////////////////////////////////////////|
;|//      V2TODTPP.PAR --  Version 2 Time Period Factors                        //|
;|////////////////////////////////////////////////////////////////////////////////|
;|\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\|
;  NOTE: Time Period Definitions:
;             AM Peak  Period: 6:00 AM - 9:00 AM
;             PM Peak  Period: 4:00 PM - 7:00 PM
;             Off-Peak Period: All other hours
;
; I-I med/heavy truck pcts. updated 9/04/02(rjm) based on 9/96
; Quick Response Freight Manual temporal distributions (pg 4-38)
;
;                      Period       Purpose   Mode        Direction
;                     --------      -------   ----        ---------
; Start of HBW
AMWADHNP = '67.72'    ; AM  Pk Prd    HBW     Auto Driver  H -> NH
PMWADHNP = ' 2.78'    ; PM  Pk Prd    HBW     Auto Driver  H -> NH
OPWADHNP = '29.50'    ; NON Pk Prd    HBW     Auto Driver  H -> NH

AMWADNHP = ' 1.41'    ; AM  Pk Prd    HBW     Auto Driver  NH -> H
PMWADNHP = '63.29'    ; PM  Pk Prd    HBW     Auto Driver  NH -> H
OPWADNHP = '35.30'    ; NON Pk Prd    HBW     Auto Driver  NH -> H
;
AMWDAHNP = '66.39'    ; AM  Pk Prd    HBW     Drive Alone  H -> NH
PMWDAHNP = ' 2.80'    ; PM  Pk Prd    HBW     Drive Alone  H -> NH
OPWDAHNP = '30.81'    ; NON Pk Prd    HBW     Drive Alone  H -> NH

AMWDANHP = ' 1.50'    ; AM  Pk Prd    HBW     Drive Alone  NH -> H
PMWDANHP = '61.21'    ; PM  Pk Prd    HBW     Drive Alone  NH -> H
OPWDANHP = '37.29'    ; NON Pk Prd    HBW     Drive Alone  NH -> H
;
AMWCPHNP = '74.66'    ; AM  Pk Prd    HBW     CarPool Psn  H -> NH
PMWCPHNP = ' 3.04'    ; PM  Pk Prd    HBW     CarPool Psn  H -> NH
OPWCPHNP = '22.30'    ; NON Pk Prd    HBW     CarPool Psn  H -> NH

AMWCPNHP = ' 0.87'    ; AM  Pk Prd    HBW     CarPool Psn  NH -> H
PMWCPNHP = '72.39'    ; PM  Pk Prd    HBW     CarPool Psn  NH -> H
OPWCPNHP = '26.74'    ; NON Pk Prd    HBW     CarPool Psn  NH -> H
; End of HBW
;
; Start of HBS
AMSADHNP = '10.62'    ; AM  Pk Prd    HBS     Auto Driver  H -> NH
PMSADHNP = '20.69'    ; PM  Pk Prd    HBS     Auto Driver  H -> NH
OPSADHNP = '68.69'    ; NON Pk Prd    HBS     Auto Driver  H -> NH

AMSADNHP = ' 1.75'    ; AM  Pk Prd    HBS     Auto Driver  NH -> H
PMSADNHP = '31.49'    ; PM  Pk Prd    HBS     Auto Driver  NH -> H
OPSADNHP = '66.76'    ; NON Pk Prd    HBS     Auto Driver  NH -> H
;
AMSDAHNP = '12.66'    ; AM  Pk Prd    HBS     Drive Alone  H -> NH
PMSDAHNP = '18.12'    ; PM  Pk Prd    HBS     Drive Alone  H -> NH
OPSDAHNP = '69.22'    ; NON Pk Prd    HBS     Drive Alone  H -> NH

AMSDANHP = ' 2.33'    ; AM  Pk Prd    HBS     Drive Alone  NH -> H
PMSDANHP = '31.82'    ; PM  Pk Prd    HBS     Drive Alone  NH -> H
OPSDANHP = '65.85'    ; NON Pk Prd    HBS     Drive Alone  NH -> H
;
AMSCPHNP = ' 5.85'    ; AM  Pk Prd    HBS     CarPool Psn  H -> NH
PMSCPHNP = '26.45'    ; PM  Pk Prd    HBS     CarPool Psn  H -> NH
OPSCPHNP = '67.70'    ; NON Pk Prd    HBS     CarPool Psn  H -> NH

AMSCPNHP = ' 0.47'    ; AM  Pk Prd    HBS     CarPool Psn  NH -> H
PMSCPNHP = '31.37'    ; PM  Pk Prd    HBS     CarPool Psn  NH -> H
OPSCPNHP = '68.16'    ; NON Pk Prd    HBS     CarPool Psn  NH -> H
; End of HBS
;
; Start of HBO
AMOADHNP = '24.40'    ; AM  Pk Prd    HBO     Auto Driver  H -> NH
PMOADHNP = '21.42'    ; PM  Pk Prd    HBO     Auto Driver  H -> NH
OPOADHNP = '54.18'    ; NON Pk Prd    HBO     Auto Driver  H -> NH

AMOADNHP = ' 4.98'    ; AM  Pk Prd    HBO     Auto Driver  NH -> H
PMOADNHP = '28.54'    ; PM  Pk Prd    HBO     Auto Driver  NH -> H
OPOADNHP = '66.48'    ; NON Pk Prd    HBO     Auto Driver  NH -> H
;
AMODAHNP = '23.37'    ; AM  Pk Prd    HBO     Drive Alone  H -> NH
PMODAHNP = '18.59'    ; PM  Pk Prd    HBO     Drive Alone  H -> NH
OPODAHNP = '58.04'    ; NON Pk Prd    HBO     Drive Alone  H -> NH

AMODANHP = ' 6.48'    ; AM  Pk Prd    HBO     Drive Alone  NH -> H
PMODANHP = '25.83'    ; PM  Pk Prd    HBO     Drive Alone  NH -> H
OPODANHP = '67.69'    ; NON Pk Prd    HBO     Drive Alone  NH -> H
;
AMOCPHNP = '28.66'    ; AM  Pk Prd    HBO     CarPool Psn  H -> NH
PMOCPHNP = '26.61'    ; PM  Pk Prd    HBO     CarPool Psn  H -> NH
OPOCPHNP = '44.73'    ; NON Pk Prd    HBO     CarPool Psn  H -> NH

AMOCPNHP = ' 1.89'    ; AM  Pk Prd    HBO     CarPool Psn  NH -> H
PMOCPNHP = '31.46'    ; PM  Pk Prd    HBO     CarPool Psn  NH -> H
OPOCPNHP = '66.65'    ; NON Pk Prd    HBO     CarPool Psn  NH -> H
; End of HBO
;
; Start of NHB
AMNADHNP = ' 8.49'    ; AM  Pk Prd    NHB     Auto Driver  H -> NH
PMNADHNP = '26.97'    ; PM  Pk Prd    NHB     Auto Driver  H -> NH
OPNADHNP = '64.54'    ; NON Pk Prd    NHB     Auto Driver  H -> NH

AMNADNHP = ' 8.49'    ; AM  Pk Prd    NHB     Auto Driver  NH -> H
PMNADNHP = '26.97'    ; PM  Pk Prd    NHB     Auto Driver  NH -> H
OPNADNHP = '64.54'    ; NON Pk Prd    NHB     Auto Driver  NH -> H
;
AMNDAHNP = ' 9.41'    ; AM  Pk Prd    NHB     Drive Alone  H -> NH
PMNDAHNP = '25.94'    ; PM  Pk Prd    NHB     Drive Alone  H -> NH
```

```
OPNDAHNP = '64.65'    ; NON Pk Prd    NHB     Drive Alone  H -> NH

AMNDANHP = ' 9.41'    ; AM  Pk Prd    NHB     Drive Alone  NH -> H
PMNDANHP = '25.94'    ; PM  Pk Prd    NHB     Drive Alone  NH -> H
OPNDANHP = '64.65'    ; NON Pk Prd    NHB     Drive Alone  NH -> H
;
AMNCPHNP = ' 7.04'    ; AM  Pk Prd    NHB     CarPool Psn  H -> NH
PMNCPHNP = '28.15'    ; PM  Pk Prd    NHB     CarPool Psn  H -> NH
OPNCPHNP = '64.81'    ; NON Pk Prd    NHB     CarPool Psn  H -> NH

AMNCPNHP = ' 7.04'    ; AM  Pk Prd    NHB     CarPool Psn  NH -> H
PMNCPNHP = '28.15'    ; PM  Pk Prd    NHB     CarPool Psn  NH -> H
OPNCPNHP = '64.81'    ; NON Pk Prd    NHB     CarPool Psn  NH -> H
; End of NHB
;
; Start of Through, Internal Trucks and Through Auto Driver
AMXXTRKP = '23.00'    ; AM  Pk Prd    XX      Trucks
PMXXTRKP = '11.00'    ; PM  Pk Prd    XX      Trucks
OPXXTRKP = '66.00'    ; NON Pk Prd    XX      Trucks
;
AMIIMTKP = '19.50'    ; AM  Pk Prd    II      Med. Trucks
PMIIMTKP = '15.20'    ; PM  Pk Prd    II      Med. Trucks
OPIIMTKP = '63.30'    ; NON Pk Prd    II      Med. Trucks
;
AMIIHTKP = '15.40'    ; AM  Pk Prd    II      Hvy. Trucks
PMIIHTKP = '13.00'    ; PM  Pk Prd    II      Hvy. Trucks
OPIIHTKP = '71.60'    ; NON Pk Prd    II      Hvy. Trucks
;
AMXXADRP = '18.00'    ; AM  Pk Prd    XX      Auto Driver
PMXXADRP = '22.00'    ; PM  Pk Prd    XX      Auto Driver
OPXXADRP = '60.00'    ; NON Pk Prd    XX      Auto Driver
; End of Through, Internal Trucks and Through Auto Driver
;
; Start of Misc. Auto Driver Trips (Taxi, Visitor, School)
AMTAXISP = ' 9.00'    ; AM  Pk Prd            Taxi Auto Driver
PMTAXISP = '27.00'    ; PM  Pk Prd            Taxi Auto Driver
OPTAXISP = '64.00'    ; NON Pk Prd            Taxi Auto Driver
;
AMVISITP = '33.00'    ; AM  Pk Prd            Visitor Auto Driver
PMVISITP = '33.00'    ; PM  Pk Prd            Visitor Auto Driver
OPVISITP = '34.00'    ; NON Pk Prd            Visitor Auto Driver
;
AMSCHOOP = '33.00'    ; AM  Pk Prd            School Auto Driver
PMSCHOOP = '33.00'    ; PM  Pk Prd            School Auto Driver
OPSCHOOP = '34.00'    ; NON Pk Prd            School Auto Driver
;
AMAIRPXP = '10.00'    ; AM  Pk Prd            Air Pax, Auto Dr.
PMAIRPXP = '10.00'    ; PM  Pk Prd            Air Pax, Auto Dr.
OPAIRPXP = '80.00'    ; NON Pk Prd            Air Pax, Auto Dr.
; End of Misc. Auto Driver Trips (Taxi, Visitor, School)
```

Chapter 12. Traffic Assignment

Input(s):

1. Modeled vehicle trip tables by occupant level and time period (Binary)
2. Non-modeled vehicle and truck trip tables by time period (Binary)
3. Network file (Binary)

Output(s):

Loaded Links Files by Time period (Binary)

Program File(s):

TP+

Control/Support File(s):

HIGHWAY_ASSIGNMENT.S,

Application Details:

The traffic assignment process involves running three individual loadings for the three time periods (AM, PM, and off-peak periods). The traffic assignment process is executed four times in the pump prime, base, first, and second iterations. Each assignment run utilizes an equilibrium algorithm that is run for 10 iterations.

The assignment process is executed with TP+ script named HIGHWAY_ASSIGNMENT.S. The script reads six trip files:

- AM modeled trips
- PM modeled trips
- Off-peak modeled trips
- AM truck and non-modeled trips
- PM truck and non-modeled trips
- Off-peak truck and non-modeled trips

The modeled trip files contain 3 trip tables corresponding to SOV, 2 occupant HOVs, and 3+occupant HOVs. The non-modeled files each contain 7 trip tables corresponding to through trucks, through auto drivers, taxi auto drivers, visitor auto drivers, school auto drivers, medium size trucks, and heavy trucks. The program first collapses the six files into three files (AM,PM and Off-peak) containing five tables: 1) 1-occupant auto drivers, 2) 2-occupant auto drivers, 3) 3+occupant auto drivers, 4) trucks (medium and heavy), and 5) airport passenger vehicle trips.

The assignment process is executed for each time period. After the three assignments a summary routine follows to compute daily statistics.

Chapter 13. Preparing Model Executions

The Version 2.1/TP+ model application process is designed to apply a very complex process while minimizing human error as much as possible. To further minimize errors, the following is a recommended checklist of procedures that should be undertaken before executing the Version 2.1/TP+ model.

1. The analyst should check the application environment, specifically that the subdirectory structure is complete as prescribed in Exhibit 1-4 of Chapter 1. The analyst should next check that the filenames residing in the SOFTWARE and SUPPORT subdirectories match the filenames documented in this report Exhibits 1-3 and 1-7, in Chapter 1. The TP+ scripts residing in the SCRIPTS subdirectory should be checked with the listing at the beginning of Appendix A. Control Files in the CONTROLS subdirectory should be checked with those listed in Appendix B.

2. The user should next ensure that the input files (residing in the \INPUTS subdirectory), associated with a given year or alternative, are all accounted for. The files should be consistent with those names shown in Exhibit 1-6 of Chapter 1. The contents of each file should conform to the specifications of the file format descriptions in this report.

3. Transit fare-related inputs should also be checked. The zonal input file to the MFARE2TP program is named *FARE_A2.ASC*. The file is produced by the *PREFARETP* and represents the merging of the *TAZFRZN.ASC* file and Metrorail-related walk percents derived from the GIS area file *GISWKAAM.ASC*. The *FARE_2.ASC* file should be reviewed to ensure that the merge was successful. A more detailed description of the MFARE2TP transit fare calculation is presented in Appendix E for those interested in manually checking MFARE2TP computations at the interchange level.

4. The land use file (*ZONE.ASC*) residing in the \INPUTS subdirectory should be checked to ensure that it is accurate. The totals of each variable in the land use file should be summarized and checked.

5. Highway connectivity should be checked. The highway building routine will normally provide information in the generated report that indicates which TAZs are disconnected. The analyst should check that all 'active' TAZ's are, in fact, connected.

6. Highway paths should be checked graphically. Viper enables the user to generate colored travel time isochrones. This is an excellent device for ensuring that 'tunnels' do not exist in the highway network. COG has also developed a TP+ script named AON.S which generates a network file showing LOV and HOV 'vines' from selected origins.

7. Highway plotting of link attributes to check consistency and accuracy is recommended.

8. Consistency of highway attributes over time is also important to check. COG has developed a TP+ script named HWYCHK.S which checks that the number of lanes and the facility type coding changes logically between two network years.

9. Transit paths should be checked for reasonability. The transit network building and network skimming routine (TRANSIT_SKIMS.S) writes out a fixed set of transit paths. These should be checked. Reconfiguring the program to write out specific path traces of interest is easy to implement.

10. COG has discovered that accessibility maps are very powerful tools for identifying network coding inconsistencies. If time allows, highway and transit accessibility results should be analyzed. TP+ scripts now exist for summarizing accessibility over time. The names of the script files are:

    - HIGHWAY_ACCESS.S (AM/Off-Peak Highway Accessibility Summaries)
    - TRANSIT_ACCESS.S (AM/Off-Peak Transit Access Summaries)
    - HWYAMPM_ACCESS.S (Maximum AM/PM Highway Time Accessibility Summaries)
    - WTRANSIT_ACCESS.S (AM/PM Walk Access Transit Accessibility Summaries)
    - CHECK_AC.S (prepares zonal files showing accessibility changes over time, using the results of the above scripts).

Appendix A. Version 2.1/ TP+ Scripts

ADr_Update.s

```
; ===================================================================
;  ADr_Update.s
;  This program used to develop 1-occ, 2-occ, and 3+occ auto driver
;  trip tables directly from a the Mode Choice Model Output file.
;
;  'off-the-shelf' disaggregation curves to arrive at auto driver
;  trips in occupant categories.
;    The program is applied in four 'loops'
;  -- one for each purpose (HBW, HBS, HBO, and NHB)
; ===================================================================
;  Environment Variable:  %_iter%  iteration (i1/i2)
;
;/////////////////////////////////////////////////////////////////
;
; First, establish Input/Output filenames:
LOOP PURP=1,4  ;  We'll Loop 4 times, for each purpose
               ;  Note default auto driver shares and occupant
               ;  shares to be used in case no seed shares exist

IF (PURP=1)    ; HBW Loop
 MCFILE   = 'mc_hbw%_iter_%.fin'   ; HBW Mode Choice file               (Input)
 AD123OCC = 'HBW%_iter_%.ADR'    ; HBW auto driver trips- 1,2,3+ Occ.  (Output)
 PURPOSE  = 'HBW'          ;

ELSEIF (PURP=2) ; HBS Loop
 MCFILE   = 'mc_hbs%_iter_%.fin'   ; HBS Mode Choice file               (Input)
 AD123OCC = 'HBS%_iter_%.ADR'    ; HBS auto driver trips- 1,2,3+ Occ. (Output)
 PURPOSE  = 'HBS'          ;

ELSEIF (PURP=3) ; HBO Loop
 MCFILE   = 'mc_hbo%_iter_%.fin'   ; HBO Mode Choice file               (Input)
 AD123OCC = 'HBO%_iter_%.ADR'    ; HBO auto driver trips- 1,2,3+ Occ. (Output)
 PURPOSE  = 'HBO'          ;

ELSEIF (PURP=4) ; NHB Loop
 MCFILE   = 'mc_nhb%_iter_%.fin'   ; NHB Mode Choice file               (Input)
 AD123OCC = 'NHB%_iter_%.ADR'    ; NHB auto driver trips- 1,2,3+ Occ. (Output)
 PURPOSE  = 'NHB'          ;

ENDIF
;
;/////////////////////////////////////////////////////////////////

RUN PGM=MATRIX
    MATI[1]=@MCFILE@           ;  MC model ouput


; Put Mode Choice Mats 1-7, respectively, The tables are:
; 1/LOVADRs 2/LOVAPSNs 3/Trn_Wk 4/Trn_Dr 5/HOV2ADRs 6/HOVPSNs 7/HOV3+ADRs
; HOV trips refer to carpool trips on special priority facilities.
; Carpools not on special facilities are subsumed in the LOV group.

FILLMW MW[1]  = MI.1.1,2,3,4,5,6,7
MW[8] = MW[1] + MW[5] + MW[7]     ; Total input ADR in work mat 8

JLOOP
   IF (MW[1]  = 0)             ; COMPUTE AVG LOV Auto Occupancy
       MW[10] = 0              ; in Work Mat 10
   ELSE                        ;
       MW[10] = MW[2]/MW[1]    ;
   ENDIF
; Determine LOV Vehicles in 1,2,3&4+ occupant groups using model
; COG's disaggrgegation model.
       IF     (MW[10]  < 1.0050) ;  Make sure the computed Car Occ.
               MW[10]  = 1.0050  ;  is between 1.005 and 2.500
       ELSEIF (MW[10]  > 2.5000) ;  -- if not establish boundary
               MW[10]  = 2.5000  ;     conditions
       ENDIF
;
; Apply Car Occ. Pct Model-Computes Pct Vehs.in Occ groups as function
; of avg auto occ.

IF     (MW[10] = 1.0050 - 1.1199999)
 MW[21] =  2.00264 - (0.9989 * MW[10]) ; Shr of 1-Occ Vehs
 MW[22] = -1.00050 + (0.9952 * MW[10]) ; Shr of 2-Occ Vehs
 MW[23] = -0.00158 + (0.0029 * MW[10]) ; Shr of 3-Occ Vehs
 MW[24] = -0.00056 + (0.0008 * MW[10]) ; Shr of 4-Occ Vehs
ELSEIF (MW[10] = 1.1200 - 2.5000)
 MW[21] =  1.59600 - (0.6357 * MW[10]) ; Shr of 1-Occ Vehs
 MW[22] = -0.31143 + (0.3800 * MW[10]) ; Shr of 2-Occ Vehs
 MW[23] = -0.17082 + (0.1540 * MW[10]) ; Shr of 3-Occ Vehs
 MW[24] = -0.11375 + (0.1017 * MW[10]) ; Shr of 4-Occ Vehs
ENDIF

;
;  if we're working with an intrazonal
;  situation, make all auto drivers are SOV.
;  Override modeled shares here
IF (i=j)  ;
 MW[21] =  1.00    ; Pct of 1-Occ Vehs
 MW[22] =  0.00    ; Pct of 2-Occ Vehs
 MW[23] =  0.00    ; Pct of 3-Occ Vehs
 MW[24] =  0.00    ; Pct of 4-Occ Vehs
ENDIF

;   Apply Modeled Shares to the Auto Drivers

 MW[31] =(MW[21] * MW[1]) ; Estimated LOV 1 occ vehicles
 MW[32] =(MW[22] * MW[1]) ; Estimated LOV 2 occ vehicles
 MW[33] =(MW[23] * MW[1]) ; Estimated LOV 3 occ vehicles
 MW[34] =(MW[24] * MW[1]) ; Estimated LOV 4+occ vehicles


; compute add HOV2 & HOV3 trips from MC file to LOV dissagg. trips,
; also combine 3 & 4+ occ. auto driver trips into one group.

 MW[41] = MW[31]                          ;   Total 1-Occ Auto Drivers
 MW[42] = MW[32] + MW[5]                  ;         2-occ(lov+carpool)
 MW[43] = MW[33] + MW[34] + MW[7]         ;         3-occ(lov+carpool)


;
endjloop

DUMMY = ROWFIX(41)  ; make resultant trips integers
DUMMY = ROWFIX(42)  ;
DUMMY = ROWFIX(43)  ;

MW[44] = MW[41] + MW[42] + MW[43] ; total output auto drivers

JLOOP

; Lets sum up the above to get neat total summaries

   INPLADR  = INPLADR  + MW[1]   ;  Input LOV Auto Driver Accumulation
   INPHAADR = INPHAADR + MW[5]   ;  Input HOV/2 CP ADR    Accumulation
   INPHBADR = INPHBADR + MW[7]   ;  Input HOV/3 CP ADR    Accumulation
   INPADR   = INPADR   + MW[8]   ;  Input Auto Driver     Accumulation
   OUT1ADR  = OUT1ADR  + MW[41]  ;  Output 1 occ Auto Dr  Accumulation
   OUT2ADR  = OUT2ADR  + MW[42]  ;  Output 2 occ Auto Dr  Accumulation
   OUT3ADR  = OUT3ADR  + MW[43]  ;  Output 3 occ Auto Dr  Accumulation
```

```
   OUTADR   = OUTADR   + MW[44]  ;  Output 4 occ Auto Dr  Accumulation

endjloop

IF (I == ZONES)
;
; Compute Regional Occ. distributions
;
 IF (OUTADR   = 0)
    OUTAD1SH = 0
    OUTAD2SH = 0
    OUTAD3SH = 0
 ELSE
    OUTAD1SH = OUT1ADR/OUTADR *100   ; 1-occ adr SHARE
    OUTAD2SH = OUT2ADR/OUTADR *100   ; 2-occ adr SHARE
    OUTAD3SH = OUT3ADR/OUTADR *100   ; 3+occ adr SHARE
    OUTADSH  = OUTADR /OUTADR *100   ; TOTAL     SHARE /1.000
 ENDIF


 LIST='/bt     '
 LIST='Summary of ','@PURPOSE@',' %_iter_%-ITERATION AUTO Dr Trips'
 LIST='   '
 LIST='   '
 List='       Summary of Input/Output Shares'
 List='Input  Auto LOV     Auto Drivers: ', inpladr(8)
 List='Input  Auto HOV2 CP Auto Drivers: ', inphaadr(8)
 List='Input  Auto HOV3 CP Auto Drivers: ', inphbadr(8)
 List='-----------------------------------------------'
 List='Input Total Auto Drivers:         ', inpadr(8)
 LIST='   '
 List='Output 1-Occ Auto Drivers:        ', out1adr(8),outad1sh(6.1),'%'
 List='Output 2-Occ Auto Drivers:        ', out2adr(8),outad2sh(6.1),'%'
 List='Output 3+Occ Auto Drivers:        ', out3adr(8),outad3sh(6.1),'%'
 List='-----------------------------------------------'
 List='Output Total Auto Drivers:        ', outadr(8),outadsh(6.1),'%'
 LIST='/et     '
ENDIF

MATO=@AD123OCC@,MO=41,42,43 ; output file designation

ENDRUN
ENDLOOP
```

Auto_Access.s

```
;--------------------------------------------------------------------------
;Auto_Access.s
;MWCOG VERSION 2 MODEL
;
; Develop Auto Access Taz to PNR Links from the Prime Prime Auto Skims
;
;   Input files   -  SOVppam.skm (AM, SOV Skims from the Pump Prime Assignment)
;                    SOVppop.skm (AM, SOV Skims from the Pump Prime Assignment)
;                                3 tables in each skim file:
;                                       1- time    (min),
;                                       2- distance(1/10th  mi)
;                                       3- tolls   (1980 cents)
;                    tazpnr.lkp          (TAZ pnr equivalency file)
;   Output files  -  pnr_am.tb , pnr_op.tb (will overwrite the files from the
;                    earlier Pump_Prime_skims file.
;
;
LOOP PERIOD=1,2       ;  loop through two time periods-- AM, Off-Peak
TOLLDEFL='%_TDEFL_%'    ;

 IF (PERIOD=1)
    PRD =  'AM'
    IDS =  'AM Final Auto Access Skims'
  ELSE
    PRD =  'OP'
    IDS =  'OP Final Auto Access Skims'
 ENDIF

;--------------------------------------------------------------------------
;       Step 1: Park-&-Ride Access Data
;--------------------------------------------------------------------------
;
;  Next write out TAZ-to-PNR links based on skim times/distances
;  for each time period
;
RUN PGM=MATRIX
 MATI[1]=SOVPP@PRD@.SKM

        LOOKUP NAME=TAZPNRLK,
               LOOKUP[1] = 1, RESULT=2,; pnr node 1
               LOOKUP[2] = 1, RESULT=3,; pnr node 2 (if any)
               LOOKUP[3] = 1, RESULT=4,; pnr node 3 (if any)
               LOOKUP[4] = 1, RESULT=5,; pnr node 4 (if any)
               INTERPOLATE=N, FAIL=0,0,0, FILE=TAZPNR.LKP

        ZDATI[1]=BASEZON.DAT,Z=1-5,XCRD = 7-14,YCRD= 15-22

        MW[1] = mi.1.1     ;       Time     (min)
        MW[2] = mi.1.2*10  ;       Distance (1/100ths mi)

;  calculate the i/j airline distance in miles MW[3]  and

        JLOOP
           IF (XCRD[I] = 0 || XCRD[J] = 0)
              MW[3] = 0
           ELSE
              XCHGFT =   XCRD[I] - XCRD[J]
              YCHGFT =   YCRD[I] - YCRD[J]
              MW[3]  =   (SQRT((XCHGFT**2) + (YCHGFT**2)))/ 5280.0
           ENDIF
         ENDJLOOP
;  Insert 50% of lowest time/distance value into intrazonal cells
        JLOOP
          IF (J == I)
             MW[1]=(0.50 * LOWEST(1,1,0.0001,99999.9))
             MW[2]=(0.50 * LOWEST(2,1,0.0001,99999.9))
             MW[3]=(0.50 * LOWEST(3,1,0.0001,99999.9))
          ENDIF
        ENDJLOOP



 JLOOP
    pnr = tazpnrlk(1,j)
        IF (pnr           > 0   &               ;---- Park-&-Ride Station ----
              ((i = 1   -1229 & j = 1   -1229)| ;---- DC/Maryland Internals ----
               (i = 1230-2141 & j = 1230-2141)| ;---- Virginia Internals ----
               (i = 1780-1919 & j = 1   -1229)| ;---- Loudoun to DC/Maryland ----
               (i = 2135-2141 & j = 1   -1229))) ;---- Jefferson to DC/Maryland ---
-


            ; set default airline distance tolenances here:

             dtol= 8.0 ; default distance limit to pnr stations is  9mi
                       ; limit is shorter for more developed juris.
             if (I=1-319,1230-1329,1330-1399)  dtol=4.00; 4mi/dc,arl/alx
             if (I=320-639,640-1029,1400-1779) dtol=5.00; 7mi/mtg,pg,ffx

             IF (MW[1]  > 0  & MW[3]  > 0.0001 &  MW[3] <= dtol) ;
                    _SPEED = ROUND (MW[2] / MW[1] * 0.60)
                    _dis00 =        MW[2]
                    PRINT LIST='SUPPORT N=',i(4),'-',pnr(5),
                    ' DIST=',_dis00(5),' ONEWAY=Y MODES=11 SPEED=',
                     _SPEED(3),' ;  jtaz/pnr(1)=  ',j(5),
                     ' Airln Dist(mi): ',MW[3],
                    FILE=PNR_@PRD@.TB

                    if (tazpnrlk(2,j) > 0)
                       pnr2   = tazpnrlk(2,j)
                       PRINT LIST='SUPPORT N=',i(4),'-',pnr2(5),
                       ' DIST=',_dis00(5),' ONEWAY=Y MODES=11 SPEED=',
                        _SPEED(3),' ;  jtaz/pnr(2)=  ',j(5),
                     ' Airln Dist(mi): ',MW[3],
                        FILE=PNR_@PRD@.TB
                    endif
                    if (tazpnrlk(3,j) > 0)
                       pnr3    = tazpnrlk(3,j)
                       PRINT LIST='SUPPORT N=',i(4),'-',pnr3(5),
                       ' DIST=',_dis00(5),' ONEWAY=Y MODES=11 SPEED=',
                        _SPEED(3),' ;  jtaz/pnr(3)=  ',j(5),
                     ' Airln Dist(mi): ',MW[3],
                        FILE=PNR_@PRD@.TB
                    endif
                    if (tazpnrlk(4,j) > 0)
                       pnr4    = tazpnrlk(4,j)
                       PRINT LIST='SUPPORT N=',i(4),'-',pnr4(5),
                       ' DIST=',_dis00(5),' ONEWAY=Y MODES=11 SPEED=',
                        _SPEED(3),' ;   jtaz/pnr(4)=  ',j(5),
                     ' Airln Dist(mi): ',MW[3],
                        FILE=PNR_@PRD@.TB
                    endif

               ENDIF
        ENDIF

 ENDJLOOP

ENDRUN
ENDLOOP   ;
```

BS_Auto_Drivers.s

```
; ================================================================
;  BS_Auto_Drivers.s
;  This program used to develop 1-occ, 2-occ, and 3+occ auto driver
;  trip tables directly from a the Mode Choice Model Output file.
;
;  'off-the-shelf' disaggregation curves to arrive at auto driver
;  trips in occupant categories.
;    The program is applied in four 'loops'
;  -- one for each purpose (HBW, HBS, HBO, and NHB)
; ================================================================
;
;
;//////////////////////////////////////////////////////////////////
;
; First, establish Input/Output filenames:
LOOP PURP=1,4  ;  We'll Loop 4 times, for each purpose
               ;  Note default auto driver shares and occupant
               ;  shares to be used in case no seed shares exist

IF (PURP=1)    ; HBW Loop
 MCFILE   = 'mc_hbw.fin'   ; HBW Mode Choice file               (Input)
 BS123OCC = 'HBWBS.ADR'    ; HBW auto driver trips- 1,2,3+ Occ.  (Output)
 PURPOSE  = 'HBW'          ;

ELSEIF (PURP=2) ; HBS Loop
 MCFILE   = 'mc_hbs.fin'   ; HBS Mode Choice file               (Input)
 BS123OCC = 'HBSBS.ADR'    ; HBS auto driver trips- 1,2,3+ Occ. (Output)
 PURPOSE  = 'HBS'          ;

ELSEIF (PURP=3) ; HBO Loop
 MCFILE   = 'mc_hbo.fin'   ; HBO Mode Choice file               (Input)
 BS123OCC = 'HBOBS.ADR'    ; HBO auto driver trips- 1,2,3+ Occ. (Output)
 PURPOSE  = 'HBO'          ;

ELSEIF (PURP=4) ; NHB Loop
 MCFILE   = 'mc_nhb.fin'   ; NHB Mode Choice file               (Input)
 BS123OCC = 'NHBBS.ADR'    ; NHB auto driver trips- 1,2,3+ Occ. (Output)
 PURPOSE  = 'NHB'          ;

ENDIF
;
;//////////////////////////////////////////////////////////////////

RUN PGM=MATRIX
    MATI[1]=@MCFILE@           ;  MC model ouput


; Put Mode Choice Mats 1-7, respectively, The tables are:
; 1/LOVADRs 2/LOVAPSNs 3/Trn_Wk 4/Trn_Dr 5/HOV2ADRs 6/HOVPSNs 7/HOV3+ADRs
; HOV trips refer to carpool trips on special priority facilities.
; Carpools not on special facilities are subsumed in the LOV group.

FILLMW MW[1]  = MI.1.1,2,3,4,5,6,7
MW[8] = MW[1] + MW[5] + MW[7]     ; Total input ADR in work mat 8

JLOOP
   IF (MW[1]  = 0)             ; COMPUTE AVG LOV Auto Occupancy
       MW[10] = 0              ; in Work Mat 10
   ELSE                        ;
       MW[10] = MW[2]/MW[1]    ;
   ENDIF
; Determine LOV Vehicles in 1,2,3&4+ occupant groups using model
; COG's disaggrgegation model.

        IF     (MW[10]  < 1.0050) ;  Make sure the computed Car Occ.
               MW[10]  = 1.0050  ;  is between 1.005 and 2.500
        ELSEIF (MW[10]  > 2.5000) ;  -- if not establish boundary
               MW[10]  = 2.5000  ;     conditions
        ENDIF
;
; Apply Car Occ. Pct Model-Computes Pct Vehs.in Occ groups as function
; of avg auto occ.

IF     (MW[10] = 1.0050 - 1.1199999)
 MW[21] =  2.00264 - (0.9989 * MW[10]) ; Shr of 1-Occ Vehs
 MW[22] = -1.00050 + (0.9952 * MW[10]) ; Shr of 2-Occ Vehs
 MW[23] = -0.00158 + (0.0029 * MW[10]) ; Shr of 3-Occ Vehs
 MW[24] = -0.00056 + (0.0008 * MW[10]) ; Shr of 4-Occ Vehs
ELSEIF (MW[10] = 1.1200 - 2.5000)
 MW[21] =  1.59600 - (0.6357 * MW[10]) ; Shr of 1-Occ Vehs
 MW[22] = -0.31143 + (0.3800 * MW[10]) ; Shr of 2-Occ Vehs
 MW[23] = -0.17082 + (0.1540 * MW[10]) ; Shr of 3-Occ Vehs
 MW[24] = -0.11375 + (0.1017 * MW[10]) ; Shr of 4-Occ Vehs
ENDIF

;
;  if we're working with an intrazonal
;  situation, make all auto drivers are SOV.
;  Override modeled shares here
IF (i=j)  ;
 MW[21] =  1.00    ; Pct of 1-Occ Vehs
 MW[22] =  0.00    ; Pct of 2-Occ Vehs
 MW[23] =  0.00    ; Pct of 3-Occ Vehs
 MW[24] =  0.00    ; Pct of 4-Occ Vehs
ENDIF

;   Apply Modeled Shares to the Auto Drivers

 MW[31] =(MW[21] * MW[1]) ; Estimated LOV 1 occ vehicles
 MW[32] =(MW[22] * MW[1]) ; Estimated LOV 2 occ vehicles
 MW[33] =(MW[23] * MW[1]) ; Estimated LOV 3 occ vehicles
 MW[34] =(MW[24] * MW[1]) ; Estimated LOV 4+occ vehicles


; compute add HOV2 & HOV3 trips from MC file to LOV dissagg. trips,
; also combine 3 & 4+ occ. auto driver trips into one group.

 MW[41] = MW[31]                          ;   Total 1-Occ Auto Drivers
 MW[42] = MW[32] + MW[5]                  ;         2-occ(lov+carpool)
 MW[43] = MW[33] + MW[34] + MW[7]         ;         3-occ(lov+carpool)


;
endjloop

DUMMY = ROWFIX(41)  ; make resultant trips integers
DUMMY = ROWFIX(42)  ;
DUMMY = ROWFIX(43)  ;

MW[44] = MW[41] + MW[42] + MW[43] ; total output auto drivers

JLOOP

; Lets sum up the above to get neat total summaries

   INPLADR  = INPLADR  + MW[1]   ;  Input LOV Auto Driver Accumulation
   INPHAADR = INPHAADR + MW[5]   ;  Input HOV/2 CP ADR    Accumulation
   INPHBADR = INPHBADR + MW[7]   ;  Input HOV/3 CP ADR    Accumulation
   INPADR   = INPADR   + MW[8]   ;  Input Auto Driver     Accumulation
   OUT1ADR  = OUT1ADR  + MW[41]  ;  Output 1 occ Auto Dr  Accumulation
   OUT2ADR  = OUT2ADR  + MW[42]  ;  Output 2 occ Auto Dr  Accumulation
   OUT3ADR  = OUT3ADR  + MW[43]  ;  Output 3 occ Auto Dr  Accumulation
   OUTADR   = OUTADR   + MW[44]  ;  Output 4 occ Auto Dr  Accumulation
```

```
endjloop

IF (I == ZONES)
;
; Compute Regional Occ. distributions
;
 IF (OUTADR   = 0)
    OUTAD1SH = 0
    OUTAD2SH = 0
    OUTAD3SH = 0
 ELSE
    OUTAD1SH = OUT1ADR/OUTADR *100   ; 1-occ adr SHARE
    OUTAD2SH = OUT2ADR/OUTADR *100   ; 2-occ adr SHARE
    OUTAD3SH = OUT3ADR/OUTADR *100   ; 3+occ adr SHARE
    OUTADSH  = OUTADR /OUTADR *100   ; TOTAL     SHARE /1.000
 ENDIF


 LIST='/bt     '
 LIST='Summary of ','@PURPOSE@',' BASE-ITERATION AUTO Dr Trip Results'
 LIST='   '
 LIST='   '
 List='       Summary of Input/Output Shares'
 List='Input  Auto LOV     Auto Drivers: ', inpladr(8)
 List='Input  Auto HOV2 CP Auto Drivers: ', inphaadr(8)
 List='Input  Auto HOV3 CP Auto Drivers: ', inphbadr(8)
 List='-----------------------------------------------'
 List='Input Total Auto Drivers:         ', inpadr(8)
 LIST='   '
 List='Output 1-Occ Auto Drivers:        ', out1adr(8),outad1sh(6.1),'%'
 List='Output 2-Occ Auto Drivers:        ', out2adr(8),outad2sh(6.1),'%'
 List='Output 3+Occ Auto Drivers:        ', out3adr(8),outad3sh(6.1),'%'
 List='-----------------------------------------------'
 List='Output Total Auto Drivers:        ', outadr(8),outadsh(6.1),'%'
 LIST='/et     '
ENDIF

MATO=@BS123OCC@,MO=41,42,43 ; output file designation

ENDRUN
ENDLOOP
```

export_fares.s

```
;-------------------------------------------------------------------------
; Export_Fares.s
; MWCOG Version 2 Model.
;
; Export Fare Data on Selected Interchanges
; Input Files:
;  Fare Matrix Files = MF_pp_mm.SKM
; Output Files:
;  Selected Fare Data = MF_pp_mm.ASC
;  MINUTP Fare Matrix = MF_pp.mm.FAR
;
; Step 1: Export Fare Matrix Files
;  Input Files: MF_pp_mm.SKM
;  Output Files: MF_pp_mm.ASC, MF_pp.mm.FAR
;
;-------------------------------------------------------------------------
;
COMP ID = 'MWCOG Version 2 Model -- Export Fare Matrix'
;
;-------------------------------------------------------------------------
;         Step 1: Export Fare Matrix Files
;-------------------------------------------------------------------------
;
RUN PGM=MATRIX
 MATI[1]=MF_AM_WK.SKM
 MATI[2]=MF_AM_DR.SKM
 MATI[3]=MF_OP_WK.SKM
 MATI[4]=MF_OP_DR.SKM
 MATO[1] = MF_AM_WK.FAR, MO=1, FORMAT=MINUTP
 MATO[2] = MF_AM_DR.FAR, MO=2, FORMAT=MINUTP
 MATO[3] = MF_OP_WK.FAR, MO=3, FORMAT=MINUTP
 MATO[4] = MF_OP_DR.FAR, MO=4, FORMAT=MINUTP

 FILLMW MW[1]=MI.1.1, MI.2.1, MI.3.1, MI.4.1

 JLOOP
; check for negative fare values- stop if any found

IF (MI.1.1 < 0 || MI.1.2 < 0 || MI.1.3 < 0 || MI.1.4 < 0 || MI.1.5 < 0)
   LIST ='Negative Fares 1 or more tables in MF_AM_WK.SKM, aborted run'
   ABORT
ENDIF

IF (MI.2.1 < 0 || MI.2.2 < 0 || MI.2.3 < 0 || MI.2.4 < 0 || MI.2.5 < 0)
   LIST ='Negative Fares 1 or more tables in MF_AM_DR.SKM, aborted run'
   ABORT
ENDIF

IF (MI.3.1 < 0 || MI.3.2 < 0 || MI.3.3 < 0 || MI.3.4 < 0 || MI.3.5 < 0)
   LIST ='Negative Fares 1 or more tables in MF_OP_WK.SKM, aborted run'
   ABORT
ENDIF

IF (MI.4.1 < 0 || MI.4.2 < 0 || MI.4.3 < 0 || MI.4.4 < 0 || MI.4.5 < 0)
   LIST ='Negative Fares 1 or more tables in MF_OP_DR.SKM, aborted run'
   ABORT
ENDIF

;-------------------------------------------------------------------------
; Format out Fare information from MFARE2 output for selected i/js    -
;-------------------------------------------------------------------------

 IF (i = 8, 64, 345, 362, 464, 578, 829, 927, 1043, 1231, 1236, 1337,
  1537, 1554, 1619, 1698, 1716, 1842, 1942, 1967 &
  j = 8, 64, 345, 362, 1231, 1236, 1337, 1537)

  PRINT FILE=MF_AM_WK.ASC FORM=5, LIST=I(4), J, '     1', MI.1.1, MI.1.2, MI.1.3,
MI.1.4, MI.1.5
  PRINT FILE=MF_AM_DR.ASC FORM=5, LIST=I(4), J, '     1', MI.2.1, MI.2.2, MI.2.3,
MI.2.4, MI.2.5
  PRINT FILE=MF_OP_WK.ASC FORM=5, LIST=I(4), J, '     1', MI.3.1, MI.3.2, MI.3.3,
MI.3.4, MI.3.5
  PRINT FILE=MF_OP_DR.ASC FORM=5, LIST=I(4), J, '     1', MI.4.1, MI.4.2, MI.4.3,
MI.4.4, MI.4.5

 ENDIF

 ENDJLOOP
ENDRUN
```

highway_assignment.s

```
; ====================================================================
;  HIGHWAY_ASSIGNMENT.S
;  MWCOG Version 2 Model
;  Note: Freeway VDF's updated                9/04/02 rjm
;  Note: Freeway Freeflow Speed Table Updated  9/14/02 rjm
;  Note: Bridge Penalties removed             9/17/02 rjm
;  Note: Upper limit of freeway VDF value corrected 11/05/02 rjm
;  Note: Freeway Ramp's FTYPE added           12/12/02 jcpark/RM
;   3 Steps:
;     Step 1 - Consolidate current modeled and nonmodeled trip tables //
;              for the highway assignment process.
;     Step 2 - Execute traffic assignment and compute speed averaging
;              for three time periods.
;     Step 3 - Summarize daily VMT.
;
;   Environment Variables:
;    _iter_  (Iteration indicator = 'pp','bs','i1', or 'i2')
;
;
;-------------------------------------------------------------------
;   Step 1 - Modeled & Non-Modeled Trip Table Consolidation
;            for the Highway Assignment
;            - 3 Trip files built for AM,PM,Off-Peak Time Periods
;            - Each file has 5 Trip tables:
;                1) 1-occ adrs
;                2) 2-occ adrs
;                3) 3-occ adrs
;                4) Trucks
;                5) Airport Pax Adrs
;-------------------------------------------------------------------
;                                                                    //
; I/P Auto Dr. Pct. tables:                                          //
ADRAM  = 'AM%_iter_%.ADR' ; AM     Modeled Total Auto Drivers       //
ADRPM  = 'PM%_iter_%.ADR' ; PM     Modeled Total Auto Drivers       //
ADROP  = 'OP%_iter_%.ADR' ; Off-Pk Modeled Total Auto Drivers       //
;                                                                   //
; I/P MISC Auto Dr.Tables:                                          //
MISCAM  = 'MISCAM.TT'     ; AM     Non-Modeled Trips               //
MISCPM  = 'MISCPM.TT'     ; PM     Non-Modeled Trips               //
MISCOP  = 'MISCOP.TT'     ; Off-Pk Non-Modeled Trips               //
;                                                                   //
; O/P  Vehicle  Trips:                                              //
AM_VT   = '%_iter_%AM.VTT'    ; AM VEH TRIPS FOR ASSIGNMENT             //
PM_VT   = '%_iter_%PM.VTT'    ; PM VEH TRIPS FOR ASSIGNMENT             //
OP_VT   = '%_iter_%OP.VTT'    ; OP VEH TRIPS FOR ASSIGNMENT             //
;                       ;                                           //
;                       ; based on 1994 auto ext svy /              //
;                       ; avg xx auto occ. is 1.72 -basis for:      //
XXAD1OCC = '0.5021'       ; ASSUMED SHARE OF THRU ADRS W/ 1-OCC     //
XXAD2OCC = '0.3426'       ; ASSUMED SHARE OF THRU ADRS W/ 2-OCCS    //
XXAD3OCC = '0.1553'       ; ASSUMED SHARE OF THRU ADRS W/ 3+OCCS    //
;/////////////////////////////////////////////////////////////////////


RUN PGM=MATRIX
    MATI[1]=@ADRAM@   ;
    MATI[2]=@ADRPM@   ;
    MATI[3]=@ADROP@   ;

    MATI[4]=@MISCAM@    ;
    MATI[5]=@MISCPM@    ;
    MATI[6]=@MISCOP@    ;
;
 MW[1]= MI.1.1          ; AM 1-Occ adrs
 MW[2]= MI.1.2          ; AM 2-Occ adrs
 MW[3]= MI.1.3          ; AM 3+Occ adrs
;
 MW[4]= MI.2.1          ; PM 1-Occ adrs
 MW[5]= MI.2.2          ; PM 2-Occ adrs
 MW[6]= MI.2.3          ; PM 3+Occ adrs
;
 MW[7]= MI.3.1          ; OP 1-Occ adrs
 MW[8]= MI.3.2          ; OP 2-Occ adrs
 MW[9]= MI.3.3          ; OP 3+Occ adrs
;
; AM Peak Period MISC Trips
;
 MW[11] = MI.4.1            ; AM Thru     Truck
 MW[12] = MI.4.2*@XXAD1OCC@ ; AM Thru     Auto Driver-1 OCC
 MW[13] = MI.4.2*@XXAD2OCC@ ; AM Thru     Auto Driver-2 OCC
 MW[14] = MI.4.2*@XXAD3OCC@ ; AM Thru     Auto Driver-3+OCC
 MW[15] = MI.4.3            ; AM Taxi     Auto Driver
 MW[16] = MI.4.4            ; AM Visitor  Auto Driver
 MW[17] = MI.4.5            ; AM School   Auto Driver
 MW[18] = MI.4.6            ; AM I-I,I-E,E-I Medium Truck
 MW[19] = MI.4.7            ; AM I-I,I-E,E-I Heavy  Truck

 DUMMY  = ROWFIX(12)  ;  Bucket Rnd XX AUTO 1-OCC TRIPS
 DUMMY  = ROWFIX(13)  ;                AUTO 2 OCC TRIPS
 DUMMY  = ROWFIX(14)  ;                AUTO 3+OCC TRIPS

; PM Peak Period MISC Trips
;
 MW[21] = MI.5.1            ; PM Thru     Truck
 MW[22] = MI.5.2*@XXAD1OCC@ ; PM Thru     Auto Driver-1 OCC
 MW[23] = MI.5.2*@XXAD2OCC@ ; PM Thru     Auto Driver-2 OCC
 MW[24] = MI.5.2*@XXAD3OCC@ ; PM Thru     Auto Driver-3+OCC
 MW[25] = MI.5.3            ; PM Taxi     Auto Driver
 MW[26] = MI.5.4            ; PM Visitor  Auto Driver
 MW[27] = MI.5.5            ; PM School   Auto Driver
 MW[28] = MI.5.6            ; PM I-I,I-E,E-I Medium Truck
 MW[29] = MI.5.7            ; PM I-I,I-E,E-I Heavy  Truck

 DUMMY  = ROWFIX(22)  ;  Bucket Rnd XX AUTO 1-OCC TRIPS
 DUMMY  = ROWFIX(23)  ;                AUTO 2 OCC TRIPS
 DUMMY  = ROWFIX(24)  ;                AUTO 3+OCC TRIPS

; OFF PK Peak Period MISC Trips
;
 MW[31] = MI.6.1            ; PM Thru     Truck
 MW[32] = MI.6.2*@XXAD1OCC@ ; PM Thru     Auto Driver-1 OCC
 MW[33] = MI.6.2*@XXAD2OCC@ ; PM Thru     Auto Driver-2 OCC
 MW[34] = MI.6.2*@XXAD3OCC@ ; PM Thru     Auto Driver-3+OCC
 MW[35] = MI.6.3            ; PM Taxi     Auto Driver
 MW[36] = MI.6.4            ; PM Visitor  Auto Driver
 MW[37] = MI.6.5            ; PM School   Auto Driver
 MW[38] = MI.6.6            ; PM I-I,I-E,E-I Medium Truck
 MW[39] = MI.6.7            ; PM I-I,I-E,E-I Heavy  Truck

 DUMMY  = ROWFIX(32)  ;  Bucket Rnd XX AUTO 1-OCC TRIPS
 DUMMY  = ROWFIX(33)  ;                AUTO 2 OCC TRIPS
 DUMMY  = ROWFIX(34)  ;                AUTO 3+OCC TRIPS

;  Add up vehicle tables into the appropriate categories
;  AM
 MW[40] =  MW[1]  + MW[12] + MW[17]           ; AM SOV   Vehicle Trips
 MW[41] =  MW[2]  + MW[13] + MW[15] + MW[16]  ; AM HOV2  Vehicle Trips
 MW[42] =  MW[3]  + MW[14]                    ; AM HOV3+ Vehicle Trips
 MW[43] =  MW[11] + MW[18] + MW[19]           ; AM Truck Trips
 MW[44] =  MI.4.8                             ; AM Airport Pax Adr Trips

;  PM
```

```
 MW[50] =  MW[4]  + MW[22] + MW[27]           ; PM SOV   Vehicle Trips
 MW[51] =  MW[5]  + MW[23] + MW[25] + MW[26]  ; PM HOV2  Vehicle Trips
 MW[52] =  MW[6]  + MW[24]                    ; PM HOV3+ Vehicle Trips
 MW[53] =  MW[21] + MW[28] + MW[29]           ; PM Truck Trips
 MW[54] =  MI.5.8                             ; PM Airport Pax Adr Trips

;  Off-Peak
 MW[60] =  MW[7]  + MW[32] + MW[37]           ; OP SOV   Vehicle Trips
 MW[61] =  MW[8]  + MW[33] + MW[35] + MW[36]  ; OP HOV2  Vehicle Trips
 MW[62] =  MW[9]  + MW[34]                    ; OP HOV3+ Vehicle Trips
 MW[63] =  MW[31] + MW[38] + MW[39]           ; OP Truck Trips
 MW[64] =  MI.6.8                             ; OP Airport Pax Adr Trips

;
;
; Now let's accumulate totals for neat regional summaries
jloop
     vehs =   vehs + (MW[40]+MW[41]+MW[42]+MW[43]+MW[44]) + ; daily vehs
                     (MW[50]+MW[51]+MW[52]+MW[53]+MW[54]) + ;
                     (MW[60]+MW[61]+MW[62]+MW[63]+MW[64])   ;
;AM group
   amvehs   = amvehs   + MW[40]+MW[41]+MW[42]+MW[43]+MW[44]  ; all am vehs
   am1occ   = am1occ   + MW[40]                        ; am 1-occveh's
   am2occ   = am2occ   + MW[41]                        ; am 2-occveh's
   am3occ   = am3occ   + MW[42]                        ; am 3-occveh's
   amtrks   = amtrks   + MW[43]                        ; am trucks
   amapax   = amapax   + MW[44]                        ; am airpax adrs
   am1occad = am1occad + MW[1]                         ; am 1occ adr
   am2occad = am2occad + MW[2]                         ; am 2occ adr
   am3occad = am3occad + MW[3]                         ; am 3+occ adr
   amadr    = amadr    + MW[1] + MW[2] + MW[3]         ; am total adr(modeled)
   amxxtrk  = amxxtrk  + MW[11]                        ; am Thru     Truck
   amxxad1  = amxxad1  + MW[12]                        ; am Thru 1occ Adr
   amxxad2  = amxxad2  + MW[13]                        ; am Thru 2occ Adr
   amxxad3  = amxxad3  + MW[14]                        ; am Thru 3+occAdr
   amxxadr  = amxxadr  + MW[12]+MW[13]+MW[14]          ; am total xx adr
   amtaxi   = amtaxi   + MI.4.3                        ; am Taxi     ADr
   amvisi   = amvisi   + MI.4.4                        ; am visitor  ADr
   amscho   = amscho   + MI.4.5                        ; am School   ADr
   ammtrk   = ammtrk   + MW[18]                        ; am int,ext MedTk
   amhtrk   = amhtrk   + MW[19]                        ; am int,ext HvyTk

;PM group
   pmvehs   = pmvehs   + MW[50]+MW[51]+MW[52]+MW[53]+MW[54] ; all pm vehs
   pm1occ   = pm1occ   + MW[50]                        ;  pm 1-occveh's
   pm2occ   = pm2occ   + MW[51]                        ;  pm 2-occveh's
   pm3occ   = pm3occ   + MW[52]                        ;  pm 3-occveh's
   pmtrks   = pmtrks   + MW[53]                        ;  pm trucks
   pmapax   = pmapax   + MW[54]                        ; pm airpax adrs
   pm1occad = pm1occad + MW[4]                         ; pm 1occ adr
   pm2occad = pm2occad + MW[5]                         ; pm 2occ adr
   pm3occad = pm3occad + MW[6]                         ; pm 3+occ adr
   pmadr    = pmadr    + MW[4] + MW[5] + MW[6]         ; pm total adr(modeled)
   pmxxtrk  = pmxxtrk  + MW[21]                        ; pm Thru     Truck
   pmxxad1  = pmxxad1  + MW[22]                        ; pm Thru 1occ Adr
   pmxxad2  = pmxxad2  + MW[23]                        ; pm Thru 2occ Adr
   pmxxad3  = pmxxad3  + MW[24]                        ; pm Thru 3+occAdr
   pmxxadr  = pmxxadr  + MW[22]+MW[23]+MW[24]          ; pm total xx adr
   pmtaxi   = pmtaxi   + MI.5.3                        ; pm Taxi     ADr
   pmvisi   = pmvisi   + MI.5.4                        ; pm visitor  ADr
   pmscho   = pmscho   + MI.5.5                        ; pm School   ADr
   pmmtrk   = pmmtrk   + MW[28]                        ; pm int,ext MedTk
   pmhtrk   = pmhtrk   + MW[29]                        ; pm int,ext HvyTk

;Off-Peak group
   opvehs   = opvehs   + MW[60]+MW[61]+MW[62]+MW[63]+MW[64]   ; all op vehs
   op1occ   = op1occ   + MW[60]                        ;  op 1-occveh's
   op2occ   = op2occ   + MW[61]                        ;  op 2-occveh's
   op3occ   = op3occ   + MW[62]                        ;  op 3-occveh's
   optrks   = optrks   + MW[63]                        ;  op trucks
   opapax   = opapax   + MW[64]                        ; op airpax adrs
   op1occad = op1occad + MW[7]                         ; op 1occ adr
   op2occad = op2occad + MW[8]                         ; op 2occ adr
   op3occad = op3occad + MW[9]                         ; op 3+occ adr
   opadr    = opadr    + MW[7] + MW[8] + MW[9]         ; op total adr(modeled)
   opxxtrk  = opxxtrk  + MW[31]                        ; op Thru     Truck
   opxxad1  = opxxad1  + MW[32]                        ; op Thru 1occ Adr
   opxxad2  = opxxad2  + MW[33]                        ; op Thru 2occ Adr
   opxxad3  = opxxad3  + MW[34]                        ; op Thru 3+occAdr
   opxxadr  = opxxadr  + MW[32]+MW[33]+MW[34]          ; op total xx adr
   optaxi   = optaxi   + MI.6.3                        ; op Taxi     ADr
   opvisi   = opvisi   + MI.6.4                        ; op visitor  ADr
   opscho   = opscho   + MI.6.5                        ; op School   ADr
   opmtrk   = opmtrk   + MW[38]                        ; op int,ext MedTk
   ophtrk   = ophtrk   + MW[39]                        ; op int,ext HvyTk
endjloop

if (i=zones)   ; print out results
list = '/bt      '
list = '%_iter_% Iter. Pre-Traffic Assignment Trip Table Preparation Report'
list = ' '
list = 'Total Vehs: ',vehs(9.0),'  AM,PM,OPk Vehs: ',
     amvehs(8.0),' ',pmvehs(8.0),' ',opvehs(8.0)
list = '  '
list = '               ',' AM 1,2,3+Occ Vehs, Trucks, Air Pax Adrs',
 am1occ(8.0),' ',am2occ(8.0),' ',am3occ(8.0),' ',amtrks(8.0),' ',amapax(8.0)
list = '               ',' PM 1,2,3+Occ Vehs, Trucks, Air Pax Adrs',
 pm1occ(8.0),' ',pm2occ(8.0),' ',pm3occ(8.0),' ',pmtrks(8.0),' ',pmapax(8.0)
list = '               ',' OP 1,2,3+Occ Vehs, Trucks, Air Pax Adrs',
 op1occ(8.0),' ',op2occ(8.0),' ',op3occ(8.0),' ',optrks(8.0),' ',opapax(8.0)
list = '      '
list = '                ',' AM,PM,OPk Auto Drivers (modeled) ',
     amadr(8.0),' ',pmadr(8.0),' ',opadr(8.0)
list = '                ',' AM  1,2,3+Occ Auto Drs ',
     am1occad(8.0),' ',am2occad(8.0),' ',am3occad(8.0)
list = '                ',' PM  1,2,3+Occ Auto Drs ',
     pm1occad(8.0),' ',pm2occad(8.0),' ',pm3occad(8.0)
list = '                ',' OP  1,2,3+Occ Auto Drs ',
     op1occad(8.0),' ',op2occad(8.0),' ',op3occad(8.0)
list = '          '
list = '                ',' AM Med, Hvy, XX Trk:   ',
     amxxtrk(8.0),' ',amhtrk(8.0),' ',amxxtrk(8.0)
list = '                ',' PM Med, Hvy, XX Trk:   ',
     pmxxtrk(8.0),' ',pmhtrk(8.0),' ',pmxxtrk(8.0)
list = '                ',' OP Med, Hvy, XX Trk:   ',
     opxxtrk(8.0),' ',ophtrk(8.0),' ',opxxtrk(8.0)
list = '          '
list = '                ',' AM 1,2,3+Occ,TotlXX Adr',
     amxxad1(8.0),' ',amxxad2(8.0),' ',amxxad3(8.0),' ',amxxadr(9.0)
list = '                ',' PM 1,2,3+Occ,TotlXX Adr',
     pmxxad1(8.0),' ',pmxxad2(8.0),' ',pmxxad3(8.0),' ',pmxxadr(9.0)
list = '                ',' OP 1,2,3+Occ,TotlXX Adr',
     opxxad1(8.0),' ',opxxad2(8.0),' ',opxxad3(8.0),' ',opxxadr(9.0)
list = '          '
list = '                ',' AM Taxi,Visitr,Schl Adr, Air Pax Adr',
     amtaxi(8.0),' ',amvisi(8.0),' ',amscho(8.0),' ',amapax(8.0)
list = '                ',' PM Taxi,Visitr,Schl Adr, Air Pax Adr',
     pmtaxi(8.0),' ',pmvisi(8.0),' ',pmscho(8.0),' ',pmapax(8.0)
list = '                ',' OP Taxi,Visitr,Schl Adr, Air Pax Adr',
     optaxi(8.0),' ',opvisi(8.0),' ',opscho(8.0),' ',opapax(8.0)
list = '/et      '

 endif
```

```
;  Write out the auto driver tables by time period
 MATO[1] = @AM_VT@,  MO=40-44 ; AM Veh Trips 1,2,3+occ,trucks,Air Pax Vehs
 MATO[2] = @PM_VT@,  MO=50-54 ; PM Veh Trips 1,2,3+occ,trucks,Air Pax Vehs
 MATO[3] = @OP_VT@,  MO=60-64 ; OP Veh Trips 1,2,3+occ,trucks,Air Pax Vehs

ENDRUN


;---------------------------------------------------------------
;   Step 2 - Highway Assignment
;
;
;
;---------------------------------------------------------------
itr = '%_iter_%'
; The Input Network Depends on the Iteration
IF     (itr      = 'pp')
   INPNET = 'ZONEHWY.NET'
ELSEIF (itr      = 'bs')
   INPNET = 'PPHWY.NET'
ELSEIF (itr      = 'i1')
   INPNET = 'BSHWY.NET'
ELSEIF (itr      = 'i2')
   INPNET = 'I1HWY.NET'
ENDIF

LOOP Period=1,3;  Three assignment loops: 1/AM, 2/PM, 3/Off-Pk

IF     (Period==1)         ; AM Peak Period
    PRD    =  'AM'         ;
    PCTADT =   40  ; %_AMPF_%  AM Pk Ftr (% of traffic occurring in pk hr)

ELSEIF (Period==2)         ; PM Peak Period
    PRD    =  'PM'         ;
    PCTADT =   37  ; %_PMPF_%  PM Pk Ftr (% of traffic occurring in pk hr)

ELSE                       ;  Off-Peak Period
    PRD    =  'OP'         ;
    PCTADT =   12  ; %_OPPF_%  OP Pk Ftr (% of traffic occurring in pk hr)
ENDIF

CAPFAC=1/(PCTADT/100)      ; Capacity Factor = 1/(PCTADT/100)

RUN PGM=HWYLOAD
  NETI=@INPNET@               ; TP+ Network
  ;
  ;  The input trip table has 5 Vehicle Tables:
  ;     1 - 1-Occ Auto Drivers
  ;     2 - 2-Occ Auto Drivers
  ;     3 - 3+Occ Auto Drivers
  ;     4 - Trucks
  ;     5 - Airport Pass. Auto Driver Trips

  MATI=%_iter_%@prd@.VTT ;
  ;
  NETO=temp.net          ; Output loaded network of current iter/time prd.
  ;
  ;
  ;*****************************************************************
  ;**  LOS'E' Capacities and Freeflow Speeds Assumptions:          **
  ;*****************************************************************
  ;
  ;            areatp > 1    2    3    4    5    6    7   fac type
  ;                     ---  ---  ---  ---  ---  ---  ---     V
  SPDCAP CAPACITY[01]=3150 3150 3150 3150 3150 3150 3150  ; cen
  SPDCAP CAPACITY[11]=1500 1600 2000 2000 2100 2100 2200  ; fwy
  SPDCAP CAPACITY[21]= 800  900 1000 1200 1500 1500 1500  ; maj
  SPDCAP CAPACITY[31]= 400  500  700  800  900  900 1000  ; min
  SPDCAP CAPACITY[41]= 300  400  500  700  700  700  800  ; col
  SPDCAP CAPACITY[51]= 900 1000 1000 1200 1500 1500 1500  ; xwy
  SPDCAP CAPACITY[61]=1500 1600 2000 2000 2100 2100 2200  ; rmp (fwy)
  ;
  ;  initial speed values :
  ;
  ;            areatp > 1    2    3    4    5    6    7   fac type
  ;                     ---  ---  ---  ---  ---  ---  ---     V
  SPDCAP    SPEED[01]= 15   15   20   25   30   30   35    ; cen
  SPDCAP    SPEED[11]= 65   65   70   70   70   70   70    ; fwy
  SPDCAP    SPEED[21]= 35   40   40   45   50   50   50    ; maj
  SPDCAP    SPEED[31]= 30   35   35   40   40   45   45    ; min
  SPDCAP    SPEED[41]= 25   35   35   35   40   40   40    ; col
  SPDCAP    SPEED[51]= 60   60   65   65   65   65   65    ; xwy
  SPDCAP    SPEED[61]= 65   65   70   70   70   70   70    ; Rmp (fwy)
  ;
  ;
  ;-------------------------------------------------------$
  ;    VDF (Volume Delay Function) establishment:         $
  ;-------------------------------------------------------$
  ; Note: Freeway curves updated 9/04/02 rjm based on obs. skycomp data
  ;centroids:
  LOOKUP NAME=VCRV1,FAIL=1.00,1.00,INTERPOLATE=T,
      R="1.00  1"
  ;
  ; freeway VDF lookup curve:
  LOOKUP NAME=VCRV2,FAIL=1.00,7.129,INTERPOLATE=T,
      R=" 1.000 0.0",
        " 1.000 0.1",
        " 1.003 0.3",
        " 1.007 0.5",
        " 1.014 0.7",
        " 1.040 0.9",
        " 1.998 1.1",
        " 3.851 1.3",
        " 7.129 1.5"
  ;
  ; major arterial VDF lookup curve:
  LOOKUP NAME=VCRV3,FAIL=1.00,6.22,INTERPOLATE=T,
      R="1.00  0.0",
        "1.02  0.1",
        "1.07  0.3",
        "1.15  0.5",
        "1.31  0.7",
        "1.67  0.9",
        "2.84  1.1",
        "4.42  1.3",
        "6.22  1.5"
  ;
  ; minor arterial VDF lookup curve:
  LOOKUP NAME=VCRV4,FAIL=1.00,6.35,INTERPOLATE=T,
      R="1.00  0.0",
        "1.03  0.1",
        "1.09  0.3",
        "1.20  0.5",
        "1.39  0.7",
        "1.74  0.9",
        "3.00  1.1",
        "4.58  1.3",
        "6.35  1.5"
  ;
  ; collector  VDF lookup curve:
  LOOKUP NAME=VCRV5,FAIL=1.00,2.30,INTERPOLATE=T,
      R="1.00  0.0",
        "1.03  0.1",
        "1.04  0.3",
        "1.06  0.5",
        "1.10  0.7",
```

```
      "1.18  0.9",
      "1.34  1.1",
      "1.66  1.3",
      "2.30  1.5"
;
; expressway VDF lookup curve:
LOOKUP NAME=VCRV6,FAIL=1.00,7.59,INTERPOLATE=T,
    R="1.00  0.0",
      "1.01  0.1",
      "1.04  0.3",
      "1.09  0.5",
      "1.19  0.7",
      "1.53  0.9",
      "2.83  1.1",
      "5.09  1.3",
      "7.59  1.5"

FUNCTION {            ; Congested Time (TC)specification:
  TC[1]=T0*VCRV1(VC)  ; TC(LINKCLASS) =
  TC[2]=T0*VCRV2(VC)  ;  Uncongested Time(T0) *
  TC[3]=T0*VCRV3(VC)  ;   Volume Delay Funtion(VDF)Value
  TC[4]=T0*VCRV4(VC)  ;   VDF function is based on VC
  TC[5]=T0*VCRV5(VC)  ; Note: the LINKCLASS is defined
  TC[6]=T0*VCRV6(VC)  ; during the LINKREAD phase below.
}
;
;
;
CAPFAC=@CAPFAC@  ;
MAXITERS=10     ; 10 iterations to be performed

PHASE=LINKREAD
    C     = CAPACITYFOR(LI.@PRD@LANE,LI.CAPCLASS) * @CAPFAC@
    SPEED =    SPEEDFOR(LI.@PRD@LANE,LI.SPDCLASS)
  ;
  ;
  ;   The highway network is coded with limit codes from 1 to 9
  ;     Limit Code  Definition
  ;     --------  ----------------------
  ;        1      All vehicles accepted
  ;        2      Only HOV2 (or greater) vehicles accepted only
  ;        3      Only HOV3 vehicles accepted only
  ;        4      Med,Hvy Trks not accepted, all other traffic is accepted
  ;        5      Airport Passenger Veh. Trips
  ;        6-8    (Unused)
  ;        9      No vehicles are accepted at all
  ;
  IF     (LI.@PRD@LIMIT==1)
    ADDTOGROUP=1
  ELSEIF (LI.@PRD@LIMIT==2)
    ADDTOGROUP=2
  ELSEIF (LI.@PRD@LIMIT==3)
    ADDTOGROUP=3
  ELSEIF (LI.@PRD@LIMIT==4)
    ADDTOGROUP=4
  ELSEIF (LI.@PRD@LIMIT==5)
    ADDTOGROUP=5
  ELSEIF (LI.@PRD@LIMIT==6-8)
    ADDTOGROUP=6
  ELSEIF (LI.@PRD@LIMIT==9)
    ADDTOGROUP=7
  ENDIF

  IF (LI.FTYPE = 0);
     LINKCLASS = 1       ;
  ELSEIF (LI.FTYPE = 1 || LI.FTYPE = 6)  ; FTYPE = 6 ADDED
     LINKCLASS= 2        ;
  ELSEIF (LI.FTYPE = 2)  ;
     LINKCLASS= 3        ;
  ELSEIF (LI.FTYPE = 3)  ;
     LINKCLASS= 4        ;
  ELSEIF (LI.FTYPE = 4)  ;
     LINKCLASS= 5        ;
  ELSEIF (LI.FTYPE = 5)  ;
     LINKCLASS= 6        ;
  ENDIF

 ENDPHASE

 PHASE=ILOOP
   PATH=TIME,                ; PENI=1,
     EXCLUDEGRP=2,3,5,6,7,   ; prohibitions for free SOV veh
     VOL[1]=MI.1.1
   PATH=TIME,
     EXCLUDEGRP=3,5,6,7,     ; prohibitions for HOV2 veh
     VOL[2]=MI.1.2
   PATH=TIME,
     EXCLUDEGRP=5,6,7,       ; prohibitions for HOV3 veh
     VOL[3]=MI.1.3
   PATH=TIME,
     EXCLUDEGRP=2,3,4,5,6,7, ; prohibitions for trucks
     VOL[4]=MI.1.4
   PATH=TIME,
     EXCLUDEGRP=6,7,         ; prohibitions for Airport pass.veh trips
     VOL[5]=MI.1.5
 ENDPHASE
ENDRUN



;-------------------------------------------------------------------------
;Step 3
;Calculate Restrained Speed/Perform Speed Averaging for I1 & I2 iterations
;
;-------------------------------------------------------------------------
if     (itr = 'pp' )
   itrno  = 1
   str1   = '0   ;'
   str2   = '0   ;'
 elseif (itr = 'bs')
   itrno  = 2
   str1   = '0   ;'
   str2   = '0   ;'
 elseif (itr = 'i1')
   itrno  = 3
   str1   = 'bs'
   str2   = '0   ;'
 elseif (itr = 'i2')
   itrno  = 4
   str1   = 'i1'
   str2   = '0   ;'
endif


RUN PGM=HWYNET
  NETI=temp.net             ; input network from highway assignment
  NETO=temp@prd@.net,       ; output/@PRD@ network with updated speeds
       EXCLUDE=V_1,TIME_1,VC_1,V1_1, V2_1, V3_1, V4_1,V5_1,
                          VT_1,V1T_1,V2T_1,V3T_1,V4T_1,V5T_1,
       OLDSPD,NEWVOL,OLDVOL,FFSPD,HRLNKCAP,HRLNCAP,DCD,NEWSPD,ATYPE,
       VMT,EVDF,WOSPD,WNSPD,WFSPD,SPDDIFF,COMP,%_iter_%@prd@VMT

  _CNT=1                    ; link counter      (temporary variable)

     OLDVOL  = V_1                                  ;
```

```
     NEWVOL  = V_1                                  ;
     OLDSPD  = 0                                    ;
     %_iter_%@prd@VOL = NEWVOL                        ;
IF   (DISTANCE > 0)                                 ;
     OLDSPD=DISTANCE/@Prd@HTIME*60.0                ;
ENDIF                                               ;

IF        (@itrno@  = 3   )                           ;
     OLDSPD=@str1@@prd@spd                         ;
     OLDVOL=@str1@@prd@VOL                         ;
     @itr@@prd@VOL =  ROUND((OLDVOL*1/2)+(NEWVOL*1/2)) ;
   ELSEIF (@itrno@  = 4   )                                ;
     OLDSPD=@str1@@prd@spd                           ;
     OLDVOL=@str1@@prd@VOL                           ;
     @itr@@prd@VOL =  ROUND((OLDVOL*2/3)+(NEWVOL*1/3)) ;
ENDIF

  _VMT=0                      ;

  IF (FTYPE=1-6)
     _VMT=(V_1*DISTANCE)
  ENDIF


  FFSPD  =SPEEDFOR(@prd@LANE,SPDCLASS)     ; freeflow speed
  HRLKCAP=CAPACITYFOR(@prd@LANE,CAPCLASS)  ; hrly LINK capacity
  HRLNCAP=CAPACITYFOR(1,CAPCLASS)          ; hrly LANE capacity
  DCD=1

 IF (TIME_1 =  0)                          ; current (not averaged)
  NEWSPD    =  0                           ; assignment speed.  Should be
 ELSE                                      ; same as pp@prd@spd & bs@prd@spd
  NEWSPD=(DISTANCE*60)/TIME_1              ;
 ENDIF                                     ;

  ; Tabulate VMT, _CNT by FTYPE and JUR
  CROSSTAB VAR=_VMT, FORM=12cs, ROW=FTYPE, RANGE=0-6-1,0-6
  CROSSTAB VAR=_VMT, FORM=12cs, ROW=JUR,   RANGE=0-23-1,0-23
  CROSSTAB VAR=_CNT, FORM=12cs, ROW=FTYPE, RANGE=0-6-1,0-6
  CROSSTAB VAR=_CNT, FORM=12cs, ROW=JUR,   RANGE=0-23-1,0-23


  ; LOOKUP Table relating the VC ratio to the VDF, by facility type
  LOOKUP NAME=VDFA,                  ; VDFA(FTYPE,VC)
         LOOKUP[1]=1, RESULT=2,  ; FTYPE=1
         LOOKUP[2]=1, RESULT=3,  ; FTYPE=2
         LOOKUP[3]=1, RESULT=4,  ; FTYPE=3
         LOOKUP[4]=1, RESULT=5,  ; FTYPE=4
         LOOKUP[5]=1, RESULT=6,  ; FTYPE=5
         LOOKUP[6]=1, RESULT=7,  ; FTYPE=6
         INTERPOLATE = Y,
         LIST=T,                 ; ECHO TABLE IN PRINT FILE
; VDF is the ratio of the Freeflow Time to the Restrained Time
;  -it is expressed as a function of the V/C ratio and Facility Type
; LOOKUP TABLE:
;             VC    VDF->(FT1) (FT2) (FT3) (FT4) (FT5) (FT6)
;             |           |     |     |     |     |     |
;             V           V     V     V     V     V     V
          R=" 0.00,    1.000, 1.00, 1.00, 1.00, 1.00,  1.000",
            " 0.10,    1.000, 1.02, 1.03, 1.03, 1.01,  1.000",
            " 0.30,    1.003, 1.07, 1.09, 1.04, 1.04,  1.003",
            " 0.50,    1.007, 1.15, 1.20, 1.06, 1.09,  1.007",
            " 0.70,    1.014, 1.31, 1.39, 1.10, 1.19,  1.014",
            " 0.90,    1.040, 1.67, 1.74, 1.18, 1.53,  1.040",
            " 1.10,    1.998, 2.84, 3.00, 1.34, 2.83,  1.998",
            " 1.30,    3.851, 4.42, 4.58, 1.66, 5.09,  3.851",
            " 1.50,    7.129, 6.22, 6.35, 2.30, 7.59,  7.129",
           "99.99,    7.129, 6.22, 6.35, 2.30, 7.59,  7.129"
```

```
  ; Obtain Area Type from 1st digit of SPDCLASS
  ATYPE=SPDCLASS%10


; Compute the Final VMT based on final volume
;      variable name: '<iteration><period>VMT')
;
;  %_iter_%@prd@VMT=ROUND(%_iter_%@prd@VOL*DISTANCE) ; Final VMT
   VMT=ROUND(%_iter_%@prd@VOL*DISTANCE) ; Final VMT

; Compute the Final VC ratio based on final volume
;      variable name: '<iteration><period>VC')
;
      %_iter_%@prd@VC=(%_iter_%@prd@VOL*(@pctadt@/100.0)/HRLKCAP)

; Compute the Final Volume Delay Function based on final volume
;      variable name: '<iteration><period>VDF')
;
      IF (FTYPE = 0)
         %_iter_%@prd@VDF=1.00
       ELSE
         %_iter_%@prd@VDF=VDFA(FTYPE,%_iter_%@prd@VC)
      endif

; Compute the Final Volume Delay Function based on final volume
;      variable name: '<iteration><period>SPD')
;
   IF (DISTANCE = 0)
     %_iter_%@prd@SPD   = 0
    ELSE
     %_iter_%@prd@SPD = ((FFSPD/%_iter_%@prd@VDF))
   ENDIF

; compute WEIGHTED OLD and Final SPEEDS for Aggregate summaries
      WOSPD=ROUND(VMT * OLDSPD)
      WNSPD=ROUND(VMT * %_iter_%@prd@SPD)
      WFSPD=ROUND(VMT * FFSPD)

; Compute current/previous Speed Differences at link level
;     ADIFF  = ROUND(ABS(%_iter_%@prd@SPD - OLDSPD))
      SPDDIFF= ROUND(%_iter_%@prd@SPD     - OLDSPD)


; Crosstab VMT,WOSPD,WNSPD, by FTYPE and JUR
    CROSSTAB VAR=VMT,WOSPD,WNSPD,_CNT,FORM=12cs,
     ROW=JUR,   RANGE=0-23-1,,0-23,
     COL=FTYPE, RANGE=1-6-1,1-6,
     COMP=WOSPD/VMT, FORM=12.2cs,   ; AVG INITIAL SPD
     COMP=WNSPD/VMT, FORM=12.2cs,    ; AVG FINAL SPD
     COMP=((WNSPD/VMT)-(WOSPD/VMT)), FORM=12.2cs ; DIFF(NEW-OLD)

; Crosstab VMT,WOSPD,WNSPD,_CNT2 by ATYPE and FTYPE
    CROSSTAB VAR=VMT,WOSPD,WNSPD,_CNT, FORM=12cs,
     ROW=ATYPE, RANGE=1-7-1,,1-7,
     COL=FTYPE, RANGE=1-6-1,1-6,
     COMP=WOSPD/VMT, FORM=12.2cs,   ; AVG INITIAL SPD
     COMP=WNSPD/VMT, FORM=12.2cs,    ; AVG FINAL SPD
     COMP=((WNSPD/VMT)-(WOSPD/VMT)), FORM=12.2cs ; DIFF(NEW-OLD)


; Crosstab VMT,WOSPD,WNSPD,WFSPD,_CNT2 by EVC and FTYPE
    CROSSTAB VAR=VMT,WOSPD,WNSPD,WFSPD,_CNT, FORM=12cs,
     ROW=%_iter_%@prd@VC, RANGE=0-2-0.1,,1-99,
     COL=FTYPE, RANGE=1-6-1,1-6,
     COMP=WOSPD/VMT, FORM=12.2cs,   ;  AVG INITIAL SPD
     COMP=WNSPD/VMT, FORM=12.2cs,    ; AVG FINAL SPD
```

```
     COMP=WFSPD/VMT, FORM=12.2cs,    ; Freeflow Speed
     COMP=((WFSPD/VMT)/(WOSPD/VMT)), FORM=12.2cs, ; AVG FINAL SPD
     COMP=((WFSPD/VMT)/(WNSPD/VMT)), FORM=12.2cs, ; AVG FINAL SPD
     COMP=((WNSPD/VMT)-(WOSPD/VMT)), FORM=12.2cs ; DIFF(NEW-OLD)

; Tabulate _CNT by SPEED DIFF GROUP
   CROSSTAB VAR=_CNT, FORM=12cs,
;       ROW=ADIFF, RANGE=0-2,3-5,6-8,9-11,12-14,15-17,18-100,0-100
        ROW=SPDDIFF,
        RANGE=-100--18,-17--15,-14--12,-11--9,-8--6,-5--3,-2-2,
               3-5,6-8,9-11,12-14,15-17,18-100,,-100-100

;     Tabulate _CNT2_PCT by SPEED DIFF GROUP
;    CROSSTAB VAR=_CNT_PCT, FORM=12.1cs,
;      ROW=ADIFF, RANGE=0-2,3-5,6-8,9-11,12-14,15-17,18-100,0-100

    ; PRINT TO check
    PRINT,
     LIST=A(5),' ',B(5),DISTANCE(7.2),' ',@PCTADT@(4.3),' ',@prd@LANE(2.0),' ',
     HRLKCAP(5.0),' ',HRLNCAP(5.0),' ',
     oldvol(8.2),' ',newvol(8.2),' ',%_iter_%@prd@VOL(8.2),' ',
     ffspd(5.1),' ',%_iter_%@prd@VC(6.4),' ',%_iter_%@prd@VDF(6.4),
     ' ',ftype(3.0),' ',ATYPE(3.0),
     ' ',vc_1(6.4),' ',NEWSPD(5.1),%_iter_%@prd@SPD(5.1),
;
;
            FILE=%_iter_%@prd@LLNK.ASC

ENDRUN
ENDLOOP
;---------------------------------------------------------------------
; Step 4
;   Summarize 24 hour VMT  of current AM, PM, & Off-Peak Assignments
;---------------------------------------------------------------------
;
;
RUN PGM=HWYNET
  NETI[1]=tempam.net
  NETI[2]=temppm.net
  NETI[3]=tempop.net
  NETO   =%_iter_%HWY.NET
 ;
 ;
  _VOLAM =  LI.1.%_iter_%amVOL
  _VOLPM =  LI.2.%_iter_%pmVOL
  _VOLOP =  LI.3.%_iter_%opVOL

; COMPUTE FINAL DAILY VOLUME  ON ALL LINKS
 %_iter_%24VOL =  _VOLAM + _VOLOP + _VOLPM  ; Total Daily Volume

; COMPUTE FINAL DAILY VMT ON ALL NON-CENTROID LINKS
IF (FTYPE = 0)
 %_iter_%24VMT =  0
 ELSE
 %_iter_%24VMT =  %_iter_%24VOL * DISTANCE  ; Total Daily VMT
ENDIF

;
;
IF (FTYPE=1-6)
  TVOL00=ROUND((_VOLAM+_VOLPM+_VOLOP)/1000.0) ; total hwy vol in 000s
  TVMT00=TVOL00*DISTANCE                      ; total hwy VMT in 000s
  ELSE
  TVOL00=0
  TVMT00=0                                    ;
ENDIF
;
IF (FTYPE=1-6 && COUNT > 0 || (AMLIMIT = 2-3 || PMLIMIT=2-3 || OPLIMIT=2-3))
  TVolEST=TVol00           ; total hwy vol in 000s
  TVolobs=count            ; total hwy vol in 000s
  TVMTEST=TVMT00           ; total hwy vol in 000s
  TVMTOBS=count*DISTANCE   ; total hwy VMT in 000s
  ELSE
  Tvmtest=0
  TVMTobs=0                                   ; total hwy VMT in 000s
ENDIF
;

  comp atype=spdclass%10       ; area type code     1-7
                               ;  its the first digit of spdclass var
; Crosstab TVMTEST,TVMTOBS by ATYPE and FTYPE
    CROSSTAB VAR=TVMTEST,TVMTOBS, FORM=8cs,
             ROW=ATYPE, RANGE=1-7-1,,1-7,
             COL=FTYPE, RANGE=0-6-1,0-6,
             COMP=TVMTEST-TVMTOBS, FORM=8cs,   ; Difference  (est-obs)
             COMP=TVMTEST/TVMTOBS, FORM=8.2cs  ; Ratio       (est/obs)

; Crosstab TVMTEST,TVMTOBS by Jurisdiction and FTYPE
    CROSSTAB VAR=TVMTEST,TVMTOBS, FORM=8cs,
             ROW=JUR,   RANGE=0-23-1,,0-23,
             COL=FTYPE, RANGE=0-6-1,0-6,
             COMP=TVMTEST-TVMTOBS, FORM=8cs,   ; Difference  (est-obs)
             COMP=TVMTEST/TVMTOBS, FORM=8.2cs  ; Ratio       (est/obs)

; Crosstab TVMTEST,TVMTOBS by Screenline and FTYPE
    CROSSTAB VAR=TVolEST,TVolOBS, FORM=8cs,
             ROW=SCREEN, RANGE=1-38-1,,1-38,
             COL=FTYPE,  RANGE=0-6-1,0-6,
             COMP=TVolEST-TVolOBS, FORM=8cs,   ; Difference  (est-obs)
             COMP=TVolEST/TVolOBS, FORM=8.2cs  ; Ratio       (est/obs)
; ---------------------------------------------------------------------
; ---------------------------------------------------------------------
; Crosstab Total VMT by Jurisdiction and FTYPE
    CROSSTAB VAR=%_iter_%24VMT, FORM=12cs,
             ROW=JUR,   RANGE=0-23-1,,0-23,
             COL=FTYPE, RANGE=0-6-1,0-6


ENDRUN
```

highway_build.s

```
;=============================================================
;  HIGHWAY_BUILD.S
;  MWCOG Version 2 Model / TP+
;  Highway Building
;  Note: Freeway Ramp's FTYPE added    12/12/02  jcpark,rm
;
;  STEP 1 - BUILD BASE HIGHWAY NETWORK
;               INPUT:    NODES.ASC, BASELNK.FIN (node, link files)
;
;               OUTPUTS:  hwy_pp.NET   --BUILT HIGHWAY NETWORK(AM,PM,Off-Pk)
;                         wlknet.tb    --(Walk links, transit netwk)
;
;                         trn_fwyn.asc --highway links,freeway nodes)
;
;  STEP 2 - DEVELOP ZONAL HIGHWAY TERMINAL TIMES
;               INPUT:    ZONE.ASC      --Zonal land use file
;               OUTPUT:   ZTERMTM.ASC   --Zonal Highway Terminal Time file
;
;=============================================================
;
;
;  DEFINE I/O Files
IN_NODE  = 'inputs\NODE.asc' ; INPUT Node file
IN_LINK  = 'BASELNK.FIN'      ; INPUT Link file (FROM AREALKTP PROGRAM)
OU_BSNET = 'ZONEHWY.NET'      ; OUTPUT BUILT network FILE
;
                              ; (note: 0.5447 for 1994/0.4824 for 2000+
RUN PGM = HWYNET

ZONES=2191

; Node Coordinate File
; XY Units are NAD83 (in whole feet)
FILEI NODEI=@IN_NODE@,
        VAR=N,01-06,
        VAR=X,07-14,
        VAR=Y,15-22

; Highway Links
FILEI LINKI=@IN_LINK@,
        VAR=A,01-05,         ; A-Node Number
        VAR=B,06-10,         ; B-Node Number
        VAR=DISTANCE,13-17,  ; Distance in miles (x.xx)
        VAR=SPDCLASS,23-24,  ; Speed Class    (1-67)
        VAR=CAPCLASS,26-27,  ; Capacity Class (1-67)
        VAR=COUNT,30-33,     ; 1994 Observed ADT in 1000's
        VAR=JUR,39-40,       ; Jurisdiction Code (0-23)
        VAR=SCREEN,51-52,    ; Screenline Code   (1-36)
        VAR=FTYPE,54-55,     ; Facility Type Code (0-6)
                  ; 0/Cen,1/Fwy,2/MjArt,3/MiArt,4/Coll,5/Exp,6/Ramp
        VAR=TOLL,61-64,      ; Current year Toll Value in cents
        VAR=AMLANE,81-82,    ; AM Peak Prd. No. of Lanes
        VAR=AMLIMIT,84-85,   ; AM Peak Period Operation Code (0-9)
        VAR=PMLANE,87-88,    ; PM Peak Prd. No. of Lanes
        VAR=PMLIMIT,90-91,   ; PM Peak Period Operation Code (0-9)
        VAR=OPLANE,93-94,    ; Off-Peak Prd. No. of Lanes
        VAR=OPLIMIT,96-97,   ; Off-Peak Period Operation Code (0-9)
        VAR=TAZ,99-102       ; Transportation Analysis Zone


; output network in TP+ format
NETO=@OU_BSNET@

; AM and Off-peak Initial Speed Lookup Tables
; The speed tables are a function of SPDCLASS
; note: Used for centroid speeds only
lookup name = amspd,
       lookup[1] = 1,result=2,
       file=..\SUPPORT\AMSPD.LKP

lookup name = opspd,
       lookup[1] = 1,result=2,
       file=..\SUPPORT\OPSPD.LKP


; AM and Off-peak Initial Speed Lookup Tables
; The speed tables are a function of TAZs
; note: Used for highway links (non-centroids)
lookup name = tazamspd,
       lookup[1] = 1,result=2,  ; AM Freeway Speeds (mph)
       lookup[2] = 1,result=3,  ; AM Maj Art Speeds (mph)
       lookup[3] = 1,result=4,  ; AM Min Art Speeds (mph)
       lookup[4] = 1,result=5,  ; AM Collect Speeds (mph)
       lookup[5] = 1,result=6,  ; AM Exprway Speeds (mph)
       file=..\SUPPORT\TAZAMSPD.LKP

lookup name = tazopspd,
       lookup[1] = 1,result=2,  ; OP Freeway Speeds (mph)
       lookup[2] = 1,result=3,  ; OP Maj Art Speeds (mph)
       lookup[3] = 1,result=4,  ; OP Min Art Speeds (mph)
       lookup[4] = 1,result=5,  ; OP Collect Speeds (mph)
       lookup[5] = 1,result=6,  ; OP Exprway Speeds (mph)
       file=..\SUPPORT\TAZOPSPD.LKP

; ESTABLISH  AM/PM/OFF-PEAK Initial Speeds
; AM Speed
    IF (AMLIMIT = 2-3)
            AMHTIME  =  (DISTANCE/55.0)*60.0
    ELSEIF (SPDCLASS > 0 && SPDCLASS < 8)
            AMHTIME  =  (DISTANCE/(amspd(1,spdclass)))*60.00
    ELSEIF (FTYPE = 1 || FTYPE = 6)
            AMHTIME  =  (DISTANCE/(tazamspd(1,taz)))*60.00
    ELSEIF (FTYPE = 2)
            AMHTIME  =  (DISTANCE/(tazamspd(2,taz)))*60.00
    ELSEIF (FTYPE = 3)
            AMHTIME  =  (DISTANCE/(tazamspd(3,taz)))*60.00
    ELSEIF (FTYPE = 4)
            AMHTIME  =  (DISTANCE/(tazamspd(4,taz)))*60.00
    ELSEIF (FTYPE = 5)
            AMHTIME  =  (DISTANCE/(tazamspd(5,taz)))*60.00
    ENDIF

; PM Speeds (Use the AM values initially)
    IF (PMLIMIT = 2-3)
            PMHTIME  =  (DISTANCE/55.0)*60.0
    ELSEIF (SPDCLASS > 0 && SPDCLASS < 8)
            PMHTIME  =  (DISTANCE/(amspd(1,spdclass)))*60.00
    ELSEIF (FTYPE = 1 || FTYPE = 6)
            PMHTIME  =  (DISTANCE/(tazamspd(1,taz)))*60.00
    ELSEIF (FTYPE = 2)
            PMHTIME  =  (DISTANCE/(tazamspd(2,taz)))*60.00
    ELSEIF (FTYPE = 3)
            PMHTIME  =  (DISTANCE/(tazamspd(3,taz)))*60.00
    ELSEIF (FTYPE = 4)
            PMHTIME  =  (DISTANCE/(tazamspd(4,taz)))*60.00
    ELSEIF (FTYPE = 5)
            PMHTIME  =  (DISTANCE/(tazamspd(5,taz)))*60.00
    ENDIF


; Off-Peak Speeds
    IF (OPLIMIT = 2-3)
```

```
            OPHTIME  =  (DISTANCE/55.0)*60.0
    ELSEIF (SPDCLASS > 0 && SPDCLASS < 8)
            OPHTIME  =  (DISTANCE/(opspd(1,spdclass)))*60.00
    ELSEIF (FTYPE = 1 || FTYPE = 6)
            OPHTIME  =  (DISTANCE/(tazopspd(1,taz)))*60.00
    ELSEIF (FTYPE = 2)
            OPHTIME  =  (DISTANCE/(tazopspd(2,taz)))*60.00
    ELSEIF (FTYPE = 3)
            OPHTIME  =  (DISTANCE/(tazopspd(3,taz)))*60.00
    ELSEIF (FTYPE = 4)
            OPHTIME  =  (DISTANCE/(tazopspd(4,taz)))*60.00
    ELSEIF (FTYPE = 5)
            OPHTIME  =  (DISTANCE/(tazopspd(5,taz)))*60.00
    ENDIF

;-------------------------------------------------------------
; Generate list of walk links for transit path building    -
;-------------------------------------------------------------
;  Critrerea for a Walk Link:
; 1)The links are non-centroids and non-freeways (spdclass > 19)
; 2)The X coordinate range OR Y coordinate range of the A/B nodes are within
;   the following pre-designated 'downtown-like' areas as defined by
;   XY coordinate ranges:
;   X range: 1304529- 1313238 Y range: 442628- 450578  DC Downtown Area 1
;   X range: 1294904- 1306426 Y range: 443406- 453764  DC Downtown Area 2
;   X range: 1301347- 1304777 Y range: 481102- 484409  Silver Spring
;   X range: 1297245- 1297442 Y range: 437527- 437730  Pentagon
;

if (spdclass>19)           ; if link is non-centroid & non-freeway type

if      (((a.x= 1304529- 1313238 || b.x= 1304529- 1313238 ) &&
          (a.y=  442628-  450578 || b.y=  442628-  450578 )))
           _walkflg =1
elseif  (((a.x= 1294904- 1306426 || b.x= 1294904- 1306426 ) &&
          (a.y=  443406-  453764 || b.y=  443406-  453764 )))
           _walkflg =2
elseif  (((a.x= 1301347- 1304777 || b.x= 1301347- 1304777 ) &&
          (a.y=  481102-  484409 || b.y=  481102-  484409 )))
           _walkflg =3
elseif  (((a.x= 1297245- 1297442 || b.x= 1297245- 1297442 ) &&
          (a.y=  437527-  437730 || b.y=  437527- 437730  )))
           _walkflg=4
else
           _walkflg=0
endif
if (_walkflg > 0)   ; if anode or bnode of link is within predefined areas

  print list='SUPPORT N=',a(5),'-',b(5),' MODES=13 SPEED=3 ONEWAY=Y',
              '   ;',_walkflg(3),file=wlknet.tb
endif
endif

;
;-------------------------------------------------------------
; Generate list of Freeway Nodes for cntconn2 program        -
;-------------------------------------------------------------
;
;print list=a(5),b(5),'                                      ',FTYPE(2),
;file=LINKBSE.DAT
;-----------------------------------------
if (spdclass==10-19)
print list=a(6),file=trn_fwyn.asc
endif


;  CREATE SOME FREQUENCY-CROSSTABS FOR CHECKING
_CNT= 1

CROSSTAB VAR=_CNT,ROW=FTYPE, RANGE=1-7-1, COL=AMLANE,    RANGE=1-7-1
CROSSTAB VAR=_CNT,ROW=FTYPE, RANGE=1-7-1, COL=OPLANE,    RANGE=1-7-1
CROSSTAB VAR=_CNT,ROW=FTYPE, RANGE=1-7-1, COL=PMLANE,    RANGE=1-7-1

CROSSTAB VAR=_CNT,ROW=FTYPE, RANGE=1-7-1, COL=AMLIMIT,   RANGE=0-9-1
CROSSTAB VAR=_CNT,ROW=FTYPE, RANGE=1-7-1, COL=OPLIMIT,   RANGE=0-9-1
CROSSTAB VAR=_CNT,ROW=FTYPE, RANGE=1-7-1, COL=PMLIMIT,   RANGE=0-9-1

;
;
ENDRUN

;---------------------------------------------------------------------
; HIGHWAY TERMINAL TIME DEVELOPMENT
; Input File:  ZONE.ASC (Standard Land Use File)
;
; Output File: ZTERMTM.ASC   ZONAL TERMINAL TIME FILE
;
;
;-----------------------------------------------------------------
; Set up Global Variables:
;  Inputs Files:

LUFILE  = 'inputs\zone.asc' ;  LAND USE FILE
NZONES  = '2191'            ;  ZONE MATRIX SIZE
MAXIZN  = '2144'            ;  LAST INTERNAL ZONE No.


RUN PGM=MATRIX
zones=@NZONES@
;  READ ZONAL EMPLOYMENT AND AREA FROM 'STANDARD' V2 LAND USE FILE

ZDATI[1]= @LUFILE@, Z=1-4,EMP=40-47,SQMI=83-92


; CREATE ZONAL ARRAY FOR EMPLOYMENT DENSITY

  ARRAY,                    ;  CREATE ZONAL ARRAYS
        EDENSITY = @NZONES@, ;  ARRAY FOR EMPLOYMENT DENSITY
        TERMTM   = @NZONES@  ;  ARRAY FOR TERMINAL TIME


IF (I=1)                    ;  COMPUTE EMPLOYMENT DENSITY --
      LOOP INDEX=1,@NZONES@  ;     ONCE AT THE 1ST I ZONE 'PASS'
        IF (SQMI[INDEX]    = 0)
           EDENSITY[INDEX] = 0
        ELSE
           EDENSITY[INDEX]=EMP[INDEX]/SQMI[INDEX]
        ENDIF

           IF (INDEX>@MAXIZN@)
                    TERMTM[INDEX]  = 0.0
              ELSEIF (EDENSITY[INDEX] <   4618)
                    TERMTM[INDEX]  = 1.0
              ELSEIF (EDENSITY[INDEX] <   6632)
                    TERMTM[INDEX]  = 2.0
              ELSEIF (EDENSITY[INDEX] <  11563)
                    TERMTM[INDEX]  = 4.0
              ELSEIF (EDENSITY[INDEX] <  32986)
                    TERMTM[INDEX]  = 6.0
              ELSE
                    TERMTM[INDEX]  = 8.0
              ENDIF

        TOTEMP = TOTEMP+ EMP[INDEX] ; ACCUMULATE TOTAL EMP. FOR CHECKING
        TOTSQM = TOTSQM+SQMI[INDEX] ; ACCUMULATE TOTAL SQMI.FOR CHECKING
```

```
;  WRITE OUT  ZONAL TERMINAL TIME FILE

        LIST = INDEX(4),' ',EMP[INDEX](6),' ',SQMI[INDEX](10.2),' ',
             TERMTM[INDEX](5),' ; <-- TAZ, Empl, SqMi, HwyTermTime (min)',
             FILE=ZTERMTM.ASC

      ENDLOOP
ENDIF


;  NOW PRINT OUT THE REGIONAL EMPLOYMENT, SQ MILEAGE TOTALS FOR CHECKING

IF (I=@NZONES@)
   LIST =' ** THE TOTAL EMPLOYMENT INPUT IS: ',TOTEMP(12.0C)
   LIST =' ** THE TOTAL SQ MILEAGE INPUT IS: ',TOTSQM(12.2C)
ENDIF


ENDRUN
```

Highway_Skims.s

```
;////////////////////////////////////////////////////////
;  Highway_Skims.S                                      //
;  MWCOG Version 2 Model                                //
;                                                       //
;  Build AM Peak/Off-Peak Highway Skims                 //
;  the Current Iteration Asssignment                    //
;  AM and Off-Pk Skims are built in 2 separate HWYLOAD  //
;  programs.                                            //
;  Three files are created, per SOV, HOV2, and HOV3 paths.//
;  Each file will contain 3 Tables (in MINUTP format)   //
;          1) Time     (whole minutes)                  //
;          2) Distance (implied tenths of mi.)          //
;          3) Toll     (in 1980 cents)                  //
;////////////////////////////////////////////////////////
;
;
;   Environment Variables:
;     _iter_  (Iteration indicator = 'pp','bs','i1', or 'i2')
;     _tdefl_ (hwy toll defl.factor converting from current to '80 cents)
;
;

NETIN    = '%_iter_%hwy.net'
TOLLDEFL = '%_tdefl_%'
LOOP Period=1,2         ;  We are looping through the skimming process
                        ;  twice: (1) for the AM Peak & (2) the Off-Peak
                        ;
  IF (Period=1)          ; AM Highway Skim tokens
    PRD     = 'AM'
    MATOUT1 = 'sov%_iter_%am.skm '
    MATOUT2 = 'hov2%_iter_%am.skm'
    MATOUT3 = 'hov3%_iter_%am.skm'
    MYID    = '%_iter_% AM skims'
  ELSE                  ; OP Highway Skim tokens
    PRD     = 'OP'
    MATOUT1 = 'sov%_iter_%op.skm '
    MATOUT2 = 'hov2%_iter_%op.skm'
    MATOUT3 = 'hov3%_iter_%op.skm'
    MYID    = '%_iter_% OP skims'
  ENDIF

RUN PGM=HWYLOAD
;
;
  NETI   =@NETIN@                          ; Pk Prd TP+ network
  MATO[1]=@MATOUT1@, MO=1-3, FORMAT=MINUTP ; LOV   skims
  MATO[2]=@MATOUT2@, MO=4-6, FORMAT=MINUTP ; HOV2  skims
  MATO[3]=@MATOUT3@, MO=7-9, FORMAT=MINUTP ; HOV3+ skims
  ID=@MYID@

  PHASE=LINKREAD
   SPEED  =  LI.%_iter_%@PRD@SPD     ; new line
;
;
;  Define the three path types here:
;
;
; limit codes used:
;  1=no prohibitions
;  2=prohibit  1/occ autos,trucks
;  3=prohibit  1&2occ autos,trucks
;  4=prohibit  trucks
;  5=prohibit non-airport access trips
;  6-8=unused
;  9=prohibit all traffic use

    IF (LI.@PRD@LIMIT = 2,3,5-9) ADDTOGROUP=1 ; SOV   prohibited links
    IF (LI.@PRD@LIMIT = 3,5-9)   ADDTOGROUP=2 ; HOV2  prohibited links
    IF (LI.@PRD@LIMIT = 5-9)     ADDTOGROUP=3 ; HOV3+ prohibited links
;
  ENDPHASE
;
; Now do the path skimming, per the three path types.  Time, distance,
; and Toll skims created.  Scaling to the desired specified below.
; All skims are based on minimum time paths.
;
; Note that override values of 0 will be inserted for disconnected ijs
; (i.e. cells associated with 'unused' zones and intrazonal cells).
; I don't like the TP+ default value of 1,000,000 for these situations
;
  PHASE=ILOOP
    PATHLOAD PATH=TIME, EXCLUDEGRP=1,              ; SOV   paths
             MW[1]=PATHTRACE(TIME),    NOACCESS=0, ; -excluding links
             MW[2]=PATHTRACE(DIST),    NOACCESS=0, ;   w/ LIMIT=2,3,5-9
             MW[3]=PATHTRACE(LI.TOLL), NOACCESS=0  ;
    PATHLOAD PATH=TIME, EXCLUDEGRP=2,              ; HOV2  paths
             MW[4]=PATHTRACE(TIME),    NOACCESS=0, ; -excluding links
             MW[5]=PATHTRACE(DIST),    NOACCESS=0, ;   w/ LIMIT=3,5-9
             MW[6]=PATHTRACE(LI.TOLL), NOACCESS=0  ;
    PATHLOAD PATH=TIME, EXCLUDEGRP=3,              ; HOV3+ paths
             MW[7]=PATHTRACE(TIME),    NOACCESS=0, ; -excluding links
             MW[8]=PATHTRACE(DIST),    NOACCESS=0, ;   w/ LIMIT=5-9
             MW[9]=PATHTRACE(LI.TOLL)  NOACCESS=0  ;

;---------------------------------------------------------------------
; scaling, rounding of skim tables done here!!
;---------------------------------------------------------------------

     mw[1] = ROUND(MW[1])                     ; ROUND TIME SKIMS
     mw[4] = ROUND(MW[4])                     ; TO WHOLE MINUTES
     mw[7] = ROUND(MW[7])                     ;
     mw[1] = MIN(MW[1],326.0)  ; Impose Max TIME / MC Model Maximum
     mw[4] = MIN(MW[4],326.0)  ; Impose Max TIME / MC Model Maximum
     mw[7] = MIN(MW[7],326.0)  ; Impose Max TIME / MC Model Maximum
                               ;  ...just in case
     mw[2] = ROUND(MW[2]*10)                  ; FACTOR/ROUND DIST.
     mw[5] = ROUND(MW[5]*10)                  ; SKIMS TO IMPLICIT
     mw[8] = ROUND(MW[8]*10)                  ; 1/10THS OF MILES

     mw[3] = ROUND(MW[3]*@tolldefl@)          ; FACTOR/ROUND TOLL
     mw[6] = ROUND(MW[6]*@tolldefl@)          ; SKIMS TO 1980
     mw[9] = ROUND(MW[9]*@tolldefl@)          ; WHOLE CENTS

;---------------------------------------------------------------------
; Print selected rows of skim files
; for checking.
;---------------------------------------------------------------------


     IF (i = 1-2)                       ;  for select rows (Is)
        printrow MW=1-3, j=1-2191       ;  print work matrices 1-3
     ENDIF                              ;  row value to all Js.
  ENDPHASE
ENDRUN
ENDLOOP
```

MC_Summary.s

```
;--------------------------------------------------------------------
; Program Name: MC_Summary.s
; MWCOG Version 2 Model
;
; 1) Update interchanges where person trips exceed
; 32367, by purpose.
; 2) Summarize final table by purpose
;
; Environment Variables Used:
;              %_iter_%
;              %_year_%
;              %_alt_%
;
; Updated 12/12/02 to generate model trip summaries for ALL purposes,
;                  in addition to individual purposes (rm)
;--------------------------------------------------------------------
LOOP PURP=1,4
 IF (PURP = 1)
  PURPOSE = 'HBW'
  VEH_OCC = 1.11
  INPTRIPS= 'FILLMW MW[1]=MI.2.1,2,3,4,5,6,7'
 ELSEIF (PURP = 2)
  PURPOSE = 'HBS'
  VEH_OCC = 1.23
  INPTRIPS= 'FILLMW MW[1]=MI.2.1,2,3,4'
 ELSEIF (PURP = 3)
  PURPOSE = 'HBO'
  VEH_OCC = 1.45
  INPTRIPS= 'FILLMW MW[1]=MI.2.1,2,3,4'
 ELSE
  PURPOSE = 'NHB'
  VEH_OCC = 1.25
  INPTRIPS= 'FILLMW MW[1]=MI.2.1,2,3,4'
 ENDIF
;
;--------------------------------------------------------------------------
;
;--------------------------------------------------------------------------
;
RUN PGM=MATRIX
 MATI[1] = %_iter_%_@purpose@mu.ptt ; PP Iteration Person Trips
 MATI[2] = mc_@PURPOSE@.trp         ; COGMC Model Output Trip Table
 MATO[1] = mc_@PURPOSE@.FIN, MO=1-7  ; Updated/Final Mode Choice Trips

 MW[5] = 0
 MW[6] = 0
 MW[7] = 0

 @INPTRIPS@

 ;---- Update the Mode Choice Output ----

 JLOOP
  IF (MI.1.1 > 32367)                          ;
    MW[2] = MI.1.1                             ;
    MW[1] = ROUND (MI.1.1 / @VEH_OCC@)         ;
  ENDIF                                        ;

  _PERSON = MW[2] + MW[3] + MW[4] + MW[6]

ENDJLOOP
ENDRUN
ENDLOOP
```

```
; ---------------------------------------------------------------
; Now summarize total purpose trip tables, by mode
; ---------------------------------------------------------------

RUN PGM=MATRIX
  ZONES=2191
  MATI[1]= MC_HBW.FIN
  MATI[2]= MC_HBS.FIN
  MATI[3]= MC_HBO.FIN
  MATI[4]= MC_NHB.FIN
  FILLMW MW[01]=MI.1.1,2,3,4,5,6,7
  FILLMW MW[11]=MI.2.1,2,3,4,5,6,7
  FILLMW MW[21]=MI.3.1,2,3,4,5,6,7
  FILLMW MW[31]=MI.4.1,2,3,4,5,6,7

  MW[51] = MW[01] + MW[11] + MW[21] + MW[31]  ; Total LOV Auto Drv
  MW[52] = MW[02] + MW[12] + MW[22] + MW[32]  ; Total LOV Auto Psn
  MW[53] = MW[03] + MW[13] + MW[23] + MW[33]  ; Total Walk  Acc Transit
  MW[54] = MW[04] + MW[14] + MW[24] + MW[34]  ; Total Drive Acc Transit
  MW[55] = MW[05] + MW[15] + MW[25] + MW[35]  ; Total HOV-2occ Auto Drv
  MW[56] = MW[06] + MW[16] + MW[26] + MW[36]  ; Total HOV(2/3+) Auto Psn
  MW[57] = MW[07] + MW[17] + MW[27] + MW[37]  ; Total HOV-3+occ Auto Drv

 MATO[1] = MC_ALL.FIN, MO=51-57  ; Total Purpose Mode Choice Trips
ENDRUN


;---------------------------------------------------------------
; Summarize the Mode Choice Model Output to Juris. Level
;---------------------------------------------------------------
DESCRIPT='Simulation - Year: %_year_% Alternative: %_alt_%'
LOOP PURP=1,5  ; Outer Loop for Each Purpose (HBW,HBS,HBO,NHB,Total)
IF (PURP=1)
    MCOUTTAB='mc_HBW.FIN'
    PURPOSE ='HBW'
ELSEIF (PURP=2)
    MCOUTTAB='mc_HBS.FIN'
    PURPOSE ='HBS'
ELSEIF (PURP=3)
    MCOUTTAB='mc_HBO.FIN'
    PURPOSE ='HBO'
ELSEIF (PURP=4)
    MCOUTTAB='mc_NHB.FIN'
    PURPOSE ='NHB'
ELSEIF (PURP=5)
    MCOUTTAB='mc_ALL.FIN'
    PURPOSE ='ALL'
ENDIF

;
COPY FILE=DJ.EQV
;   -- Start of Jurisiction-to-TAZ equivalency --
D 1=1-88                          ; DC cr
D 2=89-319                        ; DC ncr
D 3=320-639                       ; MTG MD
D 4=640-1029                      ; PG  MD
D 5=1230-1238                     ; ARL core
D 6=1239-1329                     ; ARLcnore
D 7=1330-1399                     ; ALX VA
D 8=1400-1779                     ; FFX VA
D 9=1780-1919                     ; LDN VA
D 10=1920-2069                    ; PW  VA
D 11=1030-1059                    ; FRD MD
D 12=1060-1079                    ; CAR MD
D 13=1080-1109                    ; HOW MD
D 14=1110-1149                    ; AAR MD
D 15=1150-1169                    ; CAL
D 16=1170-1199                    ; STM
```

```
D 17=1200-1229                  ; CHS MD
D 18=2115-2129                  ; FAU VA
D 19=2080-2099                  ; STA VA
D 20=2130-2134,2135-2144        ; CLK/JEF
D 21=2100-2104,2105-2114        ; FBG/SPTS
D 22=2070-2079                  ; KGEOVA
D 23=2145-2191                  ; EXTRNLS
;   -- end of Jurisiction-to-TAZ equivalency --
ENDCOPY

RUN PGM=MATRIX
  ZONES=2191
  MATI[1]= @MCOUTTAB@
  MW[1]=MI.1.1                      ;  SOV ADR
  MW[2]=MI.1.2                      ;  SOV APSN
  MW[3]=MI.1.3+MI.1.4               ;  Transit
  MW[4]=MI.1.6                      ;  HOV APSN
  MW[5]=MI.1.5+MI.1.7               ;  HOV ADR
  MW[6]=MI.1.1+MI.1.5+MI.1.7        ;  Auto Driver
  MW[7]=MI.1.2+MI.1.6               ;  Auto Psn
  MW[8]=MI.1.2+MI.1.3+MI.1.4+MI.1.6 ;  Person
  MW[10]=0                          ;  dummy/placemarker table
  FILEO MATO[1]  = TEMP.sad MO=1,10
        MATO[2]  = TEMP.sap MO=2,10
        MATO[3]  = TEMP.trn MO=3,10
        MATO[4]  = TEMP.hap MO=4,10
        MATO[5]  = TEMP.had MO=5,10
        MATO[6]  = TEMP.adr MO=6,10
        MATO[7]  = TEMP.apn MO=7,10
        MATO[8]  = TEMP.psn MO=8,10
        MATO[9]  = TEMP.trp MO=3,8
        MATO[10] = TEMP.occ MO=7,6

  ; renumber OUT.MAT according to DJ.EQV
  RENUMBER FILE=DJ.EQV, MISSINGZI=M, MISSINGZO=W
ENDRUN

;
LOOP INDEX2=1,10  ; Inner Loop for Each Summary Type:
;               1/LOV Adrs,2/LOV APpsns,3/Transit,4/HOV Psns,5/HOV Adrs
;               6/Adrs    ,7/Apsns     ,8/Persons,9/Pct Trn ,10/Auto Occ
;
IF (INDEX2=1)               ; Parameters for each table:
  SQFNAME='temp.sad'        ; Token name of squeezed modal trip table(s)
  MODE ='LOV Auto Driver'   ; Token mode label od trip table
  DCML=0                    ; decimal specification
  TABTYPE=1                 ; table type(1/2)-involves 1 or 2 trip tables
  SCALE=1                   ; scale factor to be applied (if desired)
  OPER='+'                  ; operation(if tabtype=2) Tab1(?)Tab2=Result
ELSEIF (INDEX2=2)
  SQFNAME='temp.sap'        ;
  MODE ='LOV Auto Person'
  DCML=0
  TABTYPE=1
  SCALE=1                   ;
  OPER='+'                  ;
ELSEIF (INDEX2=3)
  SQFNAME='temp.trn'        ;
  MODE ='Transit   '
  DCML=0
  TABTYPE=1
  SCALE=1                   ;
  OPER='+'                  ;
ELSEIF (INDEX2=4)
  SQFNAME='temp.hap'        ;
  MODE ='HOV Auto Person'
  DCML=0
  TABTYPE=1
  SCALE=1                   ;
  OPER='+'                  ;
ELSEIF (INDEX2=5)
  SQFNAME='temp.had'        ;
  MODE ='HOV AUTO Driver'
  DCML=0
  TABTYPE=1
  SCALE=1                   ;
  OPER='+'                  ;
ELSEIF (INDEX2=6)
  SQFNAME='temp.adr'        ;
  MODE ='Auto Driver'
  DCML=0
  TABTYPE=1
  SCALE=1                   ;
  OPER='+'                  ;
ELSEIF (INDEX2=7)
  SQFNAME='temp.apn'        ;
  MODE ='Auto Person  '
  DCML=0
  TABTYPE=1
  SCALE=1                   ;
  OPER='+'                  ;
ELSEIF (INDEX2=8)
  SQFNAME='temp.psn'        ;
  MODE ='Total Motorized Person'
  DCML=0
  TABTYPE=1
  SCALE=1                   ;
  OPER='+'                  ;
ELSEIF (INDEX2=9)
  SQFNAME='temp.trp'        ;
  MODE ='Transit Percentage'
  DCML=1
  TABTYPE=2
  SCALE=100                 ;
  OPER='/'
ELSEIF (INDEX2=10)
  SQFNAME='temp.occ'        ;
  MODE ='Avg. Auto Occupancy '
  DCML=2
  TABTYPE=2
  SCALE=1                   ;
  OPER='/'
ENDIF
;
RUN PGM=MATRIX
  ZONES=23
  FILEI MATI=@SQFNAME@
  ARRAY CSUM=23,CSUM1=23,CSUM2=23
; ---------------------------------------------------------------
; --  Table Cell Value decalaration or computation (in MW[1])
; ---------------------------------------------------------------

  FILLMW MW[1]=MI.1.1,2     ;    read input tables in MW 2,3

 IF (@TABTYPE@ = 2)
  FILLMW MW[2]=MI.1.1,2     ;    read input tables in MW 2,3
 ENDIF

  IF (@TABTYPE@=2)                                ; Cell Value
     JLOOP                                        ; computed for
      IF (MW[3][J]>0) MW[1]=MW[2]*@SCALE@@OPER@MW[3]; special summaries-
     ENDJLOOP                                     ; calculation in MW[1]
  ENDIF

; -----------------------------------------------------
; ---- ROW Marginal declaration or computation --------
```

```
; ---------------------------------------------------
  RSUM   =     ROWSUM(1)            ; 'normal' table- row summary value

  IF (@TABTYPE@=2)
        RSUM = @SCALE@*ROWSUM(2)@OPER@ROWSUM(3)  ; non-'normal' table
  ENDIF                                  ; compute the row marginal(%)

; ---------------------------------------------------------
; ---- COLUMN/Total Marginal Accumulation            ----
; ---- The computation (if necessary) is done below  ----
; ---------------------------------------------------------

  JLOOP                            ; COL/Total Accumulation
    CSUM[J] = CSUM[J] +  MW[1][J]  ; for 'normal' table
    TOTAL   = TOTAL   +  MW[1]     ;
  ENDJLOOP

IF (@TABTYPE@=2)
  JLOOP                              ; COL/Total Accumulation
    CSUM1[J] = CSUM1[J] +  MW[2][J]  ; for non-'normal' Table
    TOTAL1   = TOTAL1   +  MW[2]     ;
    CSUM2[J] = CSUM2[J] +  MW[3][J]  ;
    TOTAL2   = TOTAL2   +  MW[3]     ;
  ENDJLOOP
ENDIF

  IF (I==1)      ; print header

  PRINT LIST='/bt   ','@DESCRIPT@'
  PRINT LIST='      ','Purpose: ','@PURPOSE@','   MODE: ','@MODE@'
  PRINT LIST='      '

   PRINT LIST='           DESTINATION'
   PRINT LIST=' ORIGIN |',
              '      1','      2','      3','      4',
              '      5','      6','      7','      8','      9',
              '     10','     11','     12','     13','     14',
              '     15','     16','     17','     18','     19',
              '     20','     21','     22','     23',' |  TOTAL'



   PRINT LIST='==============',
              '=========================================',
              '=========================================',
              '=========================================',
              '======================================='


  ENDIF

  IF (I=1)
   CURDIST=STR(I,2,1)+' DC CR'+ '|' ; Make row header
  ELSEIF (I=2)
   CURDIST=STR(I,2,1)+' DC NC'+ '|' ; Make row header
  ELSEIF (I=3)
   CURDIST=STR(I,2,1)+' MTG  '+ '|' ; Make row header
  ELSEIF (I=4)
   CURDIST=STR(I,2,1)+' PG   '+ '|' ; Make row header
  ELSEIF (I=5)
   CURDIST=STR(I,2,1)+' ARLCR'+ '|' ; Make row header
  ELSEIF (I=6)
   CURDIST=STR(I,2,1)+' ARNCR'+ '|' ; Make row header
  ELSEIF (I=7)
   CURDIST=STR(I,2,1)+' ALX  '+ '|'; Make row header
  ELSEIF (I=8)
   CURDIST=STR(I,2,1)+' FFX  '+ '|' ; Make row header
  ELSEIF (I=9)
   CURDIST=STR(I,2,1)+' LDN  '+ '|' ; Make row header
  ELSEIF (I=10)
   CURDIST=STR(I,2,1)+' PW   '+ '|' ; Make row header
  ELSEIF (I=11)
   CURDIST=STR(I,2,1)+' FRD  '+ '|' ; Make row header
  ELSEIF (I=12)
   CURDIST=STR(I,2,1)+' CAR  '+ '|' ; Make row header
  ELSEIF (I=13)
   CURDIST=STR(I,2,1)+' HOW  '+ '|' ; Make row header
  ELSEIF (I=14)
   CURDIST=STR(I,2,1)+' AAR  '+ '|' ; Make row header
  ELSEIF (I=15)
   CURDIST=STR(I,2,1)+' CAL  '+ '|' ; Make row header
  ELSEIF (I=16)
   CURDIST=STR(I,2,1)+' STM  '+ '|' ; Make row header
  ELSEIF (I=17)
   CURDIST=STR(I,2,1)+' CHS  '+ '|' ; Make row header
  ELSEIF (I=18)
   CURDIST=STR(I,2,1)+' FAU  '+ '|' ; Make row header
  ELSEIF (I=19)
   CURDIST=STR(I,2,1)+' STA  '+ '|' ; Make row header
  ELSEIF (I=20)
   CURDIST=STR(I,2,1)+' CL/JF'+ '|' ; Make row header
  ELSEIF (I=21)
   CURDIST=STR(I,2,1)+' SP/FB'+ '|' ; Make row header
  ELSEIF (I=22)
   CURDIST=STR(I,2,1)+' KGEO '+ '|' ; Make row header
  ELSEIF (I=23)
   CURDIST=STR(I,2,1)+' EXTL '+ '|' ; Make row header
  ELSE   (I=24)
   CURDIST=STR(I,2,1)+' TOTAL'+ '|' ; Make row header
  ENDIF

  PRINT FORM=7.@DCML@ LIST=CURDIST, MW[1][1],MW[1][2],MW[1][3],MW[1][4],MW[1][5],
                      MW[1][6],MW[1][7],MW[1][8],MW[1][9],MW[1][10],
                      MW[1][11],MW[1][12],MW[1][13],MW[1][14],MW[1][15],
                      MW[1][16],MW[1][17],MW[1][18],MW[1][19],MW[1][20],
                      MW[1][21],MW[1][22],MW[1][23],' |',RSUM

  IF (I==ZONES)
; Now at the end of Processed zone matrix
;  Do final Column/Grand Total Computations
     IF (@TABTYPE@=2)
       LOOP IDX = 1,ZONES
            IF (CSUM2[IDX] = 0)
                 CSUM[IDX] = 0
            ELSE
                 CSUM[IDX] = @SCALE@* CSUM1[IDX] @OPER@ CSUM2[IDX]
            ENDIF
       ENDLOOP
     ENDIF
     IF (@TABTYPE@=2 )
            IF (TOTAL2 = 0)
                TOTAL  = 0
            ELSE
                TOTAL  = @SCALE@ *TOTAL1 @OPER@ TOTAL2
            ENDIF
     ENDIF

;  End of final Column/Grand Total Computations

   PRINT LIST='==============',
              '=========================================',
              '=========================================',
              '=========================================',
              '======================================='
```

```
    PRINT FORM=8.@DCML@,
    LIST=' TOTAL ',' ',CSUM[1],'      ' ,CSUM[3],
    '      ',CSUM[5],'      ',CSUM[7],'      ',CSUM[9],
    '      ',CSUM[11],'      ',CSUM[13],'      ',CSUM[15],
    '      ',CSUM[17],'      ',CSUM[19],'      ',CSUM[21],
    '      ',CSUM[23],' |'
    PRINT FORM=8.@DCML@,
    LIST='/et            ',CSUM[2],
    '      ' ,CSUM[4],'      ',CSUM[6],'      ',CSUM[8],
    '      ',CSUM[10],'      ',CSUM[12],'      ',CSUM[14],
    '      ',CSUM[16],'      ',CSUM[18],'      ',CSUM[20],
    '      ',CSUM[22],'       ',TOTAL(9.@DCML@)


 ENDIF
ENDRUN

ENDLOOP ; End 'Inner' Loop
ENDLOOP ; End 'Outer' Loop
```

MC_Update.s

```
;-------------------------------------------------------------
; Program Name: MC_Update.s
; MWCOG Version 2 Model
;
; 1) Update Mode Choice Model Trips for Current (i1/i2) Iteration
;
; 2) Summarize final table by purpose
;
; Environment Variables Used:
;              %_iter_%
;              %_year_%
;              %_alt_%
;
;
; Updated 12/12/02 to generate model trip summaries for ALL purposes,
;                  in addition to individual purposes (rm)
;
;
;-------------------------------------------------------------
LOOP PURP=1,4
 IF (PURP = 1)
    PURPOSE ='HBW'
    DADRSHR = '0.900'
 ELSEIF (PURP = 2)
  PURPOSE = 'HBS'
    DADRSHR = '0.813'
 ELSEIF (PURP = 3)
  PURPOSE = 'HBO'
    DADRSHR = '0.690'
 ELSE
  PURPOSE = 'NHB'
    DADRSHR = '0.800'
 ENDIF
;
;-----------------------------------------------------------------------------
;
;-----------------------------------------------------------------------------
;
RUN PGM=MATRIX
 ZONES=2191
 MATI[1] = mc_@PURPOSE@.FIN         ; COGMC Model Output Trip Table
 MATI[2] = %_iter_%_@purpose@mu.ptt ; Current Itr Person Trips

  MW[1]=MI.2.1                      ;  input Person Trips

  MW[11]=MI.1.1                     ;  input SOV ADR
  MW[12]=MI.1.2                     ;  input SOV APSN
  MW[13]=MI.1.3                     ;  input Walk Acc Transit
  MW[14]=MI.1.4                     ;  input Drv Acc  Transit
  MW[15]=MI.1.5                     ;  input HOV A ADR
  MW[16]=MI.1.6                     ;  input HOV APSN
  MW[17]=MI.1.7                     ;  input HOV B ADR

 JLOOP
  IF (MW[12] > 0.0)        ; if SOV Auto Psns > 0
    MW[20] = MW[11]/MW[12] ; Put LOV Auto dr share of auto psns in mtx 20
  ELSE                     ; else
    MW[20] = @DADRSHR@     ; use default share
  ENDIF

  MW[25] =  MW[13] + MW[14] + MW[16] ; TRN&HOV Psn trips from MC model

      MW[30] = MW[1]     ;  TDI1 Trips equal final psn trips
      MW[32] = 1.0       ;  TDI1 Trips equal final psn trips

  IF (MW[25] > MW[1])    ; if MC Trn/HOV Psns > TDI1 Psn trips
      MW[30] = MW[25]    ; 'Final' psn trips equal MC Trn/HOV Trips
      MW[31] = 1.0       ; count no. of times Psn trips < MC psn trips
  ENDIF

   MW[42] = MW[30] - MW[25] ; 'final LOV auto person trips
          IF (MW[42] < 0)
              MW[42] = 0
          ENDIF

   MW[41] = MW[42] * MW[20] ; 'final LOV Adrs

  endjloop
   dummy = ROWFIX(41)       ; bucket round LOV auto drivers

;
; Now, let's accumalate totals for neat reporting
;
 Jloop
 TD_PSN  = TD_PSN  + MW[1]  ; 'Current' Itr. Trip Distrib.Person trips

 MC_LADR = MC_LADR + MW[11] ;  Mode Ch. Model LOV Auto Dr   Trips
 MC_LAPN = MC_LAPN + MW[12] ;  Mode Ch. Model LOV Auto Psn  Trips
 MC_WTRN = MC_WTRN + MW[13] ;  Mode Ch. Model Walk Acc Trn  Trips
 MC_DTRN = MC_DTRN + MW[14] ;  Mode Ch. Model Drv  Acc Trn  Trips
 MC_H2AD = MC_H2AD + MW[15] ;  Mode Ch. Model HOV2 Auto Dr  Trips
 MC_HPSN = MC_HPSN + MW[16] ;  Mode Ch. Model HOV  Auto Psn Trips
 MC_H3AD = MC_H3AD + MW[17] ;  Mode Ch. Model HOV3 Auto Dr  Trips

 MC_GTTDP = MC_GTTDP + MW[31] ; Counter for MC Trn/HOV >  TD Psn Trips
 MC_LETDP = MC_LETDP + MW[32] ; Counter for MC Trn/HOV <= TD Psn Trips

 F_LADR   = F_LADR + MW[41]   ; Final LOV ADRS
 F_LAPN   = F_LAPN + MW[42]   ; Final LOV APSNS

 INP_PSN  = MC_LAPN + MC_WTRN + MC_DTRN + MC_HPSN    ; Input (MC) Person Trips
 OUT_PSN  = F_LAPN  + MC_WTRN + MC_DTRN + MC_HPSN    ; Output Person Trips
 ENDJLOOP

 IF (i=zones)
; Calculate Regional LOV related Differences
 D_LADR   = F_LADR - MC_LADR   ; Final LOV ADRS
 D_LAPN   = F_LAPN - MC_LAPN   ; Final LOV APSNS
 D_PSN    = INP_PSN-OUT_PSN    ; Final Persons
; Print out regional totals:
     LIST = '    '
     LIST = '    '
     LIST = '    '
     LIST = '    '
     LIST = '    '
     LIST = '    '
     LIST = '    '
     LIST = '    '
     LIST = '/bt    ','%_iter_% Iter','@PURPOSE@',' Mode Choice Results'
     LIST = '    '
     LIST = 'Mode:          Input      Output    Diff.(O-I)'
     LIST = '-------------  --------  ----------  ----------- '
     LIST = '                                                 '
     List = 'TrpDst Psns  ',TD_PSN(10)
     LIST = '                                                 '
     LIST = 'Mode Choice Model Trips:                         '
     List = 'LOV Auto Drvs',MC_LADR(10),'  ',F_LADR(10),'  ',D_LADR(10)
     List = 'LOV Auto Psns',MC_LAPN(10),'  ',F_LAPN(10),'  ',D_LAPN(10)
     List = 'Walk Acc Trn ',MC_WTRN(10),'  ',MC_WTRN(10)
```

```
     List = 'Drv  Acc Trn ',MC_DTRN(10),'  ',MC_DTRN(10)
     List = 'HOV2 Auto Dr ',MC_H2AD(10),'  ',MC_H2AD(10)
     List = 'HOV Auto Psns',MC_HPSN(10),'  ',MC_HPSN(10)
     List = 'HOV3 Auto Dr ',MC_H3AD(10),'  ',MC_H3AD(10)
     LIST = '-------------  --------  ----------  ----------- '
     LIST = '                                                 '
     LIST = 'Total Person ',INP_PSN(10),'  ',OUT_PSN(10),'  ',D_PSN(10)
     LIST = '=============                                    '
     LIST = '                                                 '
     LIST ='No.Cases where MC TRN/HOV trips >  TD Psn Trips',MC_GTTDP(10)
     LIST ='No.Cases where MC TRN/HOV trips <= TD Psn Trips',MC_LETDP(10)
     LIST = '/et                                              '

 ENDIF

  ; Write out updated Mode Choice Trips
  FILEO MATO[1]  = mc_@Purpose@%_iter_%.fin, MO=41,42,13,14,15,16,17

ENDRUN
ENDLOOP

; ---------------------------------------------------------------
; Now summarize total purpose trip tables, by mode
; ---------------------------------------------------------------

RUN PGM=MATRIX
  ZONES=2191
  MATI[1]= MC_HBW%_iter_%.FIN
  MATI[2]= MC_HBS%_iter_%.FIN
  MATI[3]= MC_HBO%_iter_%.FIN
  MATI[4]= MC_NHB%_iter_%.FIN
  FILLMW MW[01]=MI.1.1,2,3,4,5,6,7
  FILLMW MW[11]=MI.2.1,2,3,4,5,6,7
  FILLMW MW[21]=MI.3.1,2,3,4,5,6,7
  FILLMW MW[31]=MI.4.1,2,3,4,5,6,7

  MW[51] = MW[01] + MW[11] + MW[21] + MW[31]  ; Total LOV Auto Drv
  MW[52] = MW[02] + MW[12] + MW[22] + MW[32]  ; Total LOV Auto Psn
  MW[53] = MW[03] + MW[13] + MW[23] + MW[33]  ; Total Walk  Acc Transit
  MW[54] = MW[04] + MW[14] + MW[24] + MW[34]  ; Total Drive Acc Transit
  MW[55] = MW[05] + MW[15] + MW[25] + MW[35]  ; Total HOV-2occ Auto Drv
  MW[56] = MW[06] + MW[16] + MW[26] + MW[36]  ; Total HOV(2/3+) Auto Psn
  MW[57] = MW[07] + MW[17] + MW[27] + MW[37]  ; Total HOV-3+occ Auto Drv

 MATO[1] = MC_ALL%_iter_%.FIN, MO=51-57  ; Total Purpose Mode Choice Trips
ENDRUN

;---------------------------------------------------------------
; Summarize the Mode Choice Model Output to Juris. Level
;---------------------------------------------------------------
DESCRIPT='Simulation - Year: %_year_% Alternative: %_alt_%'
LOOP PURP=1,5  ; Outer Loop for Each Purpose (HBW,HBS,HBO,NHB,ALL)
IF (PURP=1)
    MCOUTTAB='mc_HBW%_iter_%.FIN'
    PURPOSE ='HBW'
ELSEIF (PURP=2)
    MCOUTTAB='mc_HBS%_iter_%.FIN'
    PURPOSE ='HBS'
ELSEIF (PURP=3)
    MCOUTTAB='mc_HBO%_iter_%.FIN'
    PURPOSE ='HBO'
ELSEIF (PURP=4)
    MCOUTTAB='mc_NHB%_iter_%.FIN'
    PURPOSE ='NHB'
ELSEIF (PURP=5)
    MCOUTTAB='mc_ALL%_iter_%.FIN'
    PURPOSE ='ALL'
ENDIF

;
COPY FILE=DJ.EQV
;   -- Start of Jurisiction-to-TAZ equivalency --
D 1=1-88                        ; DC cr
D 2=89-319                      ; DC ncr
D 3=320-639                     ; MTG MD
D 4=640-1029                    ; PG  MD
D 5=1230-1238                   ; ARL core
D 6=1239-1329                   ; ARLcnore
D 7=1330-1399                   ; ALX VA
D 8=1400-1779                   ; FFX VA
D 9=1780-1919                   ; LDN VA
D 10=1920-2069                  ; PW  VA
D 11=1030-1059                  ; FRD MD
D 12=1060-1079                  ; CAR MD
D 13=1080-1109                  ; HOW MD
D 14=1110-1149                  ; AAR MD
D 15=1150-1169                  ; CAL
D 16=1170-1199                  ; STM
D 17=1200-1229                  ; CHS MD
D 18=2115-2129                  ; FAU VA
D 19=2080-2099                  ; STA VA
D 20=2130-2134,2135-2144        ; CLK/JEF
D 21=2100-2104,2105-2114        ; FBG/SPTS
D 22=2070-2079                  ; KGEOVA
D 23=2145-2191                  ; EXTRNLS
;   -- end of Jurisiction-to-TAZ equivalency --
ENDCOPY

RUN PGM=MATRIX
  ZONES=2191
  MATI[1]= @MCOUTTAB@
  MW[1]=MI.1.1                      ;  SOV ADR
  MW[2]=MI.1.2                      ;  SOV APSN
  MW[3]=MI.1.3+MI.1.4               ;  Transit
  MW[4]=MI.1.6                      ;  HOV APSN
  MW[5]=MI.1.5+MI.1.7               ;  HOV ADR
  MW[6]=MI.1.1+MI.1.5+MI.1.7        ;  Auto Driver
  MW[7]=MI.1.2+MI.1.6               ;  Auto Psn
  MW[8]=MI.1.2+MI.1.3+MI.1.4+MI.1.6 ;  Person
  MW[10]=0                          ;  dummy/placemarker table
  FILEO MATO[1]  = TEMP.sad MO=1,10
        MATO[2]  = TEMP.sap MO=2,10
        MATO[3]  = TEMP.trn MO=3,10
        MATO[4]  = TEMP.hap MO=4,10
        MATO[5]  = TEMP.had MO=5,10
        MATO[6]  = TEMP.adr MO=6,10
        MATO[7]  = TEMP.apn MO=7,10
        MATO[8]  = TEMP.psn MO=8,10
        MATO[9]  = TEMP.trp MO=3,8
        MATO[10] = TEMP.occ MO=7,6

  ; renumber OUT.MAT according to DJ.EQV
  RENUMBER FILE=DJ.EQV, MISSINGZI=M, MISSINGZO=W
ENDRUN

;
LOOP INDEX2=1,10  ; Inner Loop for Each Summary Type:
;               1/LOV Adrs,2/LOV APpsns,3/Transit,4/HOV Psns,5/HOV Adrs
;               6/Adrs    ,7/Apsns     ,8/Persons,9/Pct Trn ,10/Auto Occ
;
IF (INDEX2=1)               ; Parameters for each table:
  SQFNAME='temp.sad'        ; Token name of squeezed modal trip table(s)
  MODE ='LOV Auto Driver'   ; Token mode label od trip table
  DCML=0                    ; decimal specification
  TABTYPE=1                 ; table type(1/2)-involves 1 or 2 trip tables
  SCALE=1                   ; scale factor to be applied (if desired)
```

```
  OPER='+'                  ; operation(if tabtype=2) Tab1(?)Tab2=Result
ELSEIF (INDEX2=2)
  SQFNAME='temp.sap'        ;
  MODE ='LOV Auto Person'
  DCML=0
  TABTYPE=1
  SCALE=1                   ;
  OPER='+'                  ;
ELSEIF (INDEX2=3)
  SQFNAME='temp.trn'        ;
  MODE ='Transit   '
  DCML=0
  TABTYPE=1
  SCALE=1                   ;
  OPER='+'                  ;
ELSEIF (INDEX2=4)
  SQFNAME='temp.hap'        ;
  MODE ='HOV Auto Person'
  DCML=0
  TABTYPE=1
  SCALE=1                   ;
  OPER='+'                  ;
ELSEIF (INDEX2=5)
  SQFNAME='temp.had'        ;
  MODE ='HOV AUTO Driver'
  DCML=0
  TABTYPE=1
  SCALE=1                   ;
  OPER='+'                  ;
ELSEIF (INDEX2=6)
  SQFNAME='temp.adr'        ;
  MODE ='Auto Driver'
  DCML=0
  TABTYPE=1
  SCALE=1                   ;
  OPER='+'                  ;
ELSEIF (INDEX2=7)
  SQFNAME='temp.apn'        ;
  MODE ='Auto Person  '
  DCML=0
  TABTYPE=1
  SCALE=1                   ;
  OPER='+'                  ;
ELSEIF (INDEX2=8)
  SQFNAME='temp.psn'        ;
  MODE ='Total Motorized Person'
  DCML=0
  TABTYPE=1
  SCALE=1                   ;
  OPER='+'                  ;
ELSEIF (INDEX2=9)
  SQFNAME='temp.trp'        ;
  MODE ='Transit Percentage'
  DCML=1
  TABTYPE=2
  SCALE=100                 ;
  OPER='/'
ELSEIF (INDEX2=10)
  SQFNAME='temp.occ'        ;
  MODE ='Avg. Auto Occupancy '
  DCML=2
  TABTYPE=2
  SCALE=1                   ;
  OPER='/'
ENDIF
;
RUN PGM=MATRIX
  ZONES=23
  FILEI MATI=@SQFNAME@
  ARRAY CSUM=23,CSUM1=23,CSUM2=23
; ---------------------------------------------------------------
; --  Table Cell Value decalaration or computation (in MW[1])
; ---------------------------------------------------------------

  FILLMW MW[1]=MI.1.1,2     ;    read input tables in MW 2,3

 IF (@TABTYPE@ = 2)
  FILLMW MW[2]=MI.1.1,2     ;    read input tables in MW 2,3
 ENDIF

  IF (@TABTYPE@=2)                                ; Cell Value
     JLOOP                                        ; computed for
      IF (MW[3][J]>0) MW[1]=MW[2]*@SCALE@@OPER@MW[3]; special summaries-
     ENDJLOOP                                     ; calculation in MW[1]
  ENDIF

; -------------------------------------------------------
; ---- ROW Marginal declaration or computation --------
; -------------------------------------------------------
  RSUM   =     ROWSUM(1)            ; 'normal' table- row summary value

  IF (@TABTYPE@=2)
        RSUM = @SCALE@*ROWSUM(2)@OPER@ROWSUM(3)  ; non-'normal' table
  ENDIF                                    ; compute the row marginal(%)

; -------------------------------------------------------
; ---- COLUMN/Total Marginal Accumulation            ----
; ---- The computation (if necessary) is done below  ----
; -------------------------------------------------------

  JLOOP                            ; COL/Total Accumulation
    CSUM[J] = CSUM[J] +  MW[1][J]  ; for 'normal' table
    TOTAL   = TOTAL   +  MW[1]     ;
  ENDJLOOP

IF (@TABTYPE@=2)
  JLOOP                              ; COL/Total Accumulation
    CSUM1[J] = CSUM1[J] +  MW[2][J]  ; for non-'normal' Table
    TOTAL1   = TOTAL1   +  MW[2]     ;
    CSUM2[J] = CSUM2[J] +  MW[3][J]  ;
    TOTAL2   = TOTAL2   +  MW[3]     ;
  ENDJLOOP
ENDIF

  IF (I==1)      ; print header

  PRINT LIST='/bt   ','@DESCRIPT@'
  PRINT LIST='      ','Purpose: ','@PURPOSE@','   MODE: ','@MODE@'
  PRINT LIST='      '

   PRINT LIST='           DESTINATION'
   PRINT LIST=' ORIGIN |',
              '      1','      2','      3','      4',
              '      5','      6','      7','      8','      9',
              '     10','     11','     12','     13','     14',
              '     15','     16','     17','     18','     19',
              '     20','     21','     22','     23',' |  TOTAL'



   PRINT LIST='==============',
              '========================================',
              '========================================',
              '========================================',
              '========================================'
```

```
  ENDIF

  IF (I=1)
   CURDIST=STR(I,2,1)+' DC CR'+ '|' ; Make row header
  ELSEIF (I=2)
   CURDIST=STR(I,2,1)+' DC NC'+ '|' ; Make row header
  ELSEIF (I=3)
   CURDIST=STR(I,2,1)+' MTG  '+ '|' ; Make row header
  ELSEIF (I=4)
   CURDIST=STR(I,2,1)+' PG   '+ '|' ; Make row header
  ELSEIF (I=5)
   CURDIST=STR(I,2,1)+' ARLCR'+ '|' ; Make row header
  ELSEIF (I=6)
   CURDIST=STR(I,2,1)+' ARNCR'+ '|' ; Make row header
  ELSEIF (I=7)
   CURDIST=STR(I,2,1)+' ALX  '+ '|'; Make row header
  ELSEIF (I=8)
   CURDIST=STR(I,2,1)+' FFX  '+ '|' ; Make row header
  ELSEIF (I=9)
   CURDIST=STR(I,2,1)+' LDN  '+ '|' ; Make row header
  ELSEIF (I=10)
   CURDIST=STR(I,2,1)+' PW   '+ '|' ; Make row header
  ELSEIF (I=11)
   CURDIST=STR(I,2,1)+' FRD  '+ '|' ; Make row header
  ELSEIF (I=12)
   CURDIST=STR(I,2,1)+' CAR  '+ '|' ; Make row header
  ELSEIF (I=13)
   CURDIST=STR(I,2,1)+' HOW  '+ '|' ; Make row header
  ELSEIF (I=14)
   CURDIST=STR(I,2,1)+' AAR  '+ '|' ; Make row header
  ELSEIF (I=15)
   CURDIST=STR(I,2,1)+' CAL  '+ '|' ; Make row header
  ELSEIF (I=16)
   CURDIST=STR(I,2,1)+' STM  '+ '|' ; Make row header
  ELSEIF (I=17)
   CURDIST=STR(I,2,1)+' CHS  '+ '|' ; Make row header
  ELSEIF (I=18)
   CURDIST=STR(I,2,1)+' FAU  '+ '|' ; Make row header
  ELSEIF (I=19)
   CURDIST=STR(I,2,1)+' STA  '+ '|' ; Make row header
  ELSEIF (I=20)
   CURDIST=STR(I,2,1)+' CL/JF'+ '|' ; Make row header
  ELSEIF (I=21)
   CURDIST=STR(I,2,1)+' SP/FB'+ '|' ; Make row header
  ELSEIF (I=22)
   CURDIST=STR(I,2,1)+' KGEO '+ '|' ; Make row header
  ELSEIF (I=23)
   CURDIST=STR(I,2,1)+' EXTL '+ '|' ; Make row header
  ELSE   (I=24)
   CURDIST=STR(I,2,1)+' TOTAL'+ '|' ; Make row header
  ENDIF

  PRINT FORM=7.@DCML@ LIST=CURDIST, MW[1][1],MW[1][2],MW[1][3],MW[1][4],MW[1][5],
                    MW[1][6],MW[1][7],MW[1][8],MW[1][9],MW[1][10],
                    MW[1][11],MW[1][12],MW[1][13],MW[1][14],MW[1][15],
                    MW[1][16],MW[1][17],MW[1][18],MW[1][19],MW[1][20],
                    MW[1][21],MW[1][22],MW[1][23],' |',RSUM

  IF (I==ZONES)
; Now at the end of Processed zone matrix
;  Do final Column/Grand Total Computations
     IF (@TABTYPE@=2)
       LOOP IDX = 1,ZONES
            IF (CSUM2[IDX] = 0)
                 CSUM[IDX] = 0
            ELSE
                 CSUM[IDX] = @SCALE@* CSUM1[IDX] @OPER@ CSUM2[IDX]
            ENDIF
       ENDLOOP
     ENDIF
     IF (@TABTYPE@=2 )
            IF (TOTAL2 = 0)
                TOTAL  = 0
            ELSE
                TOTAL  = @SCALE@ *TOTAL1 @OPER@ TOTAL2
            ENDIF
     ENDIF

;  End of final Column/Grand Total Computations

   PRINT LIST='==============',
              '========================================',
              '========================================',
              '========================================',
              '========================================'


    PRINT FORM=8.@DCML@,
    LIST=' TOTAL ',' ',CSUM[1],'      ' ,CSUM[3],
    '      ',CSUM[5],'      ',CSUM[7],'      ',CSUM[9],
    '      ',CSUM[11],'      ',CSUM[13],'      ',CSUM[15],
    '      ',CSUM[17],'      ',CSUM[19],'      ',CSUM[21],
    '      ',CSUM[23],' |'
    PRINT FORM=8.@DCML@,
    LIST='/et           ',CSUM[2],
    '      ' ,CSUM[4],'      ',CSUM[6],'      ',CSUM[8],
    '      ',CSUM[10],'      ',CSUM[12],'      ',CSUM[14],
    '      ',CSUM[16],'      ',CSUM[18],'      ',CSUM[20],
    '      ',CSUM[22],'       ',TOTAL(9.@DCML@)


 ENDIF
ENDRUN

ENDLOOP ; End 'Inner' Loop
ENDLOOP ; End 'Outer' Loop
```

Metrorail_skims.s

```
;=================================================================
;  Metrorail_skims.S
;  MWCOG Version 2 Model
;
;  Step 1: Build Metrorail Staion to Station Network
;  Step 2: Build Distance skims (in 1/100s mi) to be used in the
;  MFARE1 process
;=================================================================
;

;  Global variables:

NZONES = 116           ; Max. no. of Stations

NODIN='METNODM1.TB'    ; Input Station Links
LNKIN='METLNKM1.TB'    ; Input Station Nodes
DSKMO='rldist.skm'     ; Output Distance Skim File
TPENS='inputs\trnpen.dat'     ; Turn Penalty file


;=================================================================
; Step 1: Build Metrorail Network
;=================================================================


RUN PGM=HWYNET
;
ZONES=@NZONES@

; Node Coordinate File
; XY Units are NAD83 (in whole feet)
FILEI NODEI=@NODIN@,
        VAR=N,09-13,
        VAR=X,19-26,
        VAR=Y,32-39

; Metrorail Links
FILEI LINKI=@LNKIN@,
        VAR=A,12-16,         ; A-Node Number
        VAR=B,18-22,         ; B-Node Number
        VAR=REV,30-30,       ; Reverse Code
        VAR=DISTANCE,37-41,  ; Distance in 1/100ths of Miles
        VAR=SPEED,58-62      ; Speed Value (mph)

; output network in TP+ format
NETO=metrail.TPN
;

;=================================================================
; Step 2: Build Station Level Distance Skims
;=================================================================

RUN PGM=HWYLOAD
  NETI   =metrail.tpn        ; Metrorail Network
  MATO[1]=@DSKMO@,MO=1,
          FORMAT=MINUTP
  TURNPENI=@TPENS@


  PHASE=LINKREAD
       SPEED    = LI.SPEED            ; Use Link Coded Speed
       DISTANCE= LI.DISTANCE / 100    ; Set Distance in 1/100ths of mi to true mi
  ENDPHASE
;
; Now create station-to-station distance skims over minimum time
; paths.  The distance skims are in 100ths of miles
; (e.g. a skim value of '145' indicates 1.45 miles)
;
;
  PHASE=ILOOP

   PATHLOAD PATH=TIME, PENI=1,  TRACE=(I=64 && J=37),

              MW[1]=PATHTRACE(LI.DISTANCE), noaccess = 0
;-----------------------------------------------------------------------
; I will print selected rows of skim files
;-----------------------------------------------------------------------
     IF (i = 1-2)                       ;  for select rows (Is)
         printrow MW=1, j=1-@NZONES@    ;  print work matrices 1-3
     ENDIF                              ;  row value to all Js.
   ENDPHASE
ENDRUN
```

Misc_Time-of-Day.s

```
; ===================================================================
;  Misc_Time-of-Day.s
;  MWCOG Version 2 Model
;
;             Distribute Truck and
;             miscellaneous (non-modeled) trips among
;              among three time periods:
;              -  AM peak  (6:00 - 9:00 AM)
;              -  PM peak  (4:00 - 7:00 PM)
;              -  Off-peak (All Other Hrs)
;           The Time-of-Day factors are taken from a card image
;           file named: 'V2TODTPP.PAR'.  The factors are based on
;           the 1994 Auto External Survey & the 1996 Truck Ext survey.
; ===================================================================
;
;
;/////////////////////////////////////////////////////////////////////
;                                                                     //
; Input/Output filenames:                                             //
;                                                                     //
READ FILE=..\support\V2TODTPP.PAR  ; Time of Day Factor File         //
;                                                                     //
; I/P PP Auto Driver Trip Tables:                                     //
XXTRUCK  = 'inputs\xxtrk.vtt'           ;  TRUCK   XX Trips (t1)    //
XXAUTDR  = 'inputs\xxaut.vtt'           ;  Auto Dr XX Trips (t1)    //
;                                                                     //
TAXIADR  = 'inputs\taxi.adr'            ;  TAXI Auto Dr Trips       //
VISIADR  = 'inputs\visi.adr'            ;  Visitor A.Dr Trips       //
SCHLADR  = 'inputs\schl.adr'            ;  School  A.Dr Trips       //
;
MTKTDOUT = 'MTKESTPP.VTT'               ;  Medium Truck Trips       //
HTKTDOUT = 'HTKESTPP.VTT'               ;  Heavy  Truck Trips       //
;
APXADR   = 'inputs\airpax.adr'          ;  Air Passenger Auto Dr.   //
;
; O/P Auto Dr. Pct. tables:                                          //
MISCAM  = 'MISCAM.TT'                   ; AM     Non-Modeled Trips  //
MISCPM  = 'MISCPM.TT'                   ; PM     Non-Modeled Trips  //
MISCOP  = 'MISCOP.TT'                   ; Off-Pk Non-Modeled Trips  //
;
; Each output file contains 8 tables -                              //
; 1/xx truck,2/xx autodr,3/taxi adr,4/visitor adr,5/school adr,
; 6/med. truck, 7/hvy truck, 8/air passenger adr
;/////////////////////////////////////////////////////////////////////

RUN PGM=MATRIX                  ; Read in Daily Miscellaneous Trips
    MATI[1]=@XXTRUCK@           ; Thru Truck                  Trips
    MATI[2]=@XXAUTDR@           ; Thru            Auto Driver Trips
    MATI[3]=@TAXIADR@           ; Taxi            Auto Driver Trips
    MATI[4]=@VISIADR@           ; Visitor/Tourist Auto Driver Trips
    MATI[5]=@SCHLADR@           ; School          Auto Driver Trips
    MATI[6]=@MTKTDOUT@          ; Medium Truck (I-I,I-X,X-I)  Trips
    MATI[7]=@HTKTDOUT@          ; Heavy  Truck (I-I,I-X,X-I)  Trips
    MATI[8]=@APXADR@            ; Air Passenger auto driver   Trips

; Put Misc Trips in Work Mats     1-8, respectively
  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.6.3
  MW[7]  = MI.7.3
  MW[8]  = MI.8.1

; Apply TOD Factors
; put AM       trips in work mats 11-17
; put PM       trips in work mats 21-27
; put Off-Peak trips in work mats 31-37
;
 JLOOP
   ; AM Peak Period Trips
    MW[11] = @AMXXTRKP@ * MW[1] / 100.0 ; AM Thru     Truck
    MW[12] = @AMXXADRP@ * MW[2] / 100.0 ; AM Thru     Auto Driver
    MW[13] = @AMTAXISP@ * MW[3] / 100.0 ; AM Taxi     Auto Driver
    MW[14] = @AMVISITP@ * MW[4] / 100.0 ; AM Visitor  Auto Driver
    MW[15] = @AMSCHOOP@ * MW[5] / 100.0 ; AM School   Auto Driver
    MW[16] = @AMIIMTKP@ * MW[6] / 100.0 ; AM I-I,I-E,E-I Medium Truck
    MW[17] = @AMIIHTKP@ * MW[7] / 100.0 ; AM I-I,I-E,E-I Heavy  Truck
    MW[18] = @AMAIRPXP@ * MW[8] / 100.0 ; AM Air Pax  Auto Driver

   ; PM Peak Period Trips
    MW[21] = @PMXXTRKP@ * MW[1] / 100.0 ; PM Thru     Truck
    MW[22] = @PMXXADRP@ * MW[2] / 100.0 ; PM Thru     Auto Driver
    MW[23] = @PMTAXISP@ * MW[3] / 100.0 ; PM Taxi     Auto Driver
    MW[24] = @PMVISITP@ * MW[4] / 100.0 ; PM Visitor  Auto Driver
    MW[25] = @PMSCHOOP@ * MW[5] / 100.0 ; PM School   Auto Driver
    MW[26] = @PMIIMTKP@ * MW[6] / 100.0 ; PM I-I,I-E,E-I Medium Truck
    MW[27] = @PMIIHTKP@ * MW[7] / 100.0 ; PM I-I,I-E,E-I Heavy  Truck
    MW[28] = @PMAIRPXP@ * MW[8] / 100.0 ; PM Air Pax  Auto Driver

   ; Off-Peak Period Trips
    MW[31] = MW[1] - (MW[11] + MW[21])  ; Off-Pk Thru     Truck
    MW[32] = MW[2] - (MW[12] + MW[22])  ; Off-Pk Thru     Auto Driver
    MW[33] = MW[3] - (MW[13] + MW[23])  ; Off-Pk Taxi     Auto Driver
    MW[34] = MW[4] - (MW[14] + MW[24])  ; Off-Pk Visitor  Auto Driver
    MW[35] = MW[5] - (MW[15] + MW[25])  ; Off-Pk School   Auto Driver
    MW[36] = MW[6] - (MW[16] + MW[26])  ; Off-Pk I-I,I-E,E-I Medium Truck
    MW[37] = MW[7] - (MW[17] + MW[27])  ; Off-Pk I-I,I-E,E-I Heavy  Truck
    MW[38] = MW[8] - (MW[18] + MW[28])  ; Off-Pk Air Pax  Auto Driver
 ENDJLOOP

; Now bucket round all tables
 DUMMY=ROWFIX(11), DUMMY=ROWFIX(12), DUMMY=ROWFIX(13), DUMMY=ROWFIX(14)
 DUMMY=ROWFIX(15), DUMMY=ROWFIX(16), DUMMY=ROWFIX(17), DUMMY=ROWFIX(18)

 DUMMY=ROWFIX(21), DUMMY=ROWFIX(22), DUMMY=ROWFIX(23), DUMMY=ROWFIX(24)
 DUMMY=ROWFIX(25), DUMMY=ROWFIX(26), DUMMY=ROWFIX(27), DUMMY=ROWFIX(28)

 DUMMY=ROWFIX(31), DUMMY=ROWFIX(32), DUMMY=ROWFIX(33), DUMMY=ROWFIX(34)
 DUMMY=ROWFIX(35), DUMMY=ROWFIX(36), DUMMY=ROWFIX(37), DUMMY=ROWFIX(38)

; LETS SUMMARIZE NEATLY
 jloop
    DAYXXTK = DAYXXTK + MW[1]   ; ACCUMULATE TOTAL DAILY THRU TRUCKS
    DAYXXAD = DAYXXAD + MW[2]   ; ACCUMULATE TOTAL DAILY THRU AUTO DRV
    DAYTXAD = DAYTXAD + MW[3]   ; ACCUMULATE TOTAL DAILY TAXI    ADR TRIPS
    DAYVSAD = DAYVSAD + MW[4]   ; ACCUMULATE TOTAL DAILY VISITOR ADR TRIPS
    DAYSCAD = DAYSCAD + MW[5]   ; ACCUMULATE TOTAL DAILY SCHOOL  ADR TRIPS
    DAYMTRK = DAYMTRK + MW[6]   ; ACCUMULATE TOTAL DAILY MED. TRUCK TRIPS
    DAYHTRK = DAYHTRK + MW[7]   ; ACCUMULATE TOTAL DAILY HVY. TRUCK TRIPS
    DAYAPAX = DAYAPAX + MW[8]   ; ACCUMULATE TOTAL DAILY AIR PAX ADR TRIPS

    AMXXTK  = AMXXTK  + MW[11]  ; ACCUMULATE TOTAL AM XX    TRUCKS
    AMXXAD  = AMXXAD  + MW[12]  ; ACCUMULATE TOTAL AM XX    ADR TRIPS
    AMTXAD  = AMTXAD  + MW[13]  ; ACCUMULATE TOTAL AM TAXI  ADR TRIPS
    AMVSAD  = AMVSAD  + MW[14]  ; ACCUMULATE TOTAL AM VISIT ADR TRIPS
    AMSCAD  = AMSCAD  + MW[15]  ; ACCUMULATE TOTAL AM SCHOO ADR TRIPS
    AMMTRK  = AMMTRK  + MW[16]  ; ACCUMULATE TOTAL AM MED TRUCK TRIPS
    AMHTRK  = AMHTRK  + MW[17]  ; ACCUMULATE TOTAL AM HVY TRUCK TRIPS
    AMAPAX  = AMAPAX  + MW[18]  ; ACCUMULATE TOTAL AIR PAX ADR  TRIPS
```

```
    PMXXTK  = PMXXTK  + MW[21]  ; ACCUMULATE TOTAL PM XX    TRUCKS
    PMXXAD  = PMXXAD  + MW[22]  ; ACCUMULATE TOTAL PM XX    ADR TRIPS
    PMTXAD  = PMTXAD  + MW[23]  ; ACCUMULATE TOTAL PM TAXI  ADR TRIPS
    PMVSAD  = PMVSAD  + MW[24]  ; ACCUMULATE TOTAL PM VISIT ADR TRIPS
    PMSCAD  = PMSCAD  + MW[25]  ; ACCUMULATE TOTAL PM SCHOO ADR TRIPS
    PMMTRK  = PMMTRK  + MW[26]  ; ACCUMULATE TOTAL PM MED TRUCK TRIPS
    PMHTRK  = PMHTRK  + MW[27]  ; ACCUMULATE TOTAL PM HVY TRUCK TRIPS
    PMAPAX  = PMAPAX  + MW[28]  ; ACCUMULATE TOTAL AIR PAX ADR  TRIPS

    OPXXTK  = OPXXTK  + MW[31]  ; ACCUMULATE TOTAL OP XX    TRUCKS
    OPXXAD  = OPXXAD  + MW[32]  ; ACCUMULATE TOTAL OP XX    ADR TRIPS
    OPTXAD  = OPTXAD  + MW[33]  ; ACCUMULATE TOTAL OP TAXI  ADR TRIPS
    OPVSAD  = OPVSAD  + MW[34]  ; ACCUMULATE TOTAL OP VISIT ADR TRIPS
    OPSCAD  = OPSCAD  + MW[35]  ; ACCUMULATE TOTAL OP SCHOO ADR TRIPS
    OPMTRK  = OPMTRK  + MW[36]  ; ACCUMULATE TOTAL OP MED TRUCK TRIPS
    OPHTRK  = OPHTRK  + MW[37]  ; ACCUMULATE TOTAL OP HVY TRUCK TRIPS
    OPAPAX  = OPAPAX  + MW[38]  ; ACCUMULATE TOTAL AIR PAX ADR  TRIPS


; total input misc trips
  ipmisc  = ipmisc + MW[1]+MW[2]+MW[3]+MW[4]+MW[5]+MW[6]+MW[7]+MW[8]

; total output misc trips
  opmisc  = opmisc +
  MW[11]+MW[12]+MW[13]+MW[14]+MW[15]+MW[16]+MW[17]+MW[18]+
  MW[21]+MW[22]+MW[23]+MW[24]+MW[25]+MW[26]+MW[27]+MW[28]+
  MW[31]+MW[32]+MW[33]+MW[34]+MW[35]+MW[36]+MW[37]+MW[38]

 ENDJLOOP

IF (I=ZONES)  ;  LIST OUT THE TOTALS IF AT THE END OF THE I-LOOP
; get regional I/O differences
diff = opmisc-ipmisc ;

LIST = '/bt          '
LIST = '  MISCELLANEOUS/TRUCK TIME-OF-DAY TOTALS ','\n',
list = ' '

list = 'Input  Misc/Truck Total: ',ipmisc(8.0)
list = 'Output Misc/Truck Total: ',opmisc(8.0)
list = 'Diff.  (Output-Input):   ',diff(8.0)
list = ' '

LIST = 'DAILY XX TRUCKS:',dayxxtk(8.0),' AM,PM, Off-Pk totals:',
          AMXXTK(8.0),',',PMXXTK(8.0),',',OPXXTK(8.0)
LIST = 'DAILY XX ADRS:  ',dayxxAD(8.0),' AM,PM, Off-Pk totals: ',
          AMXXAD(8.0),',',PMXXAD(8.0),',',OPXXAD(8.0)
LIST = 'DAILY TAXI ADRS:',dayTxAD(8.0),' AM,PM, Off-Pk totals: ',
          AMTXAD(8.0),',',PMTXAD(8.0),',',OPTXAD(8.0)
LIST = 'DAILY VISI ADRS:',dayVSAD(8.0),' AM,PM, Off-Pk totals: ',
          AMVSAD(8.0),',',PMVSAD(8.0),',',OPVSAD(8.0)
LIST = 'DAILY SCHO ADRS:',daySCAD(8.0),' AM,PM, Off-Pk totals: ',
          AMSCAD(8.0),',',PMSCAD(8.0),',',OPSCAD(8.0)
LIST = 'DAILY MED TRKS: ',dayMTRK(8.0),' AM,PM, Off-Pk totals: ',
          AMMTRK(8.0),',',PMMTRK(8.0),',',OPMTRK(8.0)
LIST = 'DAILY HVY TRKS: ',dayHTRK(8.0),' AM,PM, Off-Pk totals: ',
          AMHTRK(8.0),',',PMHTRK(8.0),',',OPHTRK(8.0)
LIST = 'DAILY APX ADRS: ',dayAPAX(8.0),' AM,PM, Off-Pk totals: ',
          AMAPAX(8.0),',',PMAPAX(8.0),',',OPAPAX(8.0)

LIST = '/et          '
endif
;  Write out the Miscellaneous Trips in time period-specific files

   MATO[1] = @MISCAM@, MO=11-18  ; AM MISC Trips
   MATO[2] = @MISCPM@, MO=21-28  ; PM MISC Trips
   MATO[3] = @MISCOP@, MO=31-38  ; OP MISC Trips

ENDRUN
;
```

PP_Auto_Drivers.s

```
; ===================================================================
;  PP_Auto_Drivers.s
;  MWCOG Version 2 Model
;
;  This program used to develop 1-occ, 2-occ, and 3+occ auto driver
;  trip tables directly from the a pump-prime total person trip table.
;  The trips are developed using auto driver percentages
;  from a pre-existing (or seed) mode choice output file
;  and 'off-the-shelf' disaggregation curves to arrive at auto driver
;  trips in occupant categories.
; ===================================================================
;
;
;/////////////////////////////////////////////////////////////////
;
; First, establish Input/Output filenames:
LOOP PURP=1,4  ;  We'll Loop 4 times, for each purpose
               ;  Note default auto driver shares and occupant
               ;  shares to be used in case no seed shares exist

IF (PURP=1)     ; HBW Loop
 PPPERSON = 'HBWESTPP.PTT'; HBW Pump Prime Person Trips          (Input)
 PPPTABNO = '7'           ; Table no. for total trips PP Person trip file
 SEED_MCH = 'INPUTS\HBWMC.OLD'   ; HBW Mode Choice file          (Input)
 PP123OCC = 'HBWPP.ADR'   ; HBW auto driver trips- 1,2,3+ Occ.   (Output)
 DADRSHAR = '0.7546'      ; DFLT HBW Auto Driver Share
 DOCC1PCT = '0.8840'      ; DFLT Share of HBW Adrs that are 1  occ Adrs
 DOCC2PCT = '0.1142'      ; DFLT Share of HBW Adrs that are 2  occ Adrs
 DOCC3PCT = '0.0018'      ; DFLT Share of HBW Adrs that are 3+ occ Adrs
 PURPOSE  = 'HBW'         ;

ELSEIF (PURP=2) ; HBS Loop

 PPPERSON = 'HBSESTPP.PTT'; HBS Pump Prime Person Trips        (Input)
 PPPTABNO = '7'           ; Table no. for total trips PP Person trip file
 SEED_MCH = 'INPUTS\HBSMC.OLD'   ; HBS Mode Choice file        (Input)
 PP123OCC = 'HBSPP.ADR' ; HBS auto driver trips- 1,2,3+ Occ.   (Output)
 DADRSHAR = '0.7966'      ; DFLT HBS Auto Driver Share
 DOCC1PCT = '0.8141'      ; DFLT Share of HBS Adrs that are 1  occ Adrs
 DOCC2PCT = '0.1560'      ; DFLT Share of HBS Adrs that are 2  occ Adrs
 DOCC3PCT = '0.0299'      ; DFLT Share of HBS Adrs that are 3+ occ Adrs
 PURPOSE  = 'HBS'         ;

ELSEIF (PURP=3) ; HBO Loop

 PPPERSON = 'HBOESTPP.PTT'; HBO Pump Prime Person Trips        (Input)
 PPPTABNO = '7'           ; Table no. for total trips PP Person trip file
 SEED_MCH = 'INPUTS\HBOMC.OLD'   ; HBO Mode Choice file        (Input)
 PP123OCC = 'HBOPP.ADR' ; HBO auto driver trips- 1,2,3+ Occ.  (Output)
 DADRSHAR = '0.6722'      ; DFLT HBO Transit Share
 DOCC1PCT = '0.6806'      ; DFLT Share of HBO Adrs that are 1  occ Adrs
 DOCC2PCT = '0.2358'      ; DFLT Share of HBO Adrs that are 2  occ Adrs
 DOCC3PCT = '0.0836'      ; DFLT Share of HBO Adrs that are 3+ occ Adrs
 PURPOSE  = 'HBO'         ;

ELSEIF (PURP=4) ; NHB Loop

 PPPERSON = 'NHBESTPP.PTT'; NHB Pump Prime Person Trips        (Input)
 PPPTABNO = '4'           ; Table no. for total trips PP Person trip file
 SEED_MCH = 'INPUTS\NHBMC.OLD'   ; NHB Mode Choice file        (Input)
 PP123OCC = 'NHBPP.ADR' ; NHB auto driver trips- 1,2,3+ Occ.   (Output)
 DTRNSHAR = '0.7608'      ; DFLT NHB Auto Driver Share
 DOCC1PCT = '0.8014'      ; DFLT Share of NHB Adrs that are 1  occ Adrs
 DOCC2PCT = '0.1636'      ; DFLT Share of NHB Adrs that are 2  occ Adrs
 DOCC3PCT = '0.0350'      ; DFLT Share of NHB Adrs that are 3+ occ Adrs
 PURPOSE  = 'NHB'         ;

ENDIF
;
;/////////////////////////////////////////////////////////////////

RUN PGM=MATRIX
    MATI[1]=@SEED_MCH@           ;  MC model ouput
    MATI[2]=@PPPERSON@           ;  PP Person trips

 ;
 ; First, put 'pump prime' person trips in mtx 10 and 'seed' person
 ; trips in mtx 44. If pp persons exist but no 'seed' persons exist
 ; then apply default transit shares and adr. occ shares.  Otherwise,
 ; compute auto auto driver/occ shares directly, i.e.,
 ; 1-occ adrs/persons, 2-occ adrs/persons, and 3+occ adrs/persons)
 ;

 MW[10] = MI.2.@PPPTABNO@     ; Pump Prime Person trips


; Put Mode Choice Mats 1-7, respectively, The tables are:
; 1/LOVADRs 2/LOVAPSNs 3/Trn_Wk 4/Trn_Dr 5/HOV2ADRs 6/HOVPSNs 7/HOV3+ADRs
; HOV trips refer to carpool trips on special prioity facilities.
; Carpools not on special facilities are subsumed in the LOV group.

FILLMW MW[1] = MI.1.1,2,3,4,5,6,7
       MW[8] = MW[1] + MW[5] + MW[7] ;  'seed' auto driver total (LOV&HOV)

;  If the PP person trip table has trips but the seed person trips
;  does not let's put default values just in case..

JLOOP
  MW[44] =  MW[2] +  MW[3] + MW[4] + MW[6] ;    Total MC Model Person

  ;  If pump prime person trips exist but 'seed' person trips do not
  ;  Then apply default auto driver/occupant level share defaults

  IF (MW[10] > 0 & MW[44] = 0) ;
     MW[60] = 1.0   ; counter for the no. of cases (i/js)

     MW[50]  = MW[10] * (@DADRSHAR@) * @DOCC1PCT@   ; Apply default
     MW[51]  = MW[10] * (@DADRSHAR@) * @DOCC2PCT@   ; auto drv / occupant
     MW[52]  = MW[10] * (@DADRSHAR@) * @DOCC3PCT@   ; shares

     IF (MW[50] > MW[10])
         MW[50] = MW[10]
         MW[51] = 0
         MW[52] = 0
     ENDIF
  ;

  ; Otherwise estimate auto driver/occupant level shares from mode
  ; choice output

  ELSEIF ((MW[10] > 0 & MW[44] > 0) || (MW[10] = 0 & MW[44] > 0))

  ; Compute LOV Car Occs --put in mtx 20
  ; Note: LOV contains SOV's and background HOVs (Those not on priority
  ; facilities)
      IF (MW[1]  = 0)
          MW[20] = 0
        ELSE
          MW[20] = MW[2]/MW[1]    ; the LOV Avg Auto Occupancy
      ENDIF
```

```
; Determine LOV Vehicles in 1,2,3&4+ occupant groups using model
; COG's disaggrgegation model.

      IF       (MW[20]  < 1.0050) ;  Make sure the computed Car Occ.
                MW[20]  = 1.0050  ;  is between 1.005 and 2.500
        ELSEIF (MW[20]  > 2.5000) ;  -- if not establish boundary
                MW[20]  = 2.5000  ;     conditions
      ENDIF
;
; Apply Car Occ. Pct Model-Computes Pct Vehs.in Occ groups as function
; of avg auto occ.

     IF     (MW[20] = 1.0050 - 1.1199999)
        MW[21] =  2.00264 - (0.9989 * MW[20]) ; Pct of 1-Occ Vehs
        MW[22] = -1.00050 + (0.9952 * MW[20]) ; Pct of 2-Occ Vehs
        MW[23] = -0.00158 + (0.0029 * MW[20]) ; Pct of 3-Occ Vehs
        MW[24] = -0.00056 + (0.0008 * MW[20]) ; Pct of 4-Occ Vehs
      ELSEIF (MW[20] = 1.1200 - 2.5000)
        MW[21] =  1.59600 - (0.6357 * MW[20]) ; Pct of 1-Occ Vehs
        MW[22] = -0.31143 + (0.3800 * MW[20]) ; Pct of 2-Occ Vehs
        MW[23] = -0.17082 + (0.1540 * MW[20]) ; Pct of 3-Occ Vehs
        MW[24] = -0.11375 + (0.1017 * MW[20]) ; Pct of 4-Occ Vehs
     ENDIF

;
;  if we're working with an intrazonal
;  situation, make all auto drivers SOV.
;  Override modeled shares here
    IF (i=j)  ;
      MW[21] =  1.00    ; Pct of 1-Occ Vehs
      MW[22] =  0.00    ; Pct of 2-Occ Vehs
      MW[23] =  0.00    ; Pct of 3-Occ Vehs
      MW[24] =  0.00    ; Pct of 4-Occ Vehs
    ENDIF

;   Apply Modeled Pcts to the Auto Drivers

 MW[31] =(MW[21] * MW[1]) ; Estimated LOV 1 occ vehicles
 MW[32] =(MW[22] * MW[1]) ; Estimated LOV 2 occ vehicles
 MW[33] =(MW[23] * MW[1]) ; Estimated LOV 3 occ vehicles
 MW[34] =(MW[24] * MW[1]) ; Estimated LOV 4+occ vehicles


; compute add HOV2 & HOV3 trips from MC file to LOV dissagg. trips,
; also combine 3 & 4+ occ. auto driver trips into one group.

 MW[41] = MW[31]                         ;Total seed 1-Occ Auto Drivers
 MW[42] = MW[32] +  MW[5]                ;           2-occ(lov+carpool)
 MW[43] = MW[33] + MW[34] + MW[7]        ;           3-occ(lov+carpool)
 MW[46] = MW[41] + MW[42] + MW[43]       ;      Total seed auto drivers

;  Now distribute pump prime person trips based on the above
;
   IF (MW[46] = 0)    ;  if total seed auto drivers are zero
       MW[50] = 0     ;  then auto occ. sub groupings are zero too.
       MW[51] = 0     ;
       MW[52] = 0     ;

   ELSE               ; otherwise compute pp auto drivers with freeze-dried
                      ; auto driver/occupant level shares...
      MW[50]  = MW[10] * (MW[46]/MW[44]) * (MW[41]/(MW[46]))   ;
      MW[51]  = MW[10] * (MW[46]/MW[44]) * (MW[42]/(MW[46]))   ;
      MW[52]  = MW[10] * (MW[46]/MW[44]) * (MW[43]/(MW[46]))   ;
         IF (MW[50] > MW[10])
             MW[50] = MW[10]
             MW[51] = 0
             MW[52] = 0
         ENDIF
      ENDIF

  ENDIF               ;
ENDJLOOP            ;

DUMMY = ROWFIX(50)  ; make resultant trips integers
DUMMY = ROWFIX(51)  ;
DUMMY = ROWFIX(52)  ;

 MW[53] = MW[50] + MW[51] + MW[52] ; total output auto drivers

JLOOP

  ; Lets sum up the above to get neat total summaries

   seedpsn  = seedpsn  + MW[44]  ;  Mode choice(seed) person trips
   seedadri = seedadri + MW[8]   ;  Mode choice(seed) auto dr trips
   seedadr1 = seedadr1 + MW[41]  ;  Estim. seed 1-occ auto dr trips
   seedadr2 = seedadr2 + MW[42]  ;  Estim. seed 2-occ auto dr trips
   seedadr3 = seedadr3 + MW[43]  ;  Estim. seed 3+occ auto dr trips
   seedadro = seedadro + MW[46]  ;  Sum of seed 1,2,3+ Occ auto dr trips
   pppsn    = pppsn    + MW[10]  ;  Pump Prime person trips
   ppadr1   = ppadr1   + MW[50]  ;  Est. Pump Prime 1-occ auto dr trips
   ppadr2   = ppadr2   + MW[51]  ;  Est. Pump Prime 2-occ auto dr trips
   ppadr3   = ppadr3   + MW[52]  ;  Est. Pump Prime 3+occ auto dr trips
   ppadr    = ppadr    + MW[53]  ;  Est. Pump Prime total auto dr trips

ENDJLOOP

 IF (I == ZONES)
;
; Compute Regional Seed/Pump Prime Auto Dr Shares/Occ. distributions
;
   IF (seedpsn = 0)
       sadrpct = 0
     ELSE
       sadrpct = seedadri/seedpsn  ; seed auto driver pct
   ENDIF

   IF (seedadro = 0)
       s1adpt   = 0
       s2adpt   = 0
       s3adpt   = 0
   ELSE
       s1adpt  = seedadr1/seedadro ; seed 1-occ adr pct
       s2adpt  = seedadr2/seedadro ; seed 2-occ adr pct
       s3adpt  = seedadr3/seedadro ; seed 3+occ adr pct
   ENDIF

   IF (pppsn    = 0)
       padrpct  = 0
   ELSE
       padrpct = ppadr/pppsn       ; Pump Prime auto driver pct
   ENDIF

   IF (ppadr    = 0)
       p1adpt   = 0
       p2adpt   = 0
       p3adpt   = 0
   ELSE
       p1adpt  = ppadr1/ppadr      ; Pump Prime 1-occ adr pct
       p2adpt  = ppadr2/ppadr      ; Pump Prime 2-occ adr pct
       p3adpt  = ppadr3/ppadr      ; Pump Prime 3+occ adr pct
   ENDIF
```

```
   LIST='/bt   '
   LIST='Summary of ','@PURPOSE@',' Pump-Prime Auto Driver Trip Results'
   LIST='   '
   LIST='Total Mode Choice Model (seed) Person Trips: ', seedpsn(10)
   LIST='Total Mode CHoice Model (seed) AutoDr Trips: ', seedadri(10)
   LIST='Total seed 1-Occ Auto Dr. Trips:             ', seedadr1(10)
   LIST='Total seed 2-Occ Auto Dr. Trips:             ', seedadr2(10)
   LIST='Total seed 3+Occ Auto Dr. Trips:             ', seedadr3(10)
   LIST='Sum of seed 1,2,3+ Auto Dr. Trips:           ', seedadro(10)
   LIST='Total Pump Prime Person Trips:               ', pppsn(10)
   LIST='Total PP 1-Occ. Auto Driver Trips:           ', ppadr1(10)
   LIST='Total PP 2-Occ. Auto Driver Trips:           ', ppadr2(10)
   LIST='Total PP 3+Occ. Auto Driver Trips:           ', ppadr3(10)
   LIST='Sum of PP 1,2,3+ Auto Driver Trips:          ', ppadr(10)
   LIST='   '
   List=' Summary of Input/Output Shares'
   List='Input AutoDr Share: ', sadrpct(6.2),
   '    1,2,3+Occ.AutoDr.Shares: ',s1adpt(6.2),s2adpt(6.2),s3adpt(6.2)
   List='Output AutoDr.Share:', padrpct(6.2),
   '    1,2,3+Occ.AutoDr.Shares: ',p1adpt(6.2),p2adpt(6.2),p3adpt(6.2)
   LIST='/et   '
 ENDIF

MATO=@PP123OCC@,MO=50,51,52 ; output file designation

ENDRUN
ENDLOOP
;
```

PUMP_PRIME_SKIMS.S

```
;--------------------------------------------------------------------------
;PUMP_PRIME_SKIMS.S
;MWCOG VERSION 2 MODEL
;
; BUILDING PEAK PUMP PRIME HWY SKIMS & PNR Links
;
; Input  files   -  ZONEHWY.NET          (Zonal highway network,all periods)
; Output files   -  PP_am.skm,pp_op.skm  (AM, Off-peak SOV Skims)
;                                        3 tables in skims files:
;                                          1- time    (min),
;                                          2- distance(whole   mi)
;                                          3- tolls   (1980 cents)
;
;
;
;   Input files   -  PP_am.skm,pp_op.skm (AM, Off-peak SOV Skims)
;                    tazpnr.eqv          (TAZ pnr equivalency file)
;   Output files  -  pnr_am.tb , pnr_op.tb
;
;
;
;
;
;
; First, convert TAZ/PNR list to a lookup table that
; relates each TAZ to 1 or multiple PNR lots (if multiple lots exist).
; the lookup file name is tazpnr.lkp
; NOTE: The current script assumes that the maximum PNR lots for a
;       given TAZ is 4.
;
run pgm=matrix
  reci=tazpnr.asc, taz=2, pnr=3

  array v_taz=1000, v_pnr=1000

  _cnt=_cnt+1
  v_taz[_cnt]=ri.taz ; read data into arrays
  v_pnr[_cnt]=ri.pnr

  if (i==0) ; last record
    sort array=-v_taz, v_pnr
    _curtaz=v_taz[1] ; starting taz
    print form=10, list=v_taz[1], v_pnr[1], file=tazpnr.lkp
    loop ind=2,_cnt
      if (v_taz[ind]==_curtaz)
        print form=10, list='\\', v_pnr[ind], file=tazpnr.lkp
      else
        _curtaz=v_taz[ind] ; reset taz
        print form=10, list=v_taz[ind], v_pnr[ind], file=tazpnr.lkp
      endif
    endloop
  endif
endrun
;
*copy tazpnr.lkp tazpnr.zfl
;
LOOP PERIOD=1,2       ;  loop through two time periods-- AM, Off-Peak
TOLLDEFL='%_TDEFL_%'    ;

 IF (PERIOD=1)
    PRD =  'AM'
    IDS =  'AM Pump  Prime Skims'
  ELSE
    PRD =  'OP'
    IDS =  'Off-Peak Pump Prime Skims'
 ENDIF

RUN PGM = HWYLOAD

;
  NETI    = ZONEHWY.NET
  MATO[1] = PP_@PRD@.skm, MO=1-3, FORMAT=MINUTP ; SOV   skims
  ID      = @IDS@

  PHASE=LINKREAD

; Limit Codes:
;  0/1 = No prohibitions
;  2   = prohibit 1/occ autos,trucks
;  3   = prohibit 1&2occ autos,trucks
;  4   = prohibit trucks
;  5   = prohibit non-airport trips (year 2000 and beyond)
;  6-8 = Ununsed
;  9   = prohibit all traffic use
;
;
;  Define the three path types here:
;
    IF (LI.@PRD@LIMIT = 2,3,5-9) ADDTOGROUP=1 ; SOV   prohibited links
    IF (LI.@PRD@LIMIT = 3,5-9)   ADDTOGROUP=2 ; HOV2  prohibited links
    IF (LI.@PRD@LIMIT = 5-9)     ADDTOGROUP=3 ; HOV3+ prohibited links
;
  ENDPHASE
;
; Specify path skimming  Time, distance, & toll skims over minimum time paths
; Note that override values of 0 will be inserted for disconnected ijs
;
  PHASE=ILOOP
    PATHLOAD PATH=LI.@PRD@HTIME, EXCLUDEGRP=1,              ; SOV   paths
             MW[1]=PATHTRACE(LI.@PRD@HTIME), NOACCESS=0, ; -excluding links
             MW[2]=PATHTRACE(LI.DISTANCE),NOACCESS=0,    ;  w/ LIMIT=2,3,5-9
             MW[3]=PATHTRACE(LI.TOLL),    NOACCESS=0     ;

;--------------------------------------------------------------------------
; scaling, rounding of skim tables
;--------------------------------------------------------------------------

     mw[1] = ROUND(MW[1])                    ; round time skims to whole min

     mw[2] = Round(MW[2]*100)                ; round  distance skims to
                                             ; 100ths of mi

     mw[3] = ROUND(MW[3]* @tolldefl@)          ; round tolls to whole
                                             ; 1980 cents
;--------------------------------------------------------------------------
; I will print selected rows of skim files
;--------------------------------------------------------------------------


     IF (i = 920)                        ;  for select rows (Is)
;        printrow MW=1-3, j=1-2191       ;  print work matrices 1-3
         printrow MW=2  , j=741          ;  print work matrices 1-3
     ENDIF                               ;  row value to all Js.
  ENDPHASE
ENDRUN



;--------------------------------------------------------------------------
;       Step 2: Park-&-Ride Access Data
;--------------------------------------------------------------------------
;
```

```
;  Next write out TAZ-to-PNR links based on skim times/distances
;  for each time period
;
RUN PGM=MATRIX
 MATI[1]=PP_@PRD@.SKM


        LOOKUP NAME=TAZPNRLK,
               LOOKUP[1] = 1, RESULT=2,; pnr node 1
               LOOKUP[2] = 1, RESULT=3,; pnr node 2 (if any)
               LOOKUP[3] = 1, RESULT=4,; pnr node 3 (if any)
               LOOKUP[4] = 1, RESULT=5,; pnr node 4 (if any)
               INTERPOLATE=N, FAIL=0,0,0, FILE=TAZPNR.LKP

        ZDATI[1]=BASEZON.DAT,Z=1-5,XCRD = 7-14,YCRD= 15-22

        MW[1] = mi.1.1  ;       Time     (min)
        MW[2] = mi.1.2  ;       Distance (1/100ths mi)

;  calculate the i/j airline distance in miles MW[3]  and

        JLOOP
           IF (XCRD[I] = 0 || XCRD[J] = 0)
              MW[3] = 0
           ELSE
              XCHGFT =   XCRD[I] - XCRD[J]
              YCHGFT =   YCRD[I] - YCRD[J]
              MW[3]  =   (SQRT((XCHGFT**2) + (YCHGFT**2)))/ 5280.0
           ENDIF
         ENDJLOOP
;  Insert 50% of lowest time/distance value into intrazonal cells
        JLOOP
          IF (J == I)
              MW[1]=(0.50 * LOWEST(1,1,0.0001,99999.9))
              MW[2]=(0.50 * LOWEST(2,1,0.0001,99999.9))
              MW[3]=(0.50 * LOWEST(3,1,0.0001,99999.9))
          ENDIF
        ENDJLOOP




 JLOOP
    pnr = tazpnrlk(1,j)
        IF (pnr           > 0   &               ;---- Park-&-Ride Station ----
               ((i = 1   -1229 & j = 1   -1229)| ;---- DC/Maryland Internals ----
                (i = 1230-2141 & j = 1230-2141)| ;---- Virginia Internals ----
                (i = 1780-1919 & j = 1   -1229)| ;---- Loudoun to DC/Maryland ----
                (i = 2135-2141 & j = 1   -1229))) ;---- Jefferson to DC/Maryland ---
-


             ; set default airline distance tolenances here:

              dtol= 8.0 ; default distance limit to pnr stations is  9mi
                        ; limit is shorter for more developed juris.
              if (I=1-319,1230-1329,1330-1399)  dtol=4.00; 4mi/dc,arl/alx
              if (I=320-639,640-1029,1400-1779) dtol=5.00; 7mi/mtg,pg,ffx

              IF (MW[1]  > 0  & MW[3]  > 0.0001 &  MW[3] <= dtol) ;
                     _SPEED = ROUND (MW[2] / MW[1] * 0.60)
                     _dis00 =        MW[2]
                     PRINT LIST='SUPPORT N=',i(4),'-',pnr(5),
                     ' DIST=',_dis00(5),' ONEWAY=Y MODES=11 SPEED=',
                      _SPEED(3),' ;  jtaz/pnr(1)=  ',j(5),
                      ' Airln Dist(mi): ',MW[3],
                     FILE=PNR_@PRD@.TB

                     if (tazpnrlk(2,j) > 0)
                        pnr2   = tazpnrlk(2,j)
                        PRINT LIST='SUPPORT N=',i(4),'-',pnr2(5),
                        ' DIST=',_dis00(5),' ONEWAY=Y MODES=11 SPEED=',
                         _SPEED(3),' ;  jtaz/pnr(2)=  ',j(5),
                       ' Airln Dist(mi): ',MW[3],
                         FILE=PNR_@PRD@.TB
                     endif
                     if (tazpnrlk(3,j) > 0)
                        pnr3    = tazpnrlk(3,j)
                        PRINT LIST='SUPPORT N=',i(4),'-',pnr3(5),
                        ' DIST=',_dis00(5),' ONEWAY=Y MODES=11 SPEED=',
                         _SPEED(3),' ;  jtaz/pnr(3)=  ',j(5),
                       ' Airln Dist(mi): ',MW[3],
                         FILE=PNR_@PRD@.TB
                     endif
                     if (tazpnrlk(4,j) > 0)
                        pnr4    = tazpnrlk(4,j)
                        PRINT LIST='SUPPORT N=',i(4),'-',pnr4(5),
                        ' DIST=',_dis00(5),' ONEWAY=Y MODES=11 SPEED=',
                         _SPEED(3),' ;   jtaz/pnr(4)=  ',j(5),
                       ' Airln Dist(mi): ',MW[3],
                         FILE=PNR_@PRD@.TB
                     endif

                ENDIF
        ENDIF

 ENDJLOOP

ENDRUN
ENDLOOP   ;
```

set_factors.s

```
;--------------------------------------------------------------------
; SET_FACTORS.S
;
; MWCOG Version 2 Model
;  Set up time penalty & K-factor files used in Trip Distribution
; Income-based Time Penalty Files & Superzone-to-TAZ Equivalency File
;
; Input Files:
;
;  HBWPEN.03=      HBW TIME PENALITES (Inc 1-4)  12x12 (ASCII)
;  HBSPEN.03=      HBS TIME PENALITES (Inc 1-4)  12x12 (ASCII)
;  HBOPEN.03=      HBO TIME PENALITES (Inc 1-4)  12x12 (ASCII)
;  NHBPEN.03=      NHB TIME PENALITES            12x12 (ASCII)
;
;  PENEXPND =      JURISV21.EQV'  TIME PENALTY ZONE-TO-TAZ
;                                 EQUIVALENCE FILE
; Output Files:
;  HBWPEN.DAT=     HBW Time Penalties at 2191 zone level (Inc 1-4)
;  HBSPEN.DAT=     HBS Time Penalties at 2191 zone level (Inc 1-4)
;  HBOPEN.DAT=     HBO Time Penalties at 2191 zone level (Inc 1-4)
;  NHBPEN.DAT=     NHB Time Penalties at 2191 zone level
;
;  HBWK.DAT  =     HBW          K-Factor Matrix 2191 zone level
;  HBSK.DAT  =     HBS          K-Factor Matrix 2191 zone leve
;  HBOK.DAT  =     HBO          K-Factor Matrix 2191 zone leve
;  NHBK.DAT  =     NHB          K-Factor Matrix 2191 zone leve
;  MTKK.DAT  =     Medium Truck K-Factor Matrix 2191 zone leve
;  HTKK.DAT  =     Heavy  Truck K-Factor Matrix 2191 zone leve
;
;
;--------------------------------------------------------------------

; ---------------------------------------------------------------------
; Time Penalty Files & Superzone-to-TAZ Equivalency File
;
  HBWPEN   = '..\support\HBWPEN.03'    ;  HBW TIME PENALITES (Inc 1-4)
  HBSPEN   = '..\support\HBSPEN.03'    ;  HBS TIME PENALITES (Inc 1-4)
  HBOPEN   = '..\support\HBOPEN.03'    ;  HBO TIME PENALITES (Inc 1-4)
  NHBPEN   = '..\support\NHBPEN.03'    ;  NHB TIME PENALITES

  PENEXPND = '..\support\JURISV21.EQV' ;  TIME PENALTY ZONE-TO-TAZ
;                                       ;  EQUIVALENCE FILE
;

RUN PGM=MATRIX
ZONES=12

;  Build Income stratified time penalties (min)
;  at 12x12 superdistrict level.

MATI[1] = @HBWPEN@, PATTERN=IJM:V, FIELDS=1-5,6-10,0,11-15-4
MATI[2] = @HBSPEN@, PATTERN=IJM:V, FIELDS=1-5,6-10,0,11-15-4
MATI[3] = @HBOPEN@, PATTERN=IJM:V, FIELDS=1-5,6-10,0,11-15-4
MATI[4] = @NHBPEN@, PATTERN=IJM:V, FIELDS=1-5,6-10,0,11-15-1

; ESTABLISH WORK FILES FOR TIME PENALTIES
; HBW/INC 1-4      HBS/INC 1-4      HBO/INC 1-4       NHB
; --------------   --------------   ---------------   ----------------
 MW[1]  = MI.1.1,  MW[5]  = MI.2.1,  MW[9]  = MI.3.1,  MW[13] = MI.4.1
 MW[2]  = MI.1.2,  MW[6]  = MI.2.2,  MW[10] = MI.3.2
 MW[3]  = MI.1.3,  MW[7]  = MI.2.3,  MW[11] = MI.3.3
 MW[4]  = MI.1.4,  MW[8]  = MI.2.4,  MW[12] = MI.3.4

; NOW, WRITE OUT THE 12X12 TIME PENATLY MATRICES

MATO[1] = PENALTY.TEM, MO= 1- 13;
ENDRUN

; ---------------------------------------------------------------------
; NEXT, EXPAND TIME PENALTY MATRICES AT SUPERZONE LEVEL TO 2191 TAZ LEVEL

RUN PGM=MATRIX
ZONES=12
MATI[1] = PENALTY.TEM

; ESTABLISH WORK FILES FOR TIME PENALTIES
;    HBW/INC 1-4      HBS/INC 1-4      HBO/INC 1-4         NHB
; --------------   --------------   ---------------   ----------------
 MW[1] = MI.1.1,  MW[5] = MI.1.5,  MW[9]  = MI.1.9,  MW[13] = MI.1.13
 MW[2] = MI.1.2,  MW[6] = MI.1.6,  MW[10] = MI.1.10
 MW[3] = MI.1.3,  MW[7] = MI.1.7,  MW[11] = MI.1.11
 MW[4] = MI.1.4,  MW[8] = MI.1.8,  MW[12] = MI.1.12

RENUMBER FILE=@PENEXPND@, ZONES=2191, MISSINGZI=M, MISSINGZO=M

MATO[1] = HBWPEN.DAT, MO= 1- 4 ;
MATO[2] = HBSPEN.DAT, MO= 5- 8 ;
MATO[3] = HBOPEN.DAT, MO= 9-12 ;
MATO[4] = NHBPEN.DAT, MO=   13 ;

;
; ////////////////////////////////////////////////////////////////////
; \\\\\\\\\    5) Begin K-Factor building, by trip purpose.          \\
; \\\\\\\\\       K-Factors values below are scaled by 1000.         \\
; \\\\\\\\\       (i.e., a value of 1000 below means K-Ftr of 1)     \\
; \\\\\\\\\       The will be applied across income strata in trip   \\
; \\\\\\\\\       distribution.                                      \\
; ////////////////////////////////////////////////////////////////////

RUN PGM=MATRIX
ZONES=2191
; Now Begin the K-Factor Establishment
; Initialize K-factor matrices for each purpose:

MW[1] = 1000.0 ;  HBW       K-factor matrix
MW[2] = 1000.0 ;  HBS       K-factor matrix
MW[3] = 1000.0 ;  HBO       K-factor matrix
MW[4] = 1000.0 ;  NHB       K-factor matrix
MW[5] = 1000.0 ;  Med Truck K-factor matrix
MW[6] = 1000.0 ;  Hvy Truck K-factor matrix

; Establish Output Files for each purpose:

MATO[1] = HBWK.DAT ,MO=1
MATO[2] = HBSK.DAT ,MO=2
MATO[3] = HBOK.DAT ,MO=3
MATO[4] = NHBK.DAT ,MO=4
MATO[5] = MTKK.DAT ,MO=5
MATO[6] = HTKK.DAT ,MO=6

;----------------------------------------

; |-------------------------------------------------------------|
; |------ Start of K-Factor Specifications for All Purposes  -----|
; |-------------------------------------------------------------|

; Specify HBW K-Factors / MW[1] here:

IF     (I =    1-   88)
  MW[1] = 2200,  INCLUDE=     1-   88 ; dc cr - dc cr
  MW[1] = 2500,  INCLUDE=    89-  319 ; dc cr - dcncr
ELSEIF (I =   89-  319)
```

```
  MW[1] = 3000,  INCLUDE=     1-   88 ; dcncr - dc cr  1500
  MW[1] = 2500,  INCLUDE=    89-  319 ; dcncr - dcncr  1500
  MW[1] =  100,  INCLUDE=  2145- 2191 ; dcncr - extls
ELSEIF (I =  320-  627)
  MW[1] = 2900,  INCLUDE=     1-   88 ; mtg- dc cr
  MW[1] = 2400,  INCLUDE=    89-  319 ; mtg- dcncr
  MW[1] = 2000,  INCLUDE=   320-  627 ; mtg- mtg
  MW[1] =  200,  INCLUDE=  1080- 1099 ; mtg- how
  MW[1] =  200,  INCLUDE=  1110- 1142 ; mtg- aar
ELSEIF (I =  640- 1020)
  MW[1] = 1800,  INCLUDE=     1-   88 ; pg - dc cr
  MW[1] = 1800,  INCLUDE=    89-  319 ; pg - dcncr
  MW[1] = 2500,  INCLUDE=   640- 1020 ; pg - pg
  MW[1] =  200,  INCLUDE=  1080- 1099 ; pg - how
  MW[1] =  200,  INCLUDE=  1110- 1142 ; pg - aar
  MW[1] =  200,  INCLUDE=  2145- 2191 ; pg - ext
ELSEIF (I = 1230- 1238)
  MW[1] = 2500,  INCLUDE=     1-   88 ; arl cr- dc cr
  MW[1] = 2000,  INCLUDE=    89-  319 ; arl cr- dcncr
ELSEIF (I = 1239- 1311)
  MW[1] = 2500,  INCLUDE=     1-   88 ; arlncr- dc cr   ;2000
ELSEIF (I = 1330- 1389)
  MW[1] = 2800,  INCLUDE=     1-   88 ; alx   - dc cr
ELSEIF (I = 1080- 1099)
  MW[1] = 2500,  INCLUDE=   640- 1020 ; how- pg
  MW[1] = 2500,  INCLUDE=  2175- 2190 ; how- extls(balt)
ELSEIF (I = 1110- 1142)
  MW[1] =  500,  INCLUDE=  1110- 1142 ;  aa- aa
ELSEIF (I = 1400- 1755)
  MW[1] = 2800,  INCLUDE=     1-   88 ; ffx- dccr
  MW[1] = 2300,  INCLUDE=    89-  319 ; ffx- dcncr
  MW[1] = 1200,  INCLUDE=  1400- 1755 ; ffx- ffx
  MW[1] = 1300,  INCLUDE=  1239- 1311 ; ffx- arlnc
ELSEIF (I = 1030- 1053)
  MW[1] =  200,  INCLUDE=  1110- 1142 ; frd - aa
  MW[1] =  200,  INCLUDE=  1080- 1099 ; frd - how
ELSEIF (I =  1200-1229)
  MW[1] = 2200,  INCLUDE=     1-   88 ; chs - dc cr
  MW[1] = 2200,  INCLUDE=   640- 1020 ; chs - pg
ENDIF

; Specify HBS K-Factors / MW[2] here:

IF     (I =   89-  319)
  MW[2] = 1300,  INCLUDE=    89-  319 ; dcncr - dcncr
  MW[2] = 1200,  INCLUDE=     1-   88 ; dcncr - dc cr
  MW[2] = 2000,  INCLUDE=   320-  627 ; dcncr - mtg
ELSEIF (I =  320-  627)
  MW[2] = 2800,  INCLUDE=   320-  627 ; mtg- mtg
ELSEIF (I =  640- 1020)
  MW[2] = 1800,  INCLUDE=   640- 1020 ; pg - pg
ELSEIF (I = 1239- 1311)
  MW[2] = 2600,  INCLUDE=  1239- 1311 ; arlncr- arlncr
ELSEIF (I = 1330- 1389)
  MW[2] = 2300,  INCLUDE=  1330- 1389 ; alx - alx
 ELSEIF (I = 1400- 1755)
   MW[2] = 1100,  INCLUDE=  1400- 1755 ; ffx - ffx
ELSEIF (I = 1030- 1053)                              ; added
  MW[2] = 2800,  INCLUDE=  1030- 1053 ; frd - frd **  ; 3/12/02
ELSEIF (I = 1200- 1223)                              ;
  MW[2] = 2500,  INCLUDE=  1200- 1223 ; chs - chs **  ;
ELSEIF (I = 1060- 1079)                              ;
  MW[2] =  500,  INCLUDE=  1060- 1079 ; car - car
ENDIF

; Specify HBO K-Factors / MW[3] here:

IF     (I =   89-  319)
  MW[3] = 2000,  INCLUDE=     1-   88 ; dcncr - dc cr
  MW[3] = 1300,  INCLUDE=    89-  319 ; dcncr - dcncr
  MW[3] = 0500,  INCLUDE=  1400- 1755 ; dcncr - ffx
ELSEIF (I =  320-  627)
  MW[3] = 2000,  INCLUDE=     1-   88 ; mtg -dc cr
  MW[3] = 2500,  INCLUDE=   320-  627 ; mtg- mtg
  MW[3] = 0200,  INCLUDE=  1080- 1099 ; mtg- how
ELSEIF (I =  640- 1020)
  MW[3] = 2000,  INCLUDE=     1-   88 ; pg -dc cr
  MW[3] = 2500,  INCLUDE=   640- 1020 ; pg - pg
ELSEIF (I = 1080- 1099)
  MW[3] = 0500,  INCLUDE=   320-  627 ; how - mtg
ELSEIF (I =1110- 1142)
  MW[3] = 2500,  INCLUDE=  1110- 1142 ;  aa -  aa
  MW[3] = 0600,  INCLUDE=   640- 1020 ;  aa -  pg
ELSEIF (I = 1239- 1311)
  MW[3] = 1600,  INCLUDE=  1239- 1311 ; arlncr- arlncr
ELSEIF (I = 1330- 1389)
  MW[3] = 1900,  INCLUDE=  1330- 1389 ; alx - alx
ELSEIF (I = 1400- 1755)
  MW[3] = 2000,  INCLUDE=     1-   88 ; ffx - dc cr
  MW[3] = 2000,  INCLUDE=  1400- 1755 ; ffx - ffx
ELSEIF (I = 1030- 1053)                              ; added
  MW[3] = 2500,  INCLUDE=  1030- 1053 ; frd - frd **  ; 3/12/02
ELSEIF (I = 1200- 1223)                              ;
  MW[3] = 2500,  INCLUDE=  1200- 1223 ; chs - chs **  ;
ENDIF

; Specify NHB K-Factors / MW[4] here:

IF     (I =  320-  627)
  MW[4] = 2000,  INCLUDE=   320-  627 ; mtg- mtg
  MW[4] = 0200,  INCLUDE=  1080- 1099 ; mtg- how

ELSEIF (I =  640- 1020)
  MW[4] = 2000,  INCLUDE=   640- 1020 ; pg - pg
  MW[4] = 0200,  INCLUDE=  1110- 1142 ; pg - aa

ELSEIF (I = 1239- 1311)
  MW[4] = 2000,  INCLUDE=  1239- 1311 ; arlncr- arlncr
ELSEIF (I = 1330- 1389)
  MW[4] = 2000,  INCLUDE=  1330- 1389 ; alx - alx
ELSEIF (I = 1400- 1755)
  MW[4] = 2000,  INCLUDE=  1400- 1755 ; ffx - ffx

ELSEIF (I = 1030- 1053)                              ; added
  MW[4] = 2500,  INCLUDE=  1030- 1053 ; frd - frd **  ; 3/12/02
ELSEIF (I = 1200- 1223)                              ;
  MW[4] = 2500,  INCLUDE=  1200- 1223 ; chs - chs **  ;
ENDIF

; Specify Medium Truck K-Factors / MW[5] here:

IF (I =0320- 0505,0510-0582,0585-0593) MW[5] =01300, INCLUDE= 0320-0505
IF (I =0320- 0505,0510-0582,0585-0593) MW[5] =01300, INCLUDE= 0510-0582
IF (I =0320- 0505,0510-0582,0585-0593) MW[5] =01300, INCLUDE= 0585-0593
IF (I =  0640- 0996)                   MW[5] =02200, INCLUDE= 0640-0996
IF (I =  1230- 1311)                   MW[5] =01800, INCLUDE= 1230-1311
IF (I =  1330- 1389)                   MW[5] =02400, INCLUDE= 1330-1389
IF (I =  1400- 1755)                   MW[5] =01900, INCLUDE= 1400-1755
IF (I =1780- 1780,1781-1905)  MW[5] =01600, INCLUDE= 1780,1781-1905
IF (I =  1920- 2061)                   MW[5] =01800, INCLUDE= 1920-2061
IF (I =  0001- 0088)                   MW[5] =02600, INCLUDE= 0001-0088
IF (I =  0089- 0319)                   MW[5] =02100, INCLUDE= 0089-0319
IF (I =1825- 1898,1900-1905)  MW[5] =02000, INCLUDE= 1825-1898,1900-1905
IF (I =  0089- 0101)                   MW[5] =01900, INCLUDE= 0089-0101
IF (I =  0102- 0113)                   MW[5] =01900, INCLUDE= 0102-0113
IF (I =  0114- 0122)                   MW[5] =01900, INCLUDE= 0114-0122
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IF (I =  0123- 0132)                    MW[5] =01900, INCLUDE= 0123-0132
IF (I =  0133- 0142)                    MW[5] =01900, INCLUDE= 0133-0142
IF (I =  0143- 0148)                    MW[5] =01900, INCLUDE= 0143-0148
IF (I =  0149- 0161)                    MW[5] =01900, INCLUDE= 0149-0161
IF (I =  0162- 0171)                    MW[5] =01900, INCLUDE= 0162-0171
IF (I =  0172- 0182)                    MW[5] =01900, INCLUDE= 0172-0182
IF (I =  0183- 0193)                    MW[5] =01900, INCLUDE= 0183-0193
IF (I =  0194- 0202)                    MW[5] =03500, INCLUDE= 0194-0202
IF (I =  0203- 0207)                    MW[5] =03500, INCLUDE= 0203-0207
IF (I =  0208- 0224)                    MW[5] =03500, INCLUDE= 0208-0224
IF (I =  0225- 0245)                    MW[5] =03500, INCLUDE= 0225-0245
IF (I =  0246- 0262)                    MW[5] =03500, INCLUDE= 0246-0262
IF (I =  0263- 0269)                    MW[5] =03500, INCLUDE= 0263-0269
IF (I =  0270- 0281)                    MW[5] =03500, INCLUDE= 0270-0281
IF (I =  0282- 0291)                    MW[5] =03500, INCLUDE= 0282-0291
IF (I =  0292- 0299)                    MW[5] =03500, INCLUDE= 0292-0299
IF (I =  0300- 0312)                    MW[5] =03500, INCLUDE= 0300-0312
IF (I =  0313- 0319)                    MW[5] =03500, INCLUDE= 0313-0319
IF (I =  0001- 0006)                    MW[5] =03500, INCLUDE= 0001-0006
IF (I =  0007- 0012)                    MW[5] =03500, INCLUDE= 0007-0012
IF (I =  0013- 0018)                    MW[5] =03500, INCLUDE= 0013-0018
IF (I =  0019- 0023)                    MW[5] =03500, INCLUDE= 0019-0023
IF (I =  0024- 0029)                    MW[5] =03500, INCLUDE= 0024-0029
IF (I =  0030- 0035)                    MW[5] =03500, INCLUDE= 0030-0035
IF (I =  0036- 0045)                    MW[5] =03500, INCLUDE= 0036-0045
IF (I =  0046- 0049)                    MW[5] =03500, INCLUDE= 0046-0049
IF (I =  0050- 0054)                    MW[5] =03500, INCLUDE= 0050-0054
IF (I =  0055- 0058)                    MW[5] =03500, INCLUDE= 0055-0058
IF (I =  0059- 0067)                    MW[5] =03500, INCLUDE= 0059-0067
IF (I =  0068- 0071)                    MW[5] =03500, INCLUDE= 0068-0071
IF (I =  0072- 0081)                    MW[5] =03500, INCLUDE= 0072-0081
IF (I =  0082- 0088)                    MW[5] =03500, INCLUDE= 0082-0088
IF (I =1230- 1311,1330-1389,1400-1755) MW[5] =00400, INCLUDE= 0001-0319
IF (I =1780- 1905,1920-2061)            MW[5] =00400, INCLUDE= 0001-0319
IF (I =  0089- 0319)                    MW[5] =01900, INCLUDE= 0001-0088
IF (I =  1030- 1053)                    MW[5] =06600, INCLUDE= 1030-1053
IF (I =  1200- 1223)                    MW[5] =05000, INCLUDE= 1200-1223
IF (I =  1110- 1142)                    MW[5] =05700, INCLUDE= 1110-1142
IF (I =  1780- 1780)                    MW[5] =00001, INCLUDE= 1780
IF (I =  0828- 0833)                    MW[5] =00001, INCLUDE= 0828-0833
IF (I =  1080- 1099)                    MW[5] =02900, INCLUDE= 1080-1099
IF (I = 1030- 1053)  MW[5] =00200, INCLUDE=0320-0505,0510-0582,0585-0593
IF (I = 1030- 1053)  MW[5] =00200, INCLUDE=0594-0627,0583-0584,0506-0509
IF (I =0320- 0505,0510-0582,0585-0593) MW[5] =00300, INCLUDE= 1030-1053
IF (I =0594- 0627,0583-0584,0506-0509) MW[5] =00300, INCLUDE= 1030-1053
IF (I = 1080- 1099) MW[5] =02500, INCLUDE=1230-1311,1330-1389
IF (I = 1080- 1099) MW[5] =02500, INCLUDE=1400-1755,1780-1905,1920-2061
IF (I =1230- 1311,1330-1389)            MW[5] =02000, INCLUDE= 1080-1099
IF (I =1400- 1755,1780-1905,1920-2061) MW[5] =02000, INCLUDE= 1080-1099
IF (I = 1110- 1142)                     MW[5] =00500, INCLUDE=0001-0319
IF (I =  0001- 0319)                    MW[5] =00500, INCLUDE= 1110-1142
IF (I =  1200- 1223)                    MW[5] =02100, INCLUDE= 0001-0319
IF (I = 1200- 1223) MW[5] =02200, INCLUDE=1230-1311,1330-1389
IF (I = 1200- 1223) MW[5] =02200, INCLUDE=1400-1755,1780-1905,1920-2061
IF (I =  1080- 1099)                    MW[5] =01700, INCLUDE= 0001-0319
IF (I =  0640- 0996)                    MW[5] =00700, INCLUDE= 1200-1223
IF (I =0320- 0505,0510-0582,0585-0593) MW[5] =02500, INCLUDE= 1200-1223
IF (I =0594- 0627,0583-0584,0506-0509) MW[5] =02500, INCLUDE= 1200-1223
IF (I =0320- 0505,0510-0582,0585-0593) MW[5] =01500, INCLUDE= 1110-1142
IF (I =0594- 0627,0583-0584,0506-0509) MW[5] =01500, INCLUDE= 1110-1142
IF (I = 1110- 1142) MW[5] =01400, INCLUDE=0320-0505,0510-0582,0585-0593
IF (I = 1110- 1142) MW[5] =01400, INCLUDE=0594-0627,0583-0584,0506-0509

; Specify Heavy Truck K-Factors / MW[6] here:

IF (I =0320- 0505,0510-0582,0585-0593) MW[6] =02000, INCLUDE= 0320-0505
IF (I =0320- 0505,0510-0582,0585-0593) MW[6] =02000, INCLUDE= 0510-0582
IF (I =0320- 0505,0510-0582,0585-0593) MW[6] =02000, INCLUDE= 0585-0593
IF (I = 0640- 0996)                     MW[6] =01500, INCLUDE= 0640-0996
IF (I = 1230- 1311)                     MW[6] =01600, INCLUDE= 1230-1311
IF (I =1306- 1311,1330-1389) MW[6] =01300, INCLUDE= 1306-1311,1330-1389
IF (I = 1400- 1755)                     MW[6] =01600, INCLUDE= 1400-1755
IF (I =1780- 1780,1781-1905) MW[6] =02000, INCLUDE= 1780,1781-1905
IF (I = 1920- 2061)                     MW[6] =01300, INCLUDE= 1920-2061
IF (I = 0001- 0088)                     MW[6] =01500, INCLUDE= 0001-0088
IF (I = 0089- 0319)                     MW[6] =02300, INCLUDE= 0089-0319
IF (I = 0828- 0833)                     MW[6] =00001, INCLUDE= 0828-0833
IF (I =1230- 1311,1330-1389)            MW[6] =00400, INCLUDE= 0001-0319
IF (I =1400- 1755,1780-1905,1920-2061) MW[6] =00400, INCLUDE= 0001-0319
IF (I = 0089- 0319)                     MW[6] =01900, INCLUDE= 0001-0088
IF (I =1825- 1898,1900-1905) MW[6] =01000, INCLUDE= 1035,1045
IF (I =1825- 1898,1900-1905) MW[6] =01000, INCLUDE= 1047
IF (I = 1780- 1780)                     MW[6] =00001, INCLUDE= 1780
IF (I =1825- 1898,1900-1905)  MW[6] =02000, INCLUDE= 1825-1898,1900-1905
IF (I = 1030- 1053)                     MW[6] =03800, INCLUDE= 1030-1053
IF (I = 1200- 1223)                     MW[6] =01200, INCLUDE= 1200-1223
IF (I = 1110- 1142)                     MW[6] =02500, INCLUDE= 1110-1142
IF (I = 1080- 1099)                     MW[6] =01300, INCLUDE= 1080-1099
IF (I =1080- 1099,0997-1007) MW[6] =02500, INCLUDE= 1230-1311,1330-1389
IF (I =1080- 1099,0997-1007) MW[6] =02500, INCLUDE= 1400-1755,1780-1905
IF (I =1080- 1099,0997-1007) MW[6] =02500, INCLUDE= 1920-2061
IF (I =1230- 1311,1330-1389)            MW[6] =02000, INCLUDE= 1080-1099
IF (I =1400- 1755,1780-1905,1920-2061) MW[6] =02000, INCLUDE= 1080-1099
IF (I = 1200- 1223)                     MW[6] =01200, INCLUDE= 0001-0319
IF (I = 1200- 1223)           MW[6] =01200, INCLUDE= 1230-1311,1330-1389
IF (I = 1200- 1223) MW[6] =01200, INCLUDE= 1400-1755,1780-1905,1920-2061
IF (I =0640- 0996,1230-1230)            MW[6] =00700, INCLUDE= 1200-1223
IF (I =0320- 0505,0510-0582,0585-0593) MW[6] =07000, INCLUDE= 1200-1223
IF (I =0594- 0627,0583-0584,0506-0509) MW[6] =05000, INCLUDE= 1200-1223
IF (I = 1200- 1223)                     MW[6] =01500, INCLUDE= 0640-0996
IF (I =1230- 1311,1330-1389)            MW[6] =02000, INCLUDE= 1200-1223
IF (I =1400- 1755,1780-1905,1920-2061) MW[6] =02000, INCLUDE= 1200-1223



; |\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\|
; |//////   End of K-Factor Specifications for All Purposes  /////|
; |\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\|

endrun
```

Time-of-Day.s

```
*del wcog*.PRN
; ===================================================================
; Time-of-Day.s
; MWCOG Version 2 Model
;
;
;              Distribute Modeled Pump Prime Auto Driver Trips, i.e,
;              4 Purposes (HBW,HBS,HBO,NHB), 3 Modes (1,2,3+Occ Adrs)
;              among three time periods:
;              -  AM peak  (6:00 - 9:00 AM)
;              -  PM peak  (4:00 - 7:00 PM)
;              -  Off-peak (All Other hrs )
;              A card image file named: 'V2TODTPP.PAR' is used.
;              It contains trip percentages
;              for each time period by purpose, mode, and direction.
;
;   Environment Variable:
;               _iter_  (Iteration indicator = 'pp','bs','i1', or 'i2')
; ===================================================================
;
;
;////////////////////////////////////////////////////////////////////
;                                                                    //
; Input/Output filenames:                                            //
;                                                                    //
READ FILE=..\support\V2TODTPP.PAR  ; Time of Day Factor File  //
;                                                                    //
; I/P PP Auto Driver Trip Tables:                                    //
 HBWADR = 'HBW%_iter_%.ADR' ; HBW  1,2,3+ Occ Adr Trips (t1-3)  //
 HBSADR = 'HBS%_iter_%.ADR' ; HBS  1,2,3+ Occ Adr Trips (t1-3)  //
 HBOADR = 'HBO%_iter_%.ADR' ; HBO  1,2,3+ Occ Adr Trips (t1-3)  //
 NHBADR = 'NHB%_iter_%.ADR' ; NHB  1,2,3+ Occ Adr Trips (t1-3)  //
;                                                                    //
; O/P Auto Dr. Pct. tables:                                          //
 ADRAM  = 'AM%_iter_%.ADR'  ; AM     Modeled Total Auto Drivers //
 ADRPM  = 'PM%_iter_%.ADR'  ; PM     Modeled Total Auto Drivers //
 ADROP  = 'OP%_iter_%.ADR'  ; Off-Pk Modeled Total Auto Drivers //
;                                                                   //
;////////////////////////////////////////////////////////////////////

RUN PGM=MATRIX
    MATI[1]=@HBWADR@    ; HBW 1,2,3+-Occ. Auto Drv. Trips(T1-3)
    MATI[2]=@HBSADR@    ; HBS 1,2,3+-Occ. Auto Drv. Trips(T1-3)
    MATI[3]=@HBOADR@    ; HBO 1,2,3+-Occ. Auto Drv. Trips(T1-3)
    MATI[4]=@NHBADR@    ; NHB 1,2,3+-Occ. Auto Drv. Trips(T1-3)


; Put HBW 1-Occ,2-Occ, 3+ Occ Adrs in tabs  1- 3, respectively
; Put HBS 1-Occ,2-Occ, 3+ Occ Adrs in tabs  4- 6, respectively
; Put HBO 1-Occ,2-Occ, 3+ Occ Adrs in tabs  7- 9, respectively
; Put NHB 1-Occ,2-Occ, 3+ Occ Adrs in tabs 10-12, respectively
;  These are in P/A format and represent the Home-to-NonHome direction

    FILLMW  MW[1]  = MI.1.1,  MI.1.2,  MI.1.3 ; Work 1,2,3+ Occ Adrs P/A
    FILLMW  MW[4]  = MI.2.1,  MI.2.2,  MI.2.3 ; Shop 1,2,3+ Occ Adrs P/A
    FILLMW  MW[7]  = MI.3.1,  MI.3.2,  MI.3.3 ; Othr 1,2,3+ Occ Adrs P/A
    FILLMW MW[10]  = MI.4.1,  MI.4.2,  MI.4.3 ; NHB  1,2,3+ Occ Adrs P/A

; Put Transpose of the above
; HBW, HBS, HBO, and NHB trip tables in Work Mats 21-32
; The transpose represents the NonHome-to-Home direction

MW[21]=MI.1.1.T, MW[22]=MI.1.2.T, MW[23]=MI.1.3.T; HBW 1,2,3+ Occ Adrs A/P
MW[24]=MI.2.1.T, MW[25]=MI.2.2.T, MW[26]=MI.2.3.T; HBS 1,2,3+ Occ Adrs A/P
MW[27]=MI.3.1.T, MW[28]=MI.3.2.T, MW[29]=MI.3.3.T; HBO 1,2,3+ Occ Adrs A/P
MW[30]=MI.4.1.T, MW[31]=MI.4.2.T, MW[32]=MI.4.3.T; NHB 1,2,3+ Occ Adrs A/P

; Now we're ready to apply apply TOD factors
;
;
 JLOOP

;\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
;///////////////// AM Trip Calculations          ////////////////////
;\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\

; AM Peak Period Auto Driver Trips
;    HBW:
MW[40]=(( MW[1]*(@AMWDAHNP@/100.0))+(MW[21]*(@AMWDANHP@/100.0)))/2.0;1occ
MW[41]=(( MW[2]*(@AMWCPHNP@/100.0))+(MW[22]*(@AMWCPNHP@/100.0)))/2.0;2occ
MW[42]=(( MW[3]*(@AMWCPHNP@/100.0))+(MW[23]*(@AMWCPNHP@/100.0)))/2.0;3+oc
;    HBS:
MW[45]=(( MW[4]*(@AMSDAHNP@/100.0))+(MW[24]*(@AMSDANHP@/100.0)))/2.0;1occ
MW[46]=(( MW[5]*(@AMSCPHNP@/100.0))+(MW[25]*(@AMSCPNHP@/100.0)))/2.0;2occ
MW[47]=(( MW[6]*(@AMSCPHNP@/100.0))+(MW[26]*(@AMSCPNHP@/100.0)))/2.0;3+oc
;    HBO:
MW[50]=(( MW[7]*(@AMODAHNP@/100.0))+(MW[27]*(@AMODANHP@/100.0)))/2.0;1occ
MW[51]=(( MW[8]*(@AMOCPHNP@/100.0))+(MW[28]*(@AMOCPNHP@/100.0)))/2.0;2occ
MW[52]=(( MW[9]*(@AMOCPHNP@/100.0))+(MW[29]*(@AMOCPNHP@/100.0)))/2.0;3+oc
;    NHB:
MW[55]=((MW[10]*(@AMNDAHNP@/100.0))+(MW[30]*(@AMNDANHP@/100.0)))/2.0;1occ
MW[56]=((MW[11]*(@AMNCPHNP@/100.0))+(MW[31]*(@AMNCPNHP@/100.0)))/2.0;2occ
MW[57]=((MW[12]*(@AMNCPHNP@/100.0))+(MW[32]*(@AMNCPNHP@/100.0)))/2.0;3+oc
;

;\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
;///////////////// PM Trip Calculations          ////////////////////
;\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\

; PM Peak Period Auto Driver Trips
;    HBW:
MW[60]=(( MW[1]*(@PMWDAHNP@/100.0))+(MW[21]*(@PMWDANHP@/100.0)))/2.0;1occ
MW[61]=(( MW[2]*(@PMWCPHNP@/100.0))+(MW[22]*(@PMWCPNHP@/100.0)))/2.0;2occ
MW[62]=(( MW[3]*(@PMWCPHNP@/100.0))+(MW[23]*(@PMWCPNHP@/100.0)))/2.0;3+oc
;    HBS:
MW[65]=(( MW[4]*(@PMSDAHNP@/100.0))+(MW[24]*(@PMSDANHP@/100.0)))/2.0;1occ
MW[66]=(( MW[5]*(@PMSCPHNP@/100.0))+(MW[25]*(@PMSCPNHP@/100.0)))/2.0;2occ
MW[67]=(( MW[6]*(@PMSCPHNP@/100.0))+(MW[26]*(@PMSCPNHP@/100.0)))/2.0;3+oc
;    HBO:
MW[70]=(( MW[7]*(@PMODAHNP@/100.0))+(MW[27]*(@PMODANHP@/100.0)))/2.0;1occ
MW[71]=(( MW[8]*(@PMOCPHNP@/100.0))+(MW[28]*(@PMOCPNHP@/100.0)))/2.0;2occ
MW[72]=(( MW[9]*(@PMOCPHNP@/100.0))+(MW[29]*(@PMOCPNHP@/100.0)))/2.0;3+oc
;    NHB:
MW[75]=((MW[10]*(@PMNDAHNP@/100.0))+(MW[30]*(@PMNDANHP@/100.0)))/2.0;1occ
MW[76]=((MW[11]*(@PMNCPHNP@/100.0))+(MW[31]*(@PMNCPNHP@/100.0)))/2.0;2occ
MW[77]=((MW[12]*(@PMNCPHNP@/100.0))+(MW[32]*(@PMNCPNHP@/100.0)))/2.0;3+oc
;

;\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
;///////////////// Off-Pk Trip Calculations      ////////////////////
;\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\

; Off-Peak Period Auto Driver Trips
;    HBW:
MW[80]=(( MW[1]*(@OPWDAHNP@/100.0))+(MW[21]*(@OPWDANHP@/100.0)))/2.0;1occ
MW[81]=(( MW[2]*(@OPWCPHNP@/100.0))+(MW[22]*(@OPWCPNHP@/100.0)))/2.0;2occ
MW[82]=(( MW[3]*(@OPWCPHNP@/100.0))+(MW[23]*(@OPWCPNHP@/100.0)))/2.0;3+oc
;    HBS:
MW[85]=(( MW[4]*(@OPSDAHNP@/100.0))+(MW[24]*(@OPSDANHP@/100.0)))/2.0;1occ
MW[86]=(( MW[5]*(@OPSCPHNP@/100.0))+(MW[25]*(@OPSCPNHP@/100.0)))/2.0;2occ
MW[87]=(( MW[6]*(@OPSCPHNP@/100.0))+(MW[26]*(@OPSCPNHP@/100.0)))/2.0;3+oc
;    HBO:
```

```
MW[90]=(( MW[7]*(@OPODAHNP@/100.0))+(MW[27]*(@OPODANHP@/100.0)))/2.0;1occ
MW[91]=(( MW[8]*(@OPOCPHNP@/100.0))+(MW[28]*(@OPOCPNHP@/100.0)))/2.0;2occ
MW[92]=(( MW[9]*(@OPOCPHNP@/100.0))+(MW[29]*(@OPOCPNHP@/100.0)))/2.0;3+oc
;    NHB:
MW[95]=((MW[10]*(@OPNDAHNP@/100.0))+(MW[30]*(@OPNDANHP@/100.0)))/2.0;1occ
MW[96]=((MW[11]*(@OPNCPHNP@/100.0))+(MW[31]*(@OPNCPNHP@/100.0)))/2.0;2occ
MW[97]=((MW[12]*(@OPNCPHNP@/100.0))+(MW[32]*(@OPNCPNHP@/100.0)))/2.0;3+oc
;
ENDJLOOP

;  bucket round

   DUMMY = ROWFIX(40) ; FINAL AM hbw 1-OCC Adr Trips
   DUMMY = ROWFIX(41) ;              2-OCC Adr Trips
   DUMMY = ROWFIX(42) ;              3+OCC Adr Trips
   DUMMY = ROWFIX(45) ; FINAL AM hbs 1-OCC Adr Trips
   DUMMY = ROWFIX(46) ;              2-OCC Adr Trips
   DUMMY = ROWFIX(47) ;              3+OCC Adr Trips
   DUMMY = ROWFIX(50) ; FINAL AM hbo 1-OCC Adr Trips
   DUMMY = ROWFIX(51) ;              2-OCC Adr Trips
   DUMMY = ROWFIX(52) ;              3+OCC Adr Trips
   DUMMY = ROWFIX(55) ; FINAL AM nhb 1-OCC Adr Trips
   DUMMY = ROWFIX(56) ;              2-OCC Adr Trips
   DUMMY = ROWFIX(57) ;              3+OCC Adr Trips


   DUMMY = ROWFIX(60) ; FINAL PM hbw 1-OCC Adr Trips
   DUMMY = ROWFIX(61) ;              2-OCC Adr Trips
   DUMMY = ROWFIX(62) ;              3+OCC Adr Trips
   DUMMY = ROWFIX(65) ; FINAL PM hbs 1-OCC Adr Trips
   DUMMY = ROWFIX(66) ;              2-OCC Adr Trips
   DUMMY = ROWFIX(67) ;              3+OCC Adr Trips
   DUMMY = ROWFIX(70) ; FINAL PM hbo 1-OCC Adr Trips
   DUMMY = ROWFIX(71) ;              2-OCC Adr Trips
   DUMMY = ROWFIX(72) ;              3+OCC Adr Trips
   DUMMY = ROWFIX(75) ; FINAL PM nhb 1-OCC Adr Trips
   DUMMY = ROWFIX(76) ;              2-OCC Adr Trips
   DUMMY = ROWFIX(77) ;              3+OCC Adr Trips

   DUMMY = ROWFIX(80) ; FINAL OP hbw 1-OCC Adr Trips
   DUMMY = ROWFIX(81) ;              2-OCC Adr Trips
   DUMMY = ROWFIX(82) ;              3+OCC Adr Trips
   DUMMY = ROWFIX(85) ; FINAL OP hbs 1-OCC Adr Trips
   DUMMY = ROWFIX(86) ;              2-OCC Adr Trips
   DUMMY = ROWFIX(87) ;              3+OCC Adr Trips
   DUMMY = ROWFIX(90) ; FINAL OP hbo 1-OCC Adr Trips
   DUMMY = ROWFIX(91) ;              2-OCC Adr Trips
   DUMMY = ROWFIX(92) ;              3+OCC Adr Trips
   DUMMY = ROWFIX(95) ; FINAL OP nhb 1-OCC Adr Trips
   DUMMY = ROWFIX(96) ;              2-OCC Adr Trips
   DUMMY = ROWFIX(97) ;              3+OCC Adr Trips
;-------------------------------------------------------------------------
; Summarize by purpose for checking;
; Total HBW:
 MW[100]= MW[40]+MW[41]+MW[42]+MW[60]+MW[61]+MW[62]+MW[80]+MW[81]+MW[82]
; Total HBS:
 MW[101]= MW[45]+MW[46]+MW[47]+MW[65]+MW[66]+MW[67]+MW[85]+MW[86]+MW[87]
; Total HBW:
 MW[102]= MW[50]+MW[51]+MW[52]+MW[70]+MW[71]+MW[72]+MW[90]+MW[91]+MW[92]
; Total HBS:
 MW[103]= MW[55]+MW[56]+MW[57]+MW[75]+MW[76]+MW[77]+MW[95]+MW[96]+MW[97]

;-------------------------------------------------------------------------
; Summarize by Time period, Occ Group for Assignment
;
 MW[110]= MW[40]+MW[45]+MW[50]+MW[55] ; AM 1-Occ adrs
 MW[111]= MW[41]+MW[46]+MW[51]+MW[56] ; AM 2-Occ adrs
 MW[112]= MW[42]+MW[47]+MW[52]+MW[57] ; AM 3+Occ adrs
;
 MW[113]= MW[60]+MW[65]+MW[70]+MW[75] ; PM 1-Occ adrs
 MW[114]= MW[61]+MW[66]+MW[71]+MW[76] ; PM 2-Occ adrs
 MW[115]= MW[62]+MW[67]+MW[72]+MW[77] ; PM 3+Occ adrs
;
 MW[116]= MW[80]+MW[85]+MW[90]+MW[95] ; OP 1-Occ adrs
 MW[117]= MW[81]+MW[86]+MW[91]+MW[96] ; OP 2-Occ adrs
 MW[118]= MW[82]+MW[87]+MW[92]+MW[97] ; OP 3+Occ adrs

; Now summarize regional totals to summarize neatly
Jloop
; am hbw, hbs, hbo, nhb by occupant totals:
amhbw1=amhbw1+MW[40], amhbw2=amhbw2+MW[41], amhbw3=amhbw3+MW[42]
amhbs1=amhbs1+MW[45], amhbs2=amhbs2+MW[46], amhbs3=amhbs3+MW[47]
amhbo1=amhbo1+MW[50], amhbo2=amhbo2+MW[51], amhbo3=amhbo3+MW[52]
amnhb1=amnhb1+MW[55], amnhb2=amnhb2+MW[56], amnhb3=amnhb3+MW[57]
; am hbw, hbs, hbo, nhb totals:
amhbw =amhbw + MW[40] + MW[41] + MW[42]
amhbs =amhbs + MW[45] + MW[46] + MW[47]
amhbo =amhbo + MW[50] + MW[51] + MW[52]
amnhb =amnhb + MW[55] + MW[56] + MW[57]
; am occupant level totals:
am1   =am1   +MW[110],am2   =am2   +MW[111],am3   =am3   +MW[112]
; am totals:
am    =am    +MW[110]               +MW[111]               +MW[112]

; pm hbw, hbs, hbo, nhb by occupant totals:
pmhbw1=pmhbw1+MW[60], pmhbw2=pmhbw2+MW[61], pmhbw3=pmhbw3+MW[62]
pmhbs1=pmhbs1+MW[65], pmhbs2=pmhbs2+MW[66], pmhbs3=pmhbs3+MW[67]
pmhbo1=pmhbo1+MW[70], pmhbo2=pmhbo2+MW[71], pmhbo3=pmhbo3+MW[72]
pmnhb1=pmnhb1+MW[75], pmnhb2=pmnhb2+MW[76], pmnhb3=pmnhb3+MW[77]
; pm hbw, hbs, hbo, nhb totals:
pmhbw =pmhbw + MW[60] + MW[61] + MW[62]
pmhbs =pmhbs + MW[65] + MW[66] + MW[67]
pmhbo =pmhbo + MW[70] + MW[71] + MW[72]
pmnhb =pmnhb + MW[75] + MW[76] + MW[77]
; pm occupant level totals:
pm1   =pm1   +MW[113],pm2   =pm2   +MW[114],pm3   =pm3   +MW[115]
; pm totals:
pm    =pm    +MW[113]               +MW[114]               +MW[115]

; op hbw, hbs, hbo, nhb by occupant totals:
ophbw1=ophbw1+MW[80], ophbw2=ophbw2+MW[81], ophbw3=ophbw3+MW[82]
ophbs1=ophbs1+MW[85], ophbs2=ophbs2+MW[86], ophbs3=ophbs3+MW[87]
ophbo1=ophbo1+MW[90], ophbo2=ophbo2+MW[91], ophbo3=ophbo3+MW[92]
opnhb1=opnhb1+MW[95], opnhb2=opnhb2+MW[96], opnhb3=opnhb3+MW[97]
; op hbw, hbs, hbo, nhb totals:
ophbw =ophbw + MW[80]  + MW[81] + MW[82]
ophbs =ophbs + MW[85]  + MW[86] + MW[87]
ophbo =ophbo + MW[90]  + MW[91] + MW[92]
opnhb =opnhb + MW[95]  + MW[96] + MW[97]
; op occupant level totals:
op1   =op1   +MW[116],op2   =op2   +MW[117],op3   =op3   +MW[118]
; op totals:
op    =op    +MW[116]               +MW[117]               +MW[118]

; total output trips by purpose--output total:
 ohbw=ohbw+MW[100], ohbs=ohbs+MW[101], ohbo=ohbo+MW[102], onhb=onhb+MW[103]

; total grand Total of output auto driver trips:
 adr = adr + MW[100] + MW[101] + MW[102] + MW[103]

; total input trips by purpose
 ihbw=ihbw + MW[1]  + MW[2]  + MW[3]
 ihbs=ihbs + MW[4]  + MW[5]  + MW[6]
 ihbo=ihbo + MW[7]  + MW[8]  + MW[9]
 inhb=inhb + MW[10] + MW[11] + MW[12]
```

```
endjloop

; now write out the totals neatly:
if (i=zones)
; get differences by purpose (output - Input)
dfhbw = ohbw - ihbw;
dfhbs = ohbs - ihbs;
dfhbo = ohbo - ihbo;
dfnhb = onhb - inhb;

LIST = '/bt     '
LIST = ' Modeled Pump Prime Time-of-Day Results','\n'
list = 'AM Period:  1-Occ.  2-Occ.  3+Occ.      Total'
list = 'HBW       ',amhbw1(8.0),amhbw2(8.0),amhbw3(8.0),'    ',amhbw(8.0)
list = 'HBS       ',amhbs1(8.0),amhbs2(8.0),amhbs3(8.0),'    ',amhbs(8.0)
list = 'HBO       ',amhbo1(8.0),amhbo2(8.0),amhbo3(8.0),'    ',amhbo(8.0)
list = 'NHB       ',amnhb1(8.0),amnhb2(8.0),amnhb3(8.0),'    ',amnhb(8.0)
list = '-------------------------------------------------'
list = 'Subtotal: ',am1(8.0),am2(8.0),am3(8.0),'    ',am(8.0)
list = '  '
list = '  '
list = 'PM Period:  1-Occ.  2-Occ.  3+Occ.      Total'
list = 'HBW       ',pmhbw1(8.0),pmhbw2(8.0),pmhbw3(8.0),'    ',pmhbw(8.0)
list = 'HBS       ',pmhbs1(8.0),pmhbs2(8.0),pmhbs3(8.0),'    ',pmhbs(8.0)
list = 'HBO       ',pmhbo1(8.0),pmhbo2(8.0),pmhbo3(8.0),'    ',pmhbo(8.0)
list = 'NHB       ',pmnhb1(8.0),pmnhb2(8.0),pmnhb3(8.0),'    ',pmnhb(8.0)
list = '-------------------------------------------------'
list = 'Subtotal: ',pm1(8.0),pm2(8.0),pm3(8.0),'    ',pm(8.0)
list = '  '
list = '  '
list = 'Off-Peak:   1-Occ.  2-Occ.  3+Occ.      Total'
list = 'HBW       ',ophbw1(8.0),ophbw2(8.0),ophbw3(8.0),'    ',ophbw(8.0)
list = 'HBS       ',ophbs1(8.0),ophbs2(8.0),ophbs3(8.0),'    ',ophbs(8.0)
list = 'HBO       ',ophbo1(8.0),ophbo2(8.0),ophbo3(8.0),'    ',ophbo(8.0)
list = 'NHB       ',opnhb1(8.0),opnhb2(8.0),opnhb3(8.0),'    ',opnhb(8.0)
list = '-------------------------------------------------'
list = 'Subtotal: ',op1(8.0),op2(8.0),op3(8.0),'    ',op(8.0)
list = '  '
list = '  '
list = ' Input / Output Totals by Purpose:
list = '                            Diff.      '
list = '        Input    Output    (O-I)      '
list = 'HBW  ',ihbw(8.0),'  ',ohbw(8.0),'  ',dfhbw(8.0)
list = 'HBS  ',ihbs(8.0),'  ',ohbs(8.0),'  ',dfhbs(8.0)
list = 'HBO  ',ihbo(8.0),'  ',ohbo(8.0),'  ',dfhbo(8.0)
list = 'NHB  ',inhb(8.0),'  ',onhb(8.0),'  ',dfnhb(8.0)
list = '  '
list = 'Total Auto Drv:',adr(8.0)

list = '/et       '
endif


;  Write out the auto driver tables by time period

   MATO[1] = @ADRAM@, MO=110-112 ; AM Auto Drv Trips 1,2,3+occ tabs 1-3
   MATO[2] = @ADRPM@, MO=113-115 ; PM Auto Drv Trips 1,2,3+occ tabs 1-3
   MATO[3] = @ADROP@, MO=116-118 ; OP Auto Drv Trips 1,2,3+occ tabs 1-3
ENDRUN
;
```

Transit_Skims.s

```
;-------------------------------------------------------------------------
;Transit_Skims.s
;MWCOG Version 2 Model.
;
;Build Transit Skims by Time Period and Access Mode
; Input Files:
;  TP+ Highway Network          = ZONEHWY.NET
;  Transit Line Files           = MODE?_pp.TB
;  Transit Network Data         = MET_*.TB, COM_*.TB, BUS_*.TB
;  Walk and Drive Access        = WALK_pp.TB, PNR_pp.TB
;  Walk Sidewalk Network        = WLKNET.TB
;  Zone Employment              = ZONE.ASC
; Output Files:
;  Walk and Drive Access Skims  = PP_pp_aa.SKM
;  Walk and Drive Station Data  = PP_pp_aa.STA
;  Walk and Drive Travel Time   = PP_pp_aa.TTT
;  Transit Access to Employment = JOBACC.ASC
;
; Step 1: AM Peak Walk Skims
;  Input Files: HWY_PP.NET, MODE?_AM.TB, *.TB
;  Output Files: TRANSIT.SKM
; Step 2: Split Skims into Multiple Files
;  Input Files: TRANSIT.SKM
;  Output Files: PP_AM_WK.SKM, PP_AM_WK.STA, PP_AM_WK.TTT
; Step 3: AM Peak Drive Skims
;  Input Files: HWY_PP.NET, MODE?_AM.TB, *.TB
;  Output Files: TRANSIT.SKM
; Step 4: Split Skims into Multiple Files
;  Input Files: TRANSIT.SKM
;  Output Files: PP_AM_DR.SKM, PP_AM_DR.STA, PP_AM_DR.TTT
; Step 5: Off Peak Walk Skims
;  Input Files: HWY_PP.NET, MODE?_OP.TB, *.TB
;  Output Files: TRANSIT.SKM
; Step 6: Split Skims into Multiple Files
;  Input Files: TRANSIT.SKM
;  Output Files: PP_OP_WK.SKM, PP_OP_WK.STA, PP_OP_WK.TTT
; Step 7: Off Peak Drive Skims
;  Input Files: HWY_PP.NET, MODE?_OP.TB, *.TB
;  Output Files: TRANSIT.SKM
; Step 8: Split Skims into Multiple Files
;  Input Files: TRANSIT.SKM
;  Output Files: PP_OP_DR.SKM, PP_OP_DR.STA, PP_OP_DR.TTT
; Step 9: Sum the Jobs by Transit Travel Time
;  Input Files: PP_AM_WK.TTT, PP_AM_DR.TTT
;  Output Files: JOBACC.ASC
;
;-------------------------------------------------------------------------
;
; Global Variables
;
;
;
;-------------------------------------------------------------------------
;         Loop through each period and access mode
;-------------------------------------------------------------------------

LOOP PERIOD = 1, 2

 IF (PERIOD = 1)
  TIME_PERIOD = 'AM'
  COMBINE = 5.0
 ELSE
  TIME_PERIOD = 'OP'
  COMBINE = 10.0
 ENDIF

;---- start the access mode loop ----

LOOP ACCESS = 1, 2

  IF (ACCESS = 1)
   ACCESS_MODE = 'WK'
   WALK_MODEL = ' '
   DRIVE_MODEL = ';'
  ELSE
   ACCESS_MODE = 'DR'
   WALK_MODEL = ';'
   DRIVE_MODEL = ' '
  ENDIF

;-------------------------------------------------------------------------
; Steps 1, 3, and 5: Build Transit Paths
;-------------------------------------------------------------------------

RUN PGM = TRNBUILD
 NETI = ZONEHWY.NET
 MATO = TRANSIT.SKM

 HWYTIME = @TIME_PERIOD@HTIME

;--- set default zone access and line parameters ----

ZONEACCESS  GENERATE=N

@WALK_MODEL@ACCESSMODES = 14,16
@DRIVE_MODEL@ACCESSMODES = 11

@WALK_MODEL@SKIPMODES = 11,15

PATHSTYLE  = 1
USERUNTIME = Y

;---- rules for combining multiple line and headways ----

COMBINE MAXDIFF[1] = 0.0, IF[1] = ((RUN - MINRUN) < @COMBINE@)
COMBINE MAXDIFF[2] = 0.0, IF[2] = ((RUN - MINRUN) < @COMBINE@)
COMBINE MAXDIFF[3] = 0.0, IF[3] = ((RUN - MINRUN) < @COMBINE@)
COMBINE MAXDIFF[4] = 0.0, IF[4] = ((RUN - MINRUN) < @COMBINE@)
COMBINE MAXDIFF[5] = 0.0, IF[5] = ((RUN - MINRUN) < @COMBINE@)
COMBINE MAXDIFF[6] = 0.0, IF[6] = ((RUN - MINRUN) < @COMBINE@)
COMBINE MAXDIFF[7] = 0.0, IF[7] = ((RUN - MINRUN) < @COMBINE@)
COMBINE MAXDIFF[8] = 0.0, IF[8] = ((RUN - MINRUN) < @COMBINE@)
COMBINE MAXDIFF[9] = 0.0, IF[9] = ((RUN - MINRUN) < @COMBINE@)

;---- factors to convert actual time to perceived time ----

MODEFAC[1]  = 10*1.00 ;---- in-vehicle time
MODEFAC[11] = 1.00    ;---- drive access time
MODEFAC[12] = 2.50    ;---- transit transfer time
MODEFAC[13] = 2.50    ;---- walk network time
MODEFAC[14] = 2.50    ;---- unused (used to be dummy link to station)
MODEFAC[15] = 2.50    ;---- park-&-ride transfer time
MODEFAC[16] = 2.50    ;---- walk access time

;---- initial and transfer wait factors ----

IWAITFAC[1] = 10*2.50
XWAITFAC[1] = 10*2.50
IWAITMAX[1] = 10*60.0

;---- boarding penalty - limit to three transfers ----
```

```
BOARDPEN[1] = 0.0, 6.0, 6.0, 60.0

;---- transfer prohibitions ----

;--- mode  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13, 14, 15, 16
NOX[1]  =  n,  n,  n,  n,  n,  n,  n,  n,  n,  n,  Y,  n,  n,  n,  Y,  n
NOX[2]  =  n,  n,  n,  n,  n,  n,  n,  n,  n,  n,  Y,  n,  n,  n,  Y,  n
NOX[3]  =  n,  n,  n,  n,  n,  n,  n,  n,  n,  n,  Y,  n,  n,  n,  Y,  n
NOX[4]  =  n,  n,  n,  n,  n,  n,  n,  n,  n,  n,  Y,  n,  n,  n,  Y,  n
NOX[5]  =  n,  n,  n,  n,  n,  n,  n,  n,  n,  n,  Y,  n,  n,  n,  Y,  n
NOX[6]  =  n,  n,  n,  n,  n,  n,  n,  n,  n,  n,  Y,  n,  n,  n,  Y,  n
NOX[7]  =  n,  n,  n,  n,  n,  n,  n,  n,  n,  n,  Y,  n,  n,  n,  Y,  n
NOX[8]  =  n,  n,  n,  n,  n,  n,  n,  n,  n,  n,  Y,  n,  n,  n,  Y,  n
NOX[9]  =  n,  n,  n,  n,  n,  n,  n,  n,  n,  n,  Y,  n,  n,  n,  Y,  n
NOX[10] =  n,  n,  n,  n,  n,  n,  n,  n,  n,  n,  Y,  n,  n,  n,  Y,  n
NOX[11] =  n,  n,  n,  n,  n,  n,  n,  n,  n,  n,  Y,  Y,  n,  Y,  n,  n
NOX[12] =  n,  n,  n,  n,  n,  n,  n,  n,  n,  n,  Y,  Y,  n,  n,  Y,  n
NOX[13] =  n,  n,  n,  n,  n,  n,  n,  n,  n,  n,  Y,  n,  n,  n,  Y,  n
NOX[14] =  n,  n,  n,  n,  n,  n,  n,  n,  n,  n,  Y,  n,  n,  n,  Y,  n
NOX[15] =  n,  n,  n,  n,  n,  n,  n,  n,  n,  n,  Y,  Y,  Y,  Y,  Y,  Y
NOX[16] =  n,  n,  n,  n,  n,  n,  n,  n,  n,  n,  Y,  n,  Y,  n,  Y,  Y

;---- Parameters ----

LISTINPUT = N         ;--- echo input files
PATHSTYLE = 1         ;--- Save only single best path into a node
MAXPATHTIME = 240.0   ;--- Kill any path with preceived time > 240 min.
FREQPERIOD = 1        ;--- Use the First Headway value
USERUNTIME = Y        ;--- Ignore any RUNTIME or RT parameters on lines.
MAXRUNTIME = 240.0    ;--- Report lines with run times > 240 min.
;ONLINE = 100          ;--- Display every 100 lines

;WALKSPEED = 3.0       ;--- Set default walk speed to 3.0 mph
;XYFACTOR = 0.84401    ;--- Replicate MINUTP value
;WALKSPEED = 2.0       ;--- Added on 09/25
;XYFACTOR = 1.97       ;--- Added on 09/25

;--------------------------
;  write out support links for later viewing in VIPER
fileo supporto = supl@access_mode@@time_period@.asc modes=11-16 oneway=t fixed=y
fileo nodeo    = supn@access_mode@@time_period@.dbf
;


;---- specify output skims ----

MATRICES NAME = WLKT, DACCT, INIT, XFERT, IVNMT, IVMT, TOTT, ISTOS, JSTOS,
 MW[1] = TIME(12,13,14,15)*0.01,             ;---- xfer walk time    (min)
 MW[2] = TIME(11)*0.01,                      ;---- drv acc time      (min)
 MW[3] = IWAIT*0.01,                         ;---- ini.wait time     (min)
 MW[4] = XWAIT(1,2,3,4,5,6,7,8,9,10)*0.01,   ;---- xfr wait time     (min)
 MW[5] = TIME(1,2,4,5,6,7,8,9,10)*0.01,      ;---- ivt-nonmetrorail (min)
 MW[6] = TIME(3)*0.01,                       ;---- ivt-metrorail    (min)
 MW[7] = (IWAIT + TIME (0) + XWAIT (0))*0.01,;---- total time       (min)
 MW[8] = NODE0(3) - 7300.0,                  ;---- metro board  sta (1-116)
 MW[9] = NODEL(3) - 7300.0                   ;---- metro alight sta (1-116)

;---- Rail Stations & Links (modes 3 & 4) ----

READ FILE = met_node.tb   ;---- Metrorail stations
READ FILE = met_link.tb   ;---- Metrorail links
READ FILE = com_node.tb   ;---- Commuter Rail stations
READ FILE = com_link.tb   ;---- Commuter Rail links

;---- Park and Ride Lots (mode 15) ----

@DRIVE_MODEL@ READ FILE = bus_pnrn.tb  ;---- Bus PNR lots (nodes)
@DRIVE_MODEL@ READ FILE = met_pnrn.tb  ;---- Metro PNR lots (nodes)
@DRIVE_MODEL@ READ FILE = com_pnrn.tb  ;---- Commuter Rail PNR lots (nodes)

@DRIVE_MODEL@ READ FILE = bus_pnrl.tb  ;---- Bus-PNR connectors (links)
@DRIVE_MODEL@ READ FILE = met_pnrl.tb  ;---- Metro-PNR connectors (links)
@DRIVE_MODEL@ READ FILE = com_pnrl.tb  ;---- Commuter Rail-PNR connectors (links)

;---- Access Links (modes 11, 12 and 16) ----

READ FILE = met_bus.tb   ;--- bus-metro links&xfer cards
READ FILE = com_bus.tb   ;--- bus-commuter rail links&xfer car

READ FILE = walk_@TIME_PERIOD@.tb ;--- walk to local transit

@DRIVE_MODEL@READ FILE = pnr_@TIME_PERIOD@.tb;--- drive to transit

;---- Dummy Centroid Access Links (mode 14) ----

;---- Sidewalk Network (mode 13) ----

READ FILE = wlknet.tb;--- walk network for transfers

;---- Transit Line Cards (modes 1-9) ----

READ FILE = MODE1@TIME_PERIOD@.TB  ;---- M1- metrobus local
READ FILE = MODE2@TIME_PERIOD@.TB  ;---- M2- metrobus express
READ FILE = MODE3@TIME_PERIOD@.TB  ;---- M3- metrorail
READ FILE = MODE4@TIME_PERIOD@.TB  ;---- M4- commuter rail
READ FILE = MODE5@TIME_PERIOD@.TB  ;---- M5- other rail (future)
READ FILE = MODE6@TIME_PERIOD@.TB  ;---- M6- other local bus
READ FILE = MODE7@TIME_PERIOD@.TB  ;---- M7- other express bus
READ FILE = MODE8@TIME_PERIOD@.TB  ;---- M8- other local bus
READ FILE = MODE9@TIME_PERIOD@.TB  ;---- M9- other express bus

;---- Reports -----
; Path Tracing
; Consider these "i"s            to      these "j"s
; -------------------------------         ---------
;   8 Downtwn      1236 Rosslyn                8  Downtwn
;  64 Union Sta    1337 Alexandria            64  Union Sta
; 345 Bethesda     1537 Tysons Crnr          345  Bethesda
; 362 Silver Spr   1554 Ft Belvoir           362  Silver Spr
; 464 N.SilverSpr  1619 Vienna              1231  Pentagon
; 578 Shady Gr Rd  1698 Dulles AP           1236  Rosslyn
; 829 Andrews AFB  1716 Reston              1337  Alexandria
; 927 New Carrltn  1842 Leesburg            1537  Tysons
;1043 Frederick    1942 Dale City
;1231 Pentagon     1967 Manassas

trace = (i = 8, 64, 345, 362, 464, 578, 829, 927, 1043, 1231, 1236, 1337,
1537, 1554, 1619, 1698, 1716, 1842, 1942, 1967 &
   j = 8, 64, 345, 362, 1231, 1236, 1337, 1537)

ENDRUN

;-------------------------------------------------------------------------
;Steps 2, 4, and 6: Split Skims into Multiple Files
;-------------------------------------------------------------------------

RUN PGM=MATRIX
 MATI[1]=TRANSIT.SKM
 MATO[1]=PP_@TIME_PERIOD@_@ACCESS_MODE@.SKM, MO = 1-6,
  FORMAT = MINUTP
; NAME = WLKT, DACCT, INIT, XFERT, IVNMT, IVMT
 MATO[2]=PP_@TIME_PERIOD@_@ACCESS_MODE@.STA, MO = 8-9,
  FORMAT = MINUTP,
 NAME = ISTOS, JSTOS
MATO[3]=PP_@TIME_PERIOD@_@ACCESS_MODE@.TTT, MO = 7,
;FORMAT = MINUTP
```

```
 NAME = TOTT

MW[1] = MI.1.1   ;   xfer walk time   (min)
MW[2] = MI.1.2   ;   drv acc time     (min)
MW[3] = MI.1.3   ;   ini.wait time    (min)
MW[4] = MI.1.4   ;   xfr wait time    (min)
MW[5] = MI.1.5   ;   ivt-nonmetrorail (min)
MW[6] = MI.1.6   ;   ivt-metrorail    (min)
MW[7] = MI.1.7   ;   total time       (min)

MW[8] = MI.1.8   ;   metro board  sta (1-116)
MW[9] = MI.1.9   ;   metro alight sta (1-116)

 JLOOP
 IF (MW[8] < 0 || MW[8] > 116 ) MW[8] = 0
 IF (MW[9] < 0 || MW[9] > 116 ) MW[9] = 0
 ENDJLOOP

ENDRUN


ENDLOOP ;---- ACCESS ----
ENDLOOP ;---- PERIOD ----
;
;-------------------------------------------------------------------------
;         Step 7: Sum the Jobs by Transit Travel Time
;-------------------------------------------------------------------------
;
RUN PGM=MATRIX
 MATI[1] = PP_AM_WK.TTT
 MATI[2] = PP_AM_DR.TTT
 ZDATI[1] = INPUTS\ZONE.ASC, Z=1-4, EMP=40-47

 _ACCESS = 0

JLOOP
 IF (MI.1.1 = 0)
 IF (MI.2.1 > 0)
    MW[1] = MI.2.1
   ELSE
    MW[1] = 0
   ENDIF
  ELSEIF (MI.2.1 = 0)
   MW[1] = MI.1.1
  ELSE
   MW[1] = MIN (MI.1.1, MI.2.1)
  ENDIF

  _ACCESS = _ACCESS + MW[1]
 ENDJLOOP

 IF (_ACCESS > 0)
  MW[1][I] = 1
 ENDIF

 _EMP30  = 0
 _EMP40  = 0
 _EMP50  = 0
 _EMP60  = 0
 _EMPTOT = 0

JLOOP
  IF (MW[1] = 1-30)
   _EMP30 = _EMP30  + ZI.1.EMP[J]
  ENDIF
  IF (MW[1] = 1-40)
   _EMP40 = _EMP40  + ZI.1.EMP[J]
  ENDIF
  IF (MW[1] = 1-50)
   _EMP50 = _EMP50  + ZI.1.EMP[J]
  ENDIF
  IF (MW[1] = 1-60)
   _EMP60 = _EMP60  + ZI.1.EMP[J]
  ENDIF
  _EMPTOT = _EMPTOT + ZI.1.EMP[J]

ENDJLOOP

PRINT FILE=JOBACC.ASC FORM=10, LIST=I(5), '               ', _EMP30, _EMP40, _EMP50,
_EMP60, _EMPTOT

ENDRUN
```

Trip_Distribution.s

```
;--------------------------------------------------------------------
; Trip_Distribution.s
; MWCOG  Version 2 Trip Distribution
; Update 8/28/02 rjm
; Note:  Corrected misspecified MAXITERS (was MAXITRS) key word  11/05/02
;
;--------------------------------------------------------------------
;
;
;
;Environment Variables:
;            %_iter_%  ;---- Run Interation (pp, bs, i1, i2)
;            %_year_%  ;
;            %_alt_%   ;
;
;Global Variables:
;
; ////////////////////////////////////////////////////////////////////
; \\\\\\\\\    INPUT/OUTPUT FILENAMES HERE:                  \\\\\\\\\\
; \\\\\\\\\    In TP Main                                    \\\\\\\\\\
; ////////////////////////////////////////////////////////////////////
;
;
; ====================================================================
; == The Output Trip Distribution Filenames of this Program are:   ==
; ====================================================================
;
HBWTDOUT = 'hbwest%_iter_%.ptt'  ; HBW Person   Trips
HBSTDOUT = 'hbsest%_iter_%.ptt'  ; HBS Person   Trips
HBOTDOUT = 'hboest%_iter_%.ptt'  ; HBO Person   Trips
NHBTDOUT = 'nhbest%_iter_%.ptt'  ; NHB Person   Trips
MTKTDOUT = 'mtkest%_iter_%.vtt'  ; Medium Truck Trips
HTKTDOUT = 'htkest%_iter_%.vtt'  ; Heavy Truck  Trips
;
; ====================================================================
; == The Input Filenames of this Program are:                       ==
; ====================================================================
; --------------------------------------------------------------------
; Land Use and Network Files:
;
LUFILE  = 'inputs\zone.asc'                   ;  LAND USE FILE
HWYTERM = 'ztermtm.asc'                       ;  Zonal HWY TERMINAL TIME

AMSOVSKM = '%_iter_%_am.skm'                  ;  AM  HWY TIME SKIMS
OPSOVSKM = '%_iter_%_op.skm'                  ;  OP  HWY TIME SKIMS

AWTRNSKM = 'pp_am_wk.ttt'                     ;  AM WK ACC TRN TIME SKIMS
ADTRNSKM = 'pp_am_dr.ttt'                     ;  AM DR ACC TRN TIME SKIMS

OWTRNSKM = 'pp_op_wk.ttt'                     ;  OP WK ACC TRN TIME SKIMS
ODTRNSKM = 'pp_op_dr.ttt'                     ;  OP DR ACC TRN TIME SKIMS

;
; --------------------------------------------------------------------
; Trip-End (P/A) Input Files:
;
PROHBWI1 = 'hbw_pro.i1'     ; HBW Productions - Income 1 (Intl Only)
PROHBWI2 = 'hbw_pro.i2'     ; HBW Productions - Income 2 (Intl Only)
PROHBWI3 = 'hbw_pro.i3'     ; HBW Productions - Income 3 (Intl Only)
PROHBWI4 = 'hbw_pro.i4'     ; HBW Productions - Income 4 (Intl Only)
PROHBWAL=  'hbw_pro.all'    ; HBW Productions - NonStrat.(Intl&Extl)

ATTHBWI1 = 'hbw_att.i1'     ; HBW Attractions - Income 1 (Intl Only)
ATTHBWI2 = 'hbw_att.i2'     ; HBW Attractions - Income 2 (Intl Only)
ATTHBWI3 = 'hbw_att.i3'     ; HBW Attractions - Income 3 (Intl Only)
ATTHBWI4 = 'hbw_att.i4'     ; HBW Attractions - Income 4 (Intl Only)
ATTHBWAL=  'hbw_att.all'    ; HBW Attractions - NonStrat.(Intl&Extl)

PROHBSI1 = 'hbs_pro.i1'     ; HBS Productions - Income 1 (Intl Only)
PROHBSI2 = 'hbs_pro.i2'     ; HBS Productions - Income 2 (Intl Only)
PROHBSI3 = 'hbs_pro.i3'     ; HBS Productions - Income 3 (Intl Only)
PROHBSI4 = 'hbs_pro.i4'     ; HBS Productions - Income 4 (Intl Only)
PROHBSAL = 'hbs_pro.all'    ; HBS Productions - NonStrat.(Intl&Extl)

ATTHBSI1 = 'hbs_att.i1'     ; HBS Attractions - Income 1 (Intl Only)
ATTHBSI2 = 'hbs_att.i2'     ; HBS Attractions - Income 2 (Intl Only)
ATTHBSI3 = 'hbs_att.i3'     ; HBS Attractions - Income 3 (Intl Only)
ATTHBSI4 = 'hbs_att.i4'     ; HBS Attractions - Income 4 (Intl Only)
ATTHBSAL = 'hbs_att.all'    ; HBS Attractions - NonStrat.(Intl&Extl)

PROHBOI1 = 'hbo_pro.i1'     ; HBO Productions - Income 1 (Intl Only)
PROHBOI2 = 'hbo_pro.i2'     ; HBO Productions - Income 2 (Intl Only)
PROHBOI3 = 'hbo_pro.i3'     ; HBO Productions - Income 3 (Intl Only)
PROHBOI4 = 'hbo_pro.i4'     ; HBO Productions - Income 4 (Intl Only)
PROHBOAL = 'hbo_pro.all'    ; HBO Productions - NonStrat.(Intl&Extl)

ATTHBOI1 = 'hbo_att.i1'     ; HBO Attractions - Income 1 (Intl Only)
ATTHBOI2 = 'hbo_att.i2'     ; HBO Attractions - Income 2 (Intl Only)
ATTHBOI3 = 'hbo_att.i3'     ; HBO Attractions - Income 3 (Intl Only)
ATTHBOI4 = 'hbo_att.i4'     ; HBO Attractions - Income 4 (Intl Only)
ATTHBOAL = 'hbo_att.all'    ; HBO Attractions - NonStrat.(Intl&Extl)

PRONHBIN = 'nhb_pro.i1'     ; NHB Productions - (Intl Only)
PRONHBAL = 'nhb_pro.all'    ; NHB Productions - (Intl&Extl)

ATTNHBIN = 'NHB_att.i1'     ; NHB Attractions - (Intl Only)
ATTNHBAL = 'NHB_att.all'    ; NHB Attractions - (Intl&Extl)

PROMTKIN = 'MTK_pro.i1'     ; Med Trk Productions - (Intl Only)
PROMTKAL = 'MTK_pro.all'    ; Med Trk Productions - (Intl&Extl)
PROHTKIN = 'HTK_pro.i1'     ; Hvy Trk Productions - (Intl Only)
PROHTKAL = 'HTK_pro.all'    ; Hvy Trk Productions - (Intl&Extl)

ATTMTKIN = 'MTK_att.i1'     ; Med Trk Attractions - (Intl Only)
ATTMTKAL = 'MTK_att.all'    ; Med Trk Attractions - (Intl&Extl)
ATTHTKIN = 'HTK_att.i1'     ; Hvy Trk Attractions - (Intl Only)
ATTHTKAL = 'HTK_att.all'    ; Hvy Trk Attractions - (Intl&Extl)
;
;
; --------------------------------------------------------------------
; Zonal-to-Zone Time Penalty Tables
;
HBWPEN   = '..\support\hbwpen.dat'    ;  HBW TIME PENALITES
HBSPEN   = '..\support\hbspen.dat'    ;  HBS TIME PENALITES
HBOPEN   = '..\support\hbopen.dat'    ;  HBO TIME PENALITES
NHBPEN   = '..\support\nhbpen.dat'    ;  NHB TIME PENALITES

; --------------------------------------------------------------------
; Zonal K-factor Files
;
HBWK     = '..\support\hbwk.dat'    ;
HBSK     = '..\support\hbsk.dat'    ;
HBOK     = '..\support\hbok.dat'    ;
NHBK     = '..\support\nhbk.dat'    ;
NHBK     = '..\support\nhbk.dat'    ;
MTKK     = '..\support\mtkk.dat'    ;
HTKK     = '..\support\htkk.dat'    ;

; --------------------------------------------------------------------
; Friction Factor Files:
;
IHBWFFS   = '..\support\HBWV2.FFS' ; HBW       6 Curves
```

```
IHBSFFS   = '..\support\HBSV2.FFS' ; HBS       6 Curves
IHBOFFS   = '..\support\HBOV2.FFS' ; HBO       6 Curves
IN_TFFS   = '..\support\N_TV2.FFS' ; NHB/Truck 7 Curves
;
; Note:  Sequence of F-Factor Curves:
;           | File:
;           | IHBWFFS       IHBSFFS        IHBOFFS       IN_TFFS
;  Curve #  | (work)        (shop)         (other)       (NHB, Truck)
; --------- |-------------------------------------------------------
;    1      | intl/inc 1    intl/inc 1    intl/inc 1    intl NHB
;    2      | intl/inc 2    intl/inc 2    intl/inc 2    intl Med.trk
;    3      | intl/inc 3    intl/inc 3    intl/inc 3    intl Hvy.truck
;    4      | intl/inc 4    intl/inc 4    intl/inc 4    extl/interst/NHB
;    5      | extl/interst. extl/interst. extl/interst. extl/arter./NHB
;    6      | extl/arter.   extl/arter.   extl/arter.   extl./Med Truck
;    7      |    --            --            --        extl./Hvy Truck

; ---------------------------------------------------------------------
; /////////////////////////////////////////////////////////////////////
; \\\\\\\\\   End of Input/Output File Section                    \\\\\\
; /////////////////////////////////////////////////////////////////////
;
;
; /////////////////////////////////////////////////////////////////////
; \\\\\\\\\    BEGIN TP+                                           \\\\\\
; /////////////////////////////////////////////////////////////////////
;
; /////////////////////////////////////////////////////////////////////
; \\\\\\\\\    1) Add Highway Terminal Times to AM, Off-peak       \\\\\\
; \\\\\\\\\       SOV Skims                                        \\\\\\
; /////////////////////////////////////////////////////////////////////

RUN PGM=MATRIX
zones=2191
;  READ ZONAL EMPLOYMENT AND AREA FROM 'STANDARD' V2 LAND USE FILE

ZDATI[1]= @hwyterm@, Z=1-4,hterm=27-28

;  READ AM PEAK & OFF-PEAK SOV TIME SKIM FILE (IN WHOLE MIN)

  MATI[1] = @AMSOVSKM@   ;  INPUT AM PK  SKIM FILE
  MATI[2] = @OPSOVSKM@   ;  INPUT OFF-PK SKIM FILE

  MW[1]   = MI.1.1       ;  INPUT AM PK  SKIM FILE
  MW[2]   = MI.2.1       ;  INPUT OFF-PK SKIM FILE


;
; Now add the terminal times to the AM/OP travel times below
; (terminal times added only to connected interchanges)
;
JLOOP
    IF  (MW[1] > 0)
         MW[3] = MW[1] + zi.1.hterm[I] + zi.1.hterm[J]
         ELSE
         MW[3] = MW[1]
    ENDIF
    IF  (MW[2] > 0)
         MW[4] = MW[2] + zi.1.hterm[I] + zi.1.hterm[J]
         ELSE
         MW[4] = MW[2]
    ENDIF
ENDJLOOP

;
; Establish Intrazonal Values for Network Time Skims
; --  Values equal to 50% of single lowest nonzero interzonal value
;
JLOOP
 IF (I=J)
      MW[3]=ROUND(0.50 * LOWEST(3,1,0.0001,99999.9))
      MW[4]=ROUND(0.50 * LOWEST(4,1,0.0001,99999.9))
 ENDIF
ENDJLOOP
; WRITE OUT FINAL TIME SKIMS

 MATO[1] = SOVAMTT.SKF, MO=3; output am sov time(min) w/ o&d term&intra times
 MATO[2] = SOVOPTT.SKF, MO=4; output op sov time(min) w/ o&d term&intra times

; print row 1 of I/O matrices for checking

   IF  (I =92)
     PRINTROW MW=1-10
   ENDIF

ENDRUN

; /////////////////////////////////////////////////////////////////////
; \\\\\\\\\    2) Compute Composite Impedances to by used in        \\\
; \\\\\\\\\       Trip Distribution for HBW, HBS, HBO, NHB Purposes \\\
; /////////////////////////////////////////////////////////////////////


RUN PGM=MATRIX
ZONES=2191

; COMPUTATION OF COMPOSITE IMPEDANCES
;  READ AM PEAK & OFF-PEAK SOV TIME SKIM FILE (IN WHOLE MIN)

MATI[1] = SOVAMTT.SKF  ;  AM  PK HWY TIME FILE W/ TERM&INTRAZNL VALUES
MATI[2] = SOVOPTT.SKF  ;  OFF-PK HWY TIME FILE W/ TERM&INTRAZNL VALUES

MATI[3] = @AWTRNSKM@   ;  AM  PK WALK ACC TRN SKIM FILE
MATI[4] = @ADTRNSKM@   ;  AM  PK AUTO ACC TRN SKIM FILE
MATI[5] = @OWTRNSKM@   ;  OFF-PK WALK ACC TRN SKIM FILE
MATI[6] = @ODTRNSKM@   ;  OFF-PK AUTO ACC TRN SKIM FILE

; ESTABLISH WORK MATRICES:

MW[1]=MI.1.1            ; AM  PK HWY TIME FILE W/ TERM&INTRAZNL VALUES
MW[2]=MI.2.1            ; OFF-PK HWY TIME FILE W/ TERM&INTRAZNL VALUES
;
;-----------------------; Make Sure interzonal (conn.or disconn.)
JLOOP                   ; have a minimum of 1 minute
  IF (MW[1] = 0.0)      ;
      MW[1] = 1.0       ;
  ENDIF                 ;
  IF (MW[2] = 0.0)      ;
      MW[2] = 1.0       ;
  ENDIF                 ;
ENDJLOOP                ;
;-----------------------;
;
MW[3]=MI.3.1            ; AM  PK WALK ACC TOTAL TRN TIME FILE
MW[4]=MI.4.1            ; AM  PK AUTO ACC TOTAL TRN TIME FILE

MW[5]=MI.5.1            ; OFF-PK WALK ACC TOTAL TRN TIME FILE
MW[6]=MI.6.1            ; OFF-PK AUTO ACC TOTAL TRN TIME FILE

;FIRST, FIND 'BEST' WALK/AUTO TRANSIT TIME BOTH AM AND OFF-PK CONDITIONS
; BEST AM TRN TIME STORED IN MW11, BEST OP TRN TIME STORED IN MW12

  JLOOP
     IF (MW[3] > 0 && MW[4] > 0)      ; 'BEST' AM PK TRN TIME
        MW[11] = MIN(MW[3],MW[4])     ; WILL BE THE MINIMUM OF
     ELSE                             ; NON-ZERO WALK/AUTO TIMES OR
```

```
      MW[11] = MAX(MW[3],MW[4])     ; THE ONE THAT'S CONNECTED
    ENDIF

    IF (MW[5] > 0 && MW[6] > 0)     ;  SAME FOR OFF PEAK
      MW[12] = MIN(MW[5],MW[6])     ;
    ELSE                            ;
      MW[12] = MAX(MW[5],MW[6])     ;
    ENDIF
  ENDJLOOP

; NOW COMPUTE HBW,HBS,HBO,NHB COMPOSITE IMPEDANCES
;
JLOOP
 IF (MW[11] = 0 || I = J)
   MW[15] = MW[1]
   MW[16] = MW[1]
   MW[17] = MW[1]
   MW[18] = MW[1]
 ELSE
   MW[15] = ROUND (1.0/((1.0/MW[1])+(0.2572/MW[11]))) ; HBW -INC 1 CI MTX
   MW[16] = ROUND (1.0/((1.0/MW[1])+(0.1484/MW[11]))) ; HBW -INC 2 CI MTX
   MW[17] = ROUND (1.0/((1.0/MW[1])+(0.1365/MW[11]))) ; HBW -INC 3 CI MTX
   MW[18] = ROUND (1.0/((1.0/MW[1])+(0.1402/MW[11]))) ; HBW -INC 4 CI MTX
 ENDIF

 IF (MW[12] = 0 || I = J)
   MW[20] =  MW[2]
   MW[21] =  MW[2]
   MW[22] =  MW[2]
   MW[23] =  MW[2]

   MW[25] =  MW[2]
   MW[26] =  MW[2]
   MW[27] =  MW[2]
   MW[28] =  MW[2]

   MW[30] =  MW[2]
 ELSE
   MW[20] = ROUND (1.0/((1.0/MW[2])+(0.0518/MW[12]))) ; HBS -INC 1 CI MTX
   MW[21] = ROUND (1.0/((1.0/MW[2])+(0.0235/MW[12]))) ; HBS -INC 2 CI MTX
   MW[22] = ROUND (1.0/((1.0/MW[2])+(0.0093/MW[12]))) ; HBS -INC 3 CI MTX
   MW[23] = ROUND (1.0/((1.0/MW[2])+(0.0075/MW[12]))) ; HBS -INC 4 CI MTX

   MW[25] = ROUND (1.0/((1.0/MW[2])+(0.0755/MW[12]))) ; HBO -INC 1 CI MTX
   MW[26] = ROUND (1.0/((1.0/MW[2])+(0.0311/MW[12]))) ; HBO -INC 2 CI MTX
   MW[27] = ROUND (1.0/((1.0/MW[2])+(0.0186/MW[12]))) ; HBO -INC 3 CI MTX
   MW[28] = ROUND (1.0/((1.0/MW[2])+(0.0244/MW[12]))) ; HBO -INC 4 CI MTX

   MW[30] = ROUND (1.0/((1.0/MW[2])+(0.0483/MW[12]))) ; NHB
 ENDIF

ENDJLOOP

MATO[1] = HBWTDIMP.MAT, MO=15,16,17,18 ;HBW COMP.IMPEDANCES-INC.LEVELS 1-4
MATO[2] = HBSTDIMP.MAT, MO=20,21,22,23 ;HBS COMP.IMPEDANCES-INC.LEVELS 1-4
MATO[3] = HBOTDIMP.MAT, MO=25,26,27,28 ;HBO COMP.IMPEDANCES-INC.LEVELS 1-4
MATO[4] = NHBTDIMP.MAT, MO=30          ;NHB COMP.IMPEDANCE
;
;
; NOW, WRITE OUT THE RESULTS OF SELECTED INTERCHANGES FOR CHECKING
;     AND COMPARING WITH MINUTP
JLOOP INCLUDE=1 ; WILL PROCESS ONLY FOR J=1
  PRINT LIST = I(4),' ',J(4),' ',mw[15](5),mw[16](5),mw[17](5),mw[18](5),
        FILE =ci_hbw.chk
  PRINT LIST = I(4),' ',J(4),' ',mw[20](5),mw[21](5),mw[22](5),mw[23](5),
        FILE =ci_hbs.chk
  PRINT LIST = I(4),' ',J(4),' ',mw[25](5),mw[26](5),mw[27](5),mw[28](5),
        FILE =ci_hbo.chk
  PRINT LIST = I(4),' ',J(4),' ',mw[30](5),
        FILE =ci_nhb.chk
ENDJLOOP
ENDRUN

; ////////////////////////////////////////////////////////////////////
; \\\\\\\\\    3) Compute Impedance files to be used in the External \\
; \\\\\\\\\       Trip Distribution processing                        \\
; ////////////////////////////////////////////////////////////////////


RUN PGM=MATRIX
;ZONES =2191
MATI[1] = SOVAMTT.SKF  ;  AM  PK HWY TIME FILE W/ TERM&INTRAZNL VALUES
MATI[2] = SOVOPTT.SKF  ;  OFF-PK HWY TIME FILE W/ TERM&INTRAZNL VALUES

MW[1]=MI.1.1           ;  AM  PK HWY TIME FILE W/ TERM&INTRAZNL VALUES
MW[2]=MI.2.1           ;  OFF-PK HWY TIME FILE W/ TERM&INTRAZNL VALUES

;  Development of Peak, Off-Peak SOV Travel times to be used
;  for External Trip distribution of Interstate and Arterial Trip Dist.
;
;  2 skim files will be written:
;  MW[11] - AM Time Period, External ij's
;  MW[12] - OffPeak Period, External ij's
;
;   First, set work matrices equal to 'Full' AM, Off-peak time skims
;
 MW[11] = MW[1]    ; AM
 MW[12] = MW[2]    ; Off-Pk

; next, put very large time value into all
; i-i and x-x ijs

 IF  (I =    1-2144)
    MW[11] =   200, INCLUDE=    1-2144 ; i-i ijs
    MW[12] =   200, INCLUDE=    1-2144 ; i-i ijs
 ELSE
    MW[11] =   200, INCLUDE= 2145-2191 ; x-x ijs
    MW[12] =   200, INCLUDE= 2145-2191 ; x-x ijs
 ENDIF

; WRITE OUT EXTERNAL TRIP DISTRIBUTION IMPEDANCE TABLES

MATO[1] = SOVAMTTE.skf, MO=11 ;  AM -PK Time skims for Extl trip dist.
MATO[2] = SOVOPTTE.skf, MO=12 ;  Off-PK Time skims for Extl trip dist.
ENDRUN
;
; ////////////////////////////////////////////////////////////////////
; \\\\\\\\\    4) Add time penalty files to composite impedance      \\
; \\\\\\\\\       skims.                                             \\
; ////////////////////////////////////////////////////////////////////


RUN PGM=MATRIX
; ADD TIME PENALTIES TO COMPOSITE TIME MATRICES
;  READ AM PEAK & OFF-PEAK SOV TIME SKIM FILE (IN WHOLE MIN)
ZONES=2191
MATI[1] = @HBWPEN@       ;  2191 TAZ LEVEL HBW TIME PENS. INC 1-4
MATI[2] = @HBSPEN@       ;                 HBS TIME PENS. INC 1-4
MATI[3] = @HBOPEN@       ;                 HBO TIME PENS. INC 1-4
MATI[4] = @NHBPEN@       ;                 NHB TIME PENS.

MATI[11] = HBWTDIMP.MAT ; HBW COMP.IMPEDANCES - INC.LEVELS 1-4
MATI[12] = HBSTDIMP.MAT ; HBS COMP.IMPEDANCES - INC.LEVELS 1-4
MATI[13] = HBOTDIMP.MAT ; HBO COMP.IMPEDANCES - INC.LEVELS 1-4
MATI[14] = NHBTDIMP.MAT ; NHB COMP.IMPEDANCE
```

```
; ESTABLISH WORK FILES FOR TIME PENALTIES
;    HBW/INC 1-4      HBS/INC 1-4      HBO/INC 1-4         NHB
; --------------   ---------------  ----------------  ----------------
MW[1] = MI.1.1, MW[5] = MI.2.1, MW[9]  = MI.3.1,  MW[13] = MI.4.1
MW[2] = MI.1.2, MW[6] = MI.2.2, MW[10] = MI.3.2
MW[3] = MI.1.3, MW[7] = MI.2.3, MW[11] = MI.3.3
MW[4] = MI.1.4, MW[8] = MI.2.4, MW[12] = MI.3.4


; ESTABLISH WORK FILES FOR COMPOSITE TIMES
;    HBW/INC 1-4      HBS/INC 1-4      HBO/INC 1-4         NHB
; --------------   ---------------  ----------------  ----------------
MW[21] = MI.11.1, MW[25] = MI.12.1, MW[29] = MI.13.1, MW[33] = MI.14.1
MW[22] = MI.11.2, MW[26] = MI.12.2, MW[30] = MI.13.2
MW[23] = MI.11.3, MW[27] = MI.12.3, MW[31] = MI.13.3
MW[24] = MI.11.4, MW[28] = MI.12.4, MW[32] = MI.13.4

;
; NOW, MERGE THE TIME PENALTIES IN WITH THE COMPOSITE TIMES
;
MW[40] = MW[1]  +  MW[21] ; FINAL HBW INC 1 COMPOSITE TIMES
MW[41] = MW[2]  +  MW[22] ; FINAL HBW INC 2 COMPOSITE TIMES
MW[42] = MW[3]  +  MW[23] ; FINAL HBW INC 3 COMPOSITE TIMES
MW[43] = MW[4]  +  MW[24] ; FINAL HBW INC 4 COMPOSITE TIMES

MW[44] = MW[5]  +  MW[25] ; FINAL HBS INC 1 COMPOSITE TIMES
MW[45] = MW[6]  +  MW[26] ; FINAL HBS INC 2 COMPOSITE TIMES
MW[46] = MW[7]  +  MW[27] ; FINAL HBS INC 3 COMPOSITE TIMES
MW[47] = MW[8]  +  MW[28] ; FINAL HBS INC 4 COMPOSITE TIMES

MW[48] = MW[9]  +  MW[29] ; FINAL HBO INC 1 COMPOSITE TIMES
MW[49] = MW[10] +  MW[30] ; FINAL HBO INC 2 COMPOSITE TIMES
MW[50] = MW[11] +  MW[31] ; FINAL HBO INC 3 COMPOSITE TIMES
MW[51] = MW[12] +  MW[32] ; FINAL HBO INC 4 COMPOSITE TIMES

MW[52] = MW[13] +  MW[33] ; FINAL NHB       COMPOSITE TIME
;
; Write out composite Impedance Tables
; The files are purpose-specific, HB purpose files have 4 tables
;   corresponding to income levels

MATO[1] = HBWCI1_4.DAT, MO=40-43 ;  HBW Composite Impedances/Incomes 1-4
MATO[2] = HBSCI1_4.DAT, MO=44-47 ;  HBS Composite Impedances/Incomes 1-4
MATO[3] = HBOCI1_4.DAT, MO=48-51 ;  HBO Composite Impedances/Incomes 1-4
MATO[4] = NHBCI.DAT   , MO=52    ;  NHB Composite Impedance

; End of Composite Impedance Development
ENDRUN
;--------------------------------------------------------------------


; |\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\|
; |//////   5) Start HBW Trip Distribution Here:                  /////|
; |\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\|

RUN PGM=TRIPDIST
  MATI= HBWCI1_4.DAT,   ; Composite Time Impedances HBW Inc.Levels 1-4
        SOVAMTTE.skf,   ; AM Travel Time Imped. for Extl/Int. Trip Dist.
        @HBWK@          ; HBW Kfactors (Scaled by 1000.0)

; Put impedance matrices in work tables 11-16
; tabs 11-14 are comp.time for inc.levels 1,2,3,4, tabs 15,16 are
; both AM pk SOV time. All impedance and time values are in whole minutes.

  FILLMW MW[11]  = MI.1.1,2,3,4,MI.2.1,MI.2.1

; Put K-factor matrix in work table 20
; The k-factor values are scaled by 1000s (eg, a mtx value of '1000'=1.0)
; the K-factors are appiled across all HBW distributions

  FILLMW MW[20] = MI.3.1
  DUMMY = ROWFAC(20,0.001) ; scale k-factor's to 'true' units

ZDATI[1]  = @PROHBWI1@, Z=1-4,P1=5-10   ; HBW Inc. 1    productions
ZDATI[2]  = @PROHBWI2@, Z=1-4,P2=5-10   ; HBW Inc. 2    productions
ZDATI[3]  = @PROHBWI3@, Z=1-4,P3=5-10   ; HBW Inc. 3    productions
ZDATI[4]  = @PROHBWI4@, Z=1-4,P4=5-10   ; HBW Inc. 4    productions
ZDATI[5]  = @PROHBWAL@, Z=1-4,P5=5-10   ; HBW Totl      productions

ZDATI[6]  = @ATTHBWI1@, Z=1-4,A1=5-10   ; HBW Inc. 1    attractions
ZDATI[7]  = @ATTHBWI2@, Z=1-4,A2=5-10   ; HBW Inc. 2    attractions
ZDATI[8]  = @ATTHBWI3@, Z=1-4,A3=5-10   ; HBW Inc. 3    attractions
ZDATI[9]  = @ATTHBWI4@, Z=1-4,A4=5-10   ; HBW Inc. 4    attractions
ZDATI[10] = @ATTHBWAL@, Z=1-4,A5=5-10   ; HBW Totl      attractions

LOOKUP FILE = @IHBWFFS@,INTERPOLATE=N,SETUPPER=T,FAIL=,0,,NAME = FF,
       LOOKUP[1] = 1, RESULT = 2,  ; HBW INC 1           F-FACTORS
       LOOKUP[2] = 1, RESULT = 3,  ; HBW INC 2           F-FACTORS
       LOOKUP[3] = 1, RESULT = 4,  ; HBW INC 3           F-FACTORS
       LOOKUP[4] = 1, RESULT = 5,  ; HBW INC 4           F-FACTORS
       LOOKUP[5] = 1, RESULT = 6,  ; HBW Extl-Interstate F-FACTORS
       LOOKUP[6] = 1, RESULT = 7   ; HBW Extl-Arterial   F-FACTORS

;  Establish production and attraction vectors here:

SETPA P[1] = P1, P[2] = P2, P[3] = P3, P[4] = P4, P[5] = P5, P[6] = P5
SETPA A[1] = A1, A[2] = A2, A[3] = A3, A[4] = A4, A[5] = A5, A[6] = A5

MAXITERS = 7    ; specify GM iterations to be 7 to be consistent with
                ; prior MINUTP runs

;  Establish gravity model run files & parameters
GRAVITY  PURPOSE  = 1, LOS=MW[11], FFACTORS= FF, KFACTORS = MW[20]
GRAVITY  PURPOSE  = 2, LOS=MW[12], FFACTORS= FF, KFACTORS = MW[20]
GRAVITY  PURPOSE  = 3, LOS=MW[13], FFACTORS= FF, KFACTORS = MW[20]
GRAVITY  PURPOSE  = 4, LOS=MW[14], FFACTORS= FF, KFACTORS = MW[20]
GRAVITY  PURPOSE  = 5, LOS=MW[15], FFACTORS= FF, KFACTORS = MW[20]
GRAVITY  PURPOSE  = 6, LOS=MW[16], FFACTORS= FF, KFACTORS = MW[20]

; Write out trips as integers to be consistent with MINUTP

DUMMY = ROWFIX(1)
DUMMY = ROWFIX(2)
DUMMY = ROWFIX(3)
DUMMY = ROWFIX(4)
DUMMY = ROWFIX(5)
DUMMY = ROWFIX(6)


MATO = EST.TEM,MO=1-6 ;   Final HBW  trip table(s)
                        ;       T1 - HBW Inc. Level 1 (i-i)
                        ;       T2 - HBW Inc. Level 2 (i-i)
                        ;       T3 - HBW Inc. Level 3 (i-i)
                        ;       T4 - HBW Inc. Level 4 (i-i)
                        ;       T5 - HBW ALL (Extl/Interst. FFs)
                        ;       T6 - HBW ALL (Extle/Arter.  FFs)
; Note: The External Interstate and Arterial trips (t5 & t6) will be
; refined in the next two matrix runs

ENDRUN
;
;
;--------------------------------------------------------------------
; Refinement of External Trip Distribution Trip Tables
; (External Interstate and External Arterial Trips)
```

```
; There are two MATRIX steps
;    1) This program reads the external interstate and external arterial
;    tables produced from the external trip dist. process above. The
;    program wipes out trips in internal or through trip interchanges
;    if any exist (there may be a small chance that some trips exist).
;    It also makes sure that no extl/art. trips exist in the
;    extl/interstate interchanges and vise-versa. Finally it writes out
;    an array containing the column totals of the total external trips.
;    to be used in the following program.
;
;    2) This program is used to make sure the row & column totals
;    of the external trip files match those of P/A files produced in
;    the trip generation process. the adjustment will affect the As
;    much more than the P's.
;--------------------------------------------------------------------


RUN PGM=MATRIX
  MATI= EST.TEM       ; read in initial ext trips from trip dist.
  ARRAY COLTOTX=2191  ; set up an array for init.col totals for ext trips

  MW[5]  = MI.1.5 ; Get Initial Extl Interstate table
  MW[6]  = MI.1.6 ; Get Initial Extl Arterial   table

  MW[15] = MW[5]  ; Store HBW trips with Extl/Interst.  FFs in MW15
  MW[16] = MW[6]  ; Store HBW trips with Extl/Arterial  FFs in MW16
;
; Now, strip away or zero out unwanted interchanges
; interstate-type external stations  MW[15]
;-
IF  (I =    1-2144)
  MW[15] =     0, INCLUDE=    1-2144 ; i-i ijs
ELSE
  MW[15] =     0, INCLUDE= 2145-2191 ; x-x ijs
ENDIF

IF  (I =      2145,2147-2148,2150-2153,2155,2157-2165,
              2167-2170,2172-2179,2181,2185-2186,2188-2190)
  MW[15] =     0 ; ext art. ijs
ENDIF

MW[15] =     0, INCLUDE=2145,2147-2148,2150-2153,2155,2157-2165,
              2167-2170,2172-2179,2181,2185-2186,2188-2190 ; ext art. ijs

;
; Now, strip away or zero out unwanted interchanges
; arterial-type external stations  MW[16]
;
IF  (I =    1-2144)
  MW[16] =     0, INCLUDE=    1-2144 ; i-i ijs
ELSE
  MW[16] =     0, INCLUDE= 2145-2191 ; x-x ijs
ENDIF

IF  (I =      2146,2149,2154,2156,2166,2171,2180,
              2182,2183,2184,2187,2191)
  MW[16] =     0 ; ext int.ijs
ENDIF

MW[16] =     0, INCLUDE=2146,2149,2154,2156,2166,2171,2180,
              2182,2183,2184,2187,2191 ; ext int.ijs
;
; -------------------------------------------------------------------
;  ACCUMULATE COLUMN TOTALS of ALL INITIAL EXTERNAL TRIPS
JLOOP
  COLTOTX[J]=COLTOTX[J] + MW[15][J] + MW[16][J]
ENDJLOOP
;
; NOW, WRITE OUT THE INITIAL COLUMN TOTALS FOR Later Use
IF (I=2191)
   LOOP K=2145,2191
        PRINT FORM=6,LIST=K, COLTOTX[K], FILE=IXCOLTOT.DAT
   ENDLOOP
ENDIF
MATO = EXT.TEM,MO=15,16 ;   Final HBW  trip table(s)

; ------------------------------------------------------------

RUN PGM=MATRIX
  MATI[1]= EXT.TEM
  MATI[2]= EST.TEM
  ZDATI[1]=@PROHBWAL@, Z=#1,RCNTL=2     ; total trip gen. prod.totals
  ZDATI[2]=@ATTHBWAL@, Z=#1,CCNTL=2     ; total trip gen. attr.totals
  ZDATI[3]=IXCOLTOT.DAT, Z=#1,ICOLTOT=2

  FILLMW MW[1]  = MI.2.1,2,3,4
  FILLMW MW[5]  = MI.1.1,2

  ARRAY IROWTOTA= 2191

  ARRAY FROWTOT = 2191
  ARRAY FCOLTOT = 2191

  ARRAY ROWADJ  = 2191
  ARRAY COLADJ  = 2191

  MW[15] = MW[5]  ; Store HBW trips with Extl/Interst.  FFs in MW15
  MW[16] = MW[6]  ; Store HBW trips with Extl/Arterial  FFs in MW16

; --------------
IF (i=1-2144)
 JLOOP
    IF  (ICOLTOT[j]   = 0)
         COLADJ[J]    = 1.0
    ELSE
         COLADJ[J]    = CCNTL[j]/ICOLTOT[j]
    ENDIF
      MW[25] = ROUND (MW[15][J]*COLADJ[J])
      MW[26] = ROUND (MW[16][J]*COLADJ[J])
      FCOLTOT[J] = FCOLTOT[J]+ MW[25][J] + MW[26][J]
 endjloop
ELSE
 irowtota[i] = ROWSUM(15) + rowsum(16)

 JLOOP
    IF  (IrowTOTa[i]   = 0)
         rowADJ[i]    = 1.0
    ELSE
         rowADJ[i]    = RCNTL[i]/IROWTOTa[i]
    ENDIF
    MW[25] =  ROUND (MW[15][J]*ROWADJ[i])
    MW[26] =  ROUND (MW[16][J]*ROWADJ[i])
    FROWTOT[i]  = FROWTOT[i]  + MW[25][j] + MW[26][j]
 endjloop
endif

 ;
 ; Now replace full external trip tables with 'trimmed' tables
 ; and compute Final Total Trip Table

 dummy = rowfix(25)  ; bucket round totals
 dummy = rowfix(26)  ;

 MW[5] = MW[25]
 MW[6] = MW[26]
```

```
 DUMMY=ROWADD(7,1,2,3,4,5,6)


MATO = @HBWTDOUT@,MO=1-7 ;   Final HBW  trip table(s)

IF (I=2191) ; if at the last zone
   LIST = ' TAZ inital contrl  final adjftr ',FILE=xcolHBW.asc
   LOOP INDEX = 2145,2191
        LIST = INDEX(4),' ',ICOLTOT[INDEX](6),' ',CCNTL[INDEX](6),' ',
                            FCOLTOT[INDEX](6),' ',coladj[INDEX](6.3),
             FILE=xcolHBW.asc
   ENDLOOP



   LIST = ' TAZ inital contrl  final adjftr ',FILE=xrowHBW.asc
   LOOP INDEX = 2145,2191
        LIST = INDEX(4),' ',IROWTOTA[INDEX](6),RCNTL[INDEX](6),' ',
                            FROWTOT[INDEX](6),rowadj[INDEX](6.3),
             FILE=xROWHBW.asc
   ENDLOOP
ENDIF
;---------------------------------------------------------------------
; END of HBW Trip Distribution
;---------------------------------------------------------------------


; |\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\|
; |//////   6) Start HBS Trip Distribution Here:             /////|
; |\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\|

RUN PGM=TRIPDIST
  MATI= HBSCI1_4.DAT,    ; Composite Time Impedances HBS Inc.Levels 1-4
        SOVOPTTE.skf,    ; Off Pk    Time Imped. for Extl/Int. Trip Dist.
        @HBSK@           ; HBW Kfactors (Scaled by 1000.0)

; Put impedance matrices in work tables 11-16
; tabs 11-14 are comp.time for inc.levels 1,2,3,4, tabs 15,16 are
; both Offpk SOV time. All impedance and time values are in whole minutes.

  FILLMW MW[11]  = MI.1.1,2,3,4,MI.2.1,MI.2.1

; Put K-factor matrix in work table 20
; The k-factor values are scaled by 1000s (eg, a mtx value of '1000'=1.0)
; the K-factors are appiled across all HBS distributions

  FILLMW MW[20] = MI.3.1
  DUMMY = ROWFAC(20,0.001) ; scale k-factor's to 'true' units

ZDATI[1]  = @PROHBSI1@, Z=1-4,P1=5-10   ; HBS Inc. 1    productions
ZDATI[2]  = @PROHBSI2@, Z=1-4,P2=5-10   ; HBS Inc. 2    productions
ZDATI[3]  = @PROHBSI3@, Z=1-4,P3=5-10   ; HBS Inc. 3    productions
ZDATI[4]  = @PROHBSI4@, Z=1-4,P4=5-10   ; HBS Inc. 4    productions
ZDATI[5]  = @PROHBSAL@, Z=1-4,P5=5-10   ; HBS Totl      productions

ZDATI[6]  = @ATTHBSI1@, Z=1-4,A1=5-10   ; HBS Inc. 1    attractions
ZDATI[7]  = @ATTHBSI2@, Z=1-4,A2=5-10   ; HBS Inc. 2    attractions
ZDATI[8]  = @ATTHBSI3@, Z=1-4,A3=5-10   ; HBS Inc. 3    attractions
ZDATI[9]  = @ATTHBSI4@, Z=1-4,A4=5-10   ; HBS Inc. 4    attractions
ZDATI[10] = @ATTHBSAL@, Z=1-4,A5=5-10   ; HBS Totl      attractions

LOOKUP FILE = @IHBSFFS@,INTERPOLATE=N,SETUPPER=T,FAIL=,0,,NAME = FF,
       LOOKUP[1] = 1, RESULT = 2,  ; HBS INC 1           F-FACTORS
       LOOKUP[2] = 1, RESULT = 3,  ; HBS INC 2           F-FACTORS
       LOOKUP[3] = 1, RESULT = 4,  ; HBS INC 3           F-FACTORS
       LOOKUP[4] = 1, RESULT = 5,  ; HBS INC 4           F-FACTORS
       LOOKUP[5] = 1, RESULT = 6,  ; HBS Extl-Interstate F-FACTORS
       LOOKUP[6] = 1, RESULT = 7   ; HBS Extl-Arterial   F-FACTORS

;  Establish production and attraction vectors here:

SETPA P[1] = P1, P[2] = P2, P[3] = P3, P[4] = P4, P[5] = P5, P[6] = P5
SETPA A[1] = A1, A[2] = A2, A[3] = A3, A[4] = A4, A[5] = A5, A[6] = A5

MAXITERS = 7    ; specify GM iterations to be 7 to be consistent with
                ; prior MINUTP runs

;  Establish gravity model run files & parameters
GRAVITY  PURPOSE  = 1, LOS=MW[11], FFACTORS= FF, KFACTORS = MW[20]
GRAVITY  PURPOSE  = 2, LOS=MW[12], FFACTORS= FF, KFACTORS = MW[20]
GRAVITY  PURPOSE  = 3, LOS=MW[13], FFACTORS= FF, KFACTORS = MW[20]
GRAVITY  PURPOSE  = 4, LOS=MW[14], FFACTORS= FF, KFACTORS = MW[20]
GRAVITY  PURPOSE  = 5, LOS=MW[15], FFACTORS= FF, KFACTORS = MW[20]
GRAVITY  PURPOSE  = 6, LOS=MW[16], FFACTORS= FF, KFACTORS = MW[20]

; Write out trips as integers to be consistent with MINUTP

DUMMY = ROWFIX(1)
DUMMY = ROWFIX(2)
DUMMY = ROWFIX(3)
DUMMY = ROWFIX(4)
DUMMY = ROWFIX(5)
DUMMY = ROWFIX(6)


MATO = EST.TEM,MO=1-6 ;   Final HBS  trip table(s)
                          ;       T1 - HBS Inc. Level 1 (i-i)
                          ;       T2 - HBS Inc. Level 2 (i-i)
                          ;       T3 - HBS Inc. Level 3 (i-i)
                          ;       T4 - HBS Inc. Level 4 (i-i)
                          ;       T5 - HBS ALL (Extl/Interst. FFs)
                          ;       T6 - HBS ALL (Extle/Arter.  FFs)
; Note: The External Interstate and Arterial trips (t5 & t6) will be
; refined in the next two matrix runs

ENDRUN
;
;
;---------------------------------------------------------------------
; Refinement of External Trip Distribution Trip Tables
; (External Interstate and External Arterial Trips)
; There are two MATRIX steps
;    1) This program reads the external interstate and external arterial
;    tables produced from the external trip dist. process above. The
;    program wipes out trips in internal or through trip interchanges
;    if any exist (there may be a small chance that some trips exist).
;    It also makes sure that no extl/art. trips exist in the
;    extl/interstate interchanges and vise-versa. Finally it writes out
;    an array containing the column totals of the total external trips.
;    to be used in the following program.
;
;    2) This program is used to make sure the row & column totals
;    of the external trip files match those of P/A files produced in
;    the trip generation process. the adjustment will affect the As
;    much more than the P's.
;---------------------------------------------------------------------


RUN PGM=MATRIX
  MATI= EST.TEM       ; read in initial ext trips from trip dist.
  ARRAY COLTOTX=2191  ; set up an array for init.col totals for ext trips

  MW[5]  = MI.1.5 ; Get Initial Extl Interstate table
  MW[6]  = MI.1.6 ; Get Initial Extl Arterial   table

  MW[15] = MW[5]  ; Store HBS trips with Extl/Interst.  FFs in MW15
```

```
  MW[16] = MW[6]  ; Store HBS trips with Extl/Arterial  FFs in MW16
;
; Now, strip away or zero out unwanted interchanges
; interstate-type external stations  MW[15]
;-
IF  (I =    1-2144)
  MW[15] =     0, INCLUDE=    1-2144 ; i-i ijs
ELSE
  MW[15] =     0, INCLUDE= 2145-2191 ; x-x ijs
ENDIF

IF  (I =      2145,2147-2148,2150-2153,2155,2157-2165,2167-2170,
              2172-2179,2181,2185-2186,2188-2190)  MW[15] =     0 ; ext art. ijs

MW[15] =     0, INCLUDE=2145,2147-2148,2150-2153,2155,2157-2165,2167-2170,
                        2172-2179,2181,2185-2186,2188-2190 ; ext art. ijs

;
; Now, strip away or zero out unwanted interchanges
; arterial-type external stations  MW[16]
;
IF  (I =    1-2144)
  MW[16] =     0, INCLUDE=    1-2144 ; i-i ijs
ELSE
  MW[16] =     0, INCLUDE= 2145-2191 ; x-x ijs
ENDIF

IF  (I =      2146,2149,2154,2156,2166,2171,2180,2182,2183,2184,
              2187,2191)  MW[16] =     0 ; ext int.ijs

MW[16] =     0, INCLUDE=2146,2149,2154,2156,2166,2171,2180,2182,2183,2184,
                        2187,2191 ; ext int.ijs
;
; ---------------------------------------------------------------------
;  ACCUMULATE COLUMN TOTALS of ALL INITIAL EXTERNAL TRIPS
JLOOP
  COLTOTX[J]=COLTOTX[J] + MW[15][J] + MW[16][J]
ENDJLOOP

;
; NOW, WRITE OUT THE INITIAL COLUMN TOTALS FOR Later Use
IF (I=2191)
   LOOP K=2145,2191
        PRINT FORM=6,LIST=K, COLTOTX[K], FILE=IXCOLTOT.DAT
   ENDLOOP
ENDIF
MATO = EXT.TEM,MO=15,16 ;   Final HBS  trip table(s)

; ---------------------------------------------------------------

RUN PGM=MATRIX
  MATI[1]= EXT.TEM
  MATI[2]= EST.TEM
  ZDATI[1]=@PROHBSAL@, Z=#1,RCNTL=2     ; total trip gen. prod.totals
  ZDATI[2]=@ATTHBSAL@, Z=#1,CCNTL=2     ; total trip gen. attr.totals
  ZDATI[3]=IXCOLTOT.DAT, Z=#1,ICOLTOT=2

  FILLMW MW[1]  = MI.2.1,2,3,4
  FILLMW MW[5]  = MI.1.1,2

  ARRAY IROWTOTA= 2191

  ARRAY FROWTOT = 2191
  ARRAY FCOLTOT = 2191

  ARRAY ROWADJ  = 2191
  ARRAY COLADJ  = 2191
```

```
   MW[15] = MW[5]  ; Store HBS trips with Extl/Interst.  FFs in MW15
   MW[16] = MW[6]  ; Store HBS trips with Extl/Arterial  FFs in MW16

; --------------
IF (i=1-2144)
 JLOOP
    IF  (ICOLTOT[j]   = 0)
         COLADJ[J]    = 1.0
    ELSE
         COLADJ[J]    = CCNTL[j]/ICOLTOT[j]
    ENDIF
      MW[25] = ROUND (MW[15][J]*COLADJ[J])
      MW[26] = ROUND (MW[16][J]*COLADJ[J])
      FCOLTOT[J] = FCOLTOT[J]+ MW[25][J] + MW[26][J]
 endjloop
ELSE
    irowtota[i] = ROWSUM(15) + rowsum(16)


 JLOOP
    IF  (IrowTOTa[i]   = 0)
         rowADJ[i]    = 1.0
    ELSE
         rowADJ[i]    = RCNTL[i]/IROWTOTa[i]
    ENDIF
    MW[25] =  ROUND (MW[15][J]*ROWADJ[i])
    MW[26] =  ROUND (MW[16][J]*ROWADJ[i])
    FROWTOT[i]  = FROWTOT[i]  + MW[25][j] + MW[26][j]
 endjloop
endif

 ;
 ; Now replace full external trip tables with 'trimmed' tables
 ; and compute Final Total Trip Table

 dummy = rowfix(25)  ; bucket round totals
 dummy = rowfix(26)  ;

 MW[5] = MW[25]
 MW[6] = MW[26]
 DUMMY=ROWADD(7,1,2,3,4,5,6)


MATO = @HBSTDOUT@,MO=1-7 ;   Final HBS  trip table(s)

IF (I=2191) ; if at the last zone
   LIST = ' TAZ inital contrl  final adjftr ',FILE=xcolHBS.asc
   LOOP INDEX = 2145,2191
        LIST = INDEX(4),' ',ICOLTOT[INDEX](6),' ',CCNTL[INDEX](6),' ',
                            FCOLTOT[INDEX](6),' ',coladj[INDEX](6.3),
             FILE=xcolHBS.asc
   ENDLOOP



   LIST = ' TAZ inital contrl  final adjftr ',FILE=xrowHBS.asc
   LOOP INDEX = 2145,2191
        LIST = INDEX(4),' ',IROWTOTA[INDEX](6),RCNTL[INDEX](6),' ',
                            FROWTOT[INDEX](6),rowadj[INDEX](6.3),
             FILE=xROWHBS.asc
   ENDLOOP
ENDIF
;---------------------------------------------------------------------
; END of HBS Trip Distribution
;---------------------------------------------------------------------


; |\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\|
```

```
; |//////   7) Start HBO Trip Distribution Here:             /////|
; |\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\|

RUN PGM=TRIPDIST
  MATI= HBOCI1_4.DAT,   ; Composite Time Impedances HBO Inc.Levels 1-4
        SOVOPTTE.skf,   ; Off Pk    Time Imped. for Extl/Int. Trip Dist.
        @HBOK@          ; HBW Kfactors (Scaled by 1000.0)

; Put impedance matrices in work tables 11-16
; tabs 11-14 are comp.time for inc.levels 1,2,3,4, tabs 15,16 are
; both Offpk SOV time. All impedance and time values are in whole minutes.

  FILLMW MW[11]  = MI.1.1,2,3,4,MI.2.1,MI.2.1

; Put K-factor matrix in work table 20
; The k-factor values are scaled by 1000s (eg, a mtx value of '1000'=1.0)
; the K-factors are appiled across all HBO distributions

  FILLMW MW[20] = MI.3.1
  DUMMY = ROWFAC(20,0.001) ; scale k-factor's to 'true' units

ZDATI[1]  = @PROHBOI1@, Z=1-4,P1=5-10   ; HBO Inc. 1    productions
ZDATI[2]  = @PROHBOI2@, Z=1-4,P2=5-10   ; HBO Inc. 2    productions
ZDATI[3]  = @PROHBOI3@, Z=1-4,P3=5-10   ; HBO Inc. 3    productions
ZDATI[4]  = @PROHBOI4@, Z=1-4,P4=5-10   ; HBO Inc. 4    productions
ZDATI[5]  = @PROHBOAL@, Z=1-4,P5=5-10   ; HBO Totl      productions

ZDATI[6]  = @ATTHBOI1@, Z=1-4,A1=5-10   ; HBO Inc. 1    attractions
ZDATI[7]  = @ATTHBOI2@, Z=1-4,A2=5-10   ; HBO Inc. 2    attractions
ZDATI[8]  = @ATTHBOI3@, Z=1-4,A3=5-10   ; HBO Inc. 3    attractions
ZDATI[9]  = @ATTHBOI4@, Z=1-4,A4=5-10   ; HBO Inc. 4    attractions
ZDATI[10] = @ATTHBOAL@, Z=1-4,A5=5-10   ; HBO Totl      attractions

LOOKUP FILE = @IHBOFFS@,INTERPOLATE=N,SETUPPER=T,FAIL=,0,,NAME = FF,
       LOOKUP[1] = 1, RESULT = 2,  ; HBO INC 1           F-FACTORS
       LOOKUP[2] = 1, RESULT = 3,  ; HBO INC 2           F-FACTORS
       LOOKUP[3] = 1, RESULT = 4,  ; HBO INC 3           F-FACTORS
       LOOKUP[4] = 1, RESULT = 5,  ; HBO INC 4           F-FACTORS
       LOOKUP[5] = 1, RESULT = 6,  ; HBO Extl-Interstate F-FACTORS
       LOOKUP[6] = 1, RESULT = 7   ; HBO Extl-Arterial   F-FACTORS

;  Establish production and attraction vectors here:

SETPA P[1] = P1, P[2] = P2, P[3] = P3, P[4] = P4, P[5] = P5, P[6] = P5
SETPA A[1] = A1, A[2] = A2, A[3] = A3, A[4] = A4, A[5] = A5, A[6] = A5

MAXITERS = 7    ; specify GM iterations to be 7 to be consistent with
               ; prior MINUTP runs

;  Establish gravity model run files & parameters
GRAVITY  PURPOSE  = 1, LOS=MW[11], FFACTORS= FF, KFACTORS = MW[20]
GRAVITY  PURPOSE  = 2, LOS=MW[12], FFACTORS= FF, KFACTORS = MW[20]
GRAVITY  PURPOSE  = 3, LOS=MW[13], FFACTORS= FF, KFACTORS = MW[20]
GRAVITY  PURPOSE  = 4, LOS=MW[14], FFACTORS= FF, KFACTORS = MW[20]
GRAVITY  PURPOSE  = 5, LOS=MW[15], FFACTORS= FF, KFACTORS = MW[20]
GRAVITY  PURPOSE  = 6, LOS=MW[16], FFACTORS= FF, KFACTORS = MW[20]

; Write out trips as integers to be consistent with MINUTP

DUMMY = ROWFIX(1)
DUMMY = ROWFIX(2)
DUMMY = ROWFIX(3)
DUMMY = ROWFIX(4)
DUMMY = ROWFIX(5)
DUMMY = ROWFIX(6)


MATO = EST.TEM,MO=1-6 ;   Final HBO  trip table(s)
                          ;       T1 - HBO Inc. Level 1 (i-i)
                          ;       T2 - HBO Inc. Level 2 (i-i)
                          ;       T3 - HBO Inc. Level 3 (i-i)
                          ;       T4 - HBO Inc. Level 4 (i-i)
                          ;       T5 - HBO ALL (Extl/Interst. FFs)
                          ;       T6 - HBO ALL (Extle/Arter.  FFs)
; Note: The External Interstate and Arterial trips (t5 & t6) will be
; refined in the next two matrix runs

ENDRUN
;
;
;-------------------------------------------------------------------
; Refinement of External Trip Distribution Trip Tables
; (External Interstate and External Arterial Trips)
; There are two MATRIX steps
;    1) This program reads the external interstate and external arterial
;    tables produced from the external trip dist. process above. The
;    program wipes out trips in internal or through trip interchanges
;    if any exist (there may be a small chance that some trips exist).
;    It also makes sure that no extl/art. trips exist in the
;    extl/interstate interchanges and vise-versa. Finally it writes out
;    an array containing the column totals of the total external trips.
;    to be used in the following program.
;
;    2) This program is used to make sure the row & column totals
;    of the external trip files match those of P/A files produced in
;    the trip generation process. the adjustment will affect the As
;    much more than the P's.
;-------------------------------------------------------------------


RUN PGM=MATRIX
  MATI= EST.TEM      ; read in initial ext trips from trip dist.
  ARRAY COLTOTX=2191  ; set up an array for init.col totals for ext trips

  MW[5]  = MI.1.5 ; Get Initial Extl Interstate table
  MW[6]  = MI.1.6 ; Get Initial Extl Arterial   table

  MW[15] = MW[5]  ; Store HBO trips with Extl/Interst.  FFs in MW15
  MW[16] = MW[6]  ; Store HBO trips with Extl/Arterial  FFs in MW16
;
; Now, strip away or zero out unwanted interchanges
; interstate-type external stations  MW[15]
;-
IF  (I =    1-2144)
  MW[15] =     0, INCLUDE=    1-2144 ; i-i ijs
ELSE
  MW[15] =     0, INCLUDE= 2145-2191 ; x-x ijs
ENDIF

IF  (I =      2145,2147-2148,2150-2153,2155,2157-2165,2167-2170,
              2172-2179,2181,2185-2186,2188-2190)  MW[15] =     0 ; ext art. ijs

MW[15] =     0, INCLUDE=2145,2147-2148,2150-2153,2155,2157-2165,2167-2170,
                        2172-2179,2181,2185-2186,2188-2190; ext art. ijs


;
; Now, strip away or zero out unwanted interchanges
; arterial-type external stations  MW[16]
;
IF  (I =    1-2144)
  MW[16] =     0, INCLUDE=    1-2144 ; i-i ijs
ELSE
  MW[16] =     0, INCLUDE= 2145-2191 ; x-x ijs
ENDIF

IF  (I =      2146,2149,2154,2156,2166,2171,2180,2182,2183,
```

```
              2184,2187,2191)  MW[16] =     0 ; ext int.ijs

MW[16] =     0, INCLUDE=2146,2149,2154,2156,2166,2171,2180,2182,2183,
                       2184,2187,2191 ; ext int.ijs
;
; -------------------------------------------------------------------
;  ACCUMULATE COLUMN TOTALS of ALL INITIAL EXTERNAL TRIPS
JLOOP
  COLTOTX[J]=COLTOTX[J] + MW[15][J] + MW[16][J]
ENDJLOOP

;
; NOW, WRITE OUT THE INITIAL COLUMN TOTALS FOR Later Use
IF (I=2191)
   LOOP K=2145,2191
        PRINT FORM=6,LIST=K, COLTOTX[K], FILE=IXCOLTOT.DAT
   ENDLOOP
ENDIF
MATO = EXT.TEM,MO=15,16 ;   Final HBO  trip table(s)

; ---------------------------------------------------------------

RUN PGM=MATRIX
  MATI[1]= EXT.TEM
  MATI[2]= EST.TEM
  ZDATI[1]=@PROHBOAL@, Z=#1,RCNTL=2     ; total trip gen. prod.totals
  ZDATI[2]=@ATTHBOAL@, Z=#1,CCNTL=2     ; total trip gen. attr.totals
  ZDATI[3]=IXCOLTOT.DAT, Z=#1,ICOLTOT=2

  FILLMW MW[1]  = MI.2.1,2,3,4
  FILLMW MW[5]  = MI.1.1,2

  ARRAY IROWTOTA= 2191

  ARRAY FROWTOT = 2191
  ARRAY FCOLTOT = 2191

  ARRAY ROWADJ  = 2191
  ARRAY COLADJ  = 2191

  MW[15] = MW[5]  ; Store HBO trips with Extl/Interst.  FFs in MW15
  MW[16] = MW[6]  ; Store HBO trips with Extl/Arterial  FFs in MW16

; --------------
IF (i=1-2144)
 JLOOP
    IF  (ICOLTOT[j]   = 0)
         COLADJ[J]    = 1.0
    ELSE
         COLADJ[J]    = CCNTL[j]/ICOLTOT[j]
    ENDIF
      MW[25] = ROUND (MW[15][J]*COLADJ[J])
      MW[26] = ROUND (MW[16][J]*COLADJ[J])
      FCOLTOT[J] = FCOLTOT[J]+ MW[25][J] + MW[26][J]
 endjloop
ELSE
    irowtota[i] = ROWSUM(15) + rowsum(16)


 JLOOP
    IF  (IrowTOTa[i]   = 0)
         rowADJ[i]    = 1.0
    ELSE
         rowADJ[i]    = RCNTL[i]/IROWTOTa[i]
    ENDIF
    MW[25] =  ROUND (MW[15][J]*ROWADJ[i])
    MW[26] =  ROUND (MW[16][J]*ROWADJ[i])
    FROWTOT[i]  = FROWTOT[i]  + MW[25][j] + MW[26][j]
 endjloop
endif

 ;
 ; Now replace full external trip tables with 'trimmed' tables
 ; and compute Final Total Trip Table

 dummy = rowfix(25)  ; bucket round totals
 dummy = rowfix(26)  ;

 MW[5] = MW[25]
 MW[6] = MW[26]
 DUMMY=ROWADD(7,1,2,3,4,5,6)


MATO = @HBOTDOUT@,MO=1-7 ;   Final HBO  trip table(s)

IF (I=2191) ; if at the last zone
   LIST = ' TAZ inital contrl  final adjftr ',FILE=xcolHBO.asc
   LOOP INDEX = 2145,2191
        LIST = INDEX(4),' ',ICOLTOT[INDEX](6),' ',CCNTL[INDEX](6),' ',
                            FCOLTOT[INDEX](6),' ',coladj[INDEX](6.3),
             FILE=xcolHBO.asc
   ENDLOOP



   LIST = ' TAZ inital contrl  final adjftr ',FILE=xrowHBO.asc
   LOOP INDEX = 2145,2191
        LIST = INDEX(4),' ',IROWTOTA[INDEX](6),RCNTL[INDEX](6),' ',
                            FROWTOT[INDEX](6),rowadj[INDEX](6.3),
             FILE=xROWHBO.asc
   ENDLOOP
ENDIF
;--------------------------------------------------------------------
; END of HBO Trip Distribution
;--------------------------------------------------------------------



; |\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\|
; |//////   8) Start NHB, Med Trk, Hvy Trk Trip Distribution Here: /////|
; |\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\|

RUN PGM=TRIPDIST
  MATI= NHBCI.DAT,      ; Composite Time Impedances NHB Inc.Levels 1-4
        SOVOPTT.SKF,    ; Off-Pk    Time Imped. for Intl      Trip Dist.
        SOVOPTTE.SKF,   ; Off Pk    Time Imped. for Extl/Int. Trip Dist.
        @NHBK@,         ; NHB        Kfactors (Scaled by 1000.0)
        @MTKK@,         ; Med Truck  Kfactors (Scaled by 1000.0)
        @HTKK@          ; Hvy Truck  Kfactors (Scaled by 1000.0)

; Put impedance matrices in work tables 11-13
; tab  11 is comp.time for Intl NHB Trips                  Purp 1
; tab  12 is SOV Off Pk time for Intl Mtk, HTK Trips       Purp 2,3
; tab  13 is SOV Off Pk time for Extl NHB, Mtk, HTK Trips  Purp 4-7
; Offpk SOV time. All impedance and time values are in whole minutes.

  FILLMW MW[11]  = MI.1.1,MI.2.1,MI.3.1

; Put K-factor matrices in work tables 20-22
; The k-factor values are scaled by 1000s (eg, a mtx value of '1000'=1.0)
; the NHB K-factors are appiled across all Intl&Extl distributions

         MW[20] = MI.4.1   ; NHB Kfactors
         MW[21] = MI.5.1   ; MTK Intl K-Factors
         MW[22] = MI.6.1   ; HTK Intl K-Factors
  DUMMY = ROWFAC(20,0.001) ; scale NHB k-factor's to 'true' units
```

```
  DUMMY = ROWFAC(21,0.001) ; scale MTK k-factor's to 'true' units
  DUMMY = ROWFAC(22,0.001) ; scale HTK k-factor's to 'true' units

ZDATI[1]  = @PRONHBIN@, Z=1-4,P1=5-10   ; Intl NHB      productions
ZDATI[2]  = @PROMTKIN@, Z=1-4,P2=5-10   ; Intl Med Trk  productions
ZDATI[3]  = @PROHTKIN@, Z=1-4,P3=5-10   ; Intl Hvy Trk  productions
ZDATI[4]  = @PRONHBAL@, Z=1-4,P4=5-10   ; Intl/Extl NHB productions
ZDATI[5]  = @PROMTKAL@, Z=1-4,P5=5-10   ; Intl/Extl MTK productions
ZDATI[6]  = @PROHTKAL@, Z=1-4,P6=5-10   ; Intl/Extl HTK productions


LOOKUP FILE = @IN_TFFS@,INTERPOLATE=N,SETUPPER=T,FAIL=,0,,NAME = FF,
       LOOKUP[1] = 1, RESULT = 2,  ; NHB Internal        F-FACTORS
       LOOKUP[2] = 1, RESULT = 3,  ; MTK Internal        F-FACTORS
       LOOKUP[3] = 1, RESULT = 4,  ; HTK Internal        F-FACTORS
       LOOKUP[4] = 1, RESULT = 5,  ; NHB Extl/Interst    F-FACTORS
       LOOKUP[5] = 1, RESULT = 6,  ; NHB Extl/Arterial   F-FACTORS
       LOOKUP[6] = 1, RESULT = 7,  ; MTK External        F-FACTORS
       LOOKUP[7] = 1, RESULT = 8   ; HTK External        F-FACTORS

;  Establish production and attraction vectors here:
;  Note here that I am reading in production z-files for BOTH
;  Production and Attraction Vectors.  Normally I'd read in 7 prod.
;  and 7 attr. files but this Version of TP+ only allows for 10 z-files
;  so I'm improvising a little bit.  Anyhow the P/A files are 'supposed'
;  to be balanced, aren't they??
;
SETPA P[1]=P1,P[2]=P2,P[3]=P3,P[4]=P4,P[5]=P4,P[6]=P5,P[7]=P6
SETPA A[1]=P1,A[2]=P2,A[3]=P3,A[4]=P4,A[5]=P4,A[6]=P5,A[7]=P6

MAXITERS = 7    ; specify GM iterations to be 7 to be consistent with
              ; prior MINUTP runs

;  Establish gravity model run files & parameters
GRAVITY  PURPOSE  = 1, LOS=MW[11], FFACTORS= FF, KFACTORS = MW[20] ;nhbin
GRAVITY  PURPOSE  = 2, LOS=MW[12], FFACTORS= FF, KFACTORS = MW[21] ;mtkin
GRAVITY  PURPOSE  = 3, LOS=MW[12], FFACTORS= FF, KFACTORS = MW[22] ;htkin
GRAVITY  PURPOSE  = 4, LOS=MW[13], FFACTORS= FF, KFACTORS = MW[20] ;nhbxi
GRAVITY  PURPOSE  = 5, LOS=MW[13], FFACTORS= FF, KFACTORS = MW[20] ;nhbxa
GRAVITY  PURPOSE  = 6, LOS=MW[13], FFACTORS= FF, KFACTORS = MW[21] ;mtkex
GRAVITY  PURPOSE  = 7, LOS=MW[13], FFACTORS= FF, KFACTORS = MW[22] ;htkex

; Write out trips as integers to be consistent with MINUTP

DUMMY = ROWFIX(1)
DUMMY = ROWFIX(2)
DUMMY = ROWFIX(3)
DUMMY = ROWFIX(4)
DUMMY = ROWFIX(5)
DUMMY = ROWFIX(6)
DUMMY = ROWFIX(7)


MATO = EST.TEM,MO=1-7    ;   Final NHB Truck  trip tables:
                         ;       T1 - NHB (i-i)
                         ;       T2 - MTK (i-i)
                         ;       T3 - HTK (i-i)
                         ;       T4 - NHB (Extl/Interst)
                         ;       T5 - NHB (Extl/Arterial)
                         ;       T6 - MTK (Extl)
                         ;       T7 - HTK (Extl)
; Note: The External Interstate and Arterial trips (t4 - t7) will be
; refined in the next two matrix runs

ENDRUN
;
;
;---------------------------------------------------------------------

; Refinement of External Trip Distribution Trip Tables
; (External Interstate and External Arterial Trips)
; There are two MATRIX steps
;    1) This program reads the external interstate and external arterial
;    tables produced from the external trip dist. process above. The
;    program wipes out trips in internal or through trip interchanges
;    if any exist (there may be a small chance that some trips exist).
;    It also makes sure that no extl/art. trips exist in the
;    extl/interstate interchanges and vise-versa. Finally it writes out
;    an array containing the column totals of the total external trips.
;
;---------------------------------------------------------------------


RUN PGM=MATRIX
  MATI= EST.TEM       ; read in initial ext trips from trip dist.
  ARRAY COLTOTN=2191  ; set up array for init.col totals for NHB ext
  ARRAY COLTOTM=2191  ; set up array for init.col totals for MTK ext trips
  ARRAY COLTOTH=2191  ; set up array for init.col totals for HTK ext trips

  MW[5]  = MI.1.4 ; Get Initial NHB Extl Interstate table
  MW[6]  = MI.1.5 ; Get Initial NHB Extl Arterial   table
  MW[7]  = MI.1.6 ; Get Initial MTK Extl            table
  MW[8]  = MI.1.7 ; Get Initial HTK Extl            table

  MW[15] = MW[5]  ; Store NHB Extl/Interst. Trips  in MW15
  MW[16] = MW[6]  ; Store NHB Extl/Arterial Trips  in MW16
  MW[17] = MW[7]  ; Store MTK External      Trips  in MW17
  MW[18] = MW[8]  ; Store HTK External      Trips  in MW18
;
; Now, strip away or zero out unwanted interchanges
; interstate-type external stations  MW[15]
;-
IF  (I =    1-2144)
  MW[15] =     0, INCLUDE=    1-2144 ; i-i ijs
ELSE
  MW[15] =     0, INCLUDE= 2145-2191 ; x-x ijs
ENDIF

IF  (I =      2145,2147-2148,2150-2153,2155,2157-2165,2167-2170,
              2172-2179,2181,2185-2186,2188-2190)  MW[15] =     0 ; ext art. ijs

MW[15] =     0, INCLUDE=2145,2147-2148,2150-2153,2155,2157-2165,2167-2170,
             2172-2179,2181,2185-2186,2188-2190; ext art. ijs

;
; Now, strip away or zero out unwanted interchanges
; arterial-type external stations  MW[16]
;
IF  (I =    1-2144)
  MW[16] =     0, INCLUDE=    1-2144 ; i-i ijs
ELSE
  MW[16] =     0, INCLUDE= 2145-2191 ; x-x ijs
ENDIF

IF  (I =      2146,2149,2154,2156,2166,2171,2180,2182,2183,
              2184,2187,2191)  MW[16] =     0 ; ext int.ijs

MW[16] =     0, INCLUDE=2146,2149,2154,2156,2166,2171,2180,2182,2183,
                        2184,2187,2191 ; ext int.ijs
;
;
; Now, strip away or zero out unwanted interchanges
; for Medium Trucks                 MW[17]
;-
IF  (I =    1-2144)
  MW[17] =     0, INCLUDE=    1-2144 ; i-i ijs
ELSE
```

```
  MW[17] =     0, INCLUDE= 2145-2191 ; x-x ijs
ENDIF

;
; Now, strip away or zero out unwanted interchanges
; for Heavy Trucks                  MW[18]
;
IF  (I =    1-2144)
  MW[18] =     0, INCLUDE=    1-2144 ; i-i ijs
ELSE
  MW[18] =     0, INCLUDE= 2145-2191 ; x-x ijs
ENDIF

;
; -------------------------------------------------------------------
;  ACCUMULATE COLUMN TOTALS of ALL INITIAL EXTERNAL TRIPS
JLOOP
  COLTOTN[J]=COLTOTN[J] + MW[15][J] + MW[16][J]  ;Col. Total NHB Extl
  COLTOTM[J]=COLTOTM[J] + MW[17][J]              ;Col. Total MTK Extl
  COLTOTH[J]=COLTOTH[J] + MW[18][J]              ;Col. Total HTK Extl
ENDJLOOP

;
; NOW, WRITE OUT THE INITIAL COLUMN TOTALS FOR Later Use
IF (I=2191)
   LOOP K=2145,2191
        PRINT FORM=6,LIST=K, COLTOTN[K], COLTOTM[K], COLTOTH[K],
                             FILE=IXCOLTOT.DAT
   ENDLOOP
ENDIF
MATO = EXT.TEM,MO=15,16,17,18 ; Final Extl NHB, Mtk, HTK  trip table(s)

; -------------------------------------------------------------

RUN PGM=MATRIX    ; Adjust NHB Externals
  MATI[1]= EXT.TEM
  MATI[2]= EST.TEM
  ZDATI[1] = @PRONHBAL@, Z=#1,RCNTL=2  ; NHB Trip Production Controls
  ZDATI[2] = @ATTNHBAL@, Z=#1,CCNTL=2  ; NHB Trip Attraction Controls
  ZDATI[3] = IXCOLTOT.DAT, Z=#1,ICOLTOT=2

  FILLMW MW[1]  = MI.2.1       ; mw 1   i-i nhb
  FILLMW MW[4]  = MI.1.1,2     ; mw 4-5 ext nhb(intst,art)

  ARRAY IROWTOTA = 2191
  ARRAY FROWTOT  = 2191
  ARRAY FCOLTOT  = 2191
  ARRAY ROWADJ   = 2191
  ARRAY COLADJ   = 2191

  MW[14] = MW[4]  ; Extr/Int. trips to be adj. --Start w/ initial trips
  MW[15] = MW[5]  ; Extr/Art. trips to be adj. --Start w/ initial trips

 IF (I=1-2144)
    JLOOP
     IF (ICOLTOT[J] = 0)
        COLADJ[J] = 1.0
     ELSE
        COLADJ[J] = CCNTL[J] / ICOLTOT[J]
     ENDIF

     MW[24] = ROUND (MW[14] * COLADJ[J])
     MW[25] = ROUND (MW[15] * COLADJ[J])
     FCOLTOT[J] = FCOLTOT[J] + MW[24] + MW[25]
    ENDJLOOP
ELSE
   IROWTOTA[I] = ROWSUM(14) + ROWSUM(15)
    JLOOP
     IF (IROWTOTA[I] = 0)
        ROWADJ[I] = 1.0
     ELSE
        ROWADJ[I] = RCNTL[I] / IROWTOTA[I]
     ENDIF

     MW[24] = ROUND (MW[14][J] * ROWADJ[I])
     MW[25] = ROUND (MW[15][J] * ROWADJ[I])
     FROWTOT[I] = FROWTOT[I] + MW[24][J] + MW[25][J]
    ENDJLOOP
ENDIF


 dummy = rowfix(24)  ; bucket round totals
 dummy = rowfix(25)  ;

  MW[4] = MW[24]  ;  Replace initial nhb ext/int trips w/ adj trips
  MW[5] = MW[25]  ;  Replace initial nhb ext/art trips w/ adj trips

  DUMMY=ROWADD(10,1,4,5)  ; total NHB trips

MATO[1] = @NHBTDOUT@,MO=1,4,5,10 ;   Final NHB  trip table(s)  1-4
                                 ;   intl,ext/int,ext/art,total


IF (I=2191) ; if at the last zone
   LIST = ' TAZ inital contrl  final adjftr ',FILE=xcolNHB.asc
   LOOP INDEX = 2145,2191
        LIST = INDEX(4),' ',ICOLTOT[INDEX](6),' ',CCNTL[INDEX](6),' ',
                            FCOLTOT[INDEX](6),' ',coladj[INDEX](6.3),
             FILE=xcolNHB.asc
   ENDLOOP



   LIST = ' TAZ inital contrl  final adjftr ',FILE=xrowNHB.asc
   LOOP INDEX = 2145,2191
        LIST = INDEX(4),' ',IROWTOTA[INDEX](6),RCNTL[INDEX](6),' ',
                            FROWTOT[INDEX](6),rowadj[INDEX](6.3),
             FILE=xROWNHB.asc
   ENDLOOP
ENDIF
;-------------------------------------------------------------------
RUN PGM=MATRIX    ; Adjust Medium Truck Externals
  MATI[1]= EXT.TEM
  MATI[2]= EST.TEM
  ZDATI[1] = @PROMTKAL@, Z=#1,RCNTL=2  ; MTK Trip Production Controls
  ZDATI[2] = @ATTMTKAL@, Z=#1,CCNTL=2  ; MTK Trip Attraction Controls
  ZDATI[3] = IXCOLTOT.DAT, Z=#1,ICOLTOT=3

  FILLMW MW[1]  = MI.2.2       ;  i-i mtk
  FILLMW MW[4]  = MI.1.3       ;  ext mtk

  ARRAY IROWTOTA = 2191
  ARRAY FROWTOT  = 2191
  ARRAY FCOLTOT  = 2191
  ARRAY ROWADJ   = 2191
  ARRAY COLADJ   = 2191

  MW[14] = MW[4]  ; Extr/Int. trips to be adj. --Start w/ initial trips

 IF (I=1-2144)
    JLOOP
     IF (ICOLTOT[J] = 0)
        COLADJ[J] = 1.0
     ELSE
        COLADJ[J] = CCNTL[J] / ICOLTOT[J]
```

```
     ENDIF

     MW[24] = ROUND (MW[14] * COLADJ[J])
     FCOLTOT[J] = FCOLTOT[J] + MW[24]
    ENDJLOOP
ELSE
   IROWTOTA[I] = ROWSUM(14)

    JLOOP
     IF (IROWTOTA[I] = 0)
        ROWADJ[I] = 1.0
     ELSE
        ROWADJ[I] = RCNTL[I] / IROWTOTA[I]
     ENDIF

     MW[24] = ROUND (MW[14][J] * ROWADJ[I])
     FROWTOT[I] = FROWTOT[I] + MW[24][J]
    ENDJLOOP
ENDIF


 dummy = rowfix(24)  ; bucket round totals


  MW[4] = MW[24]  ;  Replace initial MTK ext trips w/ adj trips

  DUMMY=ROWADD(10,1,4)        ; total MTK trips

MATO[1] = @MTKTDOUT@,MO=1,4,10   ;   Final MTK  trip table(s)  1-3
                                 ;   intl,ext,total


IF (I=2191) ; if at the last zone
   LIST = ' TAZ inital contrl  final adjftr ',FILE=xcolMTK.asc
   LOOP INDEX = 2145,2191
        LIST = INDEX(4),' ',ICOLTOT[INDEX](6),' ',CCNTL[INDEX](6),' ',
                            FCOLTOT[INDEX](6),' ',coladj[INDEX](6.3),
             FILE=xcolMTK.asc
   ENDLOOP



   LIST = ' TAZ inital contrl  final adjftr ',FILE=xrowMTK.asc
   LOOP INDEX = 2145,2191
        LIST = INDEX(4),' ',IROWTOTA[INDEX](6),RCNTL[INDEX](6),' ',
                            FROWTOT[INDEX](6),rowadj[INDEX](6.3),
             FILE=xrowMTK.asc
   ENDLOOP
ENDIF


;--------------------------------------------------------------------
RUN PGM=MATRIX    ; Adjust Heavy Truck Externals
  MATI[1]= EXT.TEM
  MATI[2]= EST.TEM
  ZDATI[1] = @PROHTKAL@, Z=#1,RCNTL=2  ; HTK Trip Production Controls
  ZDATI[2] = @ATTHTKAL@, Z=#1,CCNTL=2  ; HTK Trip Attraction Controls
  ZDATI[3] = IXCOLTOT.DAT, Z=#1,ICOLTOT=4

  FILLMW MW[1]  = MI.2.3       ;  i-i htk
  FILLMW MW[4]  = MI.1.4       ;  ext htk

  ARRAY IROWTOTA = 2191
  ARRAY FROWTOT  = 2191
  ARRAY FCOLTOT  = 2191
  ARRAY ROWADJ   = 2191
  ARRAY COLADJ   = 2191
   MW[14] = MW[4]  ; Extr/Int. trips to be adj. --Start w/ initial trips

 IF (I=1-2144)
    JLOOP
     IF (ICOLTOT[J] = 0)
        COLADJ[J] = 1.0
     ELSE
        COLADJ[J] = CCNTL[J] / ICOLTOT[J]
     ENDIF

     MW[24] = ROUND (MW[14] * COLADJ[J])
     FCOLTOT[J] = FCOLTOT[J] + MW[24]
    ENDJLOOP
 ELSE
   IROWTOTA[I] = ROWSUM(14)

    JLOOP
     IF (IROWTOTA[I] = 0)
        ROWADJ[I] = 1.0
     ELSE
        ROWADJ[I] = RCNTL[I] / IROWTOTA[I]
     ENDIF

     MW[24] = ROUND (MW[14][J] * ROWADJ[I])
     FROWTOT[I] = FROWTOT[I] + MW[24][J]
    ENDJLOOP
 ENDIF

 dummy = rowfix(24)  ; bucket round totals

 MW[4] = MW[24]  ;  Replace initial HTK ext trips w/ adj trips

  DUMMY=ROWADD(10,1,4)         ; total HTK trips

MATO[1] = @HTKTDOUT@,MO=1,4,10   ;   Final HTK  trip table(s)  1-3
                                 ;   intl,ext,total


IF (I=2191) ; if at the last zone
   LIST = ' TAZ inital contrl  final adjftr ',FILE=xcolHTK.asc
   LOOP INDEX = 2145,2191
        LIST = INDEX(4),' ',ICOLTOT[INDEX](6),' ',CCNTL[INDEX](6),' ',
                            FCOLTOT[INDEX](6),' ',coladj[INDEX](6.3),
             FILE=xcolHTK.asc
   ENDLOOP



   LIST = ' TAZ inital contrl  final adjftr ',FILE=xrowHTK.asc
   LOOP INDEX = 2145,2191
        LIST = INDEX(4),' ',IROWTOTA[INDEX](6),RCNTL[INDEX](6),' ',
                            FROWTOT[INDEX](6),rowadj[INDEX](6.3),
             FILE=xrowHTK.asc
   ENDLOOP
ENDIF

;--------------------------------------------------------------------
; END of NHB & Medium, Heavy Truck Trip Distribution
;--------------------------------------------------------------------

;
; ////////////////////////////////////////////////////////////////////
; \\\\\\\\\    9) Get final trip distribution totals                \\\
; \\\\\\\\\       and prepare input trips for the mode choice model \\\
; ////////////////////////////////////////////////////////////////////

RUN PGM=MATRIX
ZONES = 2191
```

```
  MATI[1]=   @HBWTDOUT@
  MATI[2]=   @HBSTDOUT@
  MATI[3]=   @HBOTDOUT@
  MATI[4]=   @NHBTDOUT@
  MATI[5]=   @MTKTDOUT@
  MATI[6]=   @HTKTDOUT@

  MW[1]  = MI.1.7       ; Total HBW Trips
  MW[2]  = MI.2.7       ; Total HBS Trips
  MW[3]  = MI.3.7       ; Total HBO Trips
  MW[4]  = MI.4.4       ; Total NHB Trips
  MW[5]  = MI.5.3       ; Total MTK Trips
  MW[6]  = MI.6.3       ; Total HTK Trips

  MATO[1]= %_iter_%_hbwmu.ptt,MO=1,FORMAT=MINUTP
  MATO[2]= %_iter_%_hbsmu.ptt,MO=2,FORMAT=MINUTP
  MATO[3]= %_iter_%_hbomu.ptt,MO=3,FORMAT=MINUTP
  MATO[4]= %_iter_%_nhbmu.ptt,MO=4,FORMAT=MINUTP
ENDRUN
;
;=================================================================
;
;-------------------------------------------------------
; Step 10.
; Standard 23x23 Summaries
; Trip Distribution (HBW,HBS,HBO,NHB,MTK,HTK) and formats
; them in neat jurisdictional summaries (23x23)
;
;
;-------------------------------------------------------


;
COPY FILE=DJ.EQV
;   -- Start of Jurisiction-to-TAZ equivalency --
D 1=1-88                        ; DC cr
D 2=89-319                      ; DC ncr
D 3=320-639                     ; MTG MD
D 4=640-1029                    ; PG  MD
D 5=1230-1238                   ; ARL core
D 6=1239-1329                   ; ARLcnore
D 7=1330-1399                   ; ALX VA
D 8=1400-1779                  ; FFX VA
D 9=1780-1919                  ; LDN VA
D 10=1920-2069                   ; PW  VA
D 11=1030-1059                    ; FRD MD
D 12=1060-1079                  ; CAR MD
D 13=1080-1109                   ; HOW MD
D 14=1110-1149                   ; AAR MD
D 15=1150-1169                  ; CAL
D 16=1170-1199                  ; STM
D 17=1200-1229                   ; CHS MD
D 18=2115-2129                  ; FAU VA
D 19=2080-2099                  ; STA VA
D 20=2130-2134,2135-2144        ; CLK/JEF
D 21=2100-2104,2105-2114        ; FBG/SPTS
D 22=2070-2079                  ; KGEOVA
D 23=2145-2191                  ; EXTRNLS
;   -- end of Jurisiction-to-TAZ equivalency --
ENDCOPY

RUN PGM=MATRIX
  ZONES=2191
  MATI[1]= @HBWTDOUT@
  MATI[2]= @HBSTDOUT@
  MATI[3]= @HBOTDOUT@
  MATI[4]= @NHBTDOUT@
  MATI[5]= @MTKTDOUT@
  MATI[6]= @HTKTDOUT@

  MW[1] = MI.1.7; HBW TRIP TABLE/TAZ-LEVEL
  MW[2] = MI.2.7; HBS TRIP TABLE/TAZ-LEVEL
  MW[3] = MI.3.7; HBO TRIP TABLE/TAZ-LEVEL
  MW[4] = MI.4.4; NHB TRIP TABLE/TAZ-LEVEL
  MW[5] = MI.5.3; MTK TRIP TABLE/TAZ-LEVEL
  MW[6] = MI.6.3; HTK TRIP TABLE/TAZ-LEVEL

 ; -- PLACEMARKER TABLES - FUTURE WORK
  MW[11] = 0 ;MI.11.@TABNO1@   HBW TRIP TABLE/TAZ-LEVEL
  MW[12] = 0 ;MI.12.@TABNO2@   HBS TRIP TABLE/TAZ-LEVEL
  MW[13] = 0 ;MI.13.@TABNO3@   HBO TRIP TABLE/TAZ-LEVEL
  MW[14] = 0 ;MI.14.@TABNO4@   NHB TRIP TABLE/TAZ-LEVEL
  MW[15] = 0 ;MI.15.@TABNO5@   MTK TRIP TABLE/TAZ-LEVEL
  MW[16] = 0 ;MI.16.@TABNO6@   HTK TRIP TABLE/TAZ-LEVEL

  FILEO MATO[1]  = HBW.SQZ MO=1,11 ; OUTPUT HBW TABLE(S), SQUEEZED
        MATO[2]  = HBS.SQZ MO=2,12 ; OUTPUT HBS TABLE(S), SQUEEZED
        MATO[3]  = HBO.SQZ MO=3,13 ; OUTPUT HBO TABLE(S), SQUEEZED
        MATO[4]  = NHB.SQZ MO=4,14 ; OUTPUT NHB TABLE(S), SQUEEZED
        MATO[5]  = MTK.SQZ MO=5,15 ; OUTPUT MTK TABLE(S), SQUEEZED
        MATO[6]  = HTK.SQZ MO=6,16 ; OUTPUT HTK TABLE(S), SQUEEZED

  ; renumber OUT.MAT according to DJ.EQV
  RENUMBER FILE=DJ.EQV, MISSINGZI=M, MISSINGZO=W
ENDRUN

;
LOOP PURP=1,6 ; Loop for Each Purpose
;
; Global Variables:
;   SQFNAME    Name of squeezed modal trip table(s)
;   DESCRIPT   Description
;   PURPOSE    Purpose
;   MODE       Mode
;   DCML       Decimal specification
;   TABTYPE    Table type(1/2), i.e.,-involves 1 or 2 trip tables
;   SCALE=1    Scale factor to be applied (if desired)
;   OPER='+'   Operation(if tabtype=2) Tab1(?)Tab2=Result
;
;
DESCRIPT    = 'SIMULATION-%_iter_% Itr Year: %_year_% Alt: %_alt_%'
IF (PURP=1)
  SQFNAME     = 'HBW.SQZ'
  PURPOSE     = 'HBW'
  MODE        = 'MOTORIZED PERSON'
  DCML        = 0
  TABTYPE     = 1
  SCALE       = 1
  OPER        = '+'
ELSEIF (PURP=2)
  SQFNAME     = 'HBS.SQZ'
  PURPOSE     = 'HBS'
  MODE        = 'MOTORIZED PERSON'
  DCML        = 0
  TABTYPE     = 1
  SCALE       = 1
  OPER        = '+'
ELSEIF (PURP=3)
  SQFNAME     = 'HBO.SQZ'
  PURPOSE     = 'HBO'
  MODE        = 'MOTORIZED PERSON'
  DCML        = 0
  TABTYPE     = 1
  SCALE       = 1
  OPER        = '+'
```

```
ELSEIF (PURP=4)
  SQFNAME     = 'NHB.SQZ'
  PURPOSE     = 'NHB'
  MODE        = 'MOTORIZED PERSON'
  DCML        = 0
  TABTYPE     = 1
  SCALE       = 1
  OPER        = '+'
ELSEIF (PURP=5)
  SQFNAME     = 'MTK.SQZ'
  PURPOSE     = 'MTK'
  MODE        = 'TRUCKS'
  DCML        = 0
  TABTYPE     = 1
  SCALE       = 1
  OPER        = '+'
ELSEIF (PURP=6)
  SQFNAME     = 'HTK.SQZ'
  PURPOSE     = 'HTK'
  MODE        = 'TRUCKS'
  DCML        = 0
  TABTYPE     = 1
  SCALE       = 1
  OPER        = '+'
ENDIF
;
RUN PGM=MATRIX
  ZONES=23
  FILEI MATI=@SQFNAME@
  ARRAY CSUM=23,CSUM1=23,CSUM2=23
; ---------------------------------------------------------------
; --  Table Cell Value decalaration or computation (in MW[1])
; ---------------------------------------------------------------

  FILLMW MW[1]=MI.1.1,2     ;    read input tables in MW 2,3

 IF (@TABTYPE@ = 2)
  FILLMW MW[2]=MI.1.1,2     ;    read input tables in MW 2,3
 ENDIF

  IF (@TABTYPE@=2)                                ; Cell Value
     JLOOP                                        ; computed for
      IF (MW[3][J]>0) MW[1]=MW[2]*@SCALE@@OPER@MW[3]; special summaries-
     ENDJLOOP                                     ; calculation in MW[1]
  ENDIF

; -------------------------------------------------------
; ---- ROW Marginal declaration or computation --------
; -------------------------------------------------------
  RSUM   =     ROWSUM(1)            ; 'normal' table- row summary value

  IF (@TABTYPE@=2)
        RSUM = @SCALE@*ROWSUM(2)@OPER@ROWSUM(3)  ; non-'normal' table
  ENDIF                                    ; compute the row marginal(%)

; -------------------------------------------------------
; ---- COLUMN/Total Marginal Accumulation            ----
; ---- The computation (if necessary) is done below  ----
; -------------------------------------------------------

  JLOOP                            ; COL/Total Accumulation
    CSUM[J] = CSUM[J] +  MW[1][J]  ; for 'normal' table
    TOTAL   = TOTAL   +  MW[1]     ;
  ENDJLOOP

IF (@TABTYPE@=2)
  JLOOP                             ; COL/Total Accumulation
    CSUM1[J] = CSUM1[J] +  MW[2][J]  ; for non-'normal' Table
    TOTAL1   = TOTAL1   +  MW[2]     ;
    CSUM2[J] = CSUM2[J] +  MW[3][J]  ;
    TOTAL2   = TOTAL2   +  MW[3]     ;
  ENDJLOOP
ENDIF

  IF (I==1)      ; print header

  PRINT LIST='/bt   ','@DESCRIPT@'
  PRINT LIST='      ','Purpose: ','@PURPOSE@','   MODE: ','@MODE@'
  PRINT LIST='      '

   PRINT LIST='           DESTINATION'
   PRINT LIST=' ORIGIN |',
              '      1','      2','      3','      4',
              '      5','      6','      7','      8','      9',
              '     10','     11','     12','     13','     14',
              '     15','     16','     17','     18','     19',
              '     20','     21','     22','     23',' |  TOTAL'



   PRINT LIST='==============',
              '========================================',
              '========================================',
              '========================================',
              '====================================='


  ENDIF

  IF (I=1)
   CURDIST=STR(I,2,1)+' DC CR'+ '|' ; Make row header
  ELSEIF (I=2)
   CURDIST=STR(I,2,1)+' DC NC'+ '|' ; Make row header
  ELSEIF (I=3)
   CURDIST=STR(I,2,1)+' MTG  '+ '|' ; Make row header
  ELSEIF (I=4)
   CURDIST=STR(I,2,1)+' PG   '+ '|' ; Make row header
  ELSEIF (I=5)
   CURDIST=STR(I,2,1)+' ARLCR'+ '|' ; Make row header
  ELSEIF (I=6)
   CURDIST=STR(I,2,1)+' ARNCR'+ '|' ; Make row header
  ELSEIF (I=7)
   CURDIST=STR(I,2,1)+' ALX  '+ '|'; Make row header
  ELSEIF (I=8)
   CURDIST=STR(I,2,1)+' FFX  '+ '|' ; Make row header
  ELSEIF (I=9)
   CURDIST=STR(I,2,1)+' LDN  '+ '|' ; Make row header
  ELSEIF (I=10)
   CURDIST=STR(I,2,1)+' PW   '+ '|' ; Make row header
  ELSEIF (I=11)
   CURDIST=STR(I,2,1)+' FRD  '+ '|' ; Make row header
  ELSEIF (I=12)
   CURDIST=STR(I,2,1)+' CAR  '+ '|' ; Make row header
  ELSEIF (I=13)
   CURDIST=STR(I,2,1)+' HOW  '+ '|' ; Make row header
  ELSEIF (I=14)
   CURDIST=STR(I,2,1)+' AAR  '+ '|' ; Make row header
  ELSEIF (I=15)
   CURDIST=STR(I,2,1)+' CAL  '+ '|' ; Make row header
  ELSEIF (I=16)
   CURDIST=STR(I,2,1)+' STM  '+ '|' ; Make row header
  ELSEIF (I=17)
   CURDIST=STR(I,2,1)+' CHS  '+ '|' ; Make row header
  ELSEIF (I=18)
   CURDIST=STR(I,2,1)+' FAU  '+ '|' ; Make row header
  ELSEIF (I=19)
```

```
   CURDIST=STR(I,2,1)+' STA  '+ '|' ; Make row header
  ELSEIF (I=20)
   CURDIST=STR(I,2,1)+' CL/JF'+ '|' ; Make row header
  ELSEIF (I=21)
   CURDIST=STR(I,2,1)+' SP/FB'+ '|' ; Make row header
  ELSEIF (I=22)
   CURDIST=STR(I,2,1)+' KGEO '+ '|' ; Make row header
  ELSEIF (I=23)
   CURDIST=STR(I,2,1)+' EXTL '+ '|' ; Make row header
  ELSE   (I=24)
   CURDIST=STR(I,2,1)+' TOTAL'+ '|' ; Make row header
  ENDIF

  PRINT FORM=7.@DCML@ LIST=CURDIST, MW[1][1],MW[1][2],MW[1][3],MW[1][4],MW[1][5],
                   MW[1][6],MW[1][7],MW[1][8],MW[1][9],MW[1][10],
                   MW[1][11],MW[1][12],MW[1][13],MW[1][14],MW[1][15],
                   MW[1][16],MW[1][17],MW[1][18],MW[1][19],MW[1][20],
                   MW[1][21],MW[1][22],MW[1][23],' |',RSUM

  IF (I==ZONES)
; Now at the end of Processed zone matrix
;  Do final Column/Grand Total Computations
     IF (@TABTYPE@=2)
       LOOP IDX = 1,ZONES
            IF (CSUM2[IDX] = 0)
                 CSUM[IDX] = 0
            ELSE
                 CSUM[IDX] = @SCALE@* CSUM1[IDX] @OPER@ CSUM2[IDX]
            ENDIF
       ENDLOOP
     ENDIF
     IF (@TABTYPE@=2 )
            IF (TOTAL2 = 0)
                TOTAL  = 0
            ELSE
                TOTAL  = @SCALE@ *TOTAL1 @OPER@ TOTAL2
            ENDIF
     ENDIF

;  End of final Column/Grand Total Computations

   PRINT LIST='==============',
              '========================================',
              '========================================',
              '========================================',
              '======================================='


    PRINT FORM=8.@DCML@,
    LIST=' TOTAL ',' ',CSUM[1],'      ' ,CSUM[3],
    '      ',CSUM[5],'      ',CSUM[7],'      ',CSUM[9],
    '      ',CSUM[11],'      ',CSUM[13],'      ',CSUM[15],
    '      ',CSUM[17],'      ',CSUM[19],'      ',CSUM[21],
    '      ',CSUM[23],' |'
    PRINT FORM=8.@DCML@,
    LIST='/et            ',CSUM[2],
    '      ' ,CSUM[4],'      ',CSUM[6],'      ',CSUM[8],
    '      ',CSUM[10],'      ',CSUM[12],'      ',CSUM[14],
    '      ',CSUM[16],'      ',CSUM[18],'      ',CSUM[20],
    '      ',CSUM[22],'       ',TOTAL(9.@DCML@)


 ENDIF
ENDRUN

ENDLOOP ; End Loop
```

Update_wklinks.s

```
;-------------------------------------------------------------------------;
; Update_WkLinks.S                                                        ;
; Program updates AM/Off-Pk walk access links sets to reflect a merging of  ;
; a current year and previous year walk access link set.  The updated/merged;
; file will ensure that walk access consistency is met between both years.  ;
; The files each contain three variables:                                 ;
; Anode, Bnode, and Distance in 100ths of mi. If a given link exists      ;
; in both sets with different distances- the MINIMUM distance is used.    ;
;-------------------------------------------------------------------------;
LOOP PERIOD =1,2
     IF (PERIOD=1)
        PRD='AM'
     ENDIF
     IF (PERIOD=2)
        PRD='OP'
     ENDIF

run pgm=hwynet   ; 'network 1' is previous walk link set
                 ; 'network 2' is current  walk link set
  linki[1]=inputs\walk_@PRD@.old,  ; <<-- 'previous year' walk acc set
           var=a,11-15,var=b,17-21,var=dist00,28-32
  linki[2]=walk_@PRD@.tb,            ; <<-- 'current' walk access set
           var=a,11-15,var=b,17-21,var=dist00,28-32


;  linko=combo.txt,  ; write out a combined file
;    format=txt,form=6.0 include=a,b

  zones=2191         ;

 compare record=1-2
  if (_compare=    0)  ;
      _tempstr= 'Case 1/link in old(1)/new(2) walk link set ';
      findist = li.1.dist00

  endif
  if (_compare>    0)  ;
      _tempstr= 'Case 2/link in old(1)/new (2) walk link set but DIST.DIFFERENT'
      distdiff=li.1.dist00 - li.2.dist00
      findist =MIN(li.1.dist00,li.2.dist00)
  endif

  if (_compare=   -1)
      _tempstr='Case 3/link not in old(1) but in new(2) walk link set'
      findist = li.2.dist00

  endif
  if (_compare=   -2)
      _tempstr='Case 4/link in old(1) but not in new(2) walk link set'
      findist = li.1.dist00
  endif

;
; write out 'merged walk link file unless walk link exist
;
  if (!(_compare= -2 & b = 7301-7450,7600-7802))
    list='SUPPORT N=',a(5),'-',b(5),' DIST=',findist(5),
         ' ONEWAY=N MODES= 16 SPEED= 3 ; ',_tempstr, file =walk_@PRD@.upd
  endif
ENDRUN
ENDLOOP
```

Appendix B. Version 2.1/ TP+ Control Files

atypetp.ctl

```
MWCOG VERSION2 MODEL
Control file for the area-type program

&files
   popemp     = 'INPUTS\ZONE.ASC'
   zon_file   = 'INPUTS\NODE.ASC'
   areatype   = '..\support\atypv2.csv'
   den_file   = 'atden.dat'
   db_basfile = 'basezon.dat'
   rpt_file   = 'atypetp.rpt'
   /
&specs
   max_zone = 2191
   radius   = 1.0
   num_class= 7
   max_izn  = 2144
   /
&classes
   pclass = 100.,350.,1500.,3500.,6500.,10000.,1000000.
   eclass = 100.,500.,1500.,5000.,15000.,35000.,1000000.
   /
```

closestp.ctl

```
File: CLOSESTP.CTL
Control file for the closestp.exe program
&files
   in_node  = 'inputs\NODE.ASC'
   out_node = 'basexy.clo'
   in_link  = 'inputs\LINK.ASC'
   out_link = 'baselnk.clo'
    /
Note: crd_fac parameter (no. of coordinate units in 1 mile)
has been updated, since coordinate units are now in whole feet
&specs
    max_zone = 2191
    crd_fac =  5280
    /
```

cogmca1.ctl

```
  COGMCA1.CTL
  Control File for COGMCA1.EXE Program -- Version 2, TP+ application

  The 4 INPUT files are:
       landusef - the standard v2. zonal land use file
       amshlgf  - AM pk zonal walk pct/walk time file (WLKLNKTP-based)
       opshlgf  - Offpk zonal walk pct/walk time file (WLKLNKTP-based)
       carownf  - file containing HH by vehicle own.(0,1,2+)

  The 4 OUTPUT files are:
       hbwa1v2  - Version 2 HBW zonal A1 deck
       hbsa1v2  - Version 2 HBS zonal A1 deck
       hboa1v2  - Version 2 HBO zonal A1 deck
       nhba1v2  - Version 2 NHB zonal A1 deck

Note: hh_veh.dat (zonal HH by Vehs avail) is output of vehav model

&files
   landusef = 'inputs\zone.asc'
   amshlgf  = 'shlgam.fin'
   opshlgf  = 'shlgop.fin'
   carownf  = 'hh_veh.dat'
   hbwa1v2  = 'hbwv2.a1f'
   hbsa1v2  = 'hbsv2.a1f'
   hboa1v2  = 'hbov2.a1f'
   nhba1v2  = 'nhbv2.a1f'
  /
```

ct2_am.ctl

```
CT2_AM.CTL
 Pk Period Walk to Transit Connectors for Accessibility Estimation
 Note: some params set to accomodate current model convention
 Maximum walk access threshhold (max_walk) set to 1.00 mile
 &files
 node_file = 'trn_node.asc'
 lnk_file  = 'nt_am.asc'
 xnod_file = 'trn_fwyn.asc'
 scr_file  = 'inputs\riverstp.bna'
 out_file  = 'ct2_am.asc'
 rpt_file  = 'ct2_am.rpt'
 /
 &specs
 miles     = 5280.
 max_zone  = 2191
 max_node  = 16600
 max_walk  = 1.00
 dev_fac   = 3.00
 max_conn  = 8
 mod_type  = 1
 nodesfmt  = T
 modes     = 16
 tmespd    = 'SPEED=3'
 dumdist   = F
 trnpth    = T
 trnbld    = T
 /
```

ct2_op.ctl

```
CT2_OP.CTL
 Off Pk Prd Walk to Transit Connectors for Accessibility Estimation
 Note: some params set to accomodate current model convention
 Maximum walk access threshhold (max_walk) set to 1.00 mile
 &files
 node_file = 'trn_node.asc'
 lnk_file  = 'nt_op.asc'
 xnod_file = 'trn_fwyn.asc'
 scr_file  = 'inputs\riverstp.bna'
 out_file  = 'CT2_op.asc'
 rpt_file  = 'CT2_op.RPT'
 /
 &specs
 miles     = 5280.0
 max_zone  = 2191
 max_node  = 16600
 max_walk  = 1.00
 dev_fac   = 3.00
 max_conn  = 8
 mod_type  = 1
 nodesfmt  = T
 modes     = 16
 tmespd    = 'SPEED=3'
 dumdist   = F
 trnpth    = T
```

```
 trnbld    = T
 /
```

GIS.ctl

```
  GIS.CTL
  Control File for GIS_PROC.EXE Program

  The 2 INPUT files are:
  unit  7  gispkwk  - the 'raw' GIS-produced short/long walk area file
  unit  8  gisopwk  - the 'raw' GIS-produced short/long walk area file

  The 2 OUTPUT filea are:

  unit 11  finpkwk - final am peak short/long walk file
  unit 12  finopwk - final off-pk  short/long walk file


&files

   gispkwk = 'inputs\giswkaam.asc'
   gisopwk = 'inputs\giswkaop.asc'

   finpkwk = 'shlgam.asc'
   finopwk = 'shlgop.asc'
   /
 nowlk section indicates where all walking pcts will be set to zero.
 These are zones that have a physical barrier between nearest rail
 stop  (the GIS process did not account for this).
&nowlk
  stopwlk     =    0,    0,    0,    0,    0,    0,    0,
                   0,    0,    0,    0,    0,    0,    0,
                   0,    0,    0,    0,    0,    0
   /
&param
  maxzn = 2191
   /
```

HBO_TG.ctl

```
Control File: HBO_TG.CTL
MWCOG Version 2 Trip Generation Model Run(CGTGV2TP)
Purpose:  HBO

  Trip purpose (purp) MUST be one of the following choices:
  'HBW' 'HBS' 'HBO' 'NHB' 'MTK' 'HTK'

&tpurp
 purp='HBO'
  /

&param
 zones   = 2191
 lastizn = 2144
 dcclo   =    1
 dcchi   =   88
 dcnlo   =   89
 dcnhi   =  319
 vaclo   = 1230
 vachi   = 1238
 va10lo  = 1239
 va10hi  = 1360
  /
```

```
&files
 zhhi1sv='hhi1_sv.dat'
 zhhi2sv='hhi2_sv.dat'
 zhhi3sv='hhi3_sv.dat'
 zhhi4sv='hhi4_sv.dat'

 zonelu ='inputs\zone.asc'
 ext_ps ='inputs\pext.asc'
 ext_as ='inputs\aext.asc'
 basezn ='basezon.dat'
 znmod  ='..\support\adjzpaf7.upo'



 outp1  ='hbo_pro.i1'
 outp2  ='hbo_pro.i2'
 outp3  ='hbo_pro.i3'
 outp4  ='hbo_pro.i4'
 outp5  ='hbo_pro.all'

 outa1  ='hbo_att.i1'
 outa2  ='hbo_att.i2'
 outa3  ='hbo_att.i3'
 outa4  ='hbo_att.i4'
 outa5  ='hbo_att.all'
  /
production rates:
array structure: 4 income groups (across) by size/va groups (down)


 inc,siz,veh:   111,   211,   311,  411
                121,   221,   321,  421
                131,   231,   331,  431
                141,   241,   341,  441
                 .      .     .     .
                144    244    344   444

&prates
       prat=  0.415, 0.685, 0.708, 0.708,
              0.540, 0.889, 0.889, 1.567,
              1.284, 1.349, 1.548, 3.446,
              1.364, 0.750, 3.446, 4.146,
              1.121, 1.158, 1.035, 1.087
              1.700, 1.892, 2.161, 1.810,
              2.400, 2.500, 2.843, 3.446,
              2.900, 3.486, 4.653, 4.839,
              1.435, 1.474, 1.474, 1.083,
              1.770, 1.968, 2.460, 2.460,
              2.614, 3.190, 3.190, 3.937,
              4.266, 4.266, 5.395, 5.921,
              1.435, 1.474, 1.474, 2.000,
              1.800, 2.041, 2.659, 2.460,
              2.391, 3.472, 3.559, 3.940,
              3.819, 5.674, 6.501, 6.738
  /
area type-based attraction rates:
array structure: 10 land use variables (across) by 7 area types (down)
          1      2      3      4      5      6      7      8      (9 10)
         HH    HHPOP   EMP   IndEmp RetEMP OffEMP OthEMP NRetEmp  Unused
 Atype 1
       .
       7

location- based attraction  rates:
array structure: 5 land use variables (across) by 4 locations (down)
Locations are: 1)Reg. Core, 2)DC NonCore, 3)VA 10 Mi Sq, 4)Other
          1      2      3      4      5
```

```
       IndEmp RetEMP OffEMP OthEMP  HH
 Locat 1
       .
       4

&arates
      arat= 0.00,0.77,0.00,0.00,1.30,0.00,0.00,0.30,0.00,0.00,
            0.00,0.77,0.00,0.00,1.30,0.00,0.00,0.30,0.00,0.00,
            0.00,0.77,0.00,0.00,1.30,0.00,0.00,0.30,0.00,0.00,
            0.00,0.77,0.00,0.00,1.30,0.00,0.00,0.30,0.00,0.00,
            0.00,0.77,0.00,0.00,1.30,0.00,0.00,0.30,0.00,0.00,
            0.00,0.77,0.00,0.00,1.30,0.00,0.00,0.30,0.00,0.00,
            0.00,0.77,0.00,0.00,1.30,0.00,0.00,0.30,0.00,0.00

      lrat =0.00,0.00,0.00,0.00,0.00,
            0.00,0.00,0.00,0.00,0.00,
            0.00,0.00,0.00,0.00,0.00,
            0.00,0.00,0.00,0.00,0.00

  /
prod, att jurisdiction adjustment rates for each jurisdiction(1-24)
juris. codes 1-24 are:
 1-dc   2-mtg  3-pg   4-arl  5-alx  6-ffx  7-ldn  8-pw   9  -   10-frd
11-how 12-aa  13-chs 14  -  15-car 16-cal 17-stm 18-kge 19-fbg  20-stf
21-spt 22-fau 23-clk 24-jef


&juradj
       pjuradj =1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,
                0.70,1.00,1.00,1.00,0.75,1.00,1.00,1.00,1.00,1.00,
                1.00,1.00,1.00,1.00,1.00

       ajuradj =1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,
                0.80,1.00,1.00,1.00,0.75,1.00,1.00,1.00,1.00,1.00,
                1.00,1.00,1.00,1.00,1.00
  /
global purpose adjustment array
&puradj
      purpadj  =1.500
  /
```

HBS_TG.ctl

```
Control File: HBS_TG.CTL
MWCOG Version 2 Trip Generation Model Run(CGTGV2TP)
Purpose:  HBS


  Trip purpose (purp) MUST be one of the following choices:
  'HBW' 'HBS' 'HBO' 'NHB' 'MTK' 'HTK'

&tpurp
 purp='HBS'
  /

&param
 zones   = 2191
 lastizn = 2144
 dcclo   =    1
 dcchi   =   88
 dcnlo   =   89
 dcnhi   =  319
 vaclo   = 1230
 vachi   = 1238
 val0lo  = 1239
 val0hi  = 1360
  /

&files
 zhhi1sv='hhi1_sv.dat'
 zhhi2sv='hhi2_sv.dat'
 zhhi3sv='hhi3_sv.dat'
 zhhi4sv='hhi4_sv.dat'

 zonelu ='inputs\zone.asc'
 ext_ps ='inputs\pext.asc'
 ext_as ='inputs\aext.asc'
 basezn ='basezon.dat'
 znmod  ='..\support\adjzpaf7.ups'




 outp1  ='hbs_pro.i1'
 outp2  ='hbs_pro.i2'
 outp3  ='hbs_pro.i3'
 outp4  ='hbs_pro.i4'
 outp5  ='hbs_pro.all'

 outa1  ='hbs_att.i1'
 outa2  ='hbs_att.i2'
 outa3  ='hbs_att.i3'
 outa4  ='hbs_att.i4'
 outa5  ='hbs_att.all'
  /
production rates:
array structure: 4 income groups (across) by size/va groups (down)
area type-based attraction rates:

 inc,siz,veh:   111,   211,   311,  411
                121,   221,   321,  421
                131,   231,   331,  431
                141,   241,   341,  441
                 .      .      .     .
                144    244    344   444

&prates
       prat=  0.215, 0.215, 0.294, 0.429,
              0.215, 0.294, 0.429, 0.886,
              0.215, 0.400, 0.500, 0.900,
              0.215, 0.450, 0.600, 1.092,
              0.599, 0.599, 0.666, 0.860,
              0.680, 0.680, 0.680, 0.886,
              0.680, 0.965, 0.965, 1.039,
              0.680, 0.965, 0.956, 1.278,
              0.599, 0.599, 0.666, 0.860,
              0.680, 0.680, 0.900, 0.965,
              0.838, 0.965, 1.000, 1.150,
              0.960, 1.000, 1.141, 1.333,
              0.631, 0.631, 0.666, 0.860,
              0.680, 0.840, 0.965, 0.980,
              0.838, 1.043, 1.141, 1.200,
              1.000, 1.100, 1.400, 1.659
  /
area type-based attraction rates:
array structure: 10 land use variables (across) by 7 area types (down)
          1      2      3      4      5      6      7      8      (9 10)
         HH    HHPOP   EMP   IndEmp RetEMP OffEMP OthEMP NRetEmp  Unused
 Atype 1
       .
       7

location- based attraction  rates:
array structure: 5 land use variables (across) by 4 locations (down)
```

```
Locations are: 1)Reg. Core, 2)DC NonCore, 3)VA 10 Mi Sq, 4)Other
          1      2      3      4      5
        IndEmp RetEMP OffEMP OthEMP  HH
 Locat 1
       .
       4

&arates
      arat= 0.00,0.00,0.00,0.00,0.29,0.00,0.00,0.00,0.00,0.00,
            0.00,0.00,0.00,0.00,2.44,0.00,0.00,0.00,0.00,0.00,
            0.00,0.00,0.00,0.00,3.35,0.00,0.00,0.00,0.00,0.00,
            0.00,0.00,0.00,0.00,3.35,0.00,0.00,0.00,0.00,0.00,
            0.00,0.00,0.00,0.00,3.35,0.00,0.00,0.00,0.00,0.00,
            0.00,0.00,0.00,0.00,3.35,0.00,0.00,0.00,0.00,0.00,
            0.00,0.00,0.00,0.00,3.35,0.00,0.00,0.00,0.00,0.00

      lrat =0.00,0.00,0.00,0.00,0.00,
            0.00,0.00,0.00,0.00,0.00,
            0.00,0.00,0.00,0.00,0.00,
            0.00,0.00,0.00,0.00,0.00

  /
prod, att jurisdiction adjustment rates for each jurisdiction(1-24)
juris. codes 1-24 are:
 1-dc   2-mtg  3-pg   4-arl  5-alx  6-ffx  7-ldn  8-pw   9  -   10-frd
11-how 12-aa  13-chs 14  -  15-car 16-cal 17-stm 18-kge 19-fbg  20-stf
21-spt 22-fau 23-clk 24-jef

&juradj
       pjuradj =1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,
                0.75,1.00,1.00,1.00,0.68,1.00,1.00,1.00,1.00,1.00,
                1.00,1.00,1.00,1.00,1.00

       ajuradj =1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,
                0.80,1.03,1.00,1.00,0.70,1.00,1.00,1.00,1.00,1.00,
                1.00,1.00,1.00,1.00,1.00
  /
global purpose adjustment array
&puradj
      purpadj  =1.500
  /
```

HBW_TG.ctl

```
Control File: HBW_TG.CTL
MWCOG Version 2 Trip Generation Model Run(CGTGV2TP)
Purpose:  HBW



  Trip purpose (purp) MUST be one of the following choices:
  'HBW' 'HBS' 'HBO' 'NHB' 'MTK' 'HTK'

&tpurp
 purp='HBW'
  /

&param
 zones   = 2191
 lastizn = 2144
 dcclo   =    1
 dcchi   =   88
 dcnlo   =   89
 dcnhi   =  319
 vaclo   = 1230
 vachi   = 1238
 va10lo  = 1239
 va10hi  = 1360
  /


&files
 zhhi1sv='hhi1_sv.dat'
 zhhi2sv='hhi2_sv.dat'
 zhhi3sv='hhi3_sv.dat'
 zhhi4sv='hhi4_sv.dat'

 zonelu ='inputs\zone.asc'
 ext_ps ='inputs\pext.asc'
 ext_as ='inputs\aext.asc'
 basezn ='basezon.dat'
 znmod  ='..\support\adjzpaf7.upw'


 outp1  ='hbw_pro.i1'
 outp2  ='hbw_pro.i2'
 outp3  ='hbw_pro.i3'
 outp4  ='hbw_pro.i4'
 outp5  ='hbw_pro.all'

 outa1  ='hbw_att.i1'
 outa2  ='hbw_att.i2'
 outa3  ='hbw_att.i3'
 outa4  ='hbw_att.i4'
 outa5  ='hbw_att.all'
  /
production rates:
array structure: 4 income groups (across) by size/va groups (down)
 inc,siz,veh:   111,   211,   311,  411
                121,   221,   321,  421
                131,   231,   331,  431
                141,   241,   341,  441
                 .      .     .     .
                144    244    344   444

&prates
       prat=  0.686, 1.017, 1.017, 1.335,
              1.082, 1.352, 1.464, 1.451,
              1.096, 1.662, 1.662, 1.672,
              1.664, 1.849, 2.295, 3.333,
              0.851, 1.182, 1.223, 1.335,
              1.082, 1.352, 1.464, 1.451,
              1.517, 1.662, 1.662, 1.672,
              1.664, 1.849, 2.295, 3.333,
              0.750, 1.301, 1.223, 1.335,
              1.412, 1.531, 1.841, 1.841,
              1.936, 1.790, 2.016, 2.017,
              1.936, 2.049, 2.295, 3.333,
              0.957, 1.527, 1.223, 2.000,
              1.412, 2.122, 2.152, 2.152,
              1.936, 2.122, 3.024, 3.024,
              1.936, 2.426, 3.076, 3.365
  /
area type-based attraction rates:
array structure: 10 land use variables (across) by 7 area types (down)
          1      2      3      4      5      6      7      8      (9 10)
        HH    HHPOP   EMP   IndEmp RetEMP OffEMP OthEMP NRetEmp  Unused
 Atype 1
       .
       7

location- based attraction  rates:
array structure: 5 land use variables (across) by 4 locations (down)
Locations are: 1)Reg. Core, 2)DC NonCore, 3)VA 10 Mi Sq, 4)Other
```

```
         1      2      3      4      5
       IndEmp RetEMP OffEMP OthEMP  HH
 Locat 1
       .
       4
&arates
      arat= 0.00,0.00,1.11,0.00,0.00,0.00,0.00,0.00,0.00,0.00,
            0.00,0.00,1.11,0.00,0.00,0.00,0.00,0.00,0.00,0.00,
            0.00,0.00,1.11,0.00,0.00,0.00,0.00,0.00,0.00,0.00,
            0.00,0.00,1.11,0.00,0.00,0.00,0.00,0.00,0.00,0.00,
            0.00,0.00,1.11,0.00,0.00,0.00,0.00,0.00,0.00,0.00,
            0.00,0.00,1.11,0.00,0.00,0.00,0.00,0.00,0.00,0.00,
            0.00,0.00,1.11,0.00,0.00,0.00,0.00,0.00,0.00,0.00

      lrat =0.00,0.00,0.00,0.00,0.00,
            0.00,0.00,0.00,0.00,0.00,
            0.00,0.00,0.00,0.00,0.00,
            0.00,0.00,0.00,0.00,0.00

  /
prod, att jurisdiction adjustment rates for each jurisdiction(1-24)
juris. codes 1-24 are:
 1-dc   2-mtg  3-pg   4-arl  5-alx  6-ffx  7-ldn  8-pw   9  -   10-frd
11-how 12-aa  13-chs 14  -  15-car 16-cal 17-stm 18-kge 19-fbg  20-stf
21-spt 22-fau 23-clk 24-jef 25-unused


&juradj
       pjuradj =1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,
                0.75,0.85,1.00,1.00,0.85,1.00,1.00,1.00,1.00,1.00,
                1.00,1.00,1.00,1.00,1.00

       ajuradj =1.07,1.00,1.10,1.00,1.00,1.00,1.00,1.00,1.00,1.00,
                0.75,0.85,1.00,1.00,0.85,1.00,1.00,1.00,1.00,1.00,
                1.00,1.00,1.00,1.00,1.00
  /
global purpose adjustment array
&puradj
      purpadj  =1.000
  /
```

HTK_TG.ctl

```
File: HTK_TG.CTL
MWCOG Version 2 Trip Generation Model Run(CGTGV2TP)
Purpose:  HTK

  Trip purpose (purp) MUST be one of the following choices:
  'HBW' 'HBS' 'HBO' 'NHB' 'MTK' 'HTK'

&tpurp
 purp='HTK'
  /

&param
 zones   = 2191
 lastizn = 2144
 dcclo   =    1
 dcchi   =   88
 dcnlo   =   89
 dcnhi   =  319
 vaclo   = 1230
 vachi   = 1238
 va10lo  = 1239
 va10hi  = 1360
  /


&files
 zhhi1sv='hhi1_sv.dat'
 zhhi2sv='hhi2_sv.dat'
 zhhi3sv='hhi3_sv.dat'
 zhhi4sv='hhi4_sv.dat'

 zonelu ='inputs\zone.asc'
 ext_ps ='inputs\pext.asc'
 ext_as ='inputs\aext.asc'
 basezn ='basezon.dat'
 znmod  ='..\support\adjznpaf.htk'



 outp1  ='htk_pro.i1'
 outp2  ='dummy.i2'
 outp3  ='dummy.i3'
 outp4  ='dummy.i4'
 outp5  ='htk_pro.all'

 outa1  ='htk_att.i1'
 outa2  ='dummy.i2'
 outa3  ='dummy.i3'
 outa4  ='dummy.i4'
 outa5  ='htk_att.all'
  /
production rates:
array structure: 4 income groups (across) by size/va groups (down)
 inc,siz,veh:   111,   211,   311,  411
                121,   221,   321,  421
                131,   231,   331,  431
                141,   241,   341,  441
                 .      .      .     .
                144    244    344   444

&prates
       prat=  0.000, 0.000, 0.000, 0.000,
              0.000, 0.000, 0.000, 0.000,
              0.000, 0.000, 0.000, 0.000,
              0.000, 0.000, 0.000, 0.000,
              0.000, 0.000, 0.000, 0.000,
              0.000, 0.000, 0.000, 0.000,
              0.000, 0.000, 0.000, 0.000,
              0.000, 0.000, 0.000, 0.000,
              0.000, 0.000, 0.000, 0.000,
              0.000, 0.000, 0.000, 0.000,
              0.000, 0.000, 0.000, 0.000,
              0.000, 0.000, 0.000, 0.000,
              0.000, 0.000, 0.000, 0.000,
              0.000, 0.000, 0.000, 0.000,
              0.000, 0.000, 0.000, 0.000,
              0.000, 0.000, 0.000, 0.000
  /
area type-based attraction rates:

array structure: 10 land use variables (across) by 7 area types (down)
          1      2      3      4      5      6      7      8      (9 10)
         HH    HHPOP   EMP   IndEmp RetEMP OffEMP OthEMP NRetEmp  Unused
 Atype 1
       .
       7

location- based attraction  rates:
array structure: 5 land use variables (across) by 4 locations (down)
Locations are: 1)Reg. Core, 2)DC NonCore, 3)VA 10 Mi Sq, 4)Other
```

```
          1      2      3      4      5
        IndEmp RetEMP OffEMP OthEMP  HH
 Locat 1
       .
       4

&arates
      arat= 0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,
            0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,
            0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,
            0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,
            0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,
            0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,
            0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00

      lrat =0.03,0.04,0.00,0.03,0.00,
            0.13,0.04,0.00,0.03,0.00,
            0.04,0.04,0.00,0.03,0.00,
            0.11,0.04,0.00,0.03,0.00

  /
prod, att jurisdiction adjustment rates for each jurisdiction(1-24)
juris. codes 1-24 are:
 1-dc   2-mtg  3-pg   4-arl  5-alx  6-ffx  7-ldn  8-pw   9  -   10-frd
11-how 12-aa  13-chs 14  -  15-car 16-cal 17-stm 18-kge 19-fbg  20-stf
21-spt 22-fau 23-clk 24-jef

&juradj
       pjuradj =1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,
                1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,
                1.00,1.00,1.00,1.00,1.00

       ajuradj =1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,
                1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,
                1.00,1.00,1.00,1.00,1.00
  /
global purpose adjustment array
&puradj
      purpadj  =1.000
  /
```

MC_HBO00.ctl

```
MC_HBO00.CTL - Version 2.1/TP+ Mode Choice Model Control File 12/17/02
               Purpose:   HBO    Year: 2000
               Auto Operating Cost (UPARM(12)): 5.0 cents/mi in 1980$

Auto Operating Cost Background
Source: Milone's 5/11/00 memo to files
          Bill
Year    Allen's      converted to  1980$
       '94 Est. -->  ('94 rate*82.4/148.2)
----   --------      ----------------------
2000      8.5        5.0 (<--4.7 was Adjusted to 5.0)
2005      8.3        4.6
2010      8.2        4.6
2015      8.1        4.5
2020      8.0        4.4
2025      7.9        4.4

CPI - All US Cities (base period '82-'84 = 100.)

Set file names:

&FILES
 J1=  'pp_hbomu.ptt',
 J3=  'pp_op_wk.skm',
 J4=  'mf_op_wk.far',
 J5=  'pp_op_dr.skm',
 J6=  'mf_op_dr.far',
 J7=  'sovppop .skm',
 HOVA='hov2ppop .skm',
 HOVB='hov3ppop .skm',
 A1=  'hbov2.a1f',
 D1=  '..\support\mctf_hbo.asc',
 D2=  '..\support\mccf_hbo.asc',
 D3=  '..\support\mc_fac.asc',

 J9='mc_hbo.trp',      LIST='mc_hbo.prn'     /

Set user-coded parameters.  Commonly modified UPARMS are:
 1 : minimum carpool size - HOV "A" (or liberal carpool definition)
 2 : intrazonal transit share
 3 : intrazonal auto driver share
 4 : I/X transit share
 5 : I/X auto driver share
 6 : minimum carpool size - HOV "B" (or stringent carpool definition)
11 : factor to scale input highway distance to whole miles
16 : apply parking cost model
17 : apply highway terminal time model
18 : model application option: 5=nwk per, 6=nwk adr, 7=no nwk
19 : un-transformed zonal data report switch (1=yes, 2=NO)
20 : transformed zonal data report switch (1=yes, 2=NO)
21 : run only MODAS & MODBS
30 : calibration report switch (1=yes, 2=no)

Here is a list of the UPARMS values we will use in this run
&PARAM
 zones      = 2191
 uparms(1)  = 0
 uparms(2)  = 0.0
 uparms(3)  = 1.0
 uparms(4)  = 0.0
 uparms(5)  = 0.620
 uparms(6)  = 0
 uparms(10) = 1.0
 uparms(11) = 0.1
 uparms(12) = 5.0
 uparms(13) = 82.5
 uparms(14) = 82.5
 uparms(16) = 2
 uparms(17) = 2
 uparms(18) = 7
 uparms(19) = 2
 uparms(20) = 1
 uparms(21) = 1
 uparms(22) = 0.75
 uparms(23) = 1.81
 uparms(24) = 3.71
 uparms(26) = 2.845
 uparms(27) = 3.703
 uparms(28) = 4.732
 uparms(30) = 1

 uparms(15) = 4.36
 uparms(31) = 0.02322
 uparms(32) = 0.02322
 uparms(33) = 0.02322
 uparms(34) = 0.02322
 uparms(35) = 0.02322
 uparms(36) = -3.196e-5
 uparms(37) = -1.694e-5
 uparms(38) = 0.0
 uparms(39) = 0.0
```

```
 uparms(40) = 0.0
 uparms(41) = 0.0
 uparms(42) = 0.02322
 uparms(43) = 2.9106
 uparms(44) = 0.4000
 uparms(45) = 0.1619
 uparms(46) = -3.777e-5
 uparms(47) = 0.02322
 uparms(48) = 0.02322
 uparms(49) = 0.0
 uparms(50) = 0.0
 uparms(51) = 0.0
 uparms(52) = 0.0
 uparms(53) = 3.3764
 uparms(54) = -1.0058
 uparms(55) = -1.3659
 uparms(56) = -1.941e-5
 uparms(57) = 0.02322
 uparms(58) = 0.02322
 uparms(59) = 0.0
 uparms(60) = 0.0
 uparms(61) = 0.0
 uparms(62) = 0.0
 uparms(63) = 2.0908
 uparms(64) = -0.6236
 uparms(65) = -1.2312
 uparms(66) = 0.65329
 uparms(67) = 0.68530
 uparms(68) = 0.68530
 uparms(69) = 0.0
 uparms(70) = 0.0
 uparms(71) = 0.0
 uparms(72) = 0.0
 uparms(73) = 0.68530
 uparms(74) = 0.68530
 uparms(75) = 0.0
 uparms(76) = 0.0
 uparms(77) = 0.0
 uparms(78) = 0.0
 uparms(79) = 0.0
 uparms(80) = 0.31756
 uparms(81) = 0.15151
 uparms(82) = 0.65329
 uparms(83) = 0.68530
 uparms(84) = 0.68530
 uparms(85) = 0.0
 uparms(86) = 0.0
 uparms(87) = 0.0
 uparms(88) = 0.0
 uparms(89) = 0.0
 uparms(90) = 0.0
 uparms(91) = -0.21854
 uparms(92) = -0.42569
 uparms(93) = 0.0
 uparms(94) = 0.0
 uparms(95) = 3
 uparms(96) = 0.0
 uparms(97) = 0.0
 uparms(98) = 0.0
 uparms(99) = -0.88910
 uparms(100)= 0.0
 OrigSLWalk = t
 DestSLWalk = t
 UseShort   = t
 /

Set zone-district equivalencies for exogenous modal factors
based on 2191 zone system:

HBW Transit:

 &ADJDST ADST=1,AZNE=1,-88              / dc core
 &ADJDST ADST=2,AZNE=89,-319            / dc noncore
 &ADJDST ADST=3,AZNE=320,-639           / mtg
 &ADJDST ADST=4,AZNE=640,-1029          / pg
 &ADJDST ADST=5,AZNE=1230,-1238         / arl core
 &ADJDST ADST=6,AZNE=1239,-1329         / arl noncore
 &ADJDST ADST=7,AZNE=1330,-1399         / alx
 &ADJDST ADST=8,AZNE=1400,-1779         / ffx
 &ADJDST ADST=9,AZNE=1780,-1919         / ldn
 &ADJDST ADST=10,AZNE=1920,-2069        / pw
 &ADJDST ADST=11,AZNE=1030,-1059        / frd
 &ADJDST ADST=12,AZNE=1080,-1109        / how
 &ADJDST ADST=13,AZNE=1110,-1149        / aa
 &ADJDST ADST=14,AZNE=1200,-1229        / chs
 &ADJDST ADST=15,AZNE=1060,-1079        / car
 &ADJDST ADST=16,AZNE=1150,-1199        / cal,stm
 &ADJDST ADST=17,AZNE=2070,-2114        / stf,kg,spts,fbrg
 &ADJDST ADST=18,AZNE=2115,-2129        / fau
 &ADJDST ADST=19,AZNE=2130,-2144        / clk,jef
 &ADJDST ADST=20,AZNE=2145,-2191        / externals

       Non-Work/NHB Transit: (These are not used)
 &NWKDST NDST=1,NZNE=1,-88              / dc core
 &NWKDST NDST=2,NZNE=89,-319            / dc noncore
 &NWKDST NDST=3,NZNE=320,-639           / mtg
 &NWKDST NDST=4,NZNE=640,-1029          / pg
 &NWKDST NDST=5,NZNE=1230,-1238         / arl core
 &NWKDST NDST=6,NZNE=1239,-1329         / arl noncore
 &NWKDST NDST=7,NZNE=1330,-1399         / alx
 &NWKDST NDST=8,NZNE=1400,-1779         / ffx
 &NWKDST NDST=9,NZNE=1780,-1919         / ldn
 &NWKDST NDST=10,NZNE=1920,-2069        / pw
 &NWKDST NDST=11,NZNE=1030,-1059        / frd
 &NWKDST NDST=12,NZNE=1080,-1109        / how
 &NWKDST NDST=13,NZNE=1110,-1149        / aa
 &NWKDST NDST=14,NZNE=1200,-1229        / chs
 &NWKDST NDST=15,NZNE=1060,-1079        / car
 &NWKDST NDST=16,NZNE=1150,-1199        / cal,stm
 &NWKDST NDST=17,NZNE=2070,-2114        / stf,kg,spts,fbrg
 &NWKDST NDST=18,NZNE=2115,-2129        / fau
 &NWKDST NDST=19,NZNE=2130,-2144        / clk,jef
 &NWKDST NDST=20,NZNE=2145,-2191        / externals

       Car Occupancy:
 &CARDST CDST=1,CZNE=1,-88              / dc core
 &CARDST CDST=2,CZNE=89,-319            / dc noncore
 &CARDST CDST=3,CZNE=320,-639           / mtg
 &CARDST CDST=4,CZNE=640,-1029          / pg
 &CARDST CDST=5,CZNE=1230,-1238         / arl core
 &CARDST CDST=6,CZNE=1239,-1329         / arl noncore
 &CARDST CDST=7,CZNE=1330,-1399         / alx
 &CARDST CDST=8,CZNE=1400,-1779         / ffx
 &CARDST CDST=9,CZNE=1780,-1919         / ldn
 &CARDST CDST=10,CZNE=1920,-2069        / pw
 &CARDST CDST=11,CZNE=1030,-1059        / frd
 &CARDST CDST=12,CZNE=1080,-1109        / how
 &CARDST CDST=13,CZNE=1110,-1149        / aa
 &CARDST CDST=14,CZNE=1200,-1229        / chs
 &CARDST CDST=15,CZNE=1060,-1079        / car
 &CARDST CDST=16,CZNE=1150,-1199        / cal,stm
 &CARDST CDST=17,CZNE=2070,-2114        / stf,kg,spts,fbrg
 &CARDST CDST=18,CZNE=2115,-2129        / fau
 &CARDST CDST=19,CZNE=2130,-2144        / clk,jef
 &CARDST CDST=20,CZNE=2145,-2191        / externals
```

```
        External Stations:
 &XTERN EDST = 1, EZNE = 2145         /
 &XTERN EDST = 2, EZNE = 2146         /
 &XTERN EDST = 3, EZNE = 2147,-2191   /
```

MC_HBO25.ctl

```
MC_HBO25.CTL - Version 2.1/TP+ Mode Choice Model Control File 12/17/02
               Purpose:   HBO    Year: 2025
               Auto Operating Cost (UPARM(12)): 4.4 cents/mi in 1980$

Auto Operating Cost Background
Source: Milone's 5/11/00 memo to files
         Bill
Year    Allen's      converted to  1980$
       '94 Est. -->  ('94 rate*82.4/148.2)
----   --------      ---------------------
2000      8.5        5.0 (<--4.7 was Adjusted to 5.0)
2005      8.3        4.6
2010      8.2        4.6
2015      8.1        4.5
2020      8.0        4.4
2025      7.9        4.4

CPI - All US Cities (base period '82-'84 = 100.)

Set file names:

&FILES
 J1=  'pp_hbomu.ptt',
 J3=  'pp_op_wk.skm',
 J4=  'mf_op_wk.far',
 J5=  'pp_op_dr.skm',
 J6=  'mf_op_dr.far',
 J7=  'sovppop .skm',
 HOVA='hov2ppop .skm',
 HOVB='hov3ppop .skm',
 A1=  'hbov2.a1f',
 D1=  '..\support\mctf_hbo.asc',
 D2=  '..\support\mccf_hbo.asc',
 D3=  '..\support\mc_fac.asc',

 J9='mc_hbo.trp',      LIST='mc_hbo.prn'     /

Set user-coded parameters.  Commonly modified UPARMS are:
 1 : minimum carpool size - HOV "A" (or liberal carpool definition)
 2 : intrazonal transit share
 3 : intrazonal auto driver share
 4 : I/X transit share
 5 : I/X auto driver share
 6 : minimum carpool size - HOV "B" (or stringent carpool definition)
11 : factor to scale input highway distance to whole miles
16 : apply parking cost model
17 : apply highway terminal time model
18 : model application option: 5=nwk per, 6=nwk adr, 7=no nwk
19 : un-transformed zonal data report switch (1=yes, 2=NO)
20 : transformed zonal data report switch (1=yes, 2=NO)
21 : run only MODAS & MODBS
30 : calibration report switch (1=yes, 2=no)

Here is a list of the UPARMS values we will use in this run
&PARAM
 zones      = 2191
 uparms(1)  = 0
 uparms(2)  = 0.0
 uparms(3)  = 1.0
 uparms(4)  = 0.0
 uparms(5)  = 0.620
 uparms(6)  = 0
 uparms(10) = 1.0
 uparms(11) = 0.1
 uparms(12) = 4.4
 uparms(13) = 82.5
 uparms(14) = 82.5
 uparms(16) = 2
 uparms(17) = 2
 uparms(18) = 7
 uparms(19) = 2
 uparms(20) = 1
 uparms(21) = 1
 uparms(22) = 0.75
 uparms(23) = 1.81
 uparms(24) = 3.71
 uparms(26) = 2.845
 uparms(27) = 3.703
 uparms(28) = 4.732
 uparms(30) = 1

 uparms(15) = 4.36
 uparms(31) = 0.02322
 uparms(32) = 0.02322
 uparms(33) = 0.02322
 uparms(34) = 0.02322
 uparms(35) = 0.02322
 uparms(36) = -3.196e-5
 uparms(37) = -1.694e-5
 uparms(38) = 0.0
 uparms(39) = 0.0
 uparms(40) = 0.0
 uparms(41) = 0.0
 uparms(42) = 0.02322
 uparms(43) = 2.9106
 uparms(44) = 0.4000
 uparms(45) = 0.1619
 uparms(46) = -3.777e-5
 uparms(47) = 0.02322
 uparms(48) = 0.02322
 uparms(49) = 0.0
 uparms(50) = 0.0
 uparms(51) = 0.0
 uparms(52) = 0.0
 uparms(53) = 3.3764
 uparms(54) = -1.0058
 uparms(55) = -1.3659
 uparms(56) = -1.941e-5
 uparms(57) = 0.02322
 uparms(58) = 0.02322
 uparms(59) = 0.0
 uparms(60) = 0.0
 uparms(61) = 0.0
 uparms(62) = 0.0
 uparms(63) = 2.0908
 uparms(64) = -0.6236
 uparms(65) = -1.2312
 uparms(66) = 0.65329
 uparms(67) = 0.68530
 uparms(68) = 0.68530
 uparms(69) = 0.0
 uparms(70) = 0.0
 uparms(71) = 0.0
 uparms(72) = 0.0
 uparms(73) = 0.68530
 uparms(74) = 0.68530
 uparms(75) = 0.0
 uparms(76) = 0.0
```

```
 uparms(77) = 0.0
 uparms(78) = 0.0
 uparms(79) = 0.0
 uparms(80) = 0.31756
 uparms(81) = 0.15151
 uparms(82) = 0.65329
 uparms(83) = 0.68530
 uparms(84) = 0.68530
 uparms(85) = 0.0
 uparms(86) = 0.0
 uparms(87) = 0.0
 uparms(88) = 0.0
 uparms(89) = 0.0
 uparms(90) = 0.0
 uparms(91) = -0.21854
 uparms(92) = -0.42569
 uparms(93) = 0.0
 uparms(94) = 0.0
 uparms(95) = 3
 uparms(96) = 0.0
 uparms(97) = 0.0
 uparms(98) = 0.0
 uparms(99) = -0.88910
 uparms(100)= 0.0
 OrigSLWalk = t
 DestSLWalk = t
 UseShort   = t
 /

Set zone-district equivalencies for exogenous modal factors
based on 2191 zone system:
HBW Transit:

 &ADJDST ADST=1,AZNE=1,-88              / dc core
 &ADJDST ADST=2,AZNE=89,-319            / dc noncore
 &ADJDST ADST=3,AZNE=320,-639           / mtg
 &ADJDST ADST=4,AZNE=640,-1029          / pg
 &ADJDST ADST=5,AZNE=1230,-1238         / arl core
 &ADJDST ADST=6,AZNE=1239,-1329         / arl noncore
 &ADJDST ADST=7,AZNE=1330,-1399         / alx
 &ADJDST ADST=8,AZNE=1400,-1779         / ffx
 &ADJDST ADST=9,AZNE=1780,-1919         / ldn
 &ADJDST ADST=10,AZNE=1920,-2069        / pw
 &ADJDST ADST=11,AZNE=1030,-1059        / frd
 &ADJDST ADST=12,AZNE=1080,-1109        / how
 &ADJDST ADST=13,AZNE=1110,-1149        / aa
 &ADJDST ADST=14,AZNE=1200,-1229        / chs
 &ADJDST ADST=15,AZNE=1060,-1079        / car
 &ADJDST ADST=16,AZNE=1150,-1199        / cal,stm
 &ADJDST ADST=17,AZNE=2070,-2114        / stf,kg,spts,fbrg
 &ADJDST ADST=18,AZNE=2115,-2129        / fau
 &ADJDST ADST=19,AZNE=2130,-2144        / clk,jef
 &ADJDST ADST=20,AZNE=2145,-2191        / externals

       Non-Work/NHB Transit: (These are not used)
 &NWKDST NDST=1,NZNE=1,-88              / dc core
 &NWKDST NDST=2,NZNE=89,-319            / dc noncore
 &NWKDST NDST=3,NZNE=320,-639           / mtg
 &NWKDST NDST=4,NZNE=640,-1029          / pg
 &NWKDST NDST=5,NZNE=1230,-1238         / arl core
 &NWKDST NDST=6,NZNE=1239,-1329         / arl noncore
 &NWKDST NDST=7,NZNE=1330,-1399         / alx
 &NWKDST NDST=8,NZNE=1400,-1779         / ffx
 &NWKDST NDST=9,NZNE=1780,-1919         / ldn
 &NWKDST NDST=10,NZNE=1920,-2069        / pw
 &NWKDST NDST=11,NZNE=1030,-1059        / frd
 &NWKDST NDST=12,NZNE=1080,-1109        / how
 &NWKDST NDST=13,NZNE=1110,-1149        / aa
 &NWKDST NDST=14,NZNE=1200,-1229        / chs
 &NWKDST NDST=15,NZNE=1060,-1079        / car
 &NWKDST NDST=16,NZNE=1150,-1199        / cal,stm
 &NWKDST NDST=17,NZNE=2070,-2114        / stf,kg,spts,fbrg
 &NWKDST NDST=18,NZNE=2115,-2129        / fau
 &NWKDST NDST=19,NZNE=2130,-2144        / clk,jef
 &NWKDST NDST=20,NZNE=2145,-2191        / externals

       Car Occupancy:
 &CARDST CDST=1,CZNE=1,-88              / dc core
 &CARDST CDST=2,CZNE=89,-319            / dc noncore
 &CARDST CDST=3,CZNE=320,-639           / mtg
 &CARDST CDST=4,CZNE=640,-1029          / pg
 &CARDST CDST=5,CZNE=1230,-1238         / arl core
 &CARDST CDST=6,CZNE=1239,-1329         / arl noncore
 &CARDST CDST=7,CZNE=1330,-1399         / alx
 &CARDST CDST=8,CZNE=1400,-1779         / ffx
 &CARDST CDST=9,CZNE=1780,-1919         / ldn
 &CARDST CDST=10,CZNE=1920,-2069        / pw
 &CARDST CDST=11,CZNE=1030,-1059        / frd
 &CARDST CDST=12,CZNE=1080,-1109        / how
 &CARDST CDST=13,CZNE=1110,-1149        / aa
 &CARDST CDST=14,CZNE=1200,-1229        / chs
 &CARDST CDST=15,CZNE=1060,-1079        / car
 &CARDST CDST=16,CZNE=1150,-1199        / cal,stm
 &CARDST CDST=17,CZNE=2070,-2114        / stf,kg,spts,fbrg
 &CARDST CDST=18,CZNE=2115,-2129        / fau
 &CARDST CDST=19,CZNE=2130,-2144        / clk,jef
 &CARDST CDST=20,CZNE=2145,-2191        / externals


       External Stations:
 &XTERN EDST = 1, EZNE = 2145         /
 &XTERN EDST = 2, EZNE = 2146         /
 &XTERN EDST = 3, EZNE = 2147,-2191   /
```

MC_HBO94.ctl

```
MC_HBO94.CTL - Version 2.1/TP+ Mode Choice Model Control File 12/17/02
               Purpose:   HBO    Year: 1994
               Auto Operating Cost (UPARM(12)): 5.3 cents/mi in 1980$


Set file names:

&FILES
 J1=  'pp_hbomu.ptt',
 J3=  'pp_op_wk.skm',
 J4=  'mf_op_wk.far',
 J5=  'pp_op_dr.skm',
 J6=  'mf_op_dr.far',
 J7=  'sovppop .skm',
 HOVA='hov2ppop .skm',
 HOVB='hov3ppop .skm',
 A1=  'hbov2.a1f',
 D1=  '..\support\mctf_hbo.asc',
 D2=  '..\support\mccf_hbo.asc',
 D3=  '..\support\mc_fac.asc',

 J9='mc_hbo.trp',      LIST='mc_hbo.prn'     /

Set user-coded parameters.  Commonly modified UPARMS are:
 1 : minimum carpool size - HOV "A" (or liberal carpool definition)
 2 : intrazonal transit share
 3 : intrazonal auto driver share
 4 : I/X transit share
 5 : I/X auto driver share
```

```
 6 : minimum carpool size - HOV "B" (or stringent carpool definition)
11 : factor to scale input highway distance to whole miles
16 : apply parking cost model
17 : apply highway terminal time model
18 : model application option: 5=nwk per, 6=nwk adr, 7=no nwk
19 : un-transformed zonal data report switch (1=yes, 2=NO)
20 : transformed zonal data report switch (1=yes, 2=NO)
21 : run only MODAS & MODBS
30 : calibration report switch (1=yes, 2=no)

Here is a list of the UPARMS values we will use in this run
&PARAM
 zones      = 2191
 uparms(1)  = 0
 uparms(2)  = 0.0
 uparms(3)  = 1.0
 uparms(4)  = 0.0
 uparms(5)  = 0.620
 uparms(6)  = 0
 uparms(10) = 1.0
 uparms(11) = 0.1
 uparms(12) = 5.3
 uparms(13) = 82.5
 uparms(14) = 82.5
 uparms(16) = 2
 uparms(17) = 2
 uparms(18) = 7
 uparms(19) = 2
 uparms(20) = 1
 uparms(21) = 1
 uparms(22) = 0.75
 uparms(23) = 1.81
 uparms(24) = 3.71
 uparms(26) = 2.845
 uparms(27) = 3.703
 uparms(28) = 4.732
 uparms(30) = 1

 uparms(15) = 4.36
 uparms(31) = 0.02322
 uparms(32) = 0.02322
 uparms(33) = 0.02322
 uparms(34) = 0.02322
 uparms(35) = 0.02322
 uparms(36) = -3.196e-5
 uparms(37) = -1.694e-5
 uparms(38) = 0.0
 uparms(39) = 0.0
 uparms(40) = 0.0
 uparms(41) = 0.0
 uparms(42) = 0.02322
 uparms(43) = 2.9106
 uparms(44) = 0.4000
 uparms(45) = 0.1619
 uparms(46) = -3.777e-5
 uparms(47) = 0.02322
 uparms(48) = 0.02322
 uparms(49) = 0.0
 uparms(50) = 0.0
 uparms(51) = 0.0
 uparms(52) = 0.0
 uparms(53) = 3.3764
 uparms(54) = -1.0058
 uparms(55) = -1.3659
 uparms(56) = -1.941e-5
 uparms(57) = 0.02322
 uparms(58) = 0.02322
 uparms(59) = 0.0
 uparms(60) = 0.0
 uparms(61) = 0.0
 uparms(62) = 0.0
 uparms(63) = 2.0908
 uparms(64) = -0.6236
 uparms(65) = -1.2312
 uparms(66) = 0.65329
 uparms(67) = 0.68530
 uparms(68) = 0.68530
 uparms(69) = 0.0
 uparms(70) = 0.0
 uparms(71) = 0.0
 uparms(72) = 0.0
 uparms(73) = 0.68530
 uparms(74) = 0.68530
 uparms(75) = 0.0
 uparms(76) = 0.0
 uparms(77) = 0.0
 uparms(78) = 0.0
 uparms(79) = 0.0
 uparms(80) = 0.31756
 uparms(81) = 0.15151
 uparms(82) = 0.65329
 uparms(83) = 0.68530
 uparms(84) = 0.68530
 uparms(85) = 0.0
 uparms(86) = 0.0
 uparms(87) = 0.0
 uparms(88) = 0.0
 uparms(89) = 0.0
 uparms(90) = 0.0
 uparms(91) = -0.21854
 uparms(92) = -0.42569
 uparms(93) = 0.0
 uparms(94) = 0.0
 uparms(95) = 3
 uparms(96) = 0.0
 uparms(97) = 0.0
 uparms(98) = 0.0
 uparms(99) = -0.88910
 uparms(100)= 0.0
 OrigSLWalk = t
 DestSLWalk = t
 UseShort   = t
 /

Set zone-district equivalencies for exogenous modal factors
based on 2191 zone system:
HBW Transit:

 &ADJDST ADST=1,AZNE=1,-88              / dc core
 &ADJDST ADST=2,AZNE=89,-319            / dc noncore
 &ADJDST ADST=3,AZNE=320,-639           / mtg
 &ADJDST ADST=4,AZNE=640,-1029          / pg
 &ADJDST ADST=5,AZNE=1230,-1238         / arl core
 &ADJDST ADST=6,AZNE=1239,-1329         / arl noncore
 &ADJDST ADST=7,AZNE=1330,-1399         / alx
 &ADJDST ADST=8,AZNE=1400,-1779         / ffx
 &ADJDST ADST=9,AZNE=1780,-1919         / ldn
 &ADJDST ADST=10,AZNE=1920,-2069        / pw
 &ADJDST ADST=11,AZNE=1030,-1059        / frd
 &ADJDST ADST=12,AZNE=1080,-1109        / how
 &ADJDST ADST=13,AZNE=1110,-1149        / aa
 &ADJDST ADST=14,AZNE=1200,-1229        / chs
 &ADJDST ADST=15,AZNE=1060,-1079        / car
 &ADJDST ADST=16,AZNE=1150,-1199        / cal,stm
 &ADJDST ADST=17,AZNE=2070,-2114        / stf,kg,spts,fbrg
 &ADJDST ADST=18,AZNE=2115,-2129        / fau
```

```
 &ADJDST ADST=19,AZNE=2130,-2144         / clk,jef
 &ADJDST ADST=20,AZNE=2145,-2191         / externals

       Non-Work/NHB Transit: (These are not used)
 &NWKDST NDST=1,NZNE=1,-88               / dc core
 &NWKDST NDST=2,NZNE=89,-319             / dc noncore
 &NWKDST NDST=3,NZNE=320,-639            / mtg
 &NWKDST NDST=4,NZNE=640,-1029           / pg
 &NWKDST NDST=5,NZNE=1230,-1238          / arl core
 &NWKDST NDST=6,NZNE=1239,-1329          / arl noncore
 &NWKDST NDST=7,NZNE=1330,-1399          / alx
 &NWKDST NDST=8,NZNE=1400,-1779          / ffx
 &NWKDST NDST=9,NZNE=1780,-1919          / ldn
 &NWKDST NDST=10,NZNE=1920,-2069         / pw
 &NWKDST NDST=11,NZNE=1030,-1059         / frd
 &NWKDST NDST=12,NZNE=1080,-1109         / how
 &NWKDST NDST=13,NZNE=1110,-1149         / aa
 &NWKDST NDST=14,NZNE=1200,-1229         / chs
 &NWKDST NDST=15,NZNE=1060,-1079         / car
 &NWKDST NDST=16,NZNE=1150,-1199         / cal,stm
 &NWKDST NDST=17,NZNE=2070,-2114         / stf,kg,spts,fbrg
 &NWKDST NDST=18,NZNE=2115,-2129         / fau
 &NWKDST NDST=19,NZNE=2130,-2144         / clk,jef
 &NWKDST NDST=20,NZNE=2145,-2191         / externals

       Car Occupancy:
 &CARDST CDST=1,CZNE=1,-88               / dc core
 &CARDST CDST=2,CZNE=89,-319             / dc noncore
 &CARDST CDST=3,CZNE=320,-639            / mtg
 &CARDST CDST=4,CZNE=640,-1029           / pg
 &CARDST CDST=5,CZNE=1230,-1238          / arl core
 &CARDST CDST=6,CZNE=1239,-1329          / arl noncore
 &CARDST CDST=7,CZNE=1330,-1399          / alx
 &CARDST CDST=8,CZNE=1400,-1779          / ffx
 &CARDST CDST=9,CZNE=1780,-1919          / ldn
 &CARDST CDST=10,CZNE=1920,-2069         / pw
 &CARDST CDST=11,CZNE=1030,-1059         / frd
 &CARDST CDST=12,CZNE=1080,-1109         / how
 &CARDST CDST=13,CZNE=1110,-1149         / aa
 &CARDST CDST=14,CZNE=1200,-1229         / chs
 &CARDST CDST=15,CZNE=1060,-1079         / car
 &CARDST CDST=16,CZNE=1150,-1199         / cal,stm
 &CARDST CDST=17,CZNE=2070,-2114         / stf,kg,spts,fbrg
 &CARDST CDST=18,CZNE=2115,-2129         / fau
 &CARDST CDST=19,CZNE=2130,-2144         / clk,jef
 &CARDST CDST=20,CZNE=2145,-2191         / externals


       External Stations:
 &XTERN EDST = 1, EZNE = 2145         /
 &XTERN EDST = 2, EZNE = 2146         /
 &XTERN EDST = 3, EZNE = 2147,-2191   /
```

MC_HBS00.ctl

```
MC_HBS00.CTL - Version 2.1/TP+ Mode Choice Model Control File 12/17/02
               Purpose:   HBS    Year: 2000
               Auto Operating Cost (UPARM(12)): 5.0 cents/mi in 1980$

Auto Operating Cost Background
Source: Milone's 5/11/00 memo to files
         Bill
Year    Allen's      converted to  1980$
      '94 Est. -->  ('94 rate*82.4/148.2)
----   --------      ---------------------
2000      8.5        5.0 (<--4.7 was Adjusted to 5.0)
2005      8.3        4.6
2010      8.2        4.6
2015      8.1        4.5
2020      8.0        4.4
2025      7.9        4.4

CPI - All US Cities (base period '82-'84 = 100.)

Set file names:

&FILES
 J1=  'pp_hbsmu.ptt',
 J3=  'pp_op_wk.skm',
 J4=  'mf_op_wk.far',
 J5=  'pp_op_dr.skm',
 J6=  'mf_op_dr.far',
 J7=  'sovppop.skm',
 HOVA='hov2ppop.skm',
 HOVB='hov3ppop.skm',
 A1=  'hbsv2.a1f',
 D1=  '..\support\mctf_hbs.asc',
 D2=  '..\support\mccf_hbs.asc',
 D3=  '..\support\mc_fac.asc',

 J9='mc_hbs.trp',      LIST='mc_hbs.prn'     /

Set user-coded parameters.  Commonly modified UPARMS are:
 1 : minimum carpool size - HOV "A" (or liberal carpool definition)
 2 : intrazonal transit share
 3 : intrazonal auto driver share
 4 : I/X transit share
 5 : I/X auto driver share
 6 : minimum carpool size - HOV "B" (or stringent carpool definition)
11 : factor to scale input highway distance to whole miles
16 : apply parking cost model
17 : apply highway terminal time model
18 : model application option: 5=nwk per, 6=nwk adr, 7=no nwk
19 : un-transformed zonal data report switch (1=yes, 2=NO)
20 : transformed zonal data report switch (1=yes, 2=NO)
21 : run only MODAS & MODBS
30 : calibration report switch (1=yes, 2=no)

Here is a list of the UPARMS values we will use in this run
&PARAM
 zones      = 2191
 uparms(1)  = 0
 uparms(2)  = 0.0
 uparms(3)  = 1.0
 uparms(4)  = 0.0
 uparms(5)  = 0.610
 uparms(6)  = 0
 uparms(10) = 1.0
 uparms(11) = 0.1
 uparms(12) = 5.0
 uparms(13) = 82.5
 uparms(14) = 82.5
 uparms(16) = 2
 uparms(17) = 2
 uparms(18) = 7
 uparms(19) = 2
 uparms(20) = 1
 uparms(21) = 1
 uparms(22) = 0.27
 uparms(23) = 0.72
 uparms(24) = 1.11
 uparms(26) = 2.845
 uparms(27) = 3.703
 uparms(28) = 4.732
 uparms(30) = 1
```

```
uparms(15) = 4.36
uparms(31) = 0.02168
uparms(32) = 0.02168
uparms(33) = 0.02168
uparms(34) = 0.02168
uparms(35) = 0.02168
uparms(36) = -3.752e-5
uparms(37) = -1.955e-5
uparms(38) = 0.0
uparms(39) = 0.0
uparms(40) = 0.00758
uparms(41) = 0.0
uparms(42) = 0.02168
uparms(43) = 3.827
uparms(44) = 0.3546
uparms(45) = -0.8
uparms(46) = 0.0
uparms(47) = 0.02168
uparms(48) = 0.02168
uparms(49) = 0.00758
uparms(50) = 0.00758
uparms(51) = 0.00758
uparms(52) = 0.0
uparms(53) = 3.7540
uparms(54) = -1.7629
uparms(55) = -2.9904
uparms(56) = -3.269e-5
uparms(57) = 0.02168
uparms(58) = 0.02168
uparms(59) = 0.00758
uparms(60) = 0.00758
uparms(61) = 0.00758
uparms(62) = 0.0
uparms(63) = 1.5111
uparms(64) = -1.4377
uparms(65) = -2.6864
uparms(66) = 0.0
uparms(67) = 0.45633
uparms(68) = 0.45633
uparms(69) = 0.0
uparms(70) = 0.0
uparms(71) = 0.0
uparms(72) = 0.0
uparms(73) = 0.45633
uparms(74) = 0.45633
uparms(75) = 0.0
uparms(76) = 0.0
uparms(77) = 0.0
uparms(78) = 0.0
uparms(79) = 0.0
uparms(80) = 0.92201
uparms(81) = 0.48966
uparms(82) = 0.0
uparms(83) = 0.45633
uparms(84) = 0.45633
uparms(85) = 0.0
uparms(86) = 0.0
uparms(87) = 0.0
uparms(88) = 0.0
uparms(89) = 0.0
uparms(90) = 1.51854
uparms(91) = 0.84071
uparms(92) = 0.0
uparms(93) = 0.0
uparms(94) = 0.0
uparms(95) = 3
uparms(96) = 0.0
uparms(97) = 0.0
uparms(98) = 0.0
uparms(99) = -0.97516
uparms(100)= 0.0
OrigSLWalk = t
DestSLWalk = t
UseShort   = t
/

Set zone-district equivalencies for exogenous modal factors
based on 2191 zone system:
HBW Transit:

 &ADJDST ADST=1,AZNE=1,-88              / dc core
 &ADJDST ADST=2,AZNE=89,-319            / dc noncore
 &ADJDST ADST=3,AZNE=320,-639           / mtg
 &ADJDST ADST=4,AZNE=640,-1029          / pg
 &ADJDST ADST=5,AZNE=1230,-1238         / arl core
 &ADJDST ADST=6,AZNE=1239,-1329         / arl noncore
 &ADJDST ADST=7,AZNE=1330,-1399         / alx
 &ADJDST ADST=8,AZNE=1400,-1779         / ffx
 &ADJDST ADST=9,AZNE=1780,-1919         / ldn
 &ADJDST ADST=10,AZNE=1920,-2069        / pw
 &ADJDST ADST=11,AZNE=1030,-1059        / frd
 &ADJDST ADST=12,AZNE=1080,-1109        / how
 &ADJDST ADST=13,AZNE=1110,-1149        / aa
 &ADJDST ADST=14,AZNE=1200,-1229        / chs
 &ADJDST ADST=15,AZNE=1060,-1079        / car
 &ADJDST ADST=16,AZNE=1150,-1199        / cal,stm
 &ADJDST ADST=17,AZNE=2070,-2114        / stf,kg,spts,fbrg
 &ADJDST ADST=18,AZNE=2115,-2129        / fau
 &ADJDST ADST=19,AZNE=2130,-2144        / clk,jef
 &ADJDST ADST=20,AZNE=2145,-2191        / externals

       Non-Work/NHB Transit: (These are not used)
 &NWKDST NDST=1,NZNE=1,-88              / dc core
 &NWKDST NDST=2,NZNE=89,-319            / dc noncore
 &NWKDST NDST=3,NZNE=320,-639           / mtg
 &NWKDST NDST=4,NZNE=640,-1029          / pg
 &NWKDST NDST=5,NZNE=1230,-1238         / arl core
 &NWKDST NDST=6,NZNE=1239,-1329         / arl noncore
 &NWKDST NDST=7,NZNE=1330,-1399         / alx
 &NWKDST NDST=8,NZNE=1400,-1779         / ffx
 &NWKDST NDST=9,NZNE=1780,-1919         / ldn
 &NWKDST NDST=10,NZNE=1920,-2069        / pw
 &NWKDST NDST=11,NZNE=1030,-1059        / frd
 &NWKDST NDST=12,NZNE=1080,-1109        / how
 &NWKDST NDST=13,NZNE=1110,-1149        / aa
 &NWKDST NDST=14,NZNE=1200,-1229        / chs
 &NWKDST NDST=15,NZNE=1060,-1079        / car
 &NWKDST NDST=16,NZNE=1150,-1199        / cal,stm
 &NWKDST NDST=17,NZNE=2070,-2114        / stf,kg,spts,fbrg
 &NWKDST NDST=18,NZNE=2115,-2129        / fau
 &NWKDST NDST=19,NZNE=2130,-2144        / clk,jef
 &NWKDST NDST=20,NZNE=2145,-2191        / externals

       Car Occupancy:
 &CARDST CDST=1,CZNE=1,-88              / dc core
 &CARDST CDST=2,CZNE=89,-319            / dc noncore
 &CARDST CDST=3,CZNE=320,-639           / mtg
 &CARDST CDST=4,CZNE=640,-1029          / pg
 &CARDST CDST=5,CZNE=1230,-1238         / arl core
 &CARDST CDST=6,CZNE=1239,-1329         / arl noncore
 &CARDST CDST=7,CZNE=1330,-1399         / alx
 &CARDST CDST=8,CZNE=1400,-1779         / ffx
 &CARDST CDST=9,CZNE=1780,-1919         / ldn
 &CARDST CDST=10,CZNE=1920,-2069        / pw
 &CARDST CDST=11,CZNE=1030,-1059        / frd
```

```
 &CARDST CDST=12,CZNE=1080,-1109         / how
 &CARDST CDST=13,CZNE=1110,-1149         / aa
 &CARDST CDST=14,CZNE=1200,-1229         / chs
 &CARDST CDST=15,CZNE=1060,-1079         / car
 &CARDST CDST=16,CZNE=1150,-1199         / cal,stm
 &CARDST CDST=17,CZNE=2070,-2114         / stf,kg,spts,fbrg
 &CARDST CDST=18,CZNE=2115,-2129         / fau
 &CARDST CDST=19,CZNE=2130,-2144         / clk,jef
 &CARDST CDST=20,CZNE=2145,-2191         / externals


       External Stations:
 &XTERN EDST = 1, EZNE = 2145         /
 &XTERN EDST = 2, EZNE = 2146         /
 &XTERN EDST = 3, EZNE = 2147,-2191   /
```

MC_HBS25.ctl

```
MC_HBS25.CTL - Version 2.1/TP+ Mode Choice Model Control File 12/17/02
               Purpose:   HBS    Year: 2025
               Auto Operating Cost (UPARM(12)): 4.4 cents/mi in 1980$

Auto Operating Cost Background
Source: Milone's 5/11/00 memo to files
         Bill
Year    Allen's      converted to  1980$
       '94 Est. -->  ('94 rate*82.4/148.2)
----   --------      ---------------------
2000      8.5        5.0 (<--4.7 was Adjusted to 5.0)
2005      8.3        4.6
2010      8.2        4.6
2015      8.1        4.5
2020      8.0        4.4
2025      7.9        4.4

CPI - All US Cities (base period '82-'84 = 100.)

Set file names:

&FILES
 J1=  'pp_hbsmu.ptt',
 J3=  'pp_op_wk.skm',
 J4=  'mf_op_wk.far',
 J5=  'pp_op_dr.skm',
 J6=  'mf_op_dr.far',
 J7=  'sovppop.skm',
 HOVA='hov2ppop.skm',
 HOVB='hov3ppop.skm',
 A1=  'hbsv2.a1f',
 D1=  '..\support\mctf_hbs.asc',
 D2=  '..\support\mccf_hbs.asc',
 D3=  '..\support\mc_fac.asc',

 J9='mc_hbs.trp',      LIST='mc_hbs.prn'     /

Set user-coded parameters.  Commonly modified UPARMS are:
 1 : minimum carpool size - HOV "A" (or liberal carpool definition)
 2 : intrazonal transit share
 3 : intrazonal auto driver share
 4 : I/X transit share
 5 : I/X auto driver share
 6 : minimum carpool size - HOV "B" (or stringent carpool definition)
11 : factor to scale input highway distance to whole miles
16 : apply parking cost model
17 : apply highway terminal time model
18 : model application option: 5=nwk per, 6=nwk adr, 7=no nwk
19 : un-transformed zonal data report switch (1=yes, 2=NO)
20 : transformed zonal data report switch (1=yes, 2=NO)
21 : run only MODAS & MODBS
30 : calibration report switch (1=yes, 2=no)

Here is a list of the UPARMS values we will use in this run
&PARAM
 zones      = 2191
 uparms(1)  = 0
 uparms(2)  = 0.0
 uparms(3)  = 1.0
 uparms(4)  = 0.0
 uparms(5)  = 0.610
 uparms(6)  = 0
 uparms(10) = 1.0
 uparms(11) = 0.1
 uparms(12) = 4.4
 uparms(13) = 82.5
 uparms(14) = 82.5
 uparms(16) = 2
 uparms(17) = 2
 uparms(18) = 7
 uparms(19) = 2
 uparms(20) = 1
 uparms(21) = 1
 uparms(22) = 0.27
 uparms(23) = 0.72
 uparms(24) = 1.11
 uparms(26) = 2.845
 uparms(27) = 3.703
 uparms(28) = 4.732
 uparms(30) = 1

 uparms(15) = 4.36
 uparms(31) = 0.02168
 uparms(32) = 0.02168
 uparms(33) = 0.02168
 uparms(34) = 0.02168
 uparms(35) = 0.02168
 uparms(36) = -3.752e-5
 uparms(37) = -1.955e-5
 uparms(38) = 0.0
 uparms(39) = 0.0
 uparms(40) = 0.00758
 uparms(41) = 0.0
 uparms(42) = 0.02168
 uparms(43) = 3.827
 uparms(44) = 0.3546
 uparms(45) = -0.8
 uparms(46) = 0.0
 uparms(47) = 0.02168
 uparms(48) = 0.02168
 uparms(49) = 0.00758
 uparms(50) = 0.00758
 uparms(51) = 0.00758
 uparms(52) = 0.0
 uparms(53) = 3.7540
 uparms(54) = -1.7629
 uparms(55) = -2.9904
 uparms(56) = -3.269e-5
 uparms(57) = 0.02168
 uparms(58) = 0.02168
 uparms(59) = 0.00758
 uparms(60) = 0.00758
 uparms(61) = 0.00758
 uparms(62) = 0.0
 uparms(63) = 1.5111
 uparms(64) = -1.4377
 uparms(65) = -2.6864
```

```
 uparms(66) = 0.0
 uparms(67) = 0.45633
 uparms(68) = 0.45633
 uparms(69) = 0.0
 uparms(70) = 0.0
 uparms(71) = 0.0
 uparms(72) = 0.0
 uparms(73) = 0.45633
 uparms(74) = 0.45633
 uparms(75) = 0.0
 uparms(76) = 0.0
 uparms(77) = 0.0
 uparms(78) = 0.0
 uparms(79) = 0.0
 uparms(80) = 0.92201
 uparms(81) = 0.48966
 uparms(82) = 0.0
 uparms(83) = 0.45633
 uparms(84) = 0.45633
 uparms(85) = 0.0
 uparms(86) = 0.0
 uparms(87) = 0.0
 uparms(88) = 0.0
 uparms(89) = 0.0
 uparms(90) = 1.51854
 uparms(91) = 0.84071
 uparms(92) = 0.0
 uparms(93) = 0.0
 uparms(94) = 0.0
 uparms(95) = 3
 uparms(96) = 0.0
 uparms(97) = 0.0
 uparms(98) = 0.0
 uparms(99) = -0.97516
 uparms(100)= 0.0
 OrigSLWalk = t
 DestSLWalk = t
 UseShort   = t
 /

Set zone-district equivalencies for exogenous modal factors
based on 2191 zone system:
HBW Transit:

 &ADJDST ADST=1,AZNE=1,-88              / dc core
 &ADJDST ADST=2,AZNE=89,-319            / dc noncore
 &ADJDST ADST=3,AZNE=320,-639           / mtg
 &ADJDST ADST=4,AZNE=640,-1029          / pg
 &ADJDST ADST=5,AZNE=1230,-1238         / arl core
 &ADJDST ADST=6,AZNE=1239,-1329         / arl noncore
 &ADJDST ADST=7,AZNE=1330,-1399         / alx
 &ADJDST ADST=8,AZNE=1400,-1779         / ffx
 &ADJDST ADST=9,AZNE=1780,-1919         / ldn
 &ADJDST ADST=10,AZNE=1920,-2069        / pw
 &ADJDST ADST=11,AZNE=1030,-1059        / frd
 &ADJDST ADST=12,AZNE=1080,-1109        / how
 &ADJDST ADST=13,AZNE=1110,-1149        / aa
 &ADJDST ADST=14,AZNE=1200,-1229        / chs
 &ADJDST ADST=15,AZNE=1060,-1079        / car
 &ADJDST ADST=16,AZNE=1150,-1199        / cal,stm
 &ADJDST ADST=17,AZNE=2070,-2114        / stf,kg,spts,fbrg
 &ADJDST ADST=18,AZNE=2115,-2129        / fau
 &ADJDST ADST=19,AZNE=2130,-2144        / clk,jef
 &ADJDST ADST=20,AZNE=2145,-2191        / externals

       Non-Work/NHB Transit: (These are not used)
 &NWKDST NDST=1,NZNE=1,-88              / dc core
 &NWKDST NDST=2,NZNE=89,-319            / dc noncore
 &NWKDST NDST=3,NZNE=320,-639           / mtg
 &NWKDST NDST=4,NZNE=640,-1029          / pg
 &NWKDST NDST=5,NZNE=1230,-1238         / arl core
 &NWKDST NDST=6,NZNE=1239,-1329         / arl noncore
 &NWKDST NDST=7,NZNE=1330,-1399         / alx
 &NWKDST NDST=8,NZNE=1400,-1779         / ffx
 &NWKDST NDST=9,NZNE=1780,-1919         / ldn
 &NWKDST NDST=10,NZNE=1920,-2069        / pw
 &NWKDST NDST=11,NZNE=1030,-1059        / frd
 &NWKDST NDST=12,NZNE=1080,-1109        / how
 &NWKDST NDST=13,NZNE=1110,-1149        / aa
 &NWKDST NDST=14,NZNE=1200,-1229        / chs
 &NWKDST NDST=15,NZNE=1060,-1079        / car
 &NWKDST NDST=16,NZNE=1150,-1199        / cal,stm
 &NWKDST NDST=17,NZNE=2070,-2114        / stf,kg,spts,fbrg
 &NWKDST NDST=18,NZNE=2115,-2129        / fau
 &NWKDST NDST=19,NZNE=2130,-2144        / clk,jef
 &NWKDST NDST=20,NZNE=2145,-2191        / externals

       Car Occupancy:
 &CARDST CDST=1,CZNE=1,-88              / dc core
 &CARDST CDST=2,CZNE=89,-319            / dc noncore
 &CARDST CDST=3,CZNE=320,-639           / mtg
 &CARDST CDST=4,CZNE=640,-1029          / pg
 &CARDST CDST=5,CZNE=1230,-1238         / arl core
 &CARDST CDST=6,CZNE=1239,-1329         / arl noncore
 &CARDST CDST=7,CZNE=1330,-1399         / alx
 &CARDST CDST=8,CZNE=1400,-1779         / ffx
 &CARDST CDST=9,CZNE=1780,-1919         / ldn
 &CARDST CDST=10,CZNE=1920,-2069        / pw
 &CARDST CDST=11,CZNE=1030,-1059        / frd
 &CARDST CDST=12,CZNE=1080,-1109        / how
 &CARDST CDST=13,CZNE=1110,-1149        / aa
 &CARDST CDST=14,CZNE=1200,-1229        / chs
 &CARDST CDST=15,CZNE=1060,-1079        / car
 &CARDST CDST=16,CZNE=1150,-1199        / cal,stm
 &CARDST CDST=17,CZNE=2070,-2114        / stf,kg,spts,fbrg
 &CARDST CDST=18,CZNE=2115,-2129        / fau
 &CARDST CDST=19,CZNE=2130,-2144        / clk,jef
 &CARDST CDST=20,CZNE=2145,-2191        / externals


       External Stations:
 &XTERN EDST = 1, EZNE = 2145         /
 &XTERN EDST = 2, EZNE = 2146         /
 &XTERN EDST = 3, EZNE = 2147,-2191   /
```

MC_HBS94.ctl

```
MC_HBS94.CTL - Version 2.1/TP+ Mode Choice Model Control File 12/17/02
               Purpose:   HBS    Year: 1994
               Auto Operating Cost (UPARM(12)): 5.3 cents/mi in 1980$


Set file names:

&FILES
 J1=  'pp_hbsmu.ptt',
 J3=  'pp_op_wk.skm',
 J4=  'mf_op_wk.far',
 J5=  'pp_op_dr.skm',
 J6=  'mf_op_dr.far',
 J7=  'sovppop.skm',
 HOVA='hov2ppop.skm',
 HOVB='hov3ppop.skm',
 A1=  'hbsv2.a1f',
 D1=  '..\support\mctf_hbs.asc',
```

```
 D2=  '..\support\mccf_hbs.asc',
 D3=  '..\support\mc_fac.asc',

 J9='mc_hbs.trp',      LIST='mc_hbs.prn'     /

Set user-coded parameters.  Commonly modified UPARMS are:
 1 : minimum carpool size - HOV "A" (or liberal carpool definition)
 2 : intrazonal transit share
 3 : intrazonal auto driver share
 4 : I/X transit share
 5 : I/X auto driver share
 6 : minimum carpool size - HOV "B" (or stringent carpool definition)
11 : factor to scale input highway distance to whole miles
16 : apply parking cost model
17 : apply highway terminal time model
18 : model application option: 5=nwk per, 6=nwk adr, 7=no nwk
19 : un-transformed zonal data report switch (1=yes, 2=NO)
20 : transformed zonal data report switch (1=yes, 2=NO)
21 : run only MODAS & MODBS
30 : calibration report switch (1=yes, 2=no)

Here is a list of the UPARMS values we will use in this run
&PARAM
 zones      = 2191
 uparms(1)  = 0
 uparms(2)  = 0.0
 uparms(3)  = 1.0
 uparms(4)  = 0.0
 uparms(5)  = 0.610
 uparms(6)  = 0
 uparms(10) = 1.0
 uparms(11) = 0.1
 uparms(12) = 5.3
 uparms(13) = 82.5
 uparms(14) = 82.5
 uparms(16) = 2
 uparms(17) = 2
 uparms(18) = 7
 uparms(19) = 2
 uparms(20) = 1
 uparms(21) = 1
 uparms(22) = 0.27
 uparms(23) = 0.72
 uparms(24) = 1.11
 uparms(26) = 2.845
 uparms(27) = 3.703
 uparms(28) = 4.732
 uparms(30) = 1

 uparms(15) = 4.36
 uparms(31) = 0.02168
 uparms(32) = 0.02168
 uparms(33) = 0.02168
 uparms(34) = 0.02168
 uparms(35) = 0.02168
 uparms(36) = -3.752e-5
 uparms(37) = -1.955e-5
 uparms(38) = 0.0
 uparms(39) = 0.0
 uparms(40) = 0.00758
 uparms(41) = 0.0
 uparms(42) = 0.02168
 uparms(43) = 3.827
 uparms(44) = 0.3546
 uparms(45) = -0.8
 uparms(46) = 0.0
 uparms(47) = 0.02168
 uparms(48) = 0.02168
 uparms(49) = 0.00758
 uparms(50) = 0.00758
 uparms(51) = 0.00758
 uparms(52) = 0.0
 uparms(53) = 3.7540
 uparms(54) = -1.7629
 uparms(55) = -2.9904
 uparms(56) = -3.269e-5
 uparms(57) = 0.02168
 uparms(58) = 0.02168
 uparms(59) = 0.00758
 uparms(60) = 0.00758
 uparms(61) = 0.00758
 uparms(62) = 0.0
 uparms(63) = 1.5111
 uparms(64) = -1.4377
 uparms(65) = -2.6864
 uparms(66) = 0.0
 uparms(67) = 0.45633
 uparms(68) = 0.45633
 uparms(69) = 0.0
 uparms(70) = 0.0
 uparms(71) = 0.0
 uparms(72) = 0.0
 uparms(73) = 0.45633
 uparms(74) = 0.45633
 uparms(75) = 0.0
 uparms(76) = 0.0
 uparms(77) = 0.0
 uparms(78) = 0.0
 uparms(79) = 0.0
 uparms(80) = 0.92201
 uparms(81) = 0.48966
 uparms(82) = 0.0
 uparms(83) = 0.45633
 uparms(84) = 0.45633
 uparms(85) = 0.0
 uparms(86) = 0.0
 uparms(87) = 0.0
 uparms(88) = 0.0
 uparms(89) = 0.0
 uparms(90) = 1.51854
 uparms(91) = 0.84071
 uparms(92) = 0.0
 uparms(93) = 0.0
 uparms(94) = 0.0
 uparms(95) = 3
 uparms(96) = 0.0
 uparms(97) = 0.0
 uparms(98) = 0.0
 uparms(99) = -0.97516
 uparms(100)= 0.0
 OrigSLWalk = t
 DestSLWalk = t
 UseShort   = t
 /

Set zone-district equivalencies for exogenous modal factors
based on 2191 zone system:
HBW Transit:

 &ADJDST ADST=1,AZNE=1,-88              / dc core
 &ADJDST ADST=2,AZNE=89,-319            / dc noncore
 &ADJDST ADST=3,AZNE=320,-639           / mtg
 &ADJDST ADST=4,AZNE=640,-1029          / pg
 &ADJDST ADST=5,AZNE=1230,-1238         / arl core
 &ADJDST ADST=6,AZNE=1239,-1329         / arl noncore
 &ADJDST ADST=7,AZNE=1330,-1399         / alx
```

```
 &ADJDST ADST=8,AZNE=1400,-1779          / ffx
 &ADJDST ADST=9,AZNE=1780,-1919          / ldn
 &ADJDST ADST=10,AZNE=1920,-2069         / pw
 &ADJDST ADST=11,AZNE=1030,-1059         / frd
 &ADJDST ADST=12,AZNE=1080,-1109         / how
 &ADJDST ADST=13,AZNE=1110,-1149         / aa
 &ADJDST ADST=14,AZNE=1200,-1229         / chs
 &ADJDST ADST=15,AZNE=1060,-1079         / car
 &ADJDST ADST=16,AZNE=1150,-1199         / cal,stm
 &ADJDST ADST=17,AZNE=2070,-2114         / stf,kg,spts,fbrg
 &ADJDST ADST=18,AZNE=2115,-2129         / fau
 &ADJDST ADST=19,AZNE=2130,-2144         / clk,jef
 &ADJDST ADST=20,AZNE=2145,-2191         / externals

       Non-Work/NHB Transit: (These are not used)
 &NWKDST NDST=1,NZNE=1,-88               / dc core
 &NWKDST NDST=2,NZNE=89,-319             / dc noncore
 &NWKDST NDST=3,NZNE=320,-639            / mtg
 &NWKDST NDST=4,NZNE=640,-1029           / pg
 &NWKDST NDST=5,NZNE=1230,-1238          / arl core
 &NWKDST NDST=6,NZNE=1239,-1329          / arl noncore
 &NWKDST NDST=7,NZNE=1330,-1399          / alx
 &NWKDST NDST=8,NZNE=1400,-1779          / ffx
 &NWKDST NDST=9,NZNE=1780,-1919          / ldn
 &NWKDST NDST=10,NZNE=1920,-2069         / pw
 &NWKDST NDST=11,NZNE=1030,-1059         / frd
 &NWKDST NDST=12,NZNE=1080,-1109         / how
 &NWKDST NDST=13,NZNE=1110,-1149         / aa
 &NWKDST NDST=14,NZNE=1200,-1229         / chs
 &NWKDST NDST=15,NZNE=1060,-1079         / car
 &NWKDST NDST=16,NZNE=1150,-1199         / cal,stm
 &NWKDST NDST=17,NZNE=2070,-2114         / stf,kg,spts,fbrg
 &NWKDST NDST=18,NZNE=2115,-2129         / fau
 &NWKDST NDST=19,NZNE=2130,-2144         / clk,jef
 &NWKDST NDST=20,NZNE=2145,-2191         / externals

       Car Occupancy:
 &CARDST CDST=1,CZNE=1,-88               / dc core
 &CARDST CDST=2,CZNE=89,-319             / dc noncore
 &CARDST CDST=3,CZNE=320,-639            / mtg
 &CARDST CDST=4,CZNE=640,-1029           / pg
 &CARDST CDST=5,CZNE=1230,-1238          / arl core
 &CARDST CDST=6,CZNE=1239,-1329          / arl noncore
 &CARDST CDST=7,CZNE=1330,-1399          / alx
 &CARDST CDST=8,CZNE=1400,-1779          / ffx
 &CARDST CDST=9,CZNE=1780,-1919          / ldn
 &CARDST CDST=10,CZNE=1920,-2069         / pw
 &CARDST CDST=11,CZNE=1030,-1059         / frd
 &CARDST CDST=12,CZNE=1080,-1109         / how
 &CARDST CDST=13,CZNE=1110,-1149         / aa
 &CARDST CDST=14,CZNE=1200,-1229         / chs
 &CARDST CDST=15,CZNE=1060,-1079         / car
 &CARDST CDST=16,CZNE=1150,-1199         / cal,stm
 &CARDST CDST=17,CZNE=2070,-2114         / stf,kg,spts,fbrg
 &CARDST CDST=18,CZNE=2115,-2129         / fau
 &CARDST CDST=19,CZNE=2130,-2144         / clk,jef
 &CARDST CDST=20,CZNE=2145,-2191         / externals


       External Stations:
 &XTERN EDST = 1, EZNE = 2145         /
 &XTERN EDST = 2, EZNE = 2146         /
 &XTERN EDST = 3, EZNE = 2147,-2191   /
```

MC_HBW00.ctl

```
MC_HBW00.CTL - Version 2.1/TP+ Mode Choice Model Control File 12/17/02
               Purpose:   HBW    Year: 2000
               Auto Operating Cost (UPARM(12)): 5.0 cents/mi in 1980$

Auto Operating Cost Background
Source: Milone's 5/11/00 memo to files
          Bill
Year    Allen's      converted to  1980$
       '94 Est. -->  ('94 rate*82.4/148.2)
----   --------      --------------------
2000      8.5        5.0 (<--4.7 was Adjusted to 5.0)
2005      8.3        4.6
2010      8.2        4.6
2015      8.1        4.5
2020      8.0        4.4
2025      7.9        4.4

CPI - All US Cities (base period '82-'84 = 100.)

Set file names:

&FILES
 J1=  'pp_hbwmu.ptt',
 J3=  'pp_am_wk.skm',
 J4=  'mf_am_wk.far',
 J5=  'pp_am_dr.skm',
 J6=  'mf_am_dr.far',
 J7=  'sovppam.skm ',
 HOVA='hov2ppam.skm ',
 HOVB='hov3ppam.skm ',
 A1=  'hbwv2.a1f',
 D1=  '..\support\mctf_hbw.asc',
 D2=  '..\support\mccf_hbw.asc',
 D3=  '..\support\mc_fac.asc',

 J9='mc_hbw.trp',      LIST='mc_hbw.prn'     /

Set user-coded parameters.  Commonly modified UPARMS are:
 1 : minimum carpool size - HOV "A" (or liberal carpool definition)
 2 : intrazonal transit share
 3 : intrazonal auto driver share
 4 : I/X transit share
 5 : I/X auto driver share
 6 : minimum carpool size - HOV "B" (or stringent carpool definition)
11 : factor to scale input highway distance to whole miles
16 : apply parking cost model
17 : apply highway terminal time model
18 : model application option: 5=nwk per, 6=nwk adr, 7=no nwk
19 : un-transformed zonal data report switch (1=yes, 2=NO)
20 : transformed zonal data report switch (1=yes, 2=NO)
21 : run only MODAS & MODBS
30 : calibration report switch (1=yes, 2=no)

Here is a list of the UPARMS values we will use in this run.
The first set of UPARMS are those that the user may change.
The second set of UPARMS should not be changed w/o re-calibration
&PARAM
 zones      = 2191
 uparms(1)  = 2
 uparms(2)  = 0.0
 uparms(3)  = 1.0
 uparms(4)  = 0.0
 uparms(5)  = 0.870
 uparms(6)  = 3
 uparms(10) = 1.0
 uparms(11) = 0.1
 uparms(12) = 5.0
 uparms(13) = 82.5
 uparms(14) = 82.5
```

```
uparms(16) = 2
uparms(17) = 2
uparms(18) = 7
uparms(19) = 2
uparms(20) = 1
uparms(21) = 1
uparms(22) = 0.90
uparms(23) = 1.25
uparms(24) = 2.15
uparms(26) = 2.845
uparms(27) = 3.703
uparms(28) = 4.732
uparms(30) = 1

uparms(15) = 4.55
uparms(31) = 0.05319
uparms(32) = 0.05319
uparms(33) = 0.05319
uparms(34) = 0.03556
uparms(35) = 0.03556
uparms(36) = 0.0
uparms(37) = 1.825e-5
uparms(38) = 0.0
uparms(39) = 0.0
uparms(40) = 0.00766
uparms(41) = 0.0
uparms(42) = 0.03556
uparms(43) = 2.4455
uparms(44) = 0.4766
uparms(45) = 0.1947
uparms(46) = -1.390e-5
uparms(47) = 0.03556
uparms(48) = 0.03556
uparms(49) = 0.00766
uparms(50) = 0.00766
uparms(51) = 0.00766
uparms(52) = 0.0
uparms(53) = 3.8787
uparms(54) = -0.1387
uparms(55) = -1.1138
uparms(56) = 0.0
uparms(57) = 0.03556
uparms(58) = 0.03556
uparms(59) = 0.00766
uparms(60) = 0.00766
uparms(61) = 0.00766
uparms(62) = 0.0
uparms(63) = 3.6470
uparms(64) = 1.3654
uparms(65) = 0.8698
uparms(66) = 0.0
uparms(67) = 0.0
uparms(68) = 0.0
uparms(69) = 0.01388
uparms(70) = 0.04190
uparms(71) = 0.05371
uparms(72) = 0.0
uparms(73) = 0.0
uparms(74) = 0.0
uparms(75) = 0.01388
uparms(76) = 0.04190
uparms(77) = 0.05371
uparms(78) = 0.0
uparms(79) = 0.0
uparms(80) = 1.45273
uparms(81) = 1.87733
uparms(82) = 0.0
uparms(83) = 0.0
uparms(84) = 0.0
uparms(85) = 0.01388
uparms(86) = 0.04190
uparms(87) = 0.05371
uparms(88) = 0.0
uparms(89) = 0.0
uparms(90) = 3.03413
uparms(91) = 2.56171
uparms(92) = 0.0
uparms(93) = 0.0
uparms(94) = 0.0
uparms(95) = 3
uparms(96) = 0.0
uparms(97) = 0.0
uparms(98) = -0.05001
uparms(99) = -0.85678
uparms(100)= 0.0
OrigSLWalk = t
DestSLWalk = t
UseShort   = t
/

Set zone-district equivalencies for exogenous modal factors
based on 2191 zone system:
HBW Transit:

 &ADJDST ADST=1,AZNE=1,-88              / dc core
 &ADJDST ADST=2,AZNE=89,-319            / dc noncore
 &ADJDST ADST=3,AZNE=320,-639           / mtg
 &ADJDST ADST=4,AZNE=640,-1029          / pg
 &ADJDST ADST=5,AZNE=1230,-1238         / arl core
 &ADJDST ADST=6,AZNE=1239,-1329         / arl noncore
 &ADJDST ADST=7,AZNE=1330,-1399         / alx
 &ADJDST ADST=8,AZNE=1400,-1779         / ffx
 &ADJDST ADST=9,AZNE=1780,-1919         / ldn
 &ADJDST ADST=10,AZNE=1920,-2069        / pw
 &ADJDST ADST=11,AZNE=1030,-1059        / frd
 &ADJDST ADST=12,AZNE=1080,-1109        / how
 &ADJDST ADST=13,AZNE=1110,-1149        / aa
 &ADJDST ADST=14,AZNE=1200,-1229        / chs
 &ADJDST ADST=15,AZNE=1060,-1079        / car
 &ADJDST ADST=16,AZNE=1150,-1199        / cal,stm
 &ADJDST ADST=17,AZNE=2070,-2114        / stf,kg,spts,fbrg
 &ADJDST ADST=18,AZNE=2115,-2129        / fau
 &ADJDST ADST=19,AZNE=2130,-2144        / clk,jef
 &ADJDST ADST=20,AZNE=2145,-2191        / externals

       Non-Work/NHB Transit: (These are not used)
 &NWKDST NDST=1,NZNE=1,-88              / dc core
 &NWKDST NDST=2,NZNE=89,-319            / dc noncore
 &NWKDST NDST=3,NZNE=320,-639           / mtg
 &NWKDST NDST=4,NZNE=640,-1029          / pg
 &NWKDST NDST=5,NZNE=1230,-1238         / arl core
 &NWKDST NDST=6,NZNE=1239,-1329         / arl noncore
 &NWKDST NDST=7,NZNE=1330,-1399         / alx
 &NWKDST NDST=8,NZNE=1400,-1779         / ffx
 &NWKDST NDST=9,NZNE=1780,-1919         / ldn
 &NWKDST NDST=10,NZNE=1920,-2069        / pw
 &NWKDST NDST=11,NZNE=1030,-1059        / frd
 &NWKDST NDST=12,NZNE=1080,-1109        / how
 &NWKDST NDST=13,NZNE=1110,-1149        / aa
 &NWKDST NDST=14,NZNE=1200,-1229        / chs
 &NWKDST NDST=15,NZNE=1060,-1079        / car
 &NWKDST NDST=16,NZNE=1150,-1199        / cal,stm
 &NWKDST NDST=17,NZNE=2070,-2114        / stf,kg,spts,fbrg
 &NWKDST NDST=18,NZNE=2115,-2129        / fau
 &NWKDST NDST=19,NZNE=2130,-2144        / clk,jef
 &NWKDST NDST=20,NZNE=2145,-2191        / externals
```

```
       Car Occupancy:
 &CARDST CDST=1,CZNE=1,-88               / dc core
 &CARDST CDST=2,CZNE=89,-319             / dc noncore
 &CARDST CDST=3,CZNE=320,-639            / mtg
 &CARDST CDST=4,CZNE=640,-1029           / pg
 &CARDST CDST=5,CZNE=1230,-1238          / arl core
 &CARDST CDST=6,CZNE=1239,-1329          / arl noncore
 &CARDST CDST=7,CZNE=1330,-1399          / alx
 &CARDST CDST=8,CZNE=1400,-1779          / ffx
 &CARDST CDST=9,CZNE=1780,-1919          / ldn
 &CARDST CDST=10,CZNE=1920,-2069         / pw
 &CARDST CDST=11,CZNE=1030,-1059         / frd
 &CARDST CDST=12,CZNE=1080,-1109         / how
 &CARDST CDST=13,CZNE=1110,-1149         / aa
 &CARDST CDST=14,CZNE=1200,-1229         / chs
 &CARDST CDST=15,CZNE=1060,-1079         / car
 &CARDST CDST=16,CZNE=1150,-1199         / cal,stm
 &CARDST CDST=17,CZNE=2070,-2114         / stf,kg,spts,fbrg
 &CARDST CDST=18,CZNE=2115,-2129         / fau
 &CARDST CDST=19,CZNE=2130,-2144         / clk,jef
 &CARDST CDST=20,CZNE=2145,-2191         / externals


       External Stations:
 &XTERN EDST = 1, EZNE = 2145         /
 &XTERN EDST = 2, EZNE = 2146         /
 &XTERN EDST = 3, EZNE = 2147,-2191   /
```

MC_HBW25.ctl

```
MC_HBW25.CTL - Version 2.1/TP+ Mode Choice Model Control File 12/17/02
               Purpose:   HBW    Year: 2025
               Auto Operating Cost (UPARM(12)): 4.4 cents/mi in 1980$

Auto Operating Cost Background
Source: Milone's 5/11/00 memo to files
         Bill
Year    Allen's      converted to  1980$
       '94 Est. -->  ('94 rate*82.4/148.2)
----   --------      ---------------------
2000      8.5        5.0 (<--4.7 was Adjusted to 5.0)
2005      8.3        4.6
2010      8.2        4.6
2015      8.1        4.5
2020      8.0        4.4
2025      7.9        4.4

CPI - All US Cities (base period '82-'84 = 100.)

Set file names:

&FILES
 J1=  'pp_hbwmu.ptt',
 J3=  'pp_am_wk.skm',
 J4=  'mf_am_wk.far',
 J5=  'pp_am_dr.skm',
 J6=  'mf_am_dr.far',
 J7=  'sovppam.skm ',
 HOVA='hov2ppam.skm ',
 HOVB='hov3ppam.skm ',
 A1=  'hbwv2.a1f',
 D1=  '..\support\mctf_hbw.asc',
 D2=  '..\support\mccf_hbw.asc',
 D3=  '..\support\mc_fac.asc',

 J9='mc_hbw.trp',      LIST='mc_hbw.prn'     /

Set user-coded parameters.  Commonly modified UPARMS are:
 1 : minimum carpool size - HOV "A" (or liberal carpool definition)
 2 : intrazonal transit share
 3 : intrazonal auto driver share
 4 : I/X transit share
 5 : I/X auto driver share
 6 : minimum carpool size - HOV "B" (or stringent carpool definition)
11 : factor to scale input highway distance to whole miles
16 : apply parking cost model
17 : apply highway terminal time model
18 : model application option: 5=nwk per, 6=nwk adr, 7=no nwk
19 : un-transformed zonal data report switch (1=yes, 2=NO)
20 : transformed zonal data report switch (1=yes, 2=NO)
21 : run only MODAS & MODBS
30 : calibration report switch (1=yes, 2=no)

Here is a list of the UPARMS values we will use in this run.
The first set of UPARMS are those that the user may change.
The second set of UPARMS should not be changed w/o re-calibration
&PARAM
 zones      = 2191
 uparms(1)  = 2
 uparms(2)  = 0.0
 uparms(3)  = 1.0
 uparms(4)  = 0.0
 uparms(5)  = 0.870
 uparms(6)  = 3
 uparms(10) = 1.0
 uparms(11) = 0.1
 uparms(12) = 4.4
 uparms(13) = 82.5
 uparms(14) = 82.5
 uparms(16) = 2
 uparms(17) = 2
 uparms(18) = 7
 uparms(19) = 2
 uparms(20) = 1
 uparms(21) = 1
 uparms(22) = 0.90
 uparms(23) = 1.25
 uparms(24) = 2.15
 uparms(26) = 2.845
 uparms(27) = 3.703
 uparms(28) = 4.732
 uparms(30) = 1

 uparms(15) = 4.55
 uparms(31) = 0.05319
 uparms(32) = 0.05319
 uparms(33) = 0.05319
 uparms(34) = 0.03556
 uparms(35) = 0.03556
 uparms(36) = 0.0
 uparms(37) = 1.825e-5
 uparms(38) = 0.0
 uparms(39) = 0.0
 uparms(40) = 0.00766
 uparms(41) = 0.0
 uparms(42) = 0.03556
 uparms(43) = 2.4455
 uparms(44) = 0.4766
 uparms(45) = 0.1947
 uparms(46) = -1.390e-5
 uparms(47) = 0.03556
 uparms(48) = 0.03556
 uparms(49) = 0.00766
 uparms(50) = 0.00766
```

```
 uparms(51) = 0.00766
 uparms(52) = 0.0
 uparms(53) = 3.8787
 uparms(54) = -0.1387
 uparms(55) = -1.1138
 uparms(56) = 0.0
 uparms(57) = 0.03556
 uparms(58) = 0.03556
 uparms(59) = 0.00766
 uparms(60) = 0.00766
 uparms(61) = 0.00766
 uparms(62) = 0.0
 uparms(63) = 3.6470
 uparms(64) = 1.3654
 uparms(65) = 0.8698
 uparms(66) = 0.0
 uparms(67) = 0.0
 uparms(68) = 0.0
 uparms(69) = 0.01388
 uparms(70) = 0.04190
 uparms(71) = 0.05371
 uparms(72) = 0.0
 uparms(73) = 0.0
 uparms(74) = 0.0
 uparms(75) = 0.01388
 uparms(76) = 0.04190
 uparms(77) = 0.05371
 uparms(78) = 0.0
 uparms(79) = 0.0
 uparms(80) = 1.45273
 uparms(81) = 1.87733
 uparms(82) = 0.0
 uparms(83) = 0.0
 uparms(84) = 0.0
 uparms(85) = 0.01388
 uparms(86) = 0.04190
 uparms(87) = 0.05371
 uparms(88) = 0.0
 uparms(89) = 0.0
 uparms(90) = 3.03413
 uparms(91) = 2.56171
 uparms(92) = 0.0
 uparms(93) = 0.0
 uparms(94) = 0.0
 uparms(95) = 3
 uparms(96) = 0.0
 uparms(97) = 0.0
 uparms(98) = -0.05001
 uparms(99) = -0.85678
 uparms(100)= 0.0
 OrigSLWalk = t
 DestSLWalk = t
 UseShort   = t
 /

Set zone-district equivalencies for exogenous modal factors
based on 2191 zone system:
HBW Transit:

 &ADJDST ADST=1,AZNE=1,-88              / dc core
 &ADJDST ADST=2,AZNE=89,-319            / dc noncore
 &ADJDST ADST=3,AZNE=320,-639           / mtg
 &ADJDST ADST=4,AZNE=640,-1029          / pg
 &ADJDST ADST=5,AZNE=1230,-1238         / arl core
 &ADJDST ADST=6,AZNE=1239,-1329         / arl noncore
 &ADJDST ADST=7,AZNE=1330,-1399         / alx
 &ADJDST ADST=8,AZNE=1400,-1779         / ffx
 &ADJDST ADST=9,AZNE=1780,-1919         / ldn
 &ADJDST ADST=10,AZNE=1920,-2069        / pw
 &ADJDST ADST=11,AZNE=1030,-1059        / frd
 &ADJDST ADST=12,AZNE=1080,-1109        / how
 &ADJDST ADST=13,AZNE=1110,-1149        / aa
 &ADJDST ADST=14,AZNE=1200,-1229        / chs
 &ADJDST ADST=15,AZNE=1060,-1079        / car
 &ADJDST ADST=16,AZNE=1150,-1199        / cal,stm
 &ADJDST ADST=17,AZNE=2070,-2114        / stf,kg,spts,fbrg
 &ADJDST ADST=18,AZNE=2115,-2129        / fau
 &ADJDST ADST=19,AZNE=2130,-2144        / clk,jef
 &ADJDST ADST=20,AZNE=2145,-2191        / externals

       Non-Work/NHB Transit: (These are not used)
 &NWKDST NDST=1,NZNE=1,-88              / dc core
 &NWKDST NDST=2,NZNE=89,-319            / dc noncore
 &NWKDST NDST=3,NZNE=320,-639           / mtg
 &NWKDST NDST=4,NZNE=640,-1029          / pg
 &NWKDST NDST=5,NZNE=1230,-1238         / arl core
 &NWKDST NDST=6,NZNE=1239,-1329         / arl noncore
 &NWKDST NDST=7,NZNE=1330,-1399         / alx
 &NWKDST NDST=8,NZNE=1400,-1779         / ffx
 &NWKDST NDST=9,NZNE=1780,-1919         / ldn
 &NWKDST NDST=10,NZNE=1920,-2069        / pw
 &NWKDST NDST=11,NZNE=1030,-1059        / frd
 &NWKDST NDST=12,NZNE=1080,-1109        / how
 &NWKDST NDST=13,NZNE=1110,-1149        / aa
 &NWKDST NDST=14,NZNE=1200,-1229        / chs
 &NWKDST NDST=15,NZNE=1060,-1079        / car
 &NWKDST NDST=16,NZNE=1150,-1199        / cal,stm
 &NWKDST NDST=17,NZNE=2070,-2114        / stf,kg,spts,fbrg
 &NWKDST NDST=18,NZNE=2115,-2129        / fau
 &NWKDST NDST=19,NZNE=2130,-2144        / clk,jef
 &NWKDST NDST=20,NZNE=2145,-2191        / externals

       Car Occupancy:
 &CARDST CDST=1,CZNE=1,-88              / dc core
 &CARDST CDST=2,CZNE=89,-319            / dc noncore
 &CARDST CDST=3,CZNE=320,-639           / mtg
 &CARDST CDST=4,CZNE=640,-1029          / pg
 &CARDST CDST=5,CZNE=1230,-1238         / arl core
 &CARDST CDST=6,CZNE=1239,-1329         / arl noncore
 &CARDST CDST=7,CZNE=1330,-1399         / alx
 &CARDST CDST=8,CZNE=1400,-1779         / ffx
 &CARDST CDST=9,CZNE=1780,-1919         / ldn
 &CARDST CDST=10,CZNE=1920,-2069        / pw
 &CARDST CDST=11,CZNE=1030,-1059        / frd
 &CARDST CDST=12,CZNE=1080,-1109        / how
 &CARDST CDST=13,CZNE=1110,-1149        / aa
 &CARDST CDST=14,CZNE=1200,-1229        / chs
 &CARDST CDST=15,CZNE=1060,-1079        / car
 &CARDST CDST=16,CZNE=1150,-1199        / cal,stm
 &CARDST CDST=17,CZNE=2070,-2114        / stf,kg,spts,fbrg
 &CARDST CDST=18,CZNE=2115,-2129        / fau
 &CARDST CDST=19,CZNE=2130,-2144        / clk,jef
 &CARDST CDST=20,CZNE=2145,-2191        / externals


       External Stations:
 &XTERN EDST = 1, EZNE = 2145         /
 &XTERN EDST = 2, EZNE = 2146         /
 &XTERN EDST = 3, EZNE = 2147,-2191   /
```

MC_HBW94.ctl

```
MC_HBW94.CTL - Version 2.1/TP+ Mode Choice Model Control File 12/17/02
               Purpose:   HBW    Year: 1994
               Auto Operating Cost (UPARM(12)): 5.3 cents/mi in 1980$
```

```
Set file names:

&FILES
 J1=  'pp_hbwmu.ptt',
 J3=  'pp_am_wk.skm',
 J4=  'mf_am_wk.far',
 J5=  'pp_am_dr.skm',
 J6=  'mf_am_dr.far',
 J7=  'sovppam.skm ',
 HOVA='hov2ppam.skm ',
 HOVB='hov3ppam.skm ',
 A1=  'hbwv2.a1f',
 D1=  '..\support\mctf_hbw.asc',
 D2=  '..\support\mccf_hbw.asc',
 D3=  '..\support\mc_fac.asc',

 J9='mc_hbw.trp',      LIST='mc_hbw.prn'     /

Set user-coded parameters.  Commonly modified UPARMS are:
 1 : minimum carpool size - HOV "A" (or liberal carpool definition)
 2 : intrazonal transit share
 3 : intrazonal auto driver share
 4 : I/X transit share
 5 : I/X auto driver share
 6 : minimum carpool size - HOV "B" (or stringent carpool definition)
11 : factor to scale input highway distance to whole miles
16 : apply parking cost model
17 : apply highway terminal time model
18 : model application option: 5=nwk per, 6=nwk adr, 7=no nwk
19 : un-transformed zonal data report switch (1=yes, 2=NO)
20 : transformed zonal data report switch (1=yes, 2=NO)
21 : run only MODAS & MODBS
30 : calibration report switch (1=yes, 2=no)

Here is a list of the UPARMS values we will use in this run.
The first set of UPARMS are those that the user may change.
The second set of UPARMS should not be changed w/o re-calibration
&PARAM
 zones      = 2191
 uparms(1)  = 2
 uparms(2)  = 0.0
 uparms(3)  = 1.0
 uparms(4)  = 0.0
 uparms(5)  = 0.870
 uparms(6)  = 3
 uparms(10) = 1.0
 uparms(11) = 0.1
 uparms(12) = 5.3
 uparms(13) = 82.5
 uparms(14) = 82.5
 uparms(16) = 2
 uparms(17) = 2
 uparms(18) = 7
 uparms(19) = 2
 uparms(20) = 1
 uparms(21) = 1
 uparms(22) = 0.90
 uparms(23) = 1.25
 uparms(24) = 2.15
 uparms(26) = 2.845
 uparms(27) = 3.703
 uparms(28) = 4.732
 uparms(30) = 1

 uparms(15) = 4.55
 uparms(31) = 0.05319
 uparms(32) = 0.05319
 uparms(33) = 0.05319
 uparms(34) = 0.03556
 uparms(35) = 0.03556
 uparms(36) = 0.0
 uparms(37) = 1.825e-5
 uparms(38) = 0.0
 uparms(39) = 0.0
 uparms(40) = 0.00766
 uparms(41) = 0.0
 uparms(42) = 0.03556
 uparms(43) = 2.4455
 uparms(44) = 0.4766
 uparms(45) = 0.1947
 uparms(46) = -1.390e-5
 uparms(47) = 0.03556
 uparms(48) = 0.03556
 uparms(49) = 0.00766
 uparms(50) = 0.00766
 uparms(51) = 0.00766
 uparms(52) = 0.0
 uparms(53) = 3.8787
 uparms(54) = -0.1387
 uparms(55) = -1.1138
 uparms(56) = 0.0
 uparms(57) = 0.03556
 uparms(58) = 0.03556
 uparms(59) = 0.00766
 uparms(60) = 0.00766
 uparms(61) = 0.00766
 uparms(62) = 0.0
 uparms(63) = 3.6470
 uparms(64) = 1.3654
 uparms(65) = 0.8698
 uparms(66) = 0.0
 uparms(67) = 0.0
 uparms(68) = 0.0
 uparms(69) = 0.01388
 uparms(70) = 0.04190
 uparms(71) = 0.05371
 uparms(72) = 0.0
 uparms(73) = 0.0
 uparms(74) = 0.0
 uparms(75) = 0.01388
 uparms(76) = 0.04190
 uparms(77) = 0.05371
 uparms(78) = 0.0
 uparms(79) = 0.0
 uparms(80) = 1.45273
 uparms(81) = 1.87733
 uparms(82) = 0.0
 uparms(83) = 0.0
 uparms(84) = 0.0
 uparms(85) = 0.01388
 uparms(86) = 0.04190
 uparms(87) = 0.05371
 uparms(88) = 0.0
 uparms(89) = 0.0
 uparms(90) = 3.03413
 uparms(91) = 2.56171
 uparms(92) = 0.0
 uparms(93) = 0.0
 uparms(94) = 0.0
 uparms(95) = 3
 uparms(96) = 0.0
 uparms(97) = 0.0
 uparms(98) = -0.05001
```

```
 uparms(99) = -0.85678
 uparms(100)= 0.0
 OrigSLWalk = t
 DestSLWalk = t
 UseShort   = t
 /

Set zone-district equivalencies for exogenous modal factors
based on 2191 zone system:
HBW Transit:

 &ADJDST ADST=1,AZNE=1,-88              / dc core
 &ADJDST ADST=2,AZNE=89,-319            / dc noncore
 &ADJDST ADST=3,AZNE=320,-639           / mtg
 &ADJDST ADST=4,AZNE=640,-1029          / pg
 &ADJDST ADST=5,AZNE=1230,-1238         / arl core
 &ADJDST ADST=6,AZNE=1239,-1329         / arl noncore
 &ADJDST ADST=7,AZNE=1330,-1399         / alx
 &ADJDST ADST=8,AZNE=1400,-1779         / ffx
 &ADJDST ADST=9,AZNE=1780,-1919         / ldn
 &ADJDST ADST=10,AZNE=1920,-2069        / pw
 &ADJDST ADST=11,AZNE=1030,-1059        / frd
 &ADJDST ADST=12,AZNE=1080,-1109        / how
 &ADJDST ADST=13,AZNE=1110,-1149        / aa
 &ADJDST ADST=14,AZNE=1200,-1229        / chs
 &ADJDST ADST=15,AZNE=1060,-1079        / car
 &ADJDST ADST=16,AZNE=1150,-1199        / cal,stm
 &ADJDST ADST=17,AZNE=2070,-2114        / stf,kg,spts,fbrg
 &ADJDST ADST=18,AZNE=2115,-2129        / fau
 &ADJDST ADST=19,AZNE=2130,-2144        / clk,jef
 &ADJDST ADST=20,AZNE=2145,-2191        / externals

       Non-Work/NHB Transit: (These are not used)
 &NWKDST NDST=1,NZNE=1,-88              / dc core
 &NWKDST NDST=2,NZNE=89,-319            / dc noncore
 &NWKDST NDST=3,NZNE=320,-639           / mtg
 &NWKDST NDST=4,NZNE=640,-1029          / pg
 &NWKDST NDST=5,NZNE=1230,-1238         / arl core
 &NWKDST NDST=6,NZNE=1239,-1329         / arl noncore
 &NWKDST NDST=7,NZNE=1330,-1399         / alx
 &NWKDST NDST=8,NZNE=1400,-1779         / ffx
 &NWKDST NDST=9,NZNE=1780,-1919         / ldn
 &NWKDST NDST=10,NZNE=1920,-2069        / pw
 &NWKDST NDST=11,NZNE=1030,-1059        / frd
 &NWKDST NDST=12,NZNE=1080,-1109        / how
 &NWKDST NDST=13,NZNE=1110,-1149        / aa
 &NWKDST NDST=14,NZNE=1200,-1229        / chs
 &NWKDST NDST=15,NZNE=1060,-1079        / car
 &NWKDST NDST=16,NZNE=1150,-1199        / cal,stm
 &NWKDST NDST=17,NZNE=2070,-2114        / stf,kg,spts,fbrg
 &NWKDST NDST=18,NZNE=2115,-2129        / fau
 &NWKDST NDST=19,NZNE=2130,-2144        / clk,jef
 &NWKDST NDST=20,NZNE=2145,-2191        / externals

       Car Occupancy:
 &CARDST CDST=1,CZNE=1,-88              / dc core
 &CARDST CDST=2,CZNE=89,-319            / dc noncore
 &CARDST CDST=3,CZNE=320,-639           / mtg
 &CARDST CDST=4,CZNE=640,-1029          / pg
 &CARDST CDST=5,CZNE=1230,-1238         / arl core
 &CARDST CDST=6,CZNE=1239,-1329         / arl noncore
 &CARDST CDST=7,CZNE=1330,-1399         / alx
 &CARDST CDST=8,CZNE=1400,-1779         / ffx
 &CARDST CDST=9,CZNE=1780,-1919         / ldn
 &CARDST CDST=10,CZNE=1920,-2069        / pw
 &CARDST CDST=11,CZNE=1030,-1059        / frd
 &CARDST CDST=12,CZNE=1080,-1109        / how
 &CARDST CDST=13,CZNE=1110,-1149        / aa
 &CARDST CDST=14,CZNE=1200,-1229        / chs
 &CARDST CDST=15,CZNE=1060,-1079        / car
 &CARDST CDST=16,CZNE=1150,-1199        / cal,stm
 &CARDST CDST=17,CZNE=2070,-2114        / stf,kg,spts,fbrg
 &CARDST CDST=18,CZNE=2115,-2129        / fau
 &CARDST CDST=19,CZNE=2130,-2144        / clk,jef
 &CARDST CDST=20,CZNE=2145,-2191        / externals


       External Stations:
 &XTERN EDST = 1, EZNE = 2145         /
 &XTERN EDST = 2, EZNE = 2146         /
 &XTERN EDST = 3, EZNE = 2147,-2191   /
```

MC_NHB00.ctl

```
MC_NHB00.CTL - Version 2.1/TP+ Mode Choice Model Control File 12/17/02
               Purpose:   NHB    Year: 2000
               Auto Operating Cost (UPARM(12)): 5.0 cents/mi in 1980$

Auto Operating Cost Background
Source: Milone's 5/11/00 memo to files
          Bill
Year    Allen's      converted to  1980$
       '94 Est. -->  ('94 rate*82.4/148.2)
----   --------      ---------------------
2000      8.5        5.0 (<--4.7 was Adjusted to 5.0)
2005      8.3        4.6
2010      8.2        4.6
2015      8.1        4.5
2020      8.0        4.4
2025      7.9        4.4

CPI - All US Cities (base period '82-'84 = 100.)

Set file names:

&FILES
 J1=  'pp_nhbmu.ptt',
 J3=  'pp_op_wk.skm',
 J4=  'mf_op_wk.far',
 J5=  'pp_op_dr.skm',
 J6=  'mf_op_dr.far',
 J7=  'sovppop.skm',
 HOVA='hov2ppop.skm',
 HOVB='hov3ppop.skm',
 A1=  'nhbv2.a1f',
 D1=  '..\support\mctf_nhb.asc',
 D2=  '..\support\mccf_nhb.asc',
 D3=  '..\support\mc_fac.asc',

 J9='mc_nhb.trp',      LIST='mc_nhb.prn'     /

Set user-coded parameters.  Commonly modified UPARMS are:
 1 : minimum carpool size - HOV "A" (or liberal carpool definition)
 2 : intrazonal transit share
 3 : intrazonal auto driver share
 4 : I/X transit share
 5 : I/X auto driver share
 6 : minimum carpool size - HOV "B" (or stringent carpool definition)
11 : factor to scale input highway distance to whole miles
16 : apply parking cost model
17 : apply highway terminal time model
18 : model application option: 5=nwk per, 6=nwk adr, 7=no nwk
19 : un-transformed zonal data report switch (1=yes, 2=NO)
20 : transformed zonal data report switch (1=yes, 2=NO)
21 : run only MODAS & MODBS
```

```
30 : calibration report switch (1=yes, 2=no)

Here is a list of the UPARMS values we will use in this run
&PARAM
 zones      = 2191
 uparms(1)  = 0
 uparms(2)  = 0.0
 uparms(3)  = 1.0
 uparms(4)  = 0.0
 uparms(5)  = 0.780
 uparms(6)  = 0
 uparms(10) = 1.0
 uparms(11) = 0.1
 uparms(12) = 5.0
 uparms(13) = 82.5
 uparms(14) = 82.5
 uparms(16) = 2
 uparms(17) = 2
 uparms(18) = 7
 uparms(19) = 2
 uparms(20) = 1
 uparms(21) = 1
 uparms(22) = 1.00
 uparms(23) = 0.00
 uparms(24) = 0.00
 uparms(26) = 2.845
 uparms(27) = 0.0
 uparms(28) = 0.0
 uparms(30) = 1

 uparms(15) = 4.38
 uparms(31) = 0.02860
 uparms(32) = 0.02860
 uparms(33) = 0.02860
 uparms(34) = 0.02860
 uparms(35) = 0.02860
 uparms(36) = -1.126e-5
 uparms(37) = -1.304e-5
 uparms(38) = 0.0
 uparms(39) = 0.0
 uparms(40) = 0.0
 uparms(41) = 0.0
 uparms(42) = 0.02860
 uparms(43) = 0.9594
 uparms(44) = 0.0
 uparms(45) = 0.0
 uparms(46) = 0.0
 uparms(47) = 0.02860
 uparms(48) = 0.02860
 uparms(49) = 0.0
 uparms(50) = 0.0
 uparms(51) = 0.0
 uparms(52) = 0.0
 uparms(53) = -1.74
 uparms(54) = 0.0
 uparms(55) = 0.0
 uparms(56) = -2.156e-5
 uparms(57) = 0.02860
 uparms(58) = 0.02860
 uparms(59) = 0.0
 uparms(60) = 0.0
 uparms(61) = 0.0
 uparms(62) = 0.0
 uparms(63) = -0.88
 uparms(64) = 0.0
 uparms(65) = 0.0
 uparms(66) = 0.76830
 uparms(67) = 0.00573
 uparms(68) = 0.00573
 uparms(69) = 0.0
 uparms(70) = 0.0
 uparms(71) = 0.0
 uparms(72) = 0.00151
 uparms(73) = 0.00573
 uparms(74) = 0.00573
 uparms(75) = 0.0
 uparms(76) = 0.0
 uparms(77) = 0.0
 uparms(78) = 0.00151
 uparms(79) = 0.97305
 uparms(80) = 0.0
 uparms(81) = 0.0
 uparms(82) = 0.76830
 uparms(83) = 0.00573
 uparms(84) = 0.00573
 uparms(85) = 0.0
 uparms(86) = 0.0
 uparms(87) = 0.0
 uparms(88) = 0.0
 uparms(89) = 1.42742
 uparms(90) = 0.0
 uparms(91) = 0.0
 uparms(92) = -0.65963
 uparms(93) = 0.0
 uparms(94) = 0.0
 uparms(95) = 1
 uparms(96) = 0.0
 uparms(97) = 0.0
 uparms(98) = 0.0
 uparms(99) = -1.84313
 uparms(100)= 0.0
 OrigSLWalk = t
 DestSLWalk = t
 UseShort   = t
 /

Set zone-district equivalencies for exogenous modal factors
based on 2191 zone system:
HBW Transit:

 &ADJDST ADST=1,AZNE=1,-88              / dc core
 &ADJDST ADST=2,AZNE=89,-319            / dc noncore
 &ADJDST ADST=3,AZNE=320,-639           / mtg
 &ADJDST ADST=4,AZNE=640,-1029          / pg
 &ADJDST ADST=5,AZNE=1230,-1238         / arl core
 &ADJDST ADST=6,AZNE=1239,-1329         / arl noncore
 &ADJDST ADST=7,AZNE=1330,-1399         / alx
 &ADJDST ADST=8,AZNE=1400,-1779         / ffx
 &ADJDST ADST=9,AZNE=1780,-1919         / ldn
 &ADJDST ADST=10,AZNE=1920,-2069        / pw
 &ADJDST ADST=11,AZNE=1030,-1059        / frd
 &ADJDST ADST=12,AZNE=1080,-1109        / how
 &ADJDST ADST=13,AZNE=1110,-1149        / aa
 &ADJDST ADST=14,AZNE=1200,-1229        / chs
 &ADJDST ADST=15,AZNE=1060,-1079        / car
 &ADJDST ADST=16,AZNE=1150,-1199        / cal,stm
 &ADJDST ADST=17,AZNE=2070,-2114        / stf,kg,spts,fbrg
 &ADJDST ADST=18,AZNE=2115,-2129        / fau
 &ADJDST ADST=19,AZNE=2130,-2144        / clk,jef
 &ADJDST ADST=20,AZNE=2145,-2191        / externals

        Non-Work/NHB Transit: (These are not used)
 &NWKDST NDST=1,NZNE=1,-88              / dc core
 &NWKDST NDST=2,NZNE=89,-319            / dc noncore
 &NWKDST NDST=3,NZNE=320,-639           / mtg
 &NWKDST NDST=4,NZNE=640,-1029          / pg
```

```
 &NWKDST NDST=5,NZNE=1230,-1238          / arl core
 &NWKDST NDST=6,NZNE=1239,-1329          / arl noncore
 &NWKDST NDST=7,NZNE=1330,-1399          / alx
 &NWKDST NDST=8,NZNE=1400,-1779          / ffx
 &NWKDST NDST=9,NZNE=1780,-1919          / ldn
 &NWKDST NDST=10,NZNE=1920,-2069         / pw
 &NWKDST NDST=11,NZNE=1030,-1059         / frd
 &NWKDST NDST=12,NZNE=1080,-1109         / how
 &NWKDST NDST=13,NZNE=1110,-1149         / aa
 &NWKDST NDST=14,NZNE=1200,-1229         / chs
 &NWKDST NDST=15,NZNE=1060,-1079         / car
 &NWKDST NDST=16,NZNE=1150,-1199         / cal,stm
 &NWKDST NDST=17,NZNE=2070,-2114         / stf,kg,spts,fbrg
 &NWKDST NDST=18,NZNE=2115,-2129         / fau
 &NWKDST NDST=19,NZNE=2130,-2144         / clk,jef
 &NWKDST NDST=20,NZNE=2145,-2191         / externals

        Car Occupancy:
 &CARDST CDST=1,CZNE=1,-88               / dc core
 &CARDST CDST=2,CZNE=89,-319             / dc noncore
 &CARDST CDST=3,CZNE=320,-639            / mtg
 &CARDST CDST=4,CZNE=640,-1029           / pg
 &CARDST CDST=5,CZNE=1230,-1238          / arl core
 &CARDST CDST=6,CZNE=1239,-1329          / arl noncore
 &CARDST CDST=7,CZNE=1330,-1399          / alx
 &CARDST CDST=8,CZNE=1400,-1779          / ffx
 &CARDST CDST=9,CZNE=1780,-1919          / ldn
 &CARDST CDST=10,CZNE=1920,-2069         / pw
 &CARDST CDST=11,CZNE=1030,-1059         / frd
 &CARDST CDST=12,CZNE=1080,-1109         / how
 &CARDST CDST=13,CZNE=1110,-1149         / aa
 &CARDST CDST=14,CZNE=1200,-1229         / chs
 &CARDST CDST=15,CZNE=1060,-1079         / car
 &CARDST CDST=16,CZNE=1150,-1199         / cal,stm
 &CARDST CDST=17,CZNE=2070,-2114         / stf,kg,spts,fbrg
 &CARDST CDST=18,CZNE=2115,-2129         / fau
 &CARDST CDST=19,CZNE=2130,-2144         / clk,jef
 &CARDST CDST=20,CZNE=2145,-2191         / externals


        External Stations:
 &XTERN EDST = 1, EZNE = 2145         /
 &XTERN EDST = 2, EZNE = 2146         /
 &XTERN EDST = 3, EZNE = 2147,-2191   /
```

MC_NHB25.ctl

```
MC_NHB25.CTL - Version 2.1/TP+ Mode Choice Model Control File 12/17/02
               Purpose:   NHB    Year: 2025
               Auto Operating Cost (UPARM(12)): 4.4 cents/mi in 1980$

Auto Operating Cost Background
Source: Milone's 5/11/00 memo to files
         Bill
Year    Allen's      converted to  1980$
       '94 Est. -->  ('94 rate*82.4/148.2)
----   --------      ---------------------
2000      8.5        5.0 (<--4.7 was Adjusted to 5.0)
2005      8.3        4.6
2010      8.2        4.6
2015      8.1        4.5
2020      8.0        4.4
2025      7.9        4.4

CPI - All US Cities (base period '82-'84 = 100.)
```

```
Set file names:

&FILES
 J1=  'pp_nhbmu.ptt',
 J3=  'pp_op_wk.skm',
 J4=  'mf_op_wk.far',
 J5=  'pp_op_dr.skm',
 J6=  'mf_op_dr.far',
 J7=  'sovppop.skm',
 HOVA='hov2ppop.skm',
 HOVB='hov3ppop.skm',
 A1=  'nhbv2.a1f',
 D1=  '..\support\mctf_nhb.asc',
 D2=  '..\support\mccf_nhb.asc',
 D3=  '..\support\mc_fac.asc',

 J9='mc_nhb.trp',      LIST='mc_nhb.prn'     /

Set user-coded parameters.  Commonly modified UPARMS are:
 1 : minimum carpool size - HOV "A" (or liberal carpool definition)
 2 : intrazonal transit share
 3 : intrazonal auto driver share
 4 : I/X transit share
 5 : I/X auto driver share
 6 : minimum carpool size - HOV "B" (or stringent carpool definition)
11 : factor to scale input highway distance to whole miles
16 : apply parking cost model
17 : apply highway terminal time model
18 : model application option: 5=nwk per, 6=nwk adr, 7=no nwk
19 : un-transformed zonal data report switch (1=yes, 2=NO)
20 : transformed zonal data report switch (1=yes, 2=NO)
21 : run only MODAS & MODBS
30 : calibration report switch (1=yes, 2=no)

Here is a list of the UPARMS values we will use in this run
&PARAM
 zones      = 2191
 uparms(1)  = 0
 uparms(2)  = 0.0
 uparms(3)  = 1.0
 uparms(4)  = 0.0
 uparms(5)  = 0.780
 uparms(6)  = 0
 uparms(10) = 1.0
 uparms(11) = 0.1
 uparms(12) = 4.4
 uparms(13) = 82.5
 uparms(14) = 82.5
 uparms(16) = 2
 uparms(17) = 2
 uparms(18) = 7
 uparms(19) = 2
 uparms(20) = 1
 uparms(21) = 1
 uparms(22) = 1.00
 uparms(23) = 0.00
 uparms(24) = 0.00
 uparms(26) = 2.845
 uparms(27) = 0.0
 uparms(28) = 0.0
 uparms(30) = 1

 uparms(15) = 4.38
 uparms(31) = 0.02860
 uparms(32) = 0.02860
 uparms(33) = 0.02860
 uparms(34) = 0.02860
 uparms(35) = 0.02860
```

```
uparms(36) = -1.126e-5
uparms(37) = -1.304e-5
uparms(38) = 0.0
uparms(39) = 0.0
uparms(40) = 0.0
uparms(41) = 0.0
uparms(42) = 0.02860
uparms(43) = 0.9594
uparms(44) = 0.0
uparms(45) = 0.0
uparms(46) = 0.0
uparms(47) = 0.02860
uparms(48) = 0.02860
uparms(49) = 0.0
uparms(50) = 0.0
uparms(51) = 0.0
uparms(52) = 0.0
uparms(53) = -1.74
uparms(54) = 0.0
uparms(55) = 0.0
uparms(56) = -2.156e-5
uparms(57) = 0.02860
uparms(58) = 0.02860
uparms(59) = 0.0
uparms(60) = 0.0
uparms(61) = 0.0
uparms(62) = 0.0
uparms(63) = -0.88
uparms(64) = 0.0
uparms(65) = 0.0
uparms(66) = 0.76830
uparms(67) = 0.00573
uparms(68) = 0.00573
uparms(69) = 0.0
uparms(70) = 0.0
uparms(71) = 0.0
uparms(72) = 0.00151
uparms(73) = 0.00573
uparms(74) = 0.00573
uparms(75) = 0.0
uparms(76) = 0.0
uparms(77) = 0.0
uparms(78) = 0.00151
uparms(79) = 0.97305
uparms(80) = 0.0
uparms(81) = 0.0
uparms(82) = 0.76830
uparms(83) = 0.00573
uparms(84) = 0.00573
uparms(85) = 0.0
uparms(86) = 0.0
uparms(87) = 0.0
uparms(88) = 0.0
uparms(89) = 1.42742
uparms(90) = 0.0
uparms(91) = 0.0
uparms(92) = -0.65963
uparms(93) = 0.0
uparms(94) = 0.0
uparms(95) = 1
uparms(96) = 0.0
uparms(97) = 0.0
uparms(98) = 0.0
uparms(99) = -1.84313
uparms(100)= 0.0
OrigSLWalk = t
DestSLWalk = t
UseShort   = t
 /

Set zone-district equivalencies for exogenous modal factors
based on 2191 zone system:
HBW Transit:

 &ADJDST ADST=1,AZNE=1,-88              / dc core
 &ADJDST ADST=2,AZNE=89,-319            / dc noncore
 &ADJDST ADST=3,AZNE=320,-639           / mtg
 &ADJDST ADST=4,AZNE=640,-1029          / pg
 &ADJDST ADST=5,AZNE=1230,-1238         / arl core
 &ADJDST ADST=6,AZNE=1239,-1329         / arl noncore
 &ADJDST ADST=7,AZNE=1330,-1399         / alx
 &ADJDST ADST=8,AZNE=1400,-1779         / ffx
 &ADJDST ADST=9,AZNE=1780,-1919         / ldn
 &ADJDST ADST=10,AZNE=1920,-2069        / pw
 &ADJDST ADST=11,AZNE=1030,-1059        / frd
 &ADJDST ADST=12,AZNE=1080,-1109        / how
 &ADJDST ADST=13,AZNE=1110,-1149        / aa
 &ADJDST ADST=14,AZNE=1200,-1229        / chs
 &ADJDST ADST=15,AZNE=1060,-1079        / car
 &ADJDST ADST=16,AZNE=1150,-1199        / cal,stm
 &ADJDST ADST=17,AZNE=2070,-2114        / stf,kg,spts,fbrg
 &ADJDST ADST=18,AZNE=2115,-2129        / fau
 &ADJDST ADST=19,AZNE=2130,-2144        / clk,jef
 &ADJDST ADST=20,AZNE=2145,-2191        / externals

       Non-Work/NHB Transit: (These are not used)
 &NWKDST NDST=1,NZNE=1,-88              / dc core
 &NWKDST NDST=2,NZNE=89,-319            / dc noncore
 &NWKDST NDST=3,NZNE=320,-639           / mtg
 &NWKDST NDST=4,NZNE=640,-1029          / pg
 &NWKDST NDST=5,NZNE=1230,-1238         / arl core
 &NWKDST NDST=6,NZNE=1239,-1329         / arl noncore
 &NWKDST NDST=7,NZNE=1330,-1399         / alx
 &NWKDST NDST=8,NZNE=1400,-1779         / ffx
 &NWKDST NDST=9,NZNE=1780,-1919         / ldn
 &NWKDST NDST=10,NZNE=1920,-2069        / pw
 &NWKDST NDST=11,NZNE=1030,-1059        / frd
 &NWKDST NDST=12,NZNE=1080,-1109        / how
 &NWKDST NDST=13,NZNE=1110,-1149        / aa
 &NWKDST NDST=14,NZNE=1200,-1229        / chs
 &NWKDST NDST=15,NZNE=1060,-1079        / car
 &NWKDST NDST=16,NZNE=1150,-1199        / cal,stm
 &NWKDST NDST=17,NZNE=2070,-2114        / stf,kg,spts,fbrg
 &NWKDST NDST=18,NZNE=2115,-2129        / fau
 &NWKDST NDST=19,NZNE=2130,-2144        / clk,jef
 &NWKDST NDST=20,NZNE=2145,-2191        / externals

       Car Occupancy:
 &CARDST CDST=1,CZNE=1,-88              / dc core
 &CARDST CDST=2,CZNE=89,-319            / dc noncore
 &CARDST CDST=3,CZNE=320,-639           / mtg
 &CARDST CDST=4,CZNE=640,-1029          / pg
 &CARDST CDST=5,CZNE=1230,-1238         / arl core
 &CARDST CDST=6,CZNE=1239,-1329         / arl noncore
 &CARDST CDST=7,CZNE=1330,-1399         / alx
 &CARDST CDST=8,CZNE=1400,-1779         / ffx
 &CARDST CDST=9,CZNE=1780,-1919         / ldn
 &CARDST CDST=10,CZNE=1920,-2069        / pw
 &CARDST CDST=11,CZNE=1030,-1059        / frd
 &CARDST CDST=12,CZNE=1080,-1109        / how
 &CARDST CDST=13,CZNE=1110,-1149        / aa
 &CARDST CDST=14,CZNE=1200,-1229        / chs
 &CARDST CDST=15,CZNE=1060,-1079        / car
 &CARDST CDST=16,CZNE=1150,-1199        / cal,stm
 &CARDST CDST=17,CZNE=2070,-2114        / stf,kg,spts,fbrg
 &CARDST CDST=18,CZNE=2115,-2129        / fau
```

```
 &CARDST CDST=19,CZNE=2130,-2144         / clk,jef
 &CARDST CDST=20,CZNE=2145,-2191         / externals


       External Stations:
 &XTERN EDST = 1, EZNE = 2145         /
 &XTERN EDST = 2, EZNE = 2146         /
 &XTERN EDST = 3, EZNE = 2147,-2191   /
```

MC_NHB94.ctl

```
MC_NHB94.CTL - Version 2.1/TP+ Mode Choice Model Control File 12/17/02
               Purpose:   NHB    Year: 1994
               Auto Operating Cost (UPARM(12)): 5.3 cents/mi in 1980$


Set file names:

&FILES
 J1=  'pp_nhbmu.ptt',
 J3=  'pp_op_wk.skm',
 J4=  'mf_op_wk.far',
 J5=  'pp_op_dr.skm',
 J6=  'mf_op_dr.far',
 J7=  'sovppop.skm',
 HOVA='hov2ppop.skm',
 HOVB='hov3ppop.skm',
 A1=  'nhbv2.a1f',
 D1=  '..\support\mctf_nhb.asc',
 D2=  '..\support\mccf_nhb.asc',
 D3=  '..\support\mc_fac.asc',

 J9='mc_nhb.trp',      LIST='mc_nhb.prn'     /

Set user-coded parameters.  Commonly modified UPARMS are:
 1 : minimum carpool size - HOV "A" (or liberal carpool definition)
 2 : intrazonal transit share
 3 : intrazonal auto driver share
 4 : I/X transit share
 5 : I/X auto driver share
 6 : minimum carpool size - HOV "B" (or stringent carpool definition)
11 : factor to scale input highway distance to whole miles
16 : apply parking cost model
17 : apply highway terminal time model
18 : model application option: 5=nwk per, 6=nwk adr, 7=no nwk
19 : un-transformed zonal data report switch (1=yes, 2=NO)
20 : transformed zonal data report switch (1=yes, 2=NO)
21 : run only MODAS & MODBS
30 : calibration report switch (1=yes, 2=no)

Here is a list of the UPARMS values we will use in this run
&PARAM
 zones      = 2191
 uparms(1)  = 0
 uparms(2)  = 0.0
 uparms(3)  = 1.0
 uparms(4)  = 0.0
 uparms(5)  = 0.780
 uparms(6)  = 0
 uparms(10) = 1.0
 uparms(11) = 0.1
 uparms(12) = 5.3
 uparms(13) = 82.5
 uparms(14) = 82.5
 uparms(16) = 2
 uparms(17) = 2
 uparms(18) = 7
 uparms(19) = 2
 uparms(20) = 1
 uparms(21) = 1
 uparms(22) = 1.00
 uparms(23) = 0.00
 uparms(24) = 0.00
 uparms(26) = 2.845
 uparms(27) = 0.0
 uparms(28) = 0.0
 uparms(30) = 1

 uparms(15) = 4.38
 uparms(31) = 0.02860
 uparms(32) = 0.02860
 uparms(33) = 0.02860
 uparms(34) = 0.02860
 uparms(35) = 0.02860
 uparms(36) = -1.126e-5
 uparms(37) = -1.304e-5
 uparms(38) = 0.0
 uparms(39) = 0.0
 uparms(40) = 0.0
 uparms(41) = 0.0
 uparms(42) = 0.02860
 uparms(43) = 0.9594
 uparms(44) = 0.0
 uparms(45) = 0.0
 uparms(46) = 0.0
 uparms(47) = 0.02860
 uparms(48) = 0.02860
 uparms(49) = 0.0
 uparms(50) = 0.0
 uparms(51) = 0.0
 uparms(52) = 0.0
 uparms(53) = -1.74
 uparms(54) = 0.0
 uparms(55) = 0.0
 uparms(56) = -2.156e-5
 uparms(57) = 0.02860
 uparms(58) = 0.02860
 uparms(59) = 0.0
 uparms(60) = 0.0
 uparms(61) = 0.0
 uparms(62) = 0.0
 uparms(63) = -0.88
 uparms(64) = 0.0
 uparms(65) = 0.0
 uparms(66) = 0.76830
 uparms(67) = 0.00573
 uparms(68) = 0.00573
 uparms(69) = 0.0
 uparms(70) = 0.0
 uparms(71) = 0.0
 uparms(72) = 0.00151
 uparms(73) = 0.00573
 uparms(74) = 0.00573
 uparms(75) = 0.0
 uparms(76) = 0.0
 uparms(77) = 0.0
 uparms(78) = 0.00151
 uparms(79) = 0.97305
 uparms(80) = 0.0
 uparms(81) = 0.0
 uparms(82) = 0.76830
 uparms(83) = 0.00573
 uparms(84) = 0.00573
 uparms(85) = 0.0
 uparms(86) = 0.0
```

```
 uparms(87) = 0.0
 uparms(88) = 0.0
 uparms(89) = 1.42742
 uparms(90) = 0.0
 uparms(91) = 0.0
 uparms(92) = -0.65963
 uparms(93) = 0.0
 uparms(94) = 0.0
 uparms(95) = 1
 uparms(96) = 0.0
 uparms(97) = 0.0
 uparms(98) = 0.0
 uparms(99) = -1.84313
 uparms(100)= 0.0
 OrigSLWalk = t
 DestSLWalk = t
 UseShort   = t
 /

Set zone-district equivalencies for exogenous modal factors
based on 2191 zone system:
HBW Transit:

 &ADJDST ADST=1,AZNE=1,-88              / dc core
 &ADJDST ADST=2,AZNE=89,-319            / dc noncore
 &ADJDST ADST=3,AZNE=320,-639           / mtg
 &ADJDST ADST=4,AZNE=640,-1029          / pg
 &ADJDST ADST=5,AZNE=1230,-1238         / arl core
 &ADJDST ADST=6,AZNE=1239,-1329         / arl noncore
 &ADJDST ADST=7,AZNE=1330,-1399         / alx
 &ADJDST ADST=8,AZNE=1400,-1779         / ffx
 &ADJDST ADST=9,AZNE=1780,-1919         / ldn
 &ADJDST ADST=10,AZNE=1920,-2069        / pw
 &ADJDST ADST=11,AZNE=1030,-1059        / frd
 &ADJDST ADST=12,AZNE=1080,-1109        / how
 &ADJDST ADST=13,AZNE=1110,-1149        / aa
 &ADJDST ADST=14,AZNE=1200,-1229        / chs
 &ADJDST ADST=15,AZNE=1060,-1079        / car
 &ADJDST ADST=16,AZNE=1150,-1199        / cal,stm
 &ADJDST ADST=17,AZNE=2070,-2114        / stf,kg,spts,fbrg
 &ADJDST ADST=18,AZNE=2115,-2129        / fau
 &ADJDST ADST=19,AZNE=2130,-2144        / clk,jef
 &ADJDST ADST=20,AZNE=2145,-2191        / externals

       Non-Work/NHB Transit: (These are not used)
 &NWKDST NDST=1,NZNE=1,-88              / dc core
 &NWKDST NDST=2,NZNE=89,-319            / dc noncore
 &NWKDST NDST=3,NZNE=320,-639           / mtg
 &NWKDST NDST=4,NZNE=640,-1029          / pg
 &NWKDST NDST=5,NZNE=1230,-1238         / arl core
 &NWKDST NDST=6,NZNE=1239,-1329         / arl noncore
 &NWKDST NDST=7,NZNE=1330,-1399         / alx
 &NWKDST NDST=8,NZNE=1400,-1779         / ffx
 &NWKDST NDST=9,NZNE=1780,-1919         / ldn
 &NWKDST NDST=10,NZNE=1920,-2069        / pw
 &NWKDST NDST=11,NZNE=1030,-1059        / frd
 &NWKDST NDST=12,NZNE=1080,-1109        / how
 &NWKDST NDST=13,NZNE=1110,-1149        / aa
 &NWKDST NDST=14,NZNE=1200,-1229        / chs
 &NWKDST NDST=15,NZNE=1060,-1079        / car
 &NWKDST NDST=16,NZNE=1150,-1199        / cal,stm
 &NWKDST NDST=17,NZNE=2070,-2114        / stf,kg,spts,fbrg
 &NWKDST NDST=18,NZNE=2115,-2129        / fau
 &NWKDST NDST=19,NZNE=2130,-2144        / clk,jef
 &NWKDST NDST=20,NZNE=2145,-2191        / externals

       Car Occupancy:
 &CARDST CDST=1,CZNE=1,-88              / dc core
 &CARDST CDST=2,CZNE=89,-319            / dc noncore
 &CARDST CDST=3,CZNE=320,-639           / mtg
 &CARDST CDST=4,CZNE=640,-1029          / pg
 &CARDST CDST=5,CZNE=1230,-1238         / arl core
 &CARDST CDST=6,CZNE=1239,-1329         / arl noncore
 &CARDST CDST=7,CZNE=1330,-1399         / alx
 &CARDST CDST=8,CZNE=1400,-1779         / ffx
 &CARDST CDST=9,CZNE=1780,-1919         / ldn
 &CARDST CDST=10,CZNE=1920,-2069        / pw
 &CARDST CDST=11,CZNE=1030,-1059        / frd
 &CARDST CDST=12,CZNE=1080,-1109        / how
 &CARDST CDST=13,CZNE=1110,-1149        / aa
 &CARDST CDST=14,CZNE=1200,-1229        / chs
 &CARDST CDST=15,CZNE=1060,-1079        / car
 &CARDST CDST=16,CZNE=1150,-1199        / cal,stm
 &CARDST CDST=17,CZNE=2070,-2114        / stf,kg,spts,fbrg
 &CARDST CDST=18,CZNE=2115,-2129        / fau
 &CARDST CDST=19,CZNE=2130,-2144        / clk,jef
 &CARDST CDST=20,CZNE=2145,-2191        / externals


       External Stations:
 &XTERN EDST = 1, EZNE = 2145         /
 &XTERN EDST = 2, EZNE = 2146         /
 &XTERN EDST = 3, EZNE = 2147,-2191   /
```

mf1am00.ctl

```
Set user-coded parameters:
MF1AM00.CTL - AM PEAK Fare 1 control file / VERSION 2 MODELS

METRORAIL STATION-TO-STATION FARE MATRIX REFLECTING WMATA TARIFF #19
EFFECTIVE 6/99.
STATION NUMBERING FOLLOWS LAST TWO DIGITS IN TRANSIT NETWORK
DESIGNATION OF STATION
SET FILE NAMES:
  INPUT FILES:
    J1 - METRORAIL STATION-TO-STATION DISTANCE MATRIX.
    A1 - METRORAIL STATION X-Y COORDINATES
  OUTPUT FILES:
    J2 - METRORAIL STATION-TO-STATION FARE MATRIX IN CURRENT CENTS
    LIST - LISTING FILE

&FILES
 J1   = 'rldist.skm',
 A1   = 'inputs\mfare1.a1a',
 J2   = 'MF1_AM.ASC',
 LIST = 'MF1_AM.rpt'   /

Set user-coded parameters:

&PARAM
 ZONES=116,
 UPARMS(1)=110.,
 UPARMS(2)=19.0,
 UPARMS(3)=325.0,
 UPARMS(4)=0.6,
 UPARMS(5)=0,
 UPARMS(6)=0,
 UPARMS(7)=3.0,
 UPARMS(8)=3.0,
 UPARMS(9)=16.5,
 UPARMS(50)=0.0,
 UPARMS(86)=0.0,
 UPARMS(87)=0.0,
 UPARMS(91)=0.0  /
```

mf1am94.ctl

```
MF1AM94.CTL - AM PEAK Fare 1 control file / VERSION 2 MODELS

METRORAIL STATION-TO-STATION FARE MATRIX REFLECTING WMATA TARIFF #16
EFFECTIVE 6/92.
STATION NUMBERING FOLLOWS LAST TWO DIGITS IN TRANSIT NETWORK
DESIGNATION OF STATION
SET FILE NAMES:
  INPUT FILES:
    J1 - METRORAIL STATION-TO-STATION DISTANCE MATRIX.
    A1 - METRORAIL STATION X-Y COORDINATES
  OUTPUT FILES:
    J2 - METRORAIL STATION-TO-STATION FARE MATRIX IN CURRENT CENTS
    LIST - LISTING FILE

&FILES
 J1   = 'rldist.skm',
 A1   = 'inputs\mfare1.a1a',
 J2   = 'MF1_AM.ASC',
 LIST = 'MF1_AM.rpt'   /

Set user-coded parameters:

&PARAM
 ZONES=116,
 UPARMS(1)=100.,
 UPARMS(2)=19.0,
 UPARMS(3)=315.0,
 UPARMS(4)=0.6,
 UPARMS(5)=0,
 UPARMS(6)=0,
 UPARMS(7)=3.0,
 UPARMS(8)=3.0,
 UPARMS(9)=16.5,
 UPARMS(50)=0.0,
 UPARMS(86)=0.0,
 UPARMS(87)=0.0,
 UPARMS(91)=0.0  /
```

mf1op00.ctl

```
MF1OP00.CTL - OFFPEAK Fare 1 control file / VERSION 2 MODELS
NOTE: This setup uses
      mfare1op.exe the off peak version of MFARE1

Whereas UPARMS 2,9 were per mile incremental charges for the
secondary and tertiary distance ranges, these values are now
considered as flat charges (not per mile charges).


METRORAIL STATION-TO-STATION FARE MATRIX REFLECTING WMATA TARIFF #19
EFFECTIVE 6/99.

specifics of tarrif #19:
 boarding fare(cents):         UPARMS(1)=110.,
 flat secondry fare increment: UPARMS(2)=50.0,
 max fare:                     UPARMS(3)=210.0,
 boarding fare distance(mi):   UPARMS(7)=7.0,
 secondary fare distance:      UPARMS(8)=3.0,
 flat tertiary fare increment: UPARMS(9)=50.0,

STATION NUMBERING FOLLOWS LAST TWO DIGITS IN TRANSIT NETWORK
DESIGNATION OF STATION
SET FILE NAMES:
  INPUT FILES:
    J1 - METRORAIL STATION-TO-STATION DISTANCE MATRIX.
    A1 - METRORAIL STATION X-Y COORDINATES
  OUTPUT FILES:
    J2 - METRORAIL STATION-TO-STATION FARE MATRIX IN CURRENT CENTS
    LIST - LISTING FILE

&FILES
 J1   = 'rldist.skm',
 A1   = 'inputs\mfare1.a1a',
 J2   = 'MF1_OP.ASC',
 LIST = 'MF1_OP.rpt'   /

Set user-coded parameters:


&PARAM
 ZONES=116,
 UPARMS(1)=110.,
 UPARMS(2)=50.0,
 UPARMS(3)=210.0,
 UPARMS(4)=0.6,
 UPARMS(5)=0,
 UPARMS(6)=0,
 UPARMS(7)=7.0,
 UPARMS(8)=3.0,
 UPARMS(9)=50.0,
 UPARMS(50)=0.0,
 UPARMS(86)=0.0,
 UPARMS(87)=0.0,
 UPARMS(91)=0.0  /
```

mf1op94.ctl

```
MF1OP94.CTL - OFFPEAK Fare 1 control file / VERSION 2 MODELS
NOTE: This setup uses
      mfare1op.exe the off peak version of MFARE1

Whereas UPARMS 2,9 were per mile incremental charges for the
secondary and tertiary distance ranges, these values are now
considered as flat charges (not per mile charges).


METRORAIL STATION-TO-STATION FARE MATRIX REFLECTING WMATA TARIFF #16
EFFECTIVE 6/92.

specifics of tarrif #16:
 boarding fare(cents):         UPARMS(1)=100.,
 flat secondry fare increment: UPARMS(2)=50.0,
 max fare:                     UPARMS(3)=200.0,
 boarding fare distance(mi):   UPARMS(7)=7.0,
 secondary fare distance:      UPARMS(8)=3.0,
 flat tertiary fare increment: UPARMS(9)=50.0,

STATION NUMBERING FOLLOWS LAST TWO DIGITS IN TRANSIT NETWORK
DESIGNATION OF STATION
SET FILE NAMES:
  INPUT FILES:
    J1 - METRORAIL STATION-TO-STATION DISTANCE MATRIX.
    A1 - METRORAIL STATION X-Y COORDINATES
  OUTPUT FILES:
    J2 - METRORAIL STATION-TO-STATION FARE MATRIX IN CURRENT CENTS
    LIST - LISTING FILE

&FILES
 J1   = 'rldist.skm',
 A1   = 'inputs\mfare1.a1a',
 J2   = 'MF1_OP.ASC',
```

```
 LIST = 'MF1_OP.rpt'   /

Set user-coded parameters:

&PARAM
 ZONES=116,
 UPARMS(1)=100.,
 UPARMS(2)=50.0,
 UPARMS(3)=200.0,
 UPARMS(4)=0.6,
 UPARMS(5)=0,
 UPARMS(6)=0,
 UPARMS(7)=7.0,
 UPARMS(8)=3.0,
 UPARMS(9)=50.0,
 UPARMS(50)=0.0,
 UPARMS(86)=0.0,
 UPARMS(87)=0.0,
 UPARMS(91)=0.0  /
```

mfamdr00.ctl

```
MFAMDR00.CTL - AM Pk Drive Access Fare2 Control


MFARE2 2191-ZONE TRANSIT NETWORK-AUTO ACCESS

BUILD BUS FARE AND TOTAL FARE MATRICES-BASED ON WMATA TARIFF NO.19
OF 6/99



Deflator - based on 2.5% inflation, 1/5 CPI growth per WMATA's direction
(See Milone's 5/11/00 memorandum on Policy Assumptions)



SET FILE NAMES:
  INPUT FILES:
    A1, A2, A3, J1
  OUTPUT FILES:
    J2, LIST
&FILES
 A1   = 'mf1_am.asc',
 A2   = 'fare_a2.asc',
 A3   = 'inputs\busfaram.asc',
 J1   = 'pp_am_dr.sta',
 J2   = 'MF_AM_DR.SKM',
 LIST = 'MF_AM_DR.RPT',  /

FILE NAME DEFINITION:
 A1       METRORAIL station to station fare matrix
 A2       Zone/Station data file (UTPS RPFARE2 A1 DECK)
 A3       Bus fare lookup table
 J1       Access/Egress station matrix, AUTO ACCESS NETWORK
 J2       OUTPUT zonal fare matrix
 List     OUTPUT listing file


SET USER-CODED PARAMETERS:
&PARAM
 zones=2191,
 uparms(1)=116.0,
 uparms(2)=0.48240,
 uparms(4)=85.0,
 uparms(5)=85.0,
 uparms(6)=85.0,
 uparms(7)=85.0,
 uparms(8)=1.0,   /
```

mfamdr94.ctl

```
MFAMDR94.CTL - AM Pk Drive Access Fare2 Control

MFARE2 2191-ZONE TRANSIT NETWORK-AUTO ACCESS

BUILD BUS FARE AND TOTAL FARE MATRICES-BASED ON WMATA TARIFF NO.16
OF 6/92

US Dept. of Labor CPI for Wasington DC-MD-VA Year Avg.

SET FILE NAMES:
  INPUT FILES:
    A1, A2, A3, J1
  OUTPUT FILES:
    J2, LIST
&FILES
 A1   = 'mf1_am.asc',
 A2   = 'fare_a2.asc',
 A3   = 'inputs\busfaram.asc',
 J1   = 'pp_am_dr.sta',
 J2   = 'MF_AM_DR.SKM',
 LIST = 'MF_AM_DR.RPT',  /

FILE NAME DEFINITION:
 A1       METRORAIL station to station fare matrix
 A2       Zone/Station data file (UTPS RPFARE2 A1 DECK)
 A3       Bus fare lookup table
 J1       Access/Egress station matrix, AUTO ACCESS NETWORK
 J2       OUTPUT zonal fare matrix
 List     OUTPUT listing file

SET USER-CODED PARAMETERS:
&PARAM
 zones     = 2191,
 uparms(1) = 116.0,
 uparms(2) = 0.54468,
 uparms(4) = 100.0,
 uparms(5) = 0.0,
 uparms(6) = 25.0,
 uparms(7) = 25.0,
 uparms(8) = 1.0,   /
```

mfamwk00.ctl

```
MFAMWK00.CTL - AM PK Walk Access Fare2 Control

MFARE2 2191-ZONE TRANSIT NETWORK-WALK ACCESS

BUILD BUS FARE AND TOTAL FARE MATRICES-BASED ON WMATA TARIFF NO.19,
6/99


SET FILE NAMES:
  INPUT FILES:
    A1, A2, A3, J1
  OUTPUT FILES:
    J2, LIST
&FILES
 A1   = 'mf1_am.asc',
 A2   = 'fare_a2.asc',
 A3   = 'inputs\busfaram.asc',
```

```
 J1   = 'pp_am_wk.sta',
 J2   = 'MF_AM_WK.SKM',
 LIST = 'MF_AM_WK.RPT',  /

FILE NAME DEFINITION:
 A1       METRORAIL station to station fare matrix
 A2       Zone/Station data file (UTPS RPFARE2 A1 DECK)
 A3       Bus fare lookup table
 J1       Access/Egress station matrix, WALK ACCESS NETWORK
 J2       OUTPUT zonal fare matrix
 List     OUTPUT listing file

SET USER-CODED PARAMETERS:
&PARAM
 zones=2191,
 uparms(1)=116.0,
 uparms(2)=0.48240,
 uparms(4)=85.0,
 uparms(5)=85.0,
 uparms(6)=85.0,
 uparms(7)=85.0,
 uparms(8)=1.0,   /
```

mfamwk94.ctl

```
MFAMWK94.CTL - AM PK Walk Access Fare2 Control

MFARE2 2191-ZONE TRANSIT NETWORK-WALK ACCESS

BUILD BUS FARE AND TOTAL FARE MATRICES-BASED ON WMATA TARIFF NO.16,
6/92

Based on US Dept. of Labor CPI for DC-MD-VA year Avg

SET FILE NAMES:
  INPUT FILES:
    A1, A2, A3, J1
  OUTPUT FILES:
    J2, LIST
&FILES
 A1   = 'mf1_am.asc',
 A2   = 'fare_a2.asc',
 A3   = 'inputs\busfaram.asc',
 J1   = 'pp_am_wk.sta',
 J2   = 'MF_AM_WK.SKM',
 LIST = 'MF_AM_WK.RPT',  /

FILE NAME DEFINITION:
 A1       METRORAIL station to station fare matrix
 A2       Zone/Station data file (UTPS RPFARE2 A1 DECK)
 A3       Bus fare lookup table
 J1       Access/Egress station matrix, WALK ACCESS NETWORK
 J2       OUTPUT zonal fare matrix
 List     OUTPUT listing file

SET USER-CODED PARAMETERS:
&PARAM
 zones     = 2191,
 uparms(1) = 116.0,
 uparms(2) = 0.54468,
 uparms(4) = 100.0,
 uparms(5) = 0.0,
 uparms(6) = 25.0,
 uparms(7) = 25.0,
 uparms(8) = 1.0,   /
```

mfopdr00.ctl

```
MFOPDR00.CTL - Off-pk Drive Access Fare2 Control


MFARE2 2191-ZONE TRANSIT NETWORK-AUTO ACCESS

BUILD BUS FARE AND TOTAL FARE MATRICES-BASED ON WMATA TARIFF NO.19
OF 6/99


Deflator - based on 2.5% inflation, 1/5 CPI growth per WMATA's direction
(See Milone's 5/11/00 memorandum on Policy Assumptions)


SET FILE NAMES:
  INPUT FILES:
    A1, A2, A3, J1
  OUTPUT FILES:
    J2, LIST
&FILES
 A1   = 'mf1_op.asc',
 A2   = 'fare_a2.asc',
 A3   = 'inputs\busfarop.asc',
 J1   = 'pp_op_dr.sta',
 J2   = 'MF_OP_DR.SKM',
 LIST = 'MF_OP_DR.RPT',  /

FILE NAME DEFINITION:
 A1       METRORAIL station to station fare matrix
 A2       Zone/Station data file (UTPS RPFARE2 A1 DECK)
 A3       Bus fare lookup table
 J1       Access/Egress station matrix, AUTO ACCESS NETWORK
 J2       OUTPUT zonal fare matrix
 List     OUTPUT listing file

SET USER-CODED PARAMETERS:


SET USER-CODED PARAMETERS:
&PARAM
 zones=2191,
 uparms(1)=116.0,
 uparms(2)=0.48240,
 uparms(4)=85.0,
 uparms(5)=85.0,
 uparms(6)=85.0,
 uparms(7)=85.0,
 uparms(8)=1.0,   /
```

mfopdr94.ctl

```
MFOPDR94.CTL - Off-pk Drive Access Fare2 Control


MFARE2 2191-ZONE TRANSIT NETWORK-AUTO ACCESS

BUILD BUS FARE AND TOTAL FARE MATRICES-BASED ON WMATA TARIFF NO.16
OF 6/92

US Dept. of Labor CPI DC-MD-VA Year Avg.

SET FILE NAMES:
  INPUT FILES:
    A1, A2, A3, J1
  OUTPUT FILES:
```

```
    J2, LIST
&FILES
 A1   = 'mf1_op.asc',
 A2   = 'fare_a2.asc',
 A3   = 'inputs\busfarop.asc',
 J1   = 'pp_op_dr.sta',
 J2   = 'MF_OP_DR.SKM',
 LIST = 'MF_OP_DR.RPT',  /

FILE NAME DEFINITION:
 A1       METRORAIL station to station fare matrix
 A2       Zone/Station data file (UTPS RPFARE2 A1 DECK)
 A3       Bus fare lookup table
 J1       Access/Egress station matrix, AUTO ACCESS NETWORK
 J2       OUTPUT zonal fare matrix
 List     OUTPUT listing file

SET USER-CODED PARAMETERS:
&PARAM
 zones     = 2191,
 uparms(1) = 116.0,
 uparms(2) = 0.54468,
 uparms(4) = 100.0,
 uparms(5) = 0.0,
 uparms(6) = 25.0,
 uparms(7) = 25.0,
 uparms(8) = 1.0,   /
```

mfopwk00.ctl

```
MFOPWK00.CTL - Off-pk Walk Access Fare2 Control


MFARE2 2191-ZONE TRANSIT NETWORK-WALK ACCESS

BUILD BUS FARE AND TOTAL FARE MATRICES-BASED ON WMATA TARIFF NO.19,
6/99
NOTE: BUS FARE MATRIX USED IS SAME AS THAT USED FOR AM PK


Deflator - based on 2.5% inflation, 1/5 CPI growth per WMATA's direction
(See Milone's 5/11/00 memorandum on Policy Assumptions)


SET FILE NAMES:
  INPUT FILES:
    A1, A2, A3, J1
  OUTPUT FILES:
    J2, LIST
&FILES
 A1   = 'mf1_op.asc',
 A2   = 'fare_a2.asc',
 A3   = 'inputs\busfarop.asc',
 J1   = 'pp_op_wk.sta',
 J2   = 'MF_OP_WK.SKM',
 LIST = 'MF_OP_WK.RPT',  /

FILE NAME DEFINITION:
 A1       METRORAIL station to station fare matrix
 A2       Zone/Station data file (UTPS RPFARE2 A1 DECK)
 A3       Bus fare lookup table
 J1       Access/Egress station matrix, WALK ACCESS NETWORK
 J2       OUTPUT zonal fare matrix
 List     OUTPUT listing file


SET USER-CODED PARAMETERS:
&PARAM
 zones=2191,
 uparms(1)=116.0,
 uparms(2)=0.48240,
 uparms(4)=85.0,
 uparms(5)=85.0,
 uparms(6)=85.0,
 uparms(7)=85.0,
 uparms(8)=1.0,   /
```

mfopwk94.ctl

```
MFOPWK94.CTL - Off-pk Walk Access Fare2 Control


MFARE2 2191-ZONE TRANSIT NETWORK-WALK ACCESS

BUILD BUS FARE AND TOTAL FARE MATRICES-BASED ON WMATA TARIFF NO.16,
6/92
NOTE: BUS FARE MATRIX USED IS SAME AS THAT USED FOR AM PK


US Dept. of Labor CPI DC-MD-VA year Avg



SET FILE NAMES:
  INPUT FILES:
    A1, A2, A3, J1
  OUTPUT FILES:
    J2, LIST
&FILES
 A1   = 'mf1_op.asc',
 A2   = 'fare_a2.asc',
 A3   = 'inputs\busfarop.asc',
 J1   = 'pp_op_wk.sta',
 J2   = 'MF_OP_WK.SKM',
 LIST = 'MF_OP_WK.RPT',  /

FILE NAME DEFINITION:
 A1       METRORAIL station to station fare matrix
 A2       Zone/Station data file (UTPS RPFARE2 A1 DECK)
 A3       Bus fare lookup table
 J1       Access/Egress station matrix, WALK ACCESS NETWORK
 J2       OUTPUT zonal fare matrix
 List     OUTPUT listing file

SET USER-CODED PARAMETERS:
&PARAM
 zones     = 2191,
 uparms(1) = 116.0,
 uparms(2) = 0.54468,
 uparms(4) = 100.0,
 uparms(5) = 0.0,
 uparms(6) = 25.0,
 uparms(7) = 25.0,
 uparms(8) = 1.0,   /
```

mtk_tg.ctl

```
File: MTK_TG.CTL
MWCOG Version 2 Trip Generation Model Run(CGTGV2TP)
Purpose:  Med. Truck

  Trip purpose (purp) MUST be one of the following choices:
```

```
 'HBW' 'HBS' 'HBO' 'NHB' 'MTK' 'HTK'

&tpurp
 purp='MTK'
  /

&param
 zones   = 2191
 lastizn = 2144
 dcclo   =    1
 dcchi   =   88
 dcnlo   =   89
 dcnhi   =  319
 vaclo   = 1230
 vachi   = 1238
 va10lo  = 1239
 va10hi  = 1360
  /


&files
 zhhi1sv='hhi1_sv.dat'
 zhhi2sv='hhi2_sv.dat'
 zhhi3sv='hhi3_sv.dat'
 zhhi4sv='hhi4_sv.dat'

 zonelu ='inputs\zone.asc'
 ext_ps ='inputs\pext.asc'
 ext_as ='inputs\aext.asc'
 basezn ='basezon.dat'
 znmod  ='..\support\adjznpaf.mtk'



 outp1  ='mtk_pro.i1'
 outp2  ='dummy.i2'
 outp3  ='dummy.i3'
 outp4  ='dummy.i4'
 outp5  ='mtk_pro.all'

 outa1  ='mtk_att.i1'
 outa2  ='dummy.i2'
 outa3  ='dummy.i3'
 outa4  ='dummy.i4'
 outa5  ='mtk_att.all'
  /
production rates:
array structure: 4 income groups (across) by size/va groups (down)
 inc,siz,veh:   111,   211,   311,  411
                121,   221,   321,  421
                131,   231,   331,  431
                141,   241,   341,  441
                 .      .      .     .
                144    244    344   444

&prates
       prat=  0.000, 0.000, 0.000, 0.000,
              0.000, 0.000, 0.000, 0.000,
              0.000, 0.000, 0.000, 0.000,
              0.000, 0.000, 0.000, 0.000,
              0.000, 0.000, 0.000, 0.000,
              0.000, 0.000, 0.000, 0.000,
              0.000, 0.000, 0.000, 0.000,
              0.000, 0.000, 0.000, 0.000,
              0.000, 0.000, 0.000, 0.000,
              0.000, 0.000, 0.000, 0.000,
              0.000, 0.000, 0.000, 0.000,
              0.000, 0.000, 0.000, 0.000,
              0.000, 0.000, 0.000, 0.000,
              0.000, 0.000, 0.000, 0.000,
              0.000, 0.000, 0.000, 0.000,
              0.000, 0.000, 0.000, 0.000
  /
area type-based attraction rates:

array structure: 10 land use variables (across) by 7 area types (down)
          1      2      3      4      5      6      7      8      (9 10)
         HH    HHPOP   EMP   IndEmp RetEMP OffEMP OthEMP NRetEmp  Unused
 Atype 1
        .
        7

location- based attraction  rates:
array structure: 5 land use variables (across) by 4 locations (down)
Locations are: 1)Reg Core, 2)DC NonCore, 3)VA 10 Mi Sq, 4)Other
          1      2      3      4      5
        IndEmp RetEMP OffEMP OthEMP  HH
 Locat 1
        .
        4

&arates
      arat= 0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,
            0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,
            0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,
            0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,
            0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,
            0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,
            0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.00

      lrat =0.09,0.17,0.01,0.04,0.04,
            0.19,0.17,0.01,0.04,0.04,
            0.14,0.17,0.01,0.04,0.04,
            0.11,0.17,0.01,0.04,0.04

  /
prod, att jurisdiction adjustment rates for each jurisdiction(1-24)
juris. codes 1-24 are:
 1-dc   2-mtg  3-pg   4-arl  5-alx  6-ffx  7-ldn  8-pw   9  -   10-frd
11-how 12-aa  13-chs 14  -  15-car 16-cal 17-stm 18-kge 19-fbg  20-stf
21-spt 22-fau 23-clk 24-jef

&juradj
       pjuradj =1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,
                1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,
                1.00,1.00,1.00,1.00,1.00

       ajuradj =1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,
                1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,
                1.00,1.00,1.00,1.00,1.00
  /
global purpose adjustment array
&puradj
      purpadj  =1.000
  /
```

Netswam.ctl

```
9
MODE1AM.TP  MODE1AM.TB
MODE2AM.TP  MODE2AM.TB
MODE3AM.TP  MODE3AM.TB
```

```
MODE4AM.TP  MODE4AM.TB
MODE5AM.TP  MODE5AM.TB
MODE6AM.TP  MODE6AM.TB
MODE7AM.TP  MODE7AM.TB
MODE8AM.TP  MODE8AM.TB
MODE9AM.TP  MODE9AM.TB
```

Netswop.ctl

```
9
MODE1OP.TP  MODE1OP.TB
MODE2OP.TP  MODE2OP.TB
MODE3OP.TP  MODE3OP.TB
MODE4OP.TP  MODE4OP.TB
MODE5OP.TP  MODE5OP.TB
MODE6OP.TP  MODE6OP.TB
MODE7OP.TP  MODE7OP.TB
MODE8OP.TP  MODE8OP.TB
MODE9OP.TP  MODE9OP.TB
```

NHB_TG.ctl

```
File: NHB_TG.CTL
MWCOG Version 2 Trip Generation Model Run(CGTGV2TP)
Purpose:  NHB


  Trip purpose (purp) MUST be one of the following choices:
  'HBW' 'HBS' 'HBO' 'NHB' 'MTK' 'HTK'

&tpurp
 purp='NHB'
  /

&param
 zones   = 2191
 lastizn = 2144
 dcclo   =    1
 dcchi   =   88
 dcnlo   =   89
 dcnhi   =  319
 vaclo   = 1230
 vachi   = 1238
 va10lo  = 1239
 va10hi  = 1360
  /


&files
 zhhi1sv='hhi1_sv.dat'
 zhhi2sv='hhi2_sv.dat'
 zhhi3sv='hhi3_sv.dat'
 zhhi4sv='hhi4_sv.dat'

 zonelu ='inputs\zone.asc'
 ext_ps ='inputs\pext.asc'
 ext_as ='inputs\aext.asc'
 basezn ='basezon.dat'
 znmod  ='..\support\adjzpaf7.upn'



 outp1  ='nhb_pro.i1'
 outp2  ='dummy.i2'
 outp3  ='dummy.i3'
 outp4  ='dummy.i4'
 outp5  ='nhb_pro.all'

 outa1  ='nhb_att.i1'
 outa2  ='dummy.i2'
 outa3  ='dummy.i3'
 outa4  ='dummy.i4'
 outa5  ='nhb_att.all'
  /
production rates:
array structure: 4 income groups (across) by size/va groups (down)


 inc,siz,veh:   111,   211,   311,  411
                121,   221,   321,  421
                131,   231,   331,  431
                141,   241,   341,  441
                 .      .     .     .
                144    244    344   444

&prates
       prat=  0.200, 0.300, 0.400, 0.600,
              0.300, 0.400, 0.500, 0.700,
              0.400, 0.500, 0.600, 0.800,
              0.500, 0.600, 0.609, 0.900,
              1.258, 1.258, 1.524, 1.760,
              1.258, 1.258, 1.625, 1.760,
              1.430, 1.762, 2.479, 2.720,
              1.500, 1.983, 2.188, 1.536,
              1.258, 1.400, 1.565, 1.760,
              1.430, 2.197, 2.330, 2.405,
              1.430, 2.600, 2.892, 2.812,
              1.600, 2.800, 2.925, 3.348,
              1.258, 1.490, 1.565, 2.405,
              1.430, 2.197, 2.536, 2.691,
              1.430, 2.800, 2.891, 3.100,
              1.700, 2.967, 4.202, 4.376
  /
area type-based attraction rates:
array structure: 10 land use variables (across) by 7 area types (down)
           1      2      3      4      5      6      7      8      (9 10)
         HH    HHPOP   EMP   IndEmp RetEMP OffEMP OthEMP NRetEmp  Unused
 Atype 1
       .
       7

location- based attraction  rates:
array structure: 5 land use variables (across) by 4 locations (down)
Locations are: 1)Reg. Core, 2)DC NonCore, 3)VA 10 Mi Sq, 4)Other
          1      2      3      4      5
        IndEmp RetEMP OffEMP OthEMP  HH
 Locat 1
       .
       4

&arates
      arat= 0.00,0.00,0.00,0.00,0.00,0.00,0.00,0.42,0.00,0.00,
            0.00,0.28,0.00,0.00,2.77,0.00,0.00,0.49,0.00,0.00,
            0.00,0.28,0.00,0.00,2.77,0.00,0.00,0.49,0.00,0.00,
            0.00,0.28,0.00,0.00,2.77,0.00,0.00,0.49,0.00,0.00,
            0.00,0.28,0.00,0.00,2.77,0.00,0.00,0.49,0.00,0.00,
            0.00,0.28,0.00,0.00,2.77,0.00,0.00,0.49,0.00,0.00,
            0.00,0.28,0.00,0.00,2.77,0.00,0.00,0.49,0.00,0.00

      lrat =0.00,0.00,0.00,0.00,0.00,
            0.00,0.00,0.00,0.00,0.00,
            0.00,0.00,0.00,0.00,0.00,
```

```
           0.00,0.00,0.00,0.00,0.00

  /
prod, att jurisdiction adjustment rates for each jurisdiction(1-24)
juris. codes 1-24 are:
 1-dc   2-mtg  3-pg   4-arl  5-alx  6-ffx  7-ldn  8-pw   9  -   10-frd
11-how 12-aa  13-chs 14  -  15-car 16-cal 17-stm 18-kge 19-fbg  20-stf
21-spt 22-fau 23-clk 24-jef

NOTE: Make sure the pjur \ ajur factors are symmetrical

&juradj
       pjuradj =1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,
                1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,
                1.00,1.00,1.00,1.00,1.00

       ajuradj =1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,
                1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,1.00,
                1.00,1.00,1.00,1.00,1.00
  /
global purpose adjustment array
&puradj
      purpadj  =1.500
  /
```

NT_AM.ctl

```
NT_AM.CTL  -   Control File for the NODESTB program (by J.Bruggeman)
               The program creates a fixed format stop nodes file
               using TRNBUILD line files.

Time Period:  AM Peak Hour
 &FILES
   fline(1)='MODE1AM.TB'
   fline(2)='MODE2AM.TB'
   fline(3)='MODE3AM.TB'
   fline(4)='MODE4AM.TB'
   fline(5)='MODE6AM.TB'
   fline(6)='MODE7AM.TB'
   fline(7)='MODE8AM.TB'
   fline(8)='MODE9AM.TB'
   FNODES  ='nt_am.asc'
   FRPT    ='nt_am.rpt'   /
 &PARAMS
   PERIOD=0    /
 &OPTIONS
   STONLY=T,
   plain=T     /
 &FACILS       /
```

NT_OP.ctl

```
NT_OP.CTL  -   Control File for the NODESTB program (by J.Bruggeman)
               The program creates a fixed format stop nodes file
               using TRNBUILD line files.

Time Period:  Off-Peak
 &FILES
   fline(1)='MODE1OP.TB'
   fline(2)='MODE2OP.TB'
   fline(3)='MODE3OP.TB'
   fline(4)='MODE4OP.TB'
   fline(5)='MODE6OP.TB'
   fline(6)='MODE7OP.TB'
   fline(7)='MODE8OP.TB'
   fline(8)='MODE9OP.TB'
   FNODES  ='nt_op.asc'
   FRPT    ='nt_op.rpt'   /
 &PARAMS
   PERIOD=0    /
 &OPTIONS
   STONLY=T,
   plain=T     /
 &FACILS       /
```

Prefartp.ctl

```
prefartp.ctl
  Control File for prefaretp.EXE Program

  FILES  section refers to INPUT FILE references
   The 2 INPUT files are:
  unit  7  gismetf - GIS file with sh/lng metro walk pcts, distances
  unit  8  bfarezf - zone/station to bus fare zone equivalencies
  unit  9  fwlkpctf - final (wlklnktp-based) zonal walk pct file

  The 1 OUTPUT file is:
  unit 11  a2deckf - final A2 deck for MFARE2 Program


&files

   gismetf = 'inputs\giswkaam.asc'
   bfarezf = 'inputs\tazfrzn.asc'
   fwlkpctf= 'shlgam.fin'
   a2deckf = 'FARE_A2.ASC'
   /
```

staprotp.ctl

```
staprotp.ctl
  Control File for STAPROTP.EXE Program

  The 2 INPUT files are:
  unit  7  statf - the consolidated station file
  unit  8  rlnkf - the metrorail/commuter rail link file

  The 14 OUTPUT files are:

  unit 11  metlnkf - metrorail     link file
  unit 28  metlnkm1- metrorail     link file for metro sta. net building
  unit 12  comlnkf - commuter rail link file

  unit 13  metnodf - metrorail station nodes
  unit 29  metnodm1- metrorail station nodes for metro sta. net. building
  unit 14  comnodf - commuter rail     nodes

  unit 15  metpnrf - metrorail     PNR nodes
  unit 16  compnrf - commuter rail PNR nodes
  unit 17  buspnrf - bus           PNR Nodes

  unit 18  mpnrlf  - metrorail      PNR Connector Links
  unit 19  cpnrlf  - commuter rail  PNR Connector Links
  unit 20  bpnrlf  - bus            PNR Connector Links

  unit 21  metblf  - metrorail/bus connector Links
  unit 22  comblf  - comm.rail/bus connector Links

  unit 23  tazpnrf - TAZ-PNR Node equiv file (for MATRIX Run)
  unit 24  mf1a1   - A1 Deck Input file to MFARE1 program
```

```
  unit 25  s_pxyf  - station and pnr lot xys (unformated)

&files

   statf   = 'inputs\sta_tpp.bse'
   rlnkf   = 'inputs\rail_lnk.bse'

   metlnkf = 'MET_LINK.TB'
   metlnkm1= 'METLNKM1.TB'
   comlnkf = 'COM_LINK.TB'
   metnodf = 'MET_NODE.TB'
   metnodm1= 'METNODM1.TB'
   comnodf = 'COM_NODE.TB'
   metpnrf = 'MET_PNRN.TB'
   compnrf = 'COM_PNRN.TB'
   buspnrf = 'BUS_PNRN.TB'
   mpnrlf  = 'MET_PNRL.TB'
   cpnrlf  = 'COM_PNRL.TB'
   bpnrlf  = 'BUS_PNRL.TB'
   metblf  = 'MET_BUS.TB'
   comblf  = 'COM_BUS.TB'
   tazpnrf = 'TAZPNR.asc'
   mf1a1   = 'mfare1.a1'
   s_pxyf  = 'stapnr.xys'
   /
```

VEHAVTP.CTL

```
  VEHAVTP.CTL
  Control File for VEHAVTP.EXE Program
  Version 2/TP+ Vehicle Availability Program

 NOTE: This control file has been updated 8/8/02 using Moran/Humeida
       updates of ALOGIT model 06d

  The 3 INPUT files are:
       hhsizinc - HH by size, income groups (produced by hhsizinc program)
       zon_dat  - land use file containing area type variable (1-7)
       amtrnemp - file with jobs reached within 40 min using AM Pk Transit

  The 5 OUTPUT files are:
    hhi1_sv  - Households of Income Grp 1 allocated by HH Size(4)&VehsAvail.(4)
    hhi2_sv  - Households of Income Grp 2 allocated by HH Size(4)&VehsAvail.(4)
    hhi3_sv  - Households of Income Grp 3 allocated by HH Size(4)&VehsAvail.(4)
    hhi4_sv  - Households of Income Grp 4 allocated by HH Size(4)&VehsAvail.(4)
    hh_va    - Totals Households by 3 VehsAvail. Levels 0,1,2+

&files
   hhsizinc = 'hhsizinc.dat'
   zon_dat  = 'basezon.dat'
   trn_acc  = 'jobacc.asc'
   lu_file  = 'inputs\zone.asc'

   hhi1_sv  = 'hhi1_sv.dat'
   hhi2_sv  = 'hhi2_sv.dat'
   hhi3_sv  = 'hhi3_sv.dat'
   hhi4_sv  = 'hhi4_sv.dat'

   hh_va    = 'HH_veh.dat'
  /
&param
   const_v0 = 0.0000
   hhsiz_v0 = 0.0000
   i1dum_v0 = 0.0000
   i2dum_v0 = 0.0000
   i3dum_v0 = 0.0000
   i4dum_v0 = 0.0000
   tr40e_v0 = 0.0000
   atype_v0 = 0.0000
   dcdum_v0 = 0.0000

   const_v1 = 1.5988
   hhsiz_v1 = 0.0000
   i1dum_v1 = 0.0000
   i2dum_v1 = 1.2376
   i3dum_v1 = 1.3285
   i4dum_v1 = 1.9991
   tr40e_v1 =-1.095e-6
   atype_v1 = 0.0668
   dcdum_v1 =-0.9246

   const_v2 =-1.4608
   hhsiz_v2 = 0.8700
   i1dum_v2 = 0.0000
   i2dum_v2 = 1.7892
   i3dum_v2 = 2.4831
   i4dum_v2 = 3.7372
   tr40e_v2 =-1.815e-6
   atype_v2 = 0.2783
   dcdum_v2 =-1.0751

   const_v3 =-4.3021
   hhsiz_v3 = 1.3026
   i1dum_v3 = 0.0000
   i2dum_v3 = 1.8221
   i3dum_v3 = 2.7395
   i4dum_v3 = 4.1987
   tr40e_v3 =-2.053e-6
   atype_v3 = 0.4093
   dcdum_v3 =-1.6334
  /
```

Walk_AM.CTL

```
walk_am.ctl
  Control File for WLKLNKtp.EXE Program

   FILES  section refers to INPUT FILE references
  The 2 INPUT files are:
  unit  7  gisslf  - GIS file with short/long walk pcts, distances
  unit  8  cntconnf- walk access links from cnt conn pgm
  unit  9  gisconnf - GIS Rail related Walk access links

  The 1 OUTPUT file is:
  unit 11  finwlkf - final walk access links file in TRNBUILD format

   PARAMS section refers to node ranges of Rail (Metrorail&Commuter)
   Node range(s).  Range 1 is from railnr11 to railnr12.
                   Range 2 is from railnr21 to railnr22
&files
   gisslf   = 'shlgam.asc'
   cntconnf = 'ct2_am.asc'
   gisconnf = 'inputs\giswklam.asc'
   finwlkf  = 'walk_am.tb'
   fwlkpctf = 'shlgam.fin'
   /

&params
   railnr11 = 7301
   railnr12 = 7999
   railnr21 =    0
   railnr21 =    0
   /
```

Walk_OP.CTL

```
walk_op.ctl
  Control File for WLKLNKtp.EXE Program

   FILES  section refers to INPUT FILE references
  The 2 INPUT files are:
  unit  7  gisslf  - GIS file with short/long walk pcts, distances
  unit  8  cntconnf- walk access links from cnt conn pgm
  unit  9  gisconnf - GIS Rail related Walk access links

  The 1 OUTPUT file is:
  unit 11  finwlkf - final walk access links file in TRNBUILD format

   PARAMS section refers to node ranges of Rail (Metrorail&Commuter)
   Node range(s).  Range 1 is from railnr11 to railnr12.
                   Range 2 is from railnr21 to railnr22
&files
   gisslf   = 'shlgop.asc'
   cntconnf = 'ct2_op.asc'
   gisconnf = 'inputs\giswklop.asc'
   finwlkf  = 'walk_op.tb'
   fwlkpctf = 'shlgop.fin'
   /

&params
   railnr11 = 7301
   railnr12 = 7999
   railnr21 =    0
   railnr21 =    0
   /
```

Appendix C. Version 2.1/ TP+ Batch Files

runall94.bat

```
REM MWCOG VERSION 2.1/TP+  1994
REM Batch for full Run / Year: 1994 Alternative: Base

set _year_=1994
set _alt_=base
set _tdefl_=0.5447


REM =================Pump Prime Iteration==========================

call Step01.PP_Highway_Build.bat %1

call Step02.PP_Highway_PNR.bat %1

call Step03.PP_Transit_Prep.bat %1

call Step04.PP_Transit_Skim.bat %1

call Step05.PP_Trip_Generation.bat %1

call Step06.PP_Trip_Distribution.bat %1

call Step07.PP_Auto_Drivers.bat %1

call Step08.Misc_Time-of-Day.bat %1

call Step09.PP_Time-of-Day.bat %1

call Step10.PP_Highway_Assignment.bat %1

call Step11.PP_Highway_Skims.bat %1

REM ====== Base Iteration ========================================

call Step12.BS_Highway_PNR.bat %1

call Step13.BS_Transit_Prep.bat %1

call Step14.BS_Transit_Skim.bat %1

REM (copy year/alt specific mfare program controls to generic names)
copy controls\mf1am94.ctl  controls\mf1_am.ctl
copy controls\mf1op94.ctl  controls\mf1_op.ctl
copy controls\mfamwk94.ctl controls\mf_am_wk.ctl
copy controls\mfamdr94.ctl controls\mf_am_dr.ctl
copy controls\mfopwk94.ctl controls\mf_op_wk.ctl
copy controls\mfopdr94.ctl controls\mf_op_dr.ctl

call Step15.Transit_Fare.bat %1

call Step16.BS_Trip_Generation.bat %1

call Step17.BS_Trip_Distribution.bat %1

REM (copy year/alt specific mode ch. controls to generic filenames)
copy controls\mc_hbw94.ctl controls\mc_hbw.ctl
copy controls\mc_hbs94.ctl controls\mc_hbs.ctl
copy controls\mc_hbo94.ctl controls\mc_hbo.ctl
copy controls\mc_nhb94.ctl controls\mc_nhb.ctl

call Step18.Mode_Choice.bat %1

call Step19.BS_Auto_Driver.bat %1

call Step20.BS_Time-of-Day.bat %1

call Step21.BS_Highway_Assignment.bat %1

call Step22.BS_Highway_Skims.bat %1

rem =================1st Iteration============================

call Step23.I1_Trip_Distribution.bat %1

call Step24.I1_Mode_Choice_Update.bat %1

call Step25.I1_Auto_Driver.bat %1

call Step26.I1_Time-of-Day.bat %1

call Step27.I1_Highway_Assignment.bat %1

call Step28.I1_Highway_Skims.bat %1

rem =================2nd Iteration============================

call Step29.I2_Trip_Distribution.bat %1

call Step30.I2_Mode_Choice_Update.bat %1

call Step31.I2_Auto_Driver.bat %1

call Step32.I2_Time-of-Day.bat %1

call Step33.I2_Highway_Assignment.bat %1

call Step34.I2_Highway_Skims.bat %1

rem =================End of Batch==============================

set _year_=
set _alt_=
set _tdefl_=
set _iter_=
```

runall00.bat

```
REM MWCOG VERSION 2.1/TP+  2000
REM Batch for full Run / Year: 2000 Alternative: Base

set _year_=2000
set _alt_=base
set _tdefl_=0.4824


REM =================Pump Prime Iteration==========================

call Step01.PP_Highway_Build.bat %1

call Step02.PP_Highway_PNR.bat %1

call Step03.PP_Transit_Prep.bat %1

call Step04.PP_Transit_Skim.bat %1

call Step05.PP_Trip_Generation.bat %1

call Step06.PP_Trip_Distribution.bat %1

call Step07.PP_Auto_Drivers.bat %1

call Step08.Misc_Time-of-Day.bat %1

call Step09.PP_Time-of-Day.bat %1

call Step10.PP_Highway_Assignment.bat %1

call Step11.PP_Highway_Skims.bat %1

REM ====== Base Iteration ========================================

call Step12.BS_Highway_PNR.bat %1

call Step13.BS_Transit_Prep.bat %1

call Step14.BS_Transit_Skim.bat %1

REM (copy year/alt specific mfare program controls to generic names)
copy controls\mf1am00.ctl  controls\mf1_am.ctl
copy controls\mf1op00.ctl  controls\mf1_op.ctl
copy controls\mfamwk00.ctl controls\mf_am_wk.ctl
copy controls\mfamdr00.ctl controls\mf_am_dr.ctl
copy controls\mfopwk00.ctl controls\mf_op_wk.ctl
copy controls\mfopdr00.ctl controls\mf_op_dr.ctl

call Step15.Transit_Fare.bat %1

call Step16.BS_Trip_Generation.bat %1

call Step17.BS_Trip_Distribution.bat %1

REM (copy year/alt specific mode ch. controls to generic filenames)
copy controls\mc_hbw00.ctl controls\mc_hbw.ctl
copy controls\mc_hbs00.ctl controls\mc_hbs.ctl
copy controls\mc_hbo00.ctl controls\mc_hbo.ctl
copy controls\mc_nhb00.ctl controls\mc_nhb.ctl

call Step18.Mode_Choice.bat %1

call Step19.BS_Auto_Driver.bat %1

call Step20.BS_Time-of-Day.bat %1

call Step21.BS_Highway_Assignment.bat %1

call Step22.BS_Highway_Skims.bat %1

rem =================1st Iteration============================

call Step23.I1_Trip_Distribution.bat %1

call Step24.I1_Mode_Choice_Update.bat %1

call Step25.I1_Auto_Driver.bat %1

call Step26.I1_Time-of-Day.bat %1

call Step27.I1_Highway_Assignment.bat %1

call Step28.I1_Highway_Skims.bat %1

rem =================2nd Iteration============================

call Step29.I2_Trip_Distribution.bat %1

call Step30.I2_Mode_Choice_Update.bat %1

call Step31.I2_Auto_Driver.bat %1

call Step32.I2_Time-of-Day.bat %1

call Step33.I2_Highway_Assignment.bat %1

call Step34.I2_Highway_Skims.bat %1

rem =================End of Batch==============================

set _year_=
set _alt_=
set _tdefl_=
set _iter_=
```

runall25.bat

```
REM MWCOG VERSION 2.1/TP+  2025
REM Batch for full Run / Year: 2025 Alternative: Base

set _year_=2025
set _alt_=base
set _tdefl_=0.4824


REM =================Pump Prime Iteration==========================

call Step01.PP_Highway_Build.bat %1

call Step02.PP_Highway_PNR.bat %1

call Step03.PP_Transit_Prep.bat %1

call Step04.PP_Transit_Skim.bat %1

call Step05.PP_Trip_Generation.bat %1

call Step06.PP_Trip_Distribution.bat %1

call Step07.PP_Auto_Drivers.bat %1

call Step08.Misc_Time-of-Day.bat %1

call Step09.PP_Time-of-Day.bat %1

call Step10.PP_Highway_Assignment.bat %1

call Step11.PP_Highway_Skims.bat %1

REM ====== Base Iteration ========================================

call Step12.BS_Highway_PNR.bat %1

call Step13.BS_Transit_Prep.bat %1

call Step14.BS_Transit_Skim.bat %1

REM (copy year/alt specific mfare program controls to generic names)
REM use 2000 fare setup to simulate full inflation assumption
copy controls\mf1am00.ctl  controls\mf1_am.ctl
copy controls\mf1op00.ctl  controls\mf1_op.ctl
copy controls\mfamwk00.ctl controls\mf_am_wk.ctl
copy controls\mfamdr00.ctl controls\mf_am_dr.ctl
copy controls\mfopwk00.ctl controls\mf_op_wk.ctl
copy controls\mfopdr00.ctl controls\mf_op_dr.ctl

call Step15.Transit_Fare.bat %1

call Step16.BS_Trip_Generation.bat %1

call Step17.BS_Trip_Distribution.bat %1

REM (copy year/alt specific mode ch. controls to generic filenames)
copy controls\mc_hbw25.ctl controls\mc_hbw.ctl
copy controls\mc_hbs25.ctl controls\mc_hbs.ctl
copy controls\mc_hbo25.ctl controls\mc_hbo.ctl
copy controls\mc_nhb25.ctl controls\mc_nhb.ctl

call Step18.Mode_Choice.bat %1

call Step19.BS_Auto_Driver.bat %1

call Step20.BS_Time-of-Day.bat %1

call Step21.BS_Highway_Assignment.bat %1

call Step22.BS_Highway_Skims.bat %1

rem =================1st Iteration============================

call Step23.I1_Trip_Distribution.bat %1

call Step24.I1_Mode_Choice_Update.bat %1

call Step25.I1_Auto_Driver.bat %1

call Step26.I1_Time-of-Day.bat %1

call Step27.I1_Highway_Assignment.bat %1

call Step28.I1_Highway_Skims.bat %1

rem =================2nd Iteration============================

call Step29.I2_Trip_Distribution.bat %1

call Step30.I2_Mode_Choice_Update.bat %1

call Step31.I2_Auto_Driver.bat %1

call Step32.I2_Time-of-Day.bat %1

call Step33.I2_Highway_Assignment.bat %1

call Step34.I2_Highway_Skims.bat %1

rem =================End of Batch============================

set _year_=
set _alt_=
set _tdefl_=
set _iter_=
```

Step00.SetFactors.bat

```
cd support

         del tppl*.*
        del set_factors.rpt
start /w TPPLUS.EXE ..\scripts\set_factors.s /start -Ptppl -S..\support
         if errorlevel 1 goto error
        copy tppl*.prn set_factors.rpt
          goto end
:error
REM Processing Error
PAUSE
:end
cd..
```

Step01.PP_Highway_Build.bat

```
cd %1

REM  Step 1: - Highway Network Building

..\software\CLOSESTP  ..\controls\closestp.ctl
if errorlevel 1 goto error

..\software\ATYPETP  ..\controls\atypetp.ctl
if errorlevel 1 goto error

..\software\STAPROTP  ..\controls\staprotp.ctl
if errorlevel 1 goto error
 del temp.dat
        del staprotp.tem

        del trn_node.asc
copy inputs\node.asc + stapnr.xys  TRN_NODE.ASC

..\software\arealktp
if errorlevel 1 goto error


del tppl*.*
        del highway_build.rpt
start /w TPPLUS.EXE  ..\scripts\highway_build.s /start -Ptppl -S..\%1
if errorlevel 1 goto error
        copy tppl*.prn highway_build.rpt
goto end

:error
REM  Processing Error.....
PAUSE
:end
cd..
```

Step02.PP_Highway_PNR.bat

```
CD %1
REM  Step 2: Highway Skimming and PNR development

del tppl*.*
del pump_prime_skims.rpt
start /w TPPLUS.EXE  ..\scripts\pump_prime_skims.s /start -Ptppl -S..\%1
if errorlevel 1 goto error
copy tppl*.prn  pump_prime_skims.rpt
goto end

:error
REM  Processing Error....
PAUSE
:end
CD..
```

Step03.PP_Transit_Prep.bat

```
CD %1

REM  Step 3: Transit Network Building (Initial)

        del MODE*.TP
        del MODE*.TB

copy inputs\MODE*.TP

copy ..\controls\netswam.ctl netsw.ctl
..\software\netsw2
        if errorlevel 1 goto error

        del netsw.ctl

copy ..\controls\netswop.ctl netsw.ctl
..\software\netsw2
        if errorlevel 1 goto error

        del netsw.ctl

..\software\NODESTB  ..\controls\nt_am.ctl
       if errorlevel 1 goto error
..\software\SORTLINE nt_am.asc

..\software\NODESTB  ..\controls\nt_op.ctl
        if errorlevel 1 goto error
..\software\SORTLINE nt_op.asc
del nodestb.tem

..\software\CNTCONN2  ..\controls\ct2_am.ctl
        if errorlevel 1 goto error

..\software\CNTCONN2  ..\controls\ct2_op.ctl
        if errorlevel 1 goto error

..\software\GIS_PROC  ..\controls\gis.ctl
if errorlevel 1 goto error
del gis_proc.tem

del  wlklnktp.rpt
del  walk_am.rpt
..\software\WLKLNKTP  ..\controls\walk_am.ctl
        if errorlevel 1 goto error
ren  wlklnktp.rpt walk_am.rpt


del  wlklnktp.rpt
del  walk_op.rpt
```

```
..\software\WLKLNKTP  ..\controls\walk_op.ctl
        if errorlevel 1 goto error
ren  wlklnktp.rpt walk_op.rpt

del  wlklnktp.tem
del  wlklnktp.rpt

rem \\\\\\\\\\\\\\\ START walk link update section \\\\\\\\\\\\\\\\\
if not exist inputs\walk_am.old goto SKPWKUP
if not exist inputs\walk_op.old goto SKPWKUP

del tppl*.*
        del Update_WkLinks.rpt
start /w TPPLUS.EXE  ..\scripts\Update_WkLinks.s /start -Ptppl -S..\%1
if errorlevel 1 goto error
        copy tppl*.prn Update_Wklinks.rpt

del  walk_??.tb
copy walk_??.upd walk_??.tb

rem \\\\\\\\\\\\\\\ END walk link update section \\\\\\\\\\\\\\\\\\\
:SKPWKUP

..\software\PREfartp  ..\controls\prefartp.ctl
        if errorlevel 1 goto error
del pre_fare.tem

goto end
:error
REM  Processing Error.....
PAUSE
:end
CD..
```

Step04.PP_Transit_Skim.bat

```
CD %1

REM  Step 4: Transit Network Building (initial)

del tppl*.*
del transit_skims.rpt
start /w TPPLUS.EXE  ..\scripts\transit_skims.s /start -Ptppl -S..\%1
if errorlevel 2 goto error
copy tppl*.prn  TRANSIT_SKIMS.RPT
goto end
:error
REM  Processing Error......
PAUSE
:end
CD..
```

Step05.PP_Trip_Generation.bat

```
CD %1

REM  Step 5: Pump Prime Trip Generation

..\software\HHSIZINC  inputs\zone.asc
if errorlevel 1 goto error

..\software\VEHAVTP  ..\controls\vehavtp.ctl
if errorlevel 1 goto error

..\software\CGTGV2TP   ..\controls\hbw_tg.ctl
if errorlevel 1 goto error
del                             hbw_tg.rpt
ren cgtgv2tp.rpt                hbw_tg.rpt
del cgtgv2tp.*


..\software\CGTGV2TP   ..\controls\hbs_tg.ctl
if errorlevel 1 goto error
del                             hbs_tg.rpt
ren cgtgv2tp.rpt                hbs_tg.rpt
del cgtgv2tp.*


..\software\CGTGV2TP   ..\controls\hbo_tg.ctl
if errorlevel 1 goto error
del                             hbo_tg.rpt
ren cgtgv2tp.rpt                hbo_tg.rpt
del cgtgv2tp.*


..\software\CGTGV2TP   ..\controls\nhb_tg.ctl
if errorlevel 1 goto error
del                             nhb_tg.rpt
ren cgtgv2tp.rpt                nhb_tg.rpt
del cgtgv2tp.*


..\software\CGTGV2TP   ..\controls\mtk_tg.ctl
if errorlevel 1 goto error
del                             mtk_tg.rpt
ren cgtgv2tp.rpt                mtk_tg.rpt
del cgtgv2tp.*

..\software\CGTGV2TP   ..\controls\htk_tg.ctl
if errorlevel 1 goto error
del                             htk_tg.rpt
ren cgtgv2tp.rpt                htk_tg.rpt
del cgtgv2tp.*


..\software\COGMCA1  ..\controls\COGMCA1.CTL
if errorlevel 1 goto error
goto end
:error
REM  Processing Error....
PAUSE
:end
CD..
```

Step06.PP_Trip_Distribution.bat

```
set _iter_=pp
CD %1

REM  Step 6: Pump Prime Trip Distribution

del tppl*.*
del                 TrpD_1%_iter_%.rpt
start /w TPPLUS.EXE  ..\scripts\trip_distribution.s /start -Ptppl -S..\%1
if errorlevel 1 goto error
copy tppl*.prn      TrpD_1%_iter_%.rpt
..\software\extrtab TrpD_1%_iter_%.rpt
```

```
copy extrtab.out    TrpD_1%_iter_%.tab
del  extrtab.out
goto end

:error
REM  Processing Error....
PAUSE
:end
CD..
```

Step07.PP_Auto_Drivers.bat

```
CD %1

REM  Step 7: Pump Prime Auto Driver Trips

del tppl*.*
del                    PP_Auto_Drivers.rpt
start /w TPPLUS.EXE  ..\scripts\PP_Auto_Drivers.s /start -Ptppl -S..\%1
if errorlevel 1 goto error
copy tppl*.prn PP_Auto_Drivers.rpt
copy                PP_Auto_Drivers.rpt temp.dat
..\software\extrtab    temp.dat
copy extrtab.out       PP_Auto_Drivers.tab
del  extrtab.out
del  temp.out

goto end
:error
REM  Processing Error....
PAUSE
:end
CD..
```

Step08.Misc_Time-of-Day.bat

```
CD %1

REM  Step 8: Non-Modeled Time-of-Day Trips

del tppl*.*
del                   Misc_Time-of-Day.rpt
start /w TPPLUS.EXE  ..\scripts\Misc_Time-of-Day.s /start -Ptppl -S..\%1
if errorlevel 1 goto error
copy tppl*.prn           Misc_Time-of-Day.rpt
copy Misc_Time-of-Day.rpt temp.dat
..\software\extrtab       temp.dat
copy extrtab.out          Misc_Time-of-Day.tab
del  extrtab.out
del  temp.out

goto end
:error
REM  Processing Error....
PAUSE
:end
CD..
```

Step09.PP_Time-of-Day.bat

```
set _iter_=pp
CD %1

REM  Step  9: Pump Prime Modeled Time-of-Day Trips

del tppl*.*
del                    %_iter_%_Time-of-Day.rpt
start /w TPPLUS.EXE  ..\scripts\Time-of-Day.s /start -Ptppl -S..\%1
if errorlevel 1 goto error
copy tppl*.prn          %_iter_%_Time-of-Day.rpt
        copy %_iter_%_Time-of-Day.rpt temp.dat
        ..\software\extrtab           temp.dat
        copy    extrtab.out           %_iter_%_Time-of-Day.tab
        del     temp.dat
          goto end
:error
REM  Processing Error....
PAUSE
:end
CD..
```

Step10.PP_Highway_Assignment.bat

```
set _iter_=pp
CD %1

REM  Step 10: Highway Assignment - Pump Prime Iteration

          del tppl*.*
          del            %_iter_%_Highway_Assignment.rpt
start /w TPPLUS.EXE  ..\scripts\Highway_Assignment.s /start -Ptppl -S..\%1
          if errorlevel 1 goto error

copy tppl*.prn       %_iter_%_Highway_Assignment.rpt
copy                 %_iter_%_Highway_Assignment.rpt  temp.dat
..\software\extrtab  temp.dat
copy    extrtab.out  %_iter_%_Highway_Assignment.tab

          goto end
:error
REM  Processing Error....
PAUSE
:end
CD..
```

Step11.PP_Highway_Skims.bat

```
set _iter_=pp
CD %1

REM  Step 11: Pump Prime Highway Skims

del tppl*.*
del            %_iter_%_Highway_Skims.rpt
start /w TPPLUS.EXE  ..\scripts\Highway_Skims.s /start -Ptppl -S..\%1
if errorlevel 1 goto error
copy tppl*.prn %_iter_%_Highway_Skims.rpt
goto end
```

```
:error
REM  Processing Error....
PAUSE
:end
CD..
```

Step12.BS_Highway_PNR.bat

```
CD %1
REM  Step 12: Auto Access PNR Link Updating (Based on PP Assignment)


del tppl*.*
del Auto_Access.rpt
start /w TPPLUS.EXE  ..\scripts\Auto_Access.s /start -Ptppl -S..\%1
if errorlevel 1 goto error
copy tppl*.prn  Auto_Access.rpt
goto end

:error
REM  Processing Error....
PAUSE
:end
CD..
```

Step13.BS_Transit_Prep.bat

```
CD %1

REM  Step 13: Transit Network Building (Final)

        del MODE*.TP
        del MODE*.TB

copy inputs\MODE*.TP

copy ..\controls\netswam.ctl netsw.ctl
..\software\netsw2
        if errorlevel 1 goto error

        del netsw.ctl

copy ..\controls\netswop.ctl netsw.ctl
..\software\netsw2
        if errorlevel 1 goto error

        del netsw.ctl

..\software\NODESTB  ..\controls\nt_am.ctl
        if errorlevel 1 goto error
..\software\SORTLINE nt_am.asc

..\software\NODESTB  ..\controls\nt_op.ctl
        if errorlevel 1 goto error
..\software\SORTLINE nt_op.asc
del nodestb.tem

..\software\CNTCONN2  ..\controls\ct2_am.ctl
        if errorlevel 1 goto error

..\software\CNTCONN2  ..\controls\ct2_op.ctl
        if errorlevel 1 goto error

..\software\GIS_PROC  ..\controls\gis.ctl
if errorlevel 1 goto error
del gis_proc.tem

del  wlklnktp.rpt
del  walk_am.rpt
..\software\WLKLNKTP  ..\controls\walk_am.ctl
        if errorlevel 1 goto error
ren  wlklnktp.rpt walk_am.rpt


del  wlklnktp.rpt
del  walk_op.rpt
..\software\WLKLNKTP  ..\controls\walk_op.ctl
        if errorlevel 1 goto error
ren  wlklnktp.rpt walk_op.rpt

del  wlklnktp.tem
del  wlklnktp.rpt

rem \\\\\\\\\\\\\\\ START walk link update section \\\\\\\\\\\\\\\\\
if not exist inputs\walk_am.old goto SKPWKUP
if not exist inputs\walk_op.old goto SKPWKUP

del tppl*.*
        del Update_WkLinks.rpt
start /w TPPLUS.EXE  ..\scripts\Update_WkLinks.s /start -Ptppl -S..\%1
if errorlevel 1 goto error
        copy tppl*.prn Update_Wklinks.rpt

del  walk_??.tb
copy walk_??.upd walk_??.tb

rem \\\\\\\\\\\\\\\ END walk link update section \\\\\\\\\\\\\\\\\\\
:SKPWKUP

..\software\PREfartp  ..\controls\prefartp.ctl
        if errorlevel 1 goto error
del pre_fare.tem

goto end
:error
REM  Processing Error.....
PAUSE
:end
CD..
```

Step14.BS_Transit_Skim.bat

```
CD %1

REM  Step 14: Transit Network Building (Final)

del tppl*.*
del transit_skims.rpt
start /w TPPLUS.EXE  ..\scripts\transit_skims.s /start -Ptppl -S..\%1
if errorlevel 2 goto error
copy tppl*.prn  TRANSIT_SKIMS.RPT
goto end
:error
REM  Processing Error......
PAUSE
:end
CD..
```

Step15.Transit_Fare.bat

```
CD %1

REM  Step 15: Transit Fares

del tppl*.*
del metrorail_skims.rpt
start /w TPPLUS.EXE  ..\scripts\metrorail_skims.s /start -Ptppl -S..\%1
if errorlevel 1 goto error
copy tppl*.prn metrorail_skims.rpt

del mf1_am.*
..\software\MFARE1  ..\controls\mf1_am.ctl
if errorlevel 1 goto error

del mf1_op.*
..\software\MFARE1OP  ..\controls\mf1_op.ctl
if errorlevel 1 goto error

del fare.eqv
copy inputs\FARE.EQV

del mf1_am.prn
..\software\MTXIJTP  mf1_am.asc
if errorlevel 1 goto error
ren mtxijtp.out  mf1_am.prn

del mf1_op.prn
..\software\MTXIJTP  mf1_op.asc
if errorlevel 1 goto error
ren mtxijtp.out  mf1_op.prn

del mf_am_wk.*
..\software\MFARE2TP  ..\controls\mf_am_wk.ctl
if errorlevel 1 goto error

del mf_am_dr.*
..\software\MFARE2TP  ..\controls\mf_am_dr.ctl
if errorlevel 1 goto error

del mf_op_wk.*
..\software\MFARE2TP  ..\controls\mf_op_wk.ctl
if errorlevel 1 goto error

del mf_op_dr.*
..\software\MFARE2TP  ..\controls\mf_op_dr.ctl
if errorlevel 1 goto error

del tppl*.*
start /w TPPLUS.EXE  ..\scripts\export_fares.s /start -Ptppl -S..\%1
if errorlevel 1 goto error
copy tppl*.prn  export_fares.rpt
goto end
:error
REM  Processing Error....
PAUSE
:end
CD..
```

Step16.BS_Trip_Generation.bat

```
CD %1

REM  Step 16: Trip Generation (Base Iteration)

..\software\HHSIZINC  inputs\zone.asc
if errorlevel 1 goto error

..\software\VEHAVTP  ..\controls\vehavtp.ctl
if errorlevel 1 goto error

..\software\CGTGV2TP   ..\controls\hbw_tg.ctl
if errorlevel 1 goto error
del                              hbw_tg.rpt
ren cgtgv2tp.rpt                 hbw_tg.rpt
del cgtgv2tp.*


..\software\CGTGV2TP   ..\controls\hbs_tg.ctl
if errorlevel 1 goto error
del                              hbs_tg.rpt
ren cgtgv2tp.rpt                 hbs_tg.rpt
del cgtgv2tp.*


..\software\CGTGV2TP   ..\controls\hbo_tg.ctl
if errorlevel 1 goto error
del                              hbo_tg.rpt
ren cgtgv2tp.rpt                 hbo_tg.rpt
del cgtgv2tp.*


..\software\CGTGV2TP   ..\controls\nhb_tg.ctl
if errorlevel 1 goto error
del                              nhb_tg.rpt
ren cgtgv2tp.rpt                 nhb_tg.rpt
del cgtgv2tp.*


..\software\CGTGV2TP   ..\controls\mtk_tg.ctl
if errorlevel 1 goto error
del                              mtk_tg.rpt
ren cgtgv2tp.rpt                 mtk_tg.rpt
del cgtgv2tp.*

..\software\CGTGV2TP   ..\controls\htk_tg.ctl
if errorlevel 1 goto error
del                              htk_tg.rpt
ren cgtgv2tp.rpt                 htk_tg.rpt
del cgtgv2tp.*


..\software\COGMCA1  ..\controls\COGMCA1.CTL
if errorlevel 1 goto error
goto end
:error
REM  Processing Error....
PAUSE
:end
CD..
```

Step17.BS_Trip_Distribution.bat

```
Step 17: Trip Distribution - Base Iteration (using PP Hwy Skims)

set _iter_=pp
CD %1

copy sovppam.skm pp_am.skm
copy sovppop.skm pp_op.skm

del tppl*.*
del                 TrpD_2%_iter_%.rpt
start /w TPPLUS.EXE  ..\scripts\trip_distribution.s /start -Ptppl -S..\%1
if errorlevel 1 goto error
copy tppl*.prn      TrpD_2%_iter_%.rpt
..\software\extrtab TrpD_2%_iter_%.rpt
copy extrtab.out    TrpD_2%_iter_%.tab
del  extrtab.out
goto end

:error
REM  Processing Error....
PAUSE
:end
CD..
```

Step18.Mode_Choice.bat

```
set _iter_=pp
CD %1

REM  Step 18: Mode Choice Model Application

del mc_hbw.*
..\software\COGMC  ..\controls\mc_hbw.ctl
if errorlevel 1 goto error

del mc_hbs.*
..\software\COGMC  ..\controls\mc_hbs.ctl
if errorlevel 1 goto error

del mc_hbo.*
..\software\COGMC  ..\controls\mc_hbo.ctl
if errorlevel 1 goto error

del mc_nhb.*
..\software\COGMC ..\controls\mc_nhb.ctl
if errorlevel 1 goto error

del tppl*.prn
del mc_summary.rpt
start /w TPPLUS.EXE  ..\scripts\mc_summary.s /start -Ptppl -S..\%1
if errorlevel 1 goto error
copy tppl*.prn      mc_summary.rpt
copy tppl*.prn      temp.rpt
..\software\extrtab temp.rpt
copy extrtab.out    mc_summary.tab
del  extrtab.out
del  temp.rpt
goto end

:error
REM  Processing Error....
PAUSE
:end
CD..
```

Step19.BS_Auto_Driver.bat

```
CD %1

REM  Step 19 Base Iteration Auto Driver Trips

del tppl*.*
       del                    BS_Auto_Drivers.rpt
start /w TPPLUS.EXE  ..\scripts\BS_Auto_Drivers.s /start -Ptppl -S..\%1
if errorlevel 1 goto error
       copy tppl*.prn BS_Auto_Drivers.rpt
copy                  BS_Auto_Drivers.rpt temp.dat
..\software\extrtab   temp.dat
copy extrtab.out      BS_Auto_Drivers.tab
del  extrtab.out
del  temp.out

goto end
:error
REM  Processing Error....
PAUSE
:end
CD..
```

Step20.BS_Time-of-Day.bat

```
set _iter_=bs
CD %1

REM  Step 20: Base Iteration Modeled Time-of-Day Trips

del tppl*.*
del                   BS_Time-of-Day.rpt
start /w TPPLUS.EXE  ..\scripts\Time-of-Day.s /start -Ptppl -S..\%1
if errorlevel 1 goto error
copy tppl*.prn        BS_Time-of-Day.rpt
       copy BS_Time-of-Day.rpt temp.dat
       ..\software\extrtab     temp.dat
       copy    extrtab.out     BS_Time-of-Day.tab
       del     temp.dat
         goto end
:error
REM  Processing Error....
PAUSE
:end
CD..
```

Step21.BS_Highway_Assignment.bat

```
set _iter_=bs
CD %1

REM  Step 21: Highway Assignment - Base Iteration

del tppl*.*
```

```
del            %_iter_%_Highway_Assignment.rpt
start /w TPPLUS.EXE  ..\scripts\Highway_Assignment.s /start -Ptppl -S..\%1
if errorlevel 1 goto error

copy tppl*.prn       %_iter_%_Highway_Assignment.rpt
copy                 %_iter_%_Highway_Assignment.rpt  temp.dat
..\software\extrtab  temp.dat
copy    extrtab.out  %_iter_%_Highway_Assignment.tab

goto end
:error
REM  Processing Error....
PAUSE
:end
CD..
```

Step22.BS_Highway_Skims.bat

```
set _iter_=bs
CD %1

REM  Step 22: Base Iteration Highway Skims

del tppl*.*
del            %_iter_%_Highway_Skims.rpt
start /w TPPLUS.EXE  ..\scripts\Highway_Skims.s /start -Ptppl -S..\%1
if errorlevel 1 goto error
copy tppl*.prn %_iter_%_Highway_Skims.rpt
goto end
:error
REM  Processing Error....
PAUSE
:end
CD..
```

Step23.I1_Trip_Distribution.bat

```
REM  Step 23: Trip Distribution - 1st Iteration

set _iter_=i1
CD %1

copy sovbsam.skm i1_am.skm
copy sovbsop.skm i1_op.skm

del tppl*.*
del                TrpDst%_iter_%.rpt
start /w TPPLUS.EXE  ..\scripts\trip_distribution.s /start -Ptppl -S..\%1
if errorlevel 1 goto error
copy tppl*.prn      TrpDst%_iter_%.rpt
..\software\extrtab TrpDst%_iter_%.rpt
copy extrtab.out    TrpDst%_iter_%.tab
del  extrtab.out
goto end

:error
REM  Processing Error....
PAUSE
:end
CD..
```

Step24.I1_Mode_Choice_Update.bat

```
REM  Step 24: 1st Iteration Update of Mode Choice Tables

set _iter_=i1
CD %1

del tppl*.*
del              MC_Update%_iter_%.rpt
start /w TPPLUS.EXE  ..\scripts\MC_Update.s /start -Ptppl -S..\%1
if errorlevel 1 goto error
copy tppl*.prn      MC_Update%_iter_%.rpt
copy tppl*.prn      temp.dat
..\software\extrtab temp.dat
copy extrtab.out    MC_Update%_iter_%.tab
del  extrtab.out
goto end

:error
REM  Processing Error....
PAUSE
:end
CD..
```

Step25.I1_Auto_Driver.bat

```
set _iter_=i1
CD %1

REM  Step 25 1st Iteration Auto Driver Trips

del tppl*.*
       del                    ADr_Update%_iter_%.rpt
start /w TPPLUS.EXE  ..\scripts\ADr_Update.s /start -Ptppl -S..\%1
if errorlevel 1 goto error
copy tppl*.prn      ADr_Update%_iter_%.rpt
copy                ADr_Update%_iter_%.rpt temp.dat
..\software\extrtab temp.dat
copy extrtab.out    ADr_Update%_iter_%.tab
del  extrtab.out
del  temp.out

goto end
:error
REM  Processing Error....
PAUSE
:end
CD..
```

Step26.I1_Time-of-Day.bat

```
set _iter_=i1
CD %1

REM  Step 26: 1st Iteration Time-of-Day Trips

del tppl*.*
del                    I1_Time-of-Day.rpt
```

```
start /w TPPLUS.EXE  ..\scripts\Time-of-Day.s /start -Ptppl -S..\%1
if errorlevel 1 goto error
copy tppl*.prn          I1_Time-of-Day.rpt
        copy I1_Time-of-Day.rpt temp.dat
        ..\software\extrtab     temp.dat
        copy    extrtab.out     I1_Time-of-Day.tab
        del     temp.dat
          goto end
:error
REM  Processing Error....
PAUSE
:end
CD..
```

Step27.I1_Highway_Assignment.bat

```
set _iter_=i1
CD %1

REM  Step 27: Highway Assignment - 1st Iteration

del tppl*.*
del             %_iter_%_Highway_Assignment.rpt
start /w TPPLUS.EXE  ..\scripts\Highway_Assignment.s /start -Ptppl -S..\%1
if errorlevel 1 goto error

copy tppl*.prn         %_iter_%_Highway_Assignment.rpt
copy                   %_iter_%_Highway_Assignment.rpt  temp.dat
..\software\extrtab    temp.dat
copy    extrtab.out    %_iter_%_Highway_Assignment.tab

goto end
:error
REM  Processing Error....
PAUSE
:end
CD..
```

Step28.I1_Highway_Skims.bat

```
set _iter_=i1
CD %1

REM  Step 28: 1st Iteration Highway Skims

del tppl*.*
del             %_iter_%_Highway_Skims.rpt
start /w TPPLUS.EXE  ..\scripts\Highway_Skims.s /start -Ptppl -S..\%1
if errorlevel 1 goto error
copy tppl*.prn %_iter_%_Highway_Skims.rpt
goto end
:error
REM  Processing Error....
PAUSE
:end
CD..
```

Step29.I2_Trip_Distribution.bat

```
REM  Step 29: Trip Distribution - 2nd Iteration
set _iter_=i2
CD %1

copy sovi1am.skm i2_am.skm
copy sovi1op.skm i2_op.skm

del tppl*.*
del              TrpDst%_iter_%.rpt
start /w TPPLUS.EXE  ..\scripts\trip_distribution.s /start -Ptppl -S..\%1
if errorlevel 1 goto error
copy tppl*.prn      TrpDst%_iter_%.rpt
..\software\extrtab TrpDst%_iter_%.rpt
copy extrtab.out    TrpDst%_iter_%.tab
del  extrtab.out
goto end

:error
REM  Processing Error....
PAUSE
:end
CD..
```

Step30.I2_Mode_Choice_Update.bat

```
set _iter_=i2

REM  Step 30: 2nd Iteration Update of Mode Choice Tables

CD %1

del tppl*.*
del              MC_Update%_iter_%.rpt
start /w TPPLUS.EXE  ..\scripts\MC_Update.s /start -Ptppl -S..\%1
if errorlevel 1 goto error
copy tppl*.prn      MC_Update%_iter_%.rpt
copy tppl*.prn      temp.dat
..\software\extrtab temp.dat
copy extrtab.out    MC_Update%_iter_%.tab
del  extrtab.out
del  temp.dat
goto end

:error
REM  Processing Error....
PAUSE
:end
CD..
```

Step31.I2_Auto_Driver.bat

```
set _iter_=i2
CD %1

REM  Step 31 2nd Iteration Auto Driver Trips

del tppl*.*
        del                     ADr_Update%_iter_%.rpt
```

```
start /w TPPLUS.EXE  ..\scripts\ADr_Update.s /start -Ptppl -S..\%1
if errorlevel 1 goto error
        copy tppl*.prn ADr_Update%_iter_%.rpt
copy                   ADr_Update%_iter_%.rpt temp.dat
..\software\extrtab    temp.dat
copy extrtab.out       ADr_Update%_iter_%.tab
del  extrtab.out
del  temp.out

goto end
:error
REM  Processing Error....
PAUSE
:end
CD..
```

Step32.I2_Time-of-Day.bat

```
set _iter_=i2
CD %1

REM  Step 32: 2nd Iteration Modeled Time-of-Day Trips

del tppl*.*
del                    I2_Time-of-Day.rpt
start /w TPPLUS.EXE  ..\scripts\Time-of-Day.s /start -Ptppl -S..\%1
if errorlevel 1 goto error
copy tppl*.prn         I2_Time-of-Day.rpt
        copy I2_Time-of-Day.rpt temp.dat
        ..\software\extrtab     temp.dat
        copy    extrtab.out    I2_Time-of-Day.tab
        del     temp.dat
        goto end
:error
REM  Processing Error....
PAUSE
:end
CD..
```

Step33.I2_Highway_Assignment.bat

```
set _iter_=i2
CD %1

REM  Step 33: Highway Assignment - 2nd Iteration

del tppl*.*
del            %_iter_%_Highway_Assignment.rpt
start /w TPPLUS.EXE  ..\scripts\Highway_Assignment.s /start -Ptppl -S..\%1
if errorlevel 1 goto error

copy tppl*.prn       %_iter_%_Highway_Assignment.rpt
copy                 %_iter_%_Highway_Assignment.rpt  temp.dat
..\software\extrtab  temp.dat
copy    extrtab.out  %_iter_%_Highway_Assignment.tab

goto end
:error
REM  Processing Error....
PAUSE
:end
CD..
```

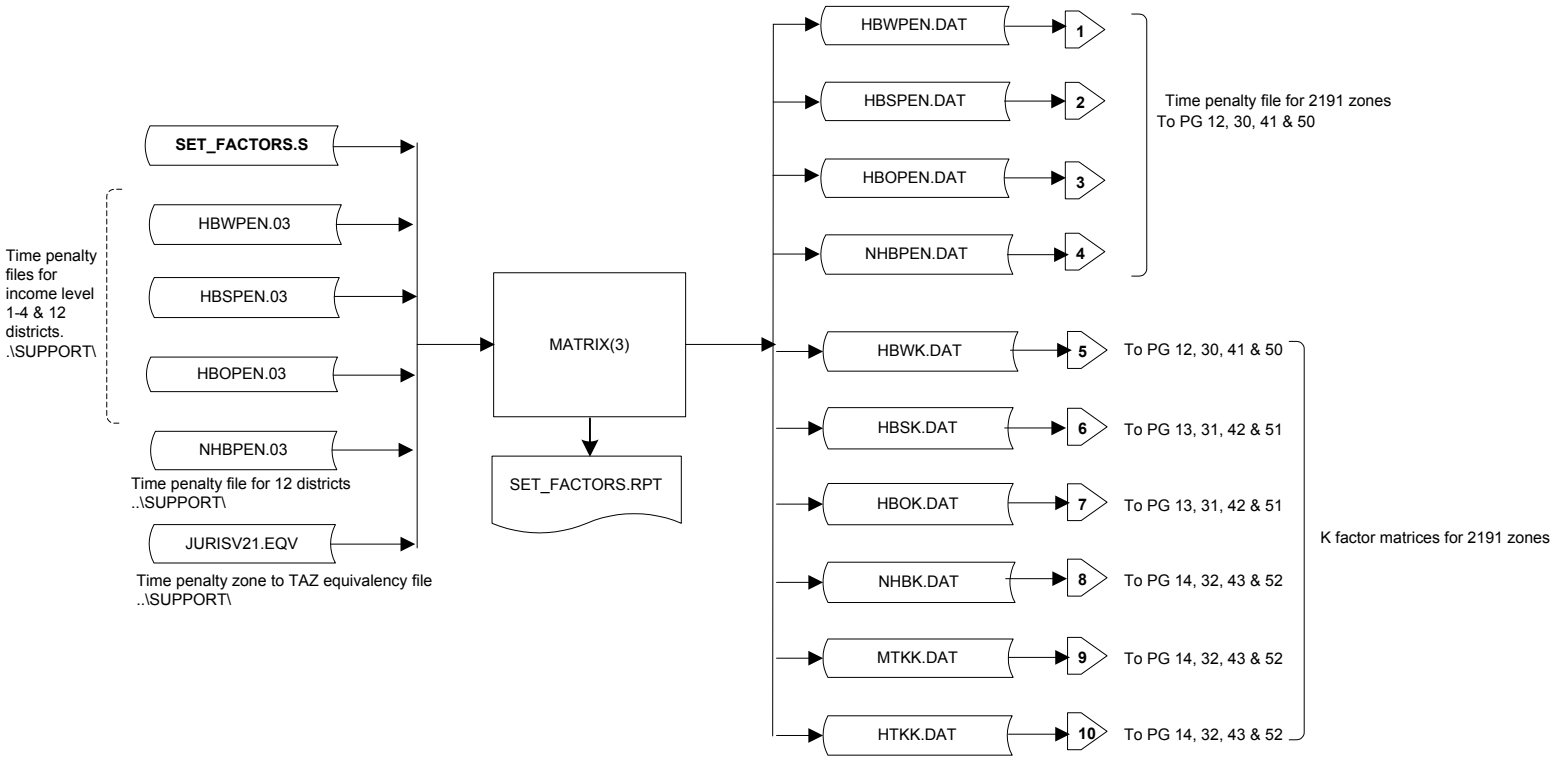
Step34.I2_Highway_Skims.bat

```
set _iter_=i2
CD %1

REM  Step 34: 2nd Iteration Highway Skims

del tppl*.*
del            %_iter_%_Highway_Skims.rpt
start /w TPPLUS.EXE  ..\scripts\Highway_Skims.s /start -Ptppl -S..\%1
if errorlevel 1 goto error
copy tppl*.prn %_iter_%_Highway_Skims.rpt
goto end
:error
REM  Processing Error....
PAUSE
:end
CD..
```

Appendix D. Version 2.1/ TP+ Travel Model Flowcharts

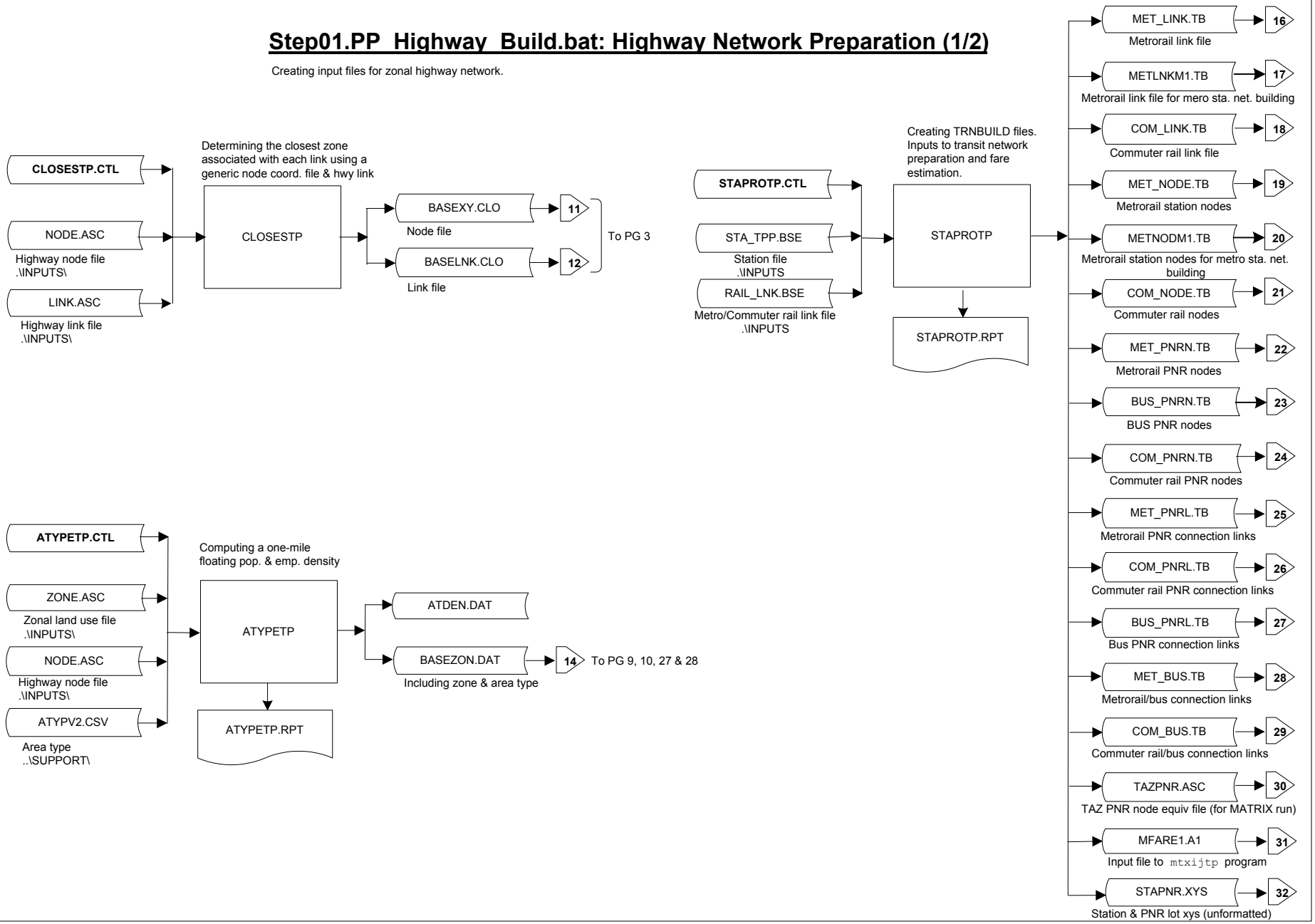
Step00.Set_Factors.bat

Setting up time penalty and K factor files for 'Trip Distribution' using income-based time penalty files and superdistrict-TAZ equivalency file (12 superdistricts to 2191 zones). Outputs are the inputs for base, the first and the final trip distributions.



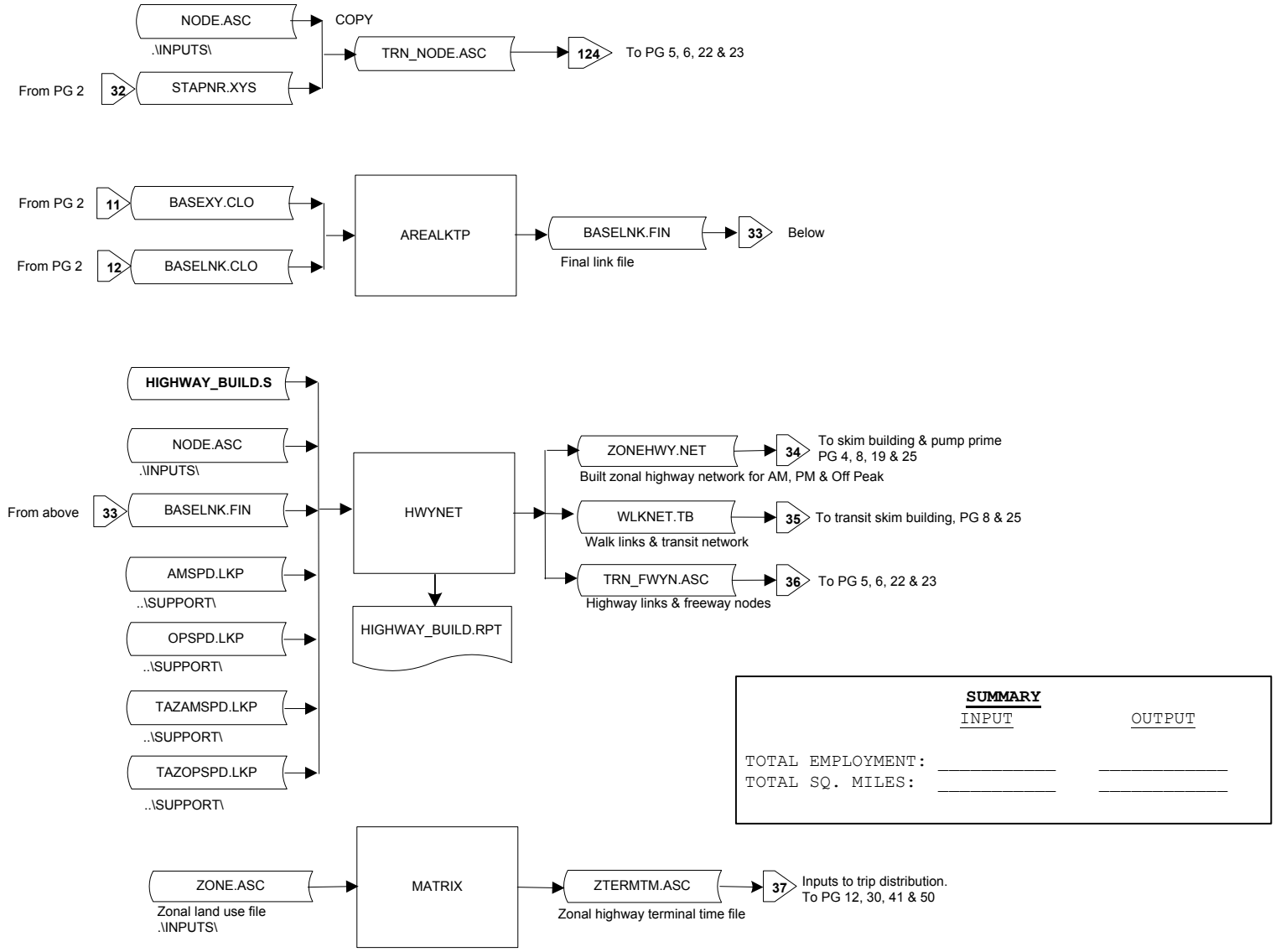
Step01.PP_Highway_Build.bat: Highway Network Preparation (1/2)

Creating input files for zonal highway network.



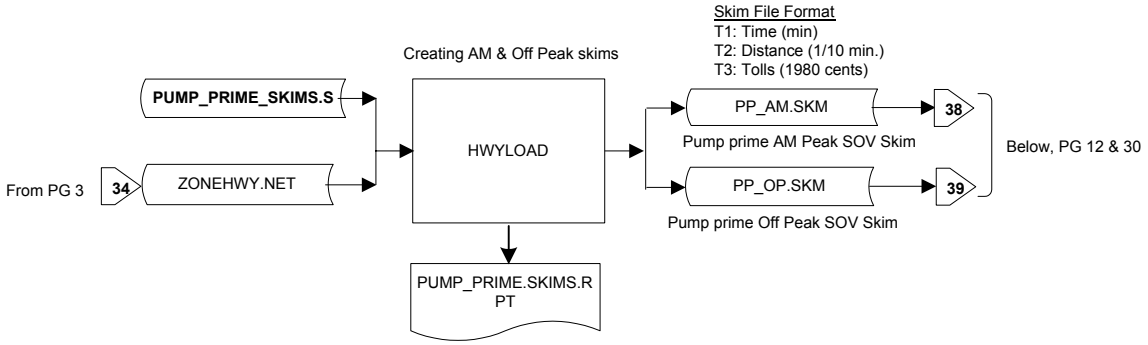
Step01.PP_Highway_Build.bat: Highway Network Preparation (2/2)

Building a zonal highway network (zonehwy.net) for AM, PM and off peak periods.

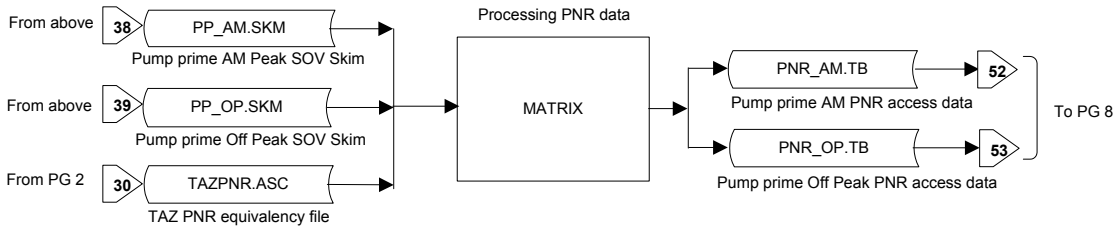


Step02.PP_Highway_PNR.bat: Highway Path Building

Creating highway path using zonal highway network for AM and off peak periods.

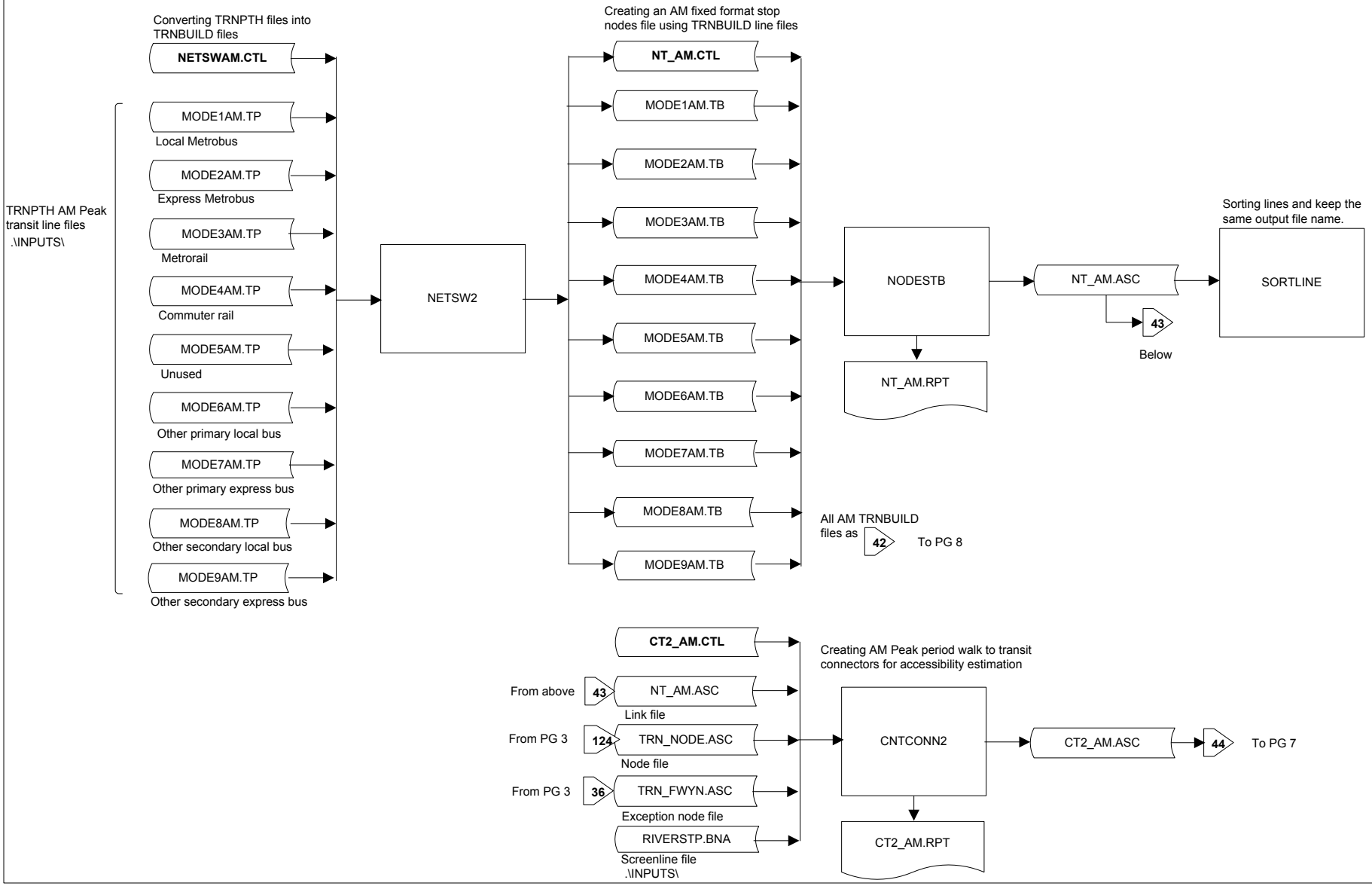


Limit Code Setup
0/1: No prohibitions
2: Prohibit 1 occupancy autos & trucks
3: Prohibit 1 & 2 occupancy autos & trucks
4: Prohibit trucks
5: Prohibit non-airport trips (Year 2000 & beyond)
6-8: Unused
9: Prohibit all traffic use



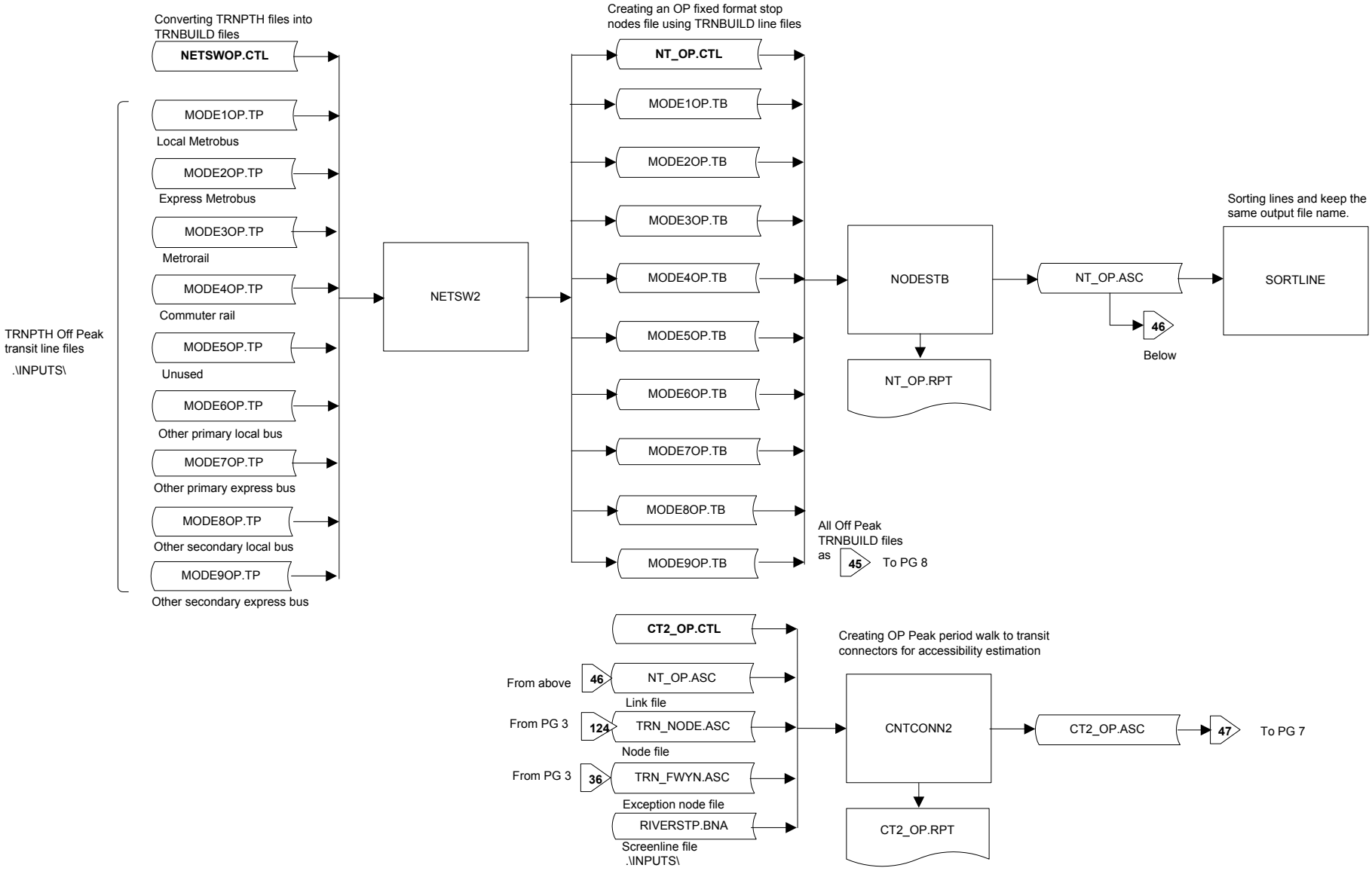
Step03.PP_Transit_Prep.bat: Transit Preparation(1/3)

Three tasks are performed: (a) Converting TRNPTH-based AM peak mode files into the TRNBUILD-based; (b) Creating an AM peak fixed format stop node files; and (c) Creating AM peak period walk to transit connectors.



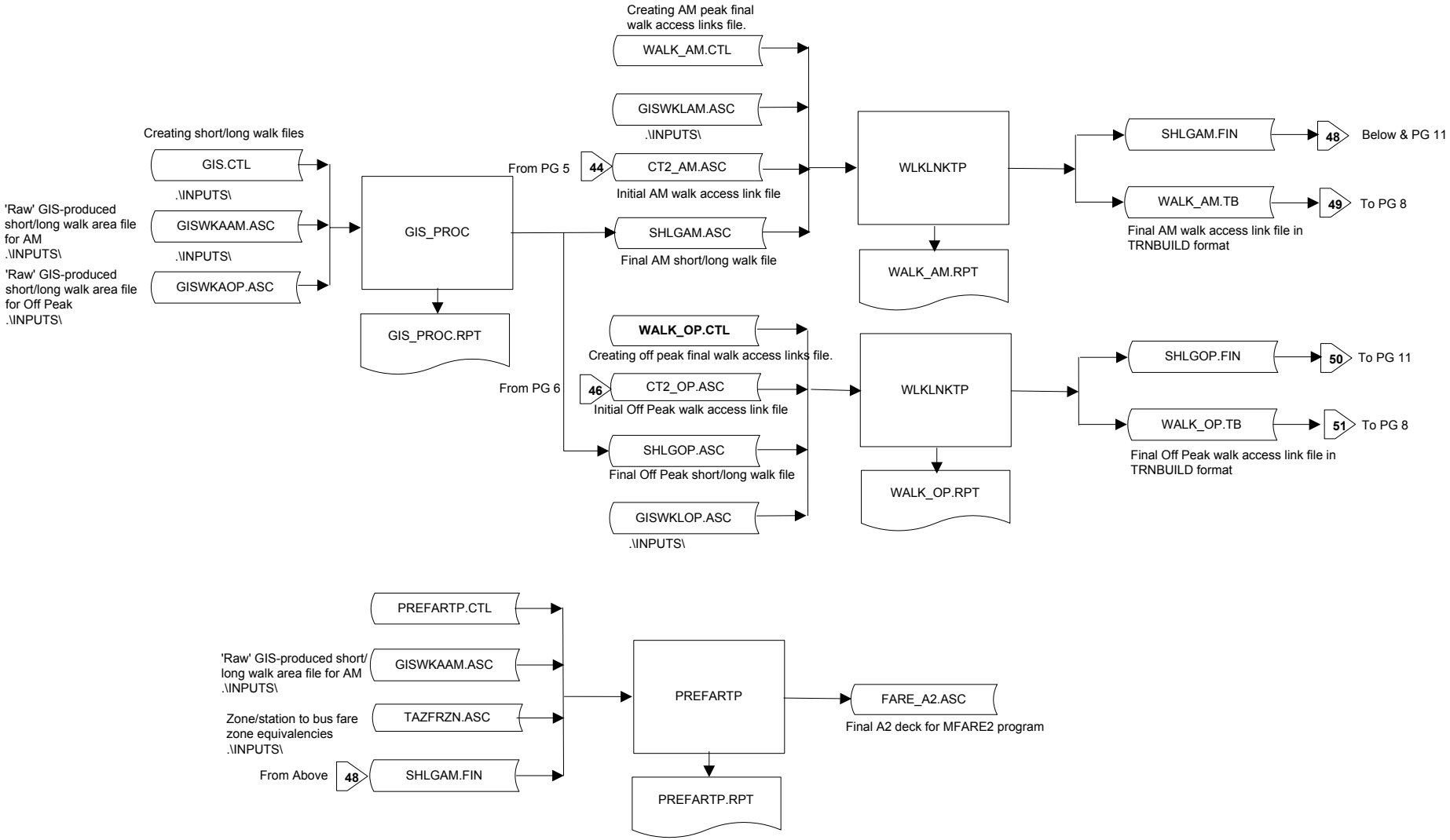
Step03.PP_Transit_Prep.bat: Transit Preparation(2/3)

Three tasks are performed: (a) Converting TRNPTH-based off peak mode files into the TRNBUILD-based; (b) Creating an off peak fixed format stop node files; and (c) Creating off peak period walk to transit connectors.



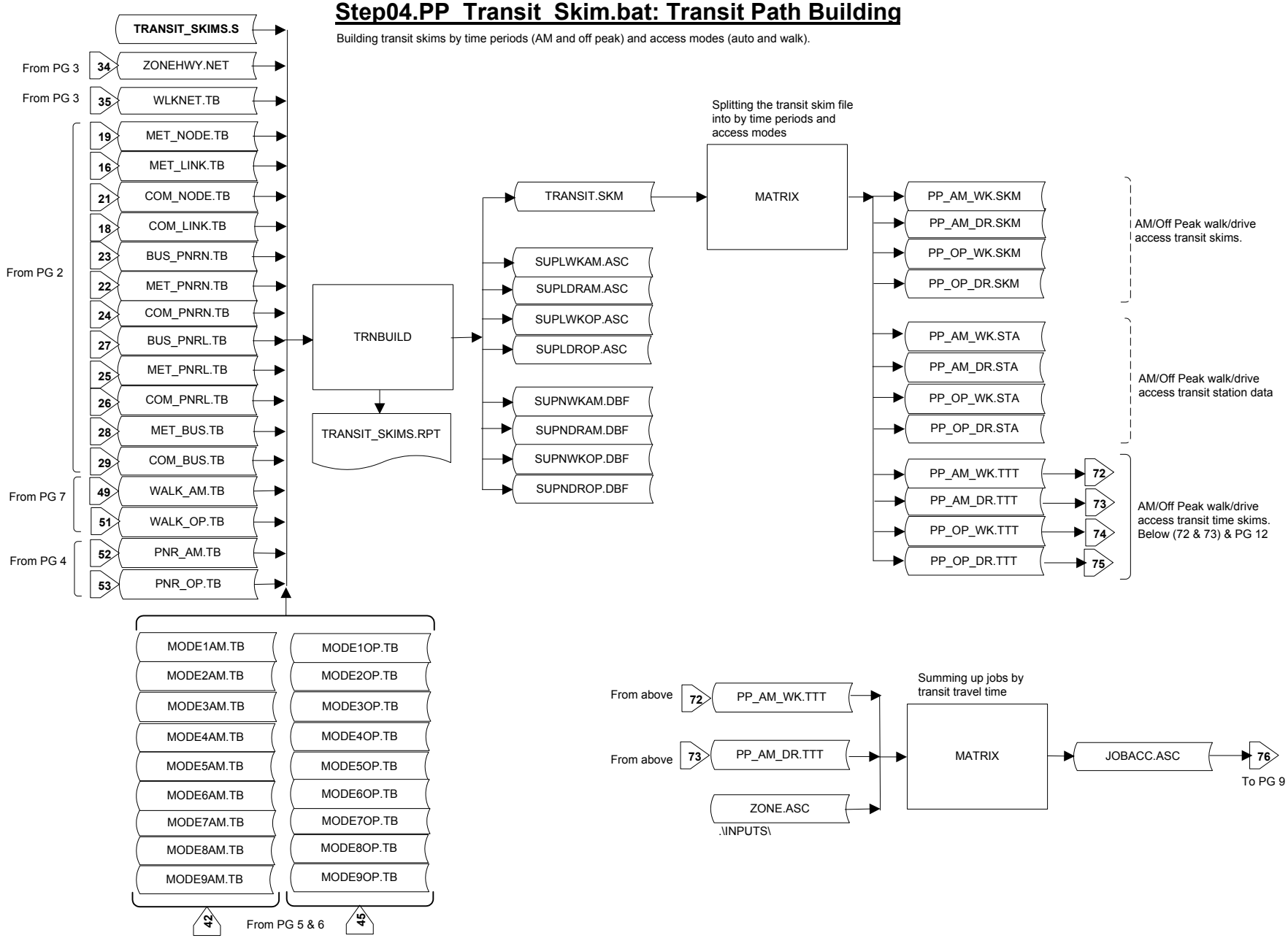
Step03.PP_Transit_Prep.bat: Transit Preparation(3/3)

Creating final auto and walk access link files for AM and off peak periods and final A2 deck for MFARE2 program.



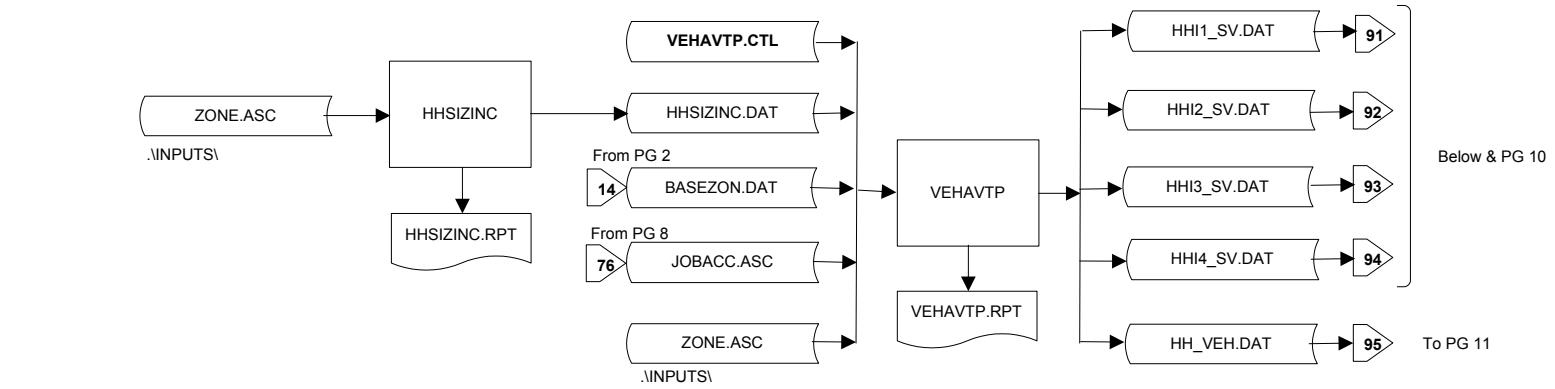
Step04.PP_Transit_Skim.bat: Transit Path Building

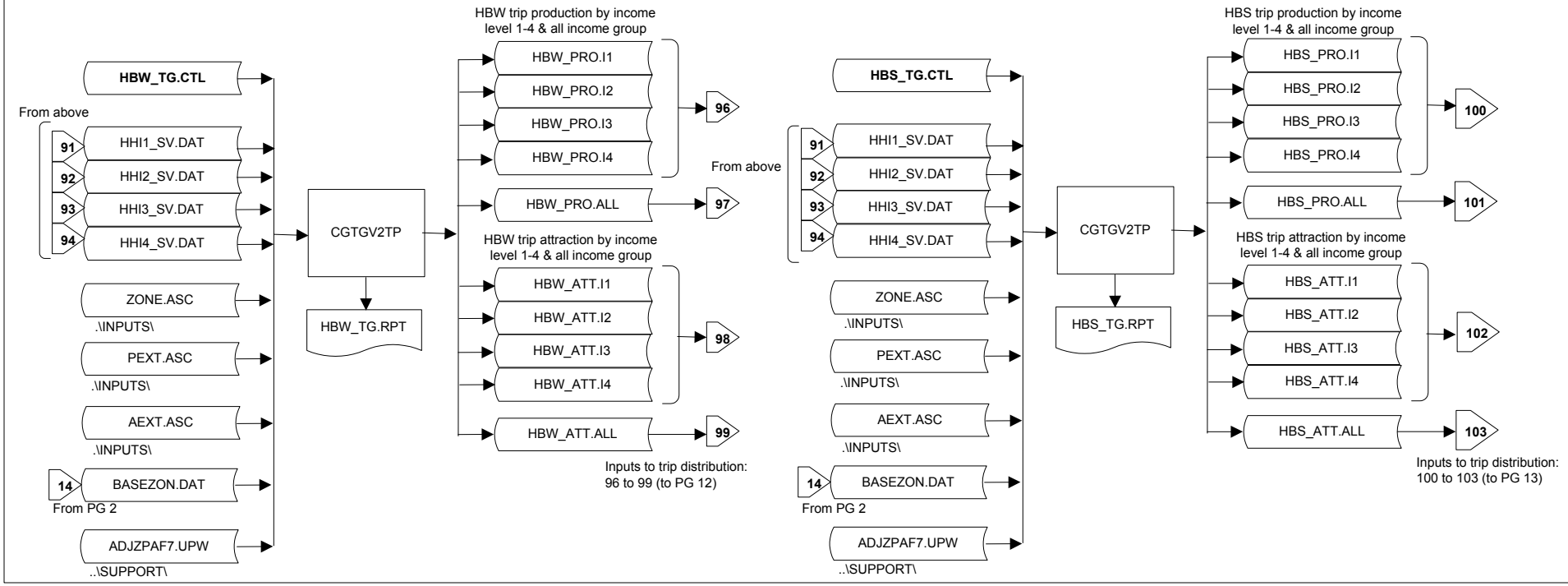
Building transit skims by time periods (AM and off peak) and access modes (auto and walk).



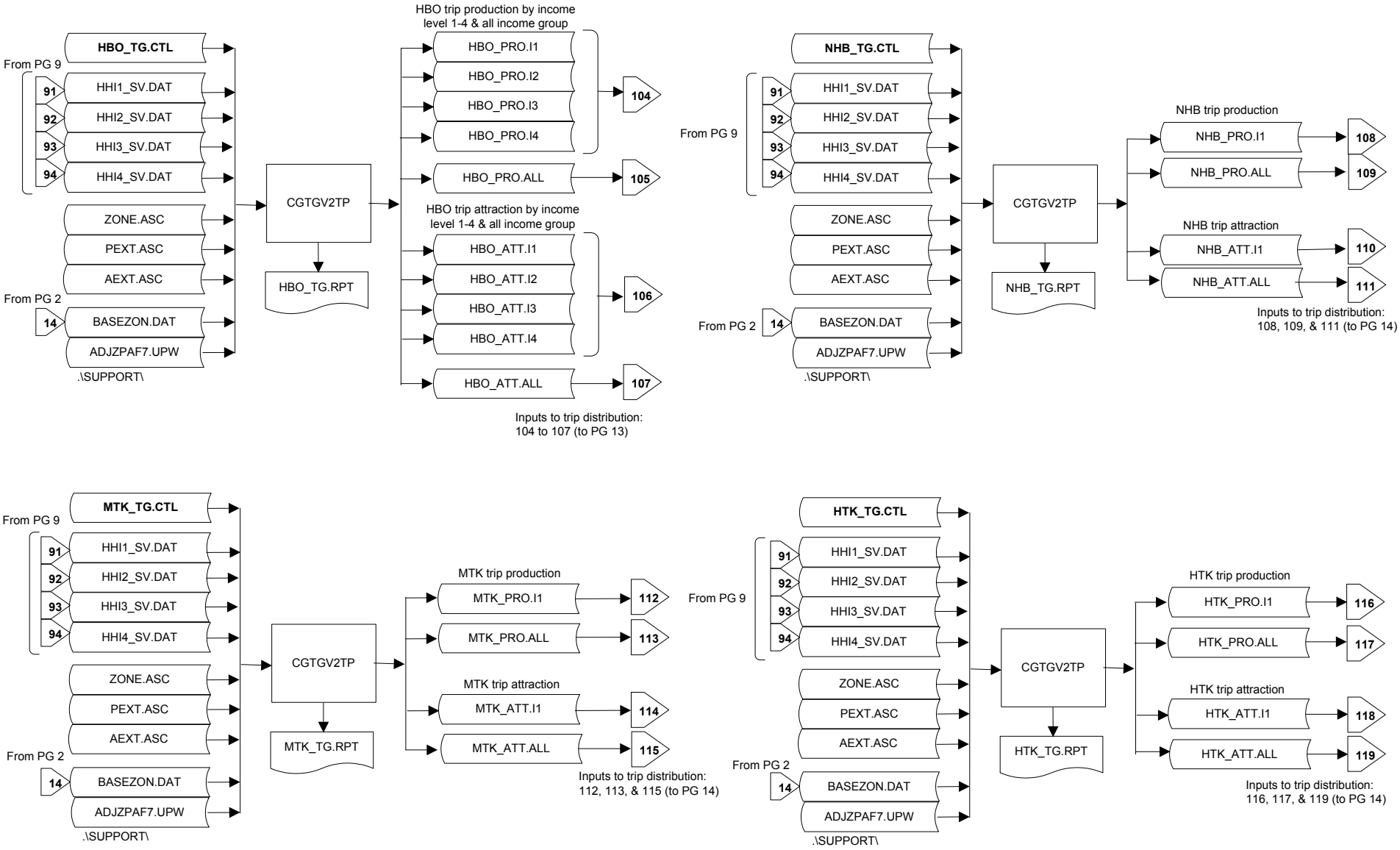
Step05.PP Trip Generation.bat: Trip Generation (1/3)

Creating trip productions/attractions by trip purpose (HBW, HBS and HBO) and income group (1 - 4) after building vehicle availability data. Only trip productions/ attractions were created for NHB purpose, medium and heavy truck trips. Outputs from trip generation by each trip purpose are fed into trip distribution.



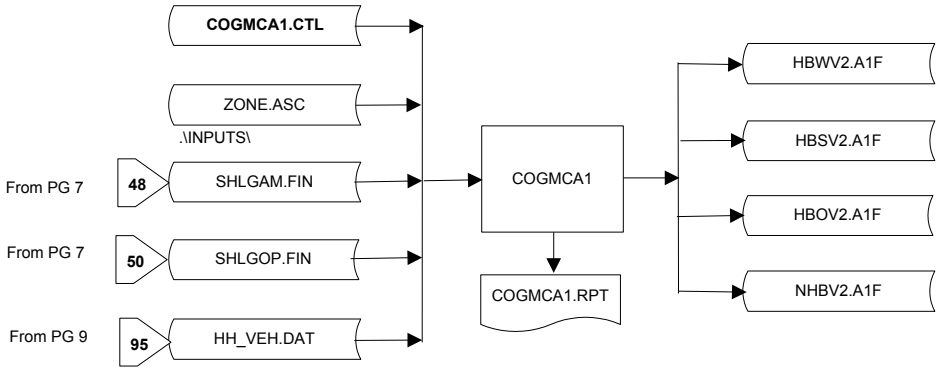


Step05.PP_Trip_Generation.bat: Trip Generation (2/3)



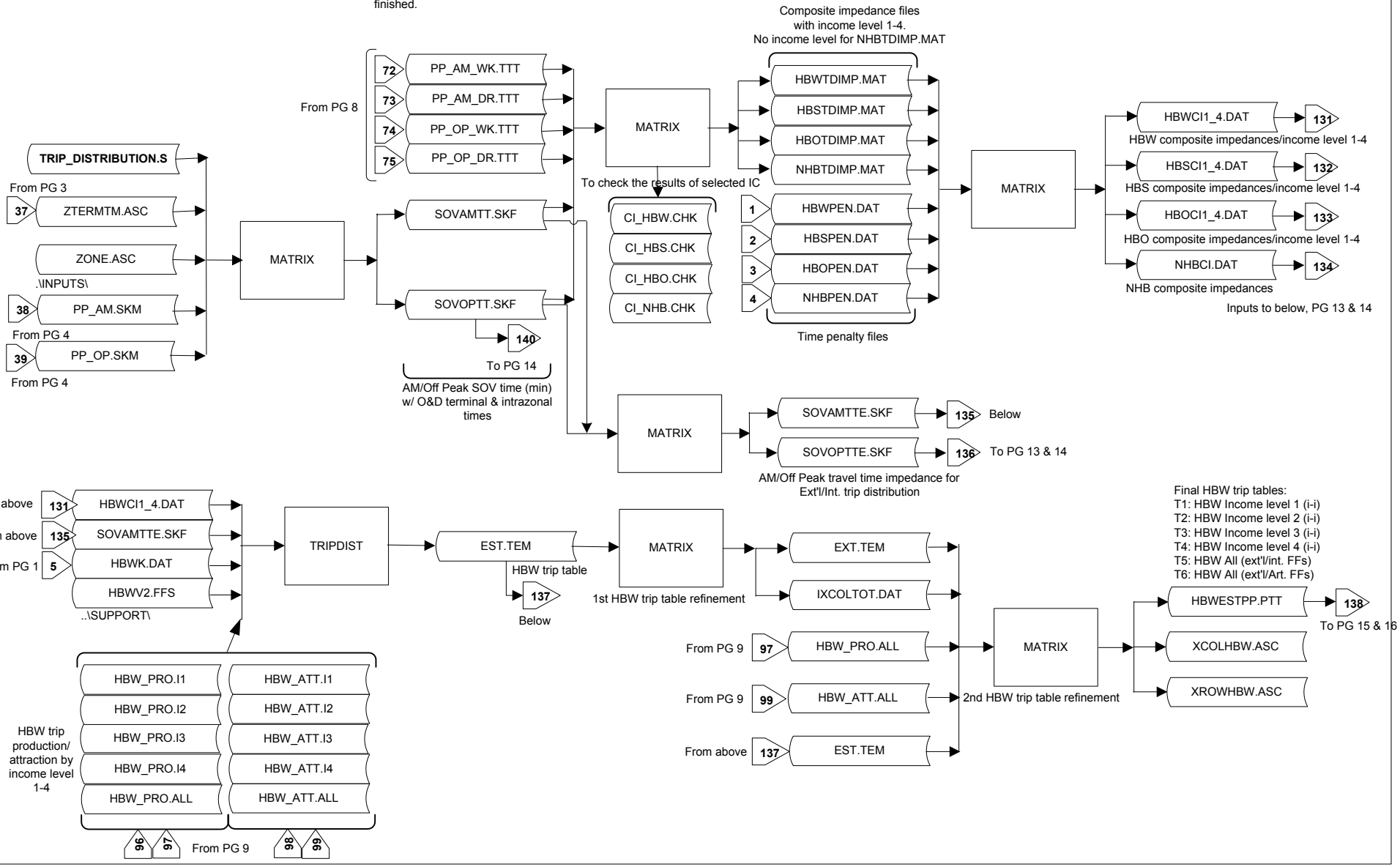
Step05.PP_Trip_Generation.bat: Trip Generation (3/3)

Creating zonal A1 deck by trip purpose.

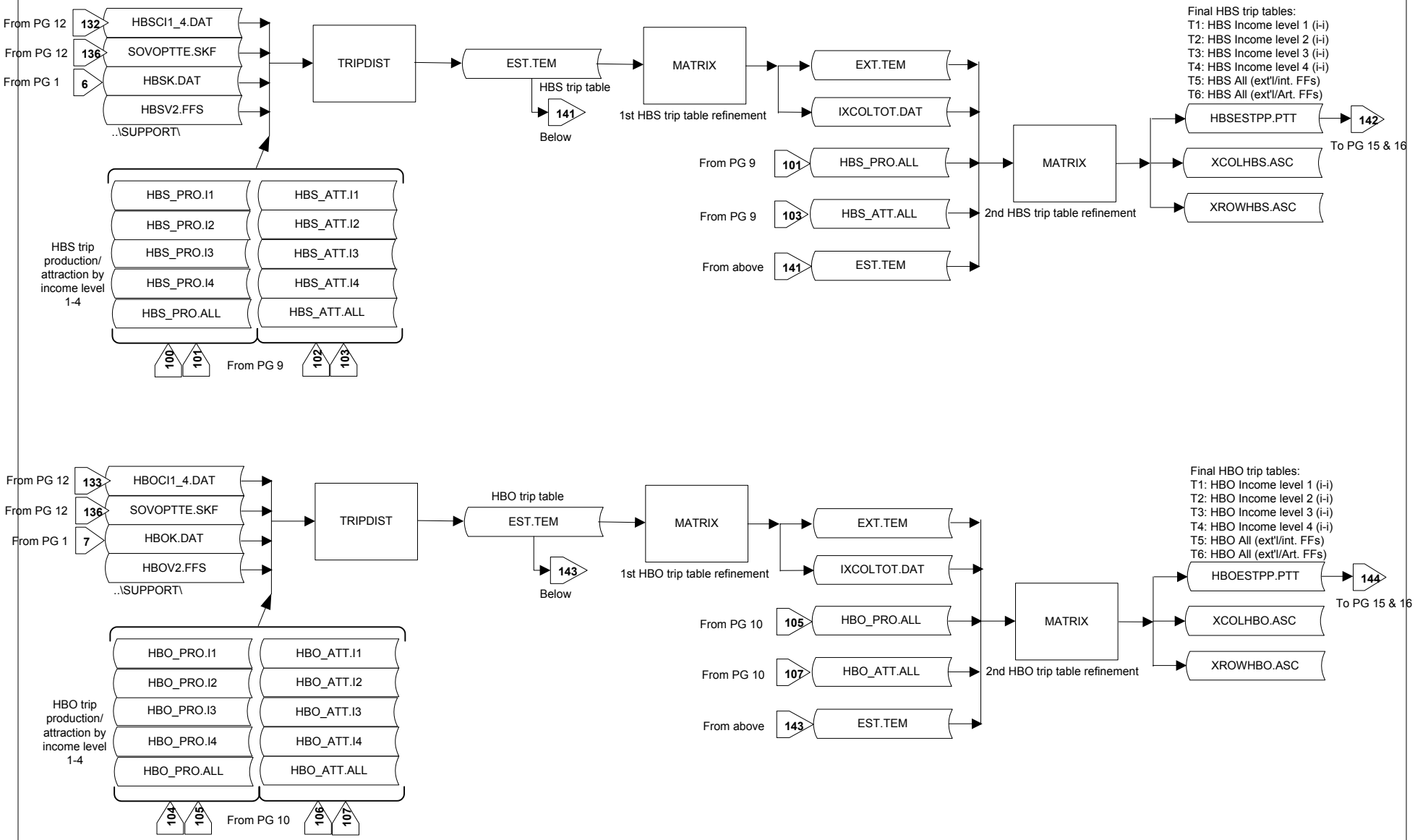


Step06.PP_Trip_Distribution.bat: Trip Distribution(1/4)

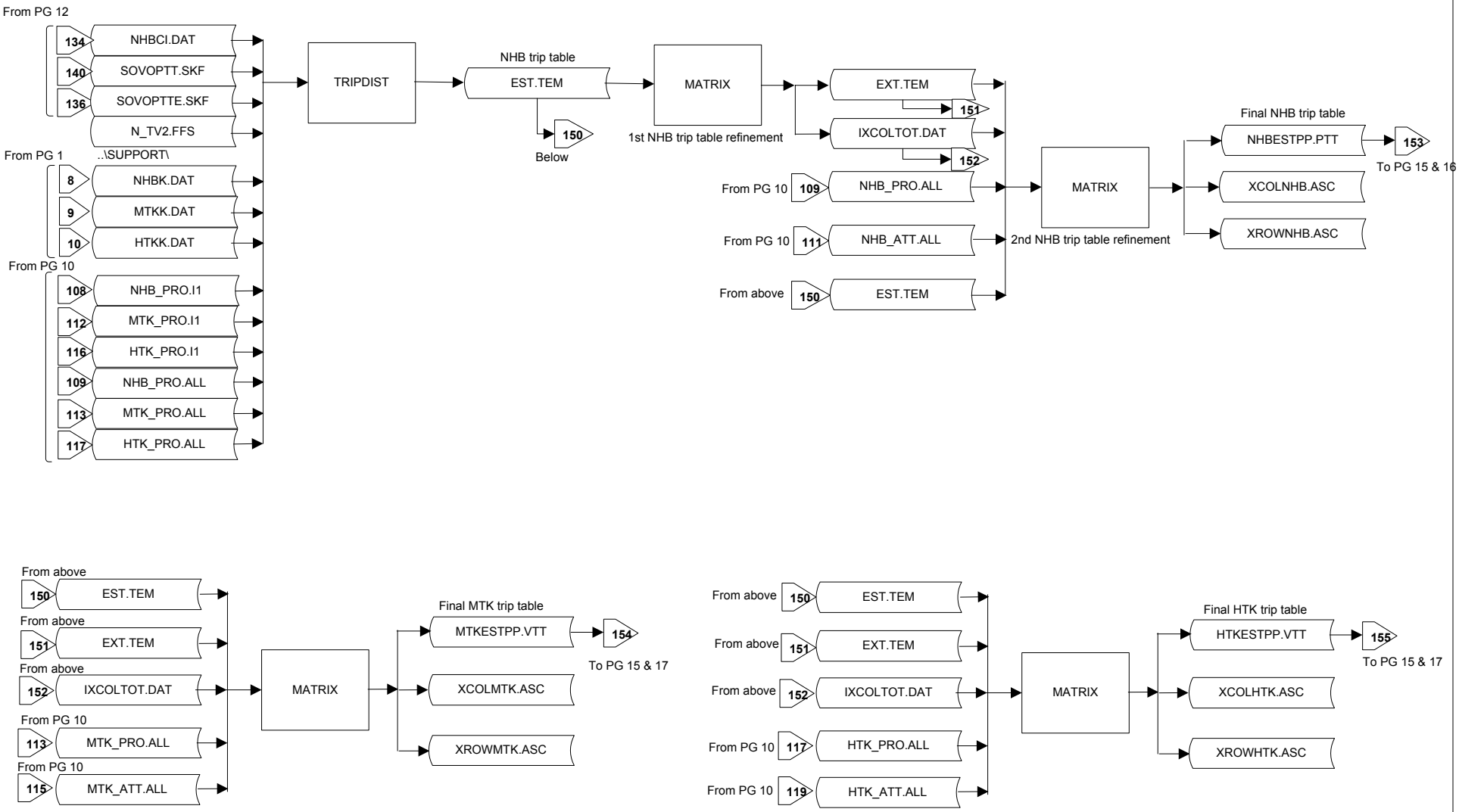
Distributing trips by trip purpose after building impedance files by income level except for NHB. No income level is available for NHB. In this process, two temp. files, 'EST.TEM' and 'EXT.TEM' are rewritten after trip distribution by each trip purpose is finished.



Step06.PP Trip Distribution.bat: Trip Distribution(2/4)

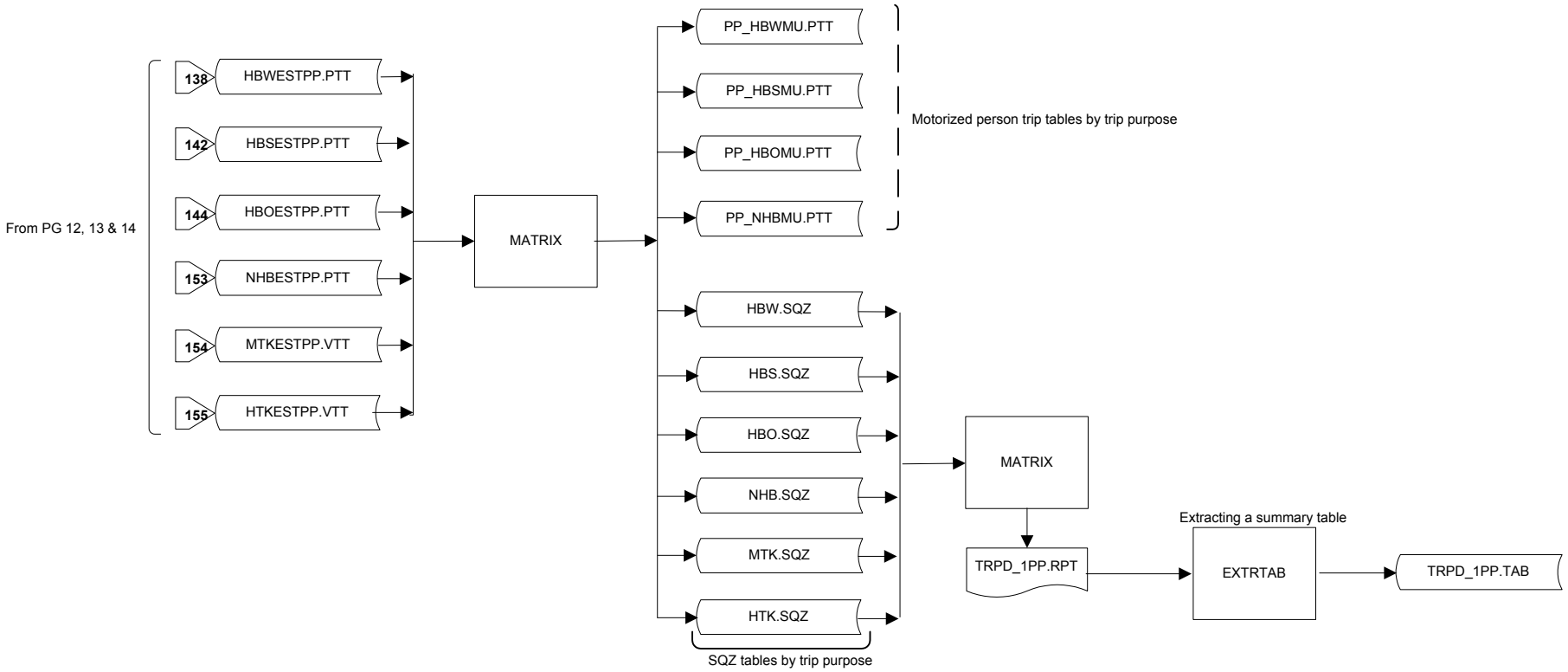


Step06.PP Trip Distribution.bat: Trip Distribution(3/4)



Step06.PP_Trip_Distribution.bat: Trip Distribution(4/4)

Output files are inputs to Mode Choice.



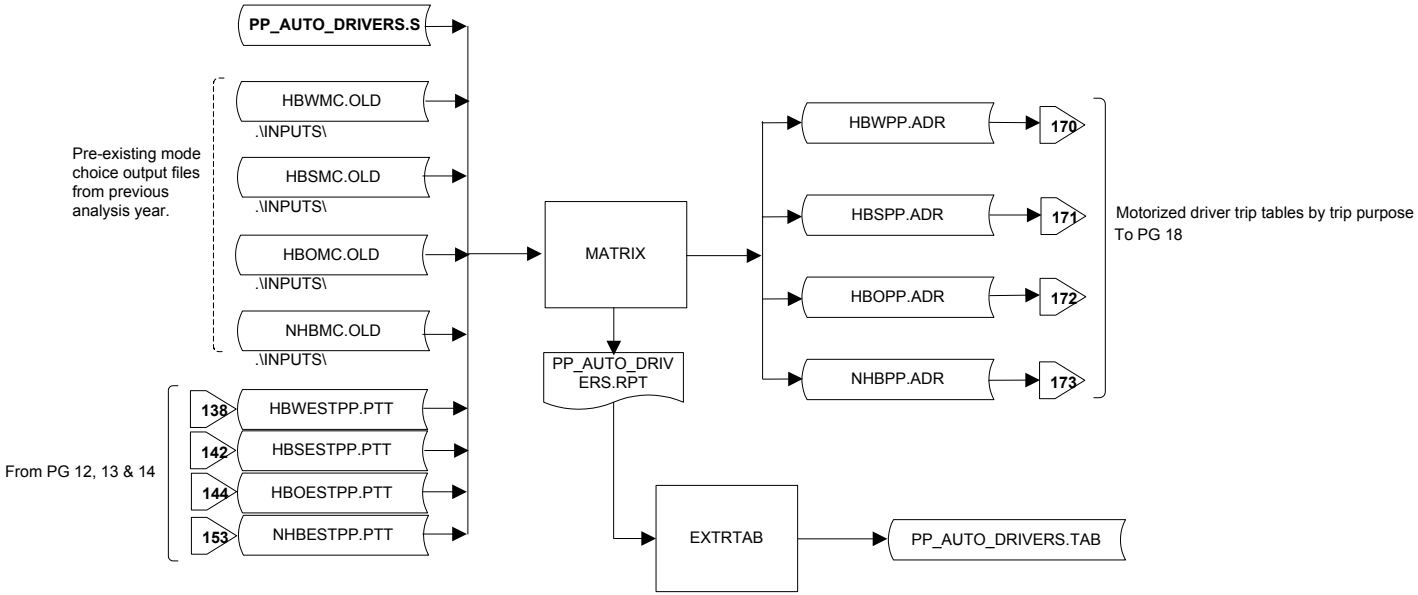
Summary

Motorized Persons/Trucks

HBW: _____
HBS: _____
HBO: _____
NHB: _____
MED. TRUCK: _____
HVY. TRUCK: _____

Step07.PP_Auto_Drivers.bat: Pump Prime Auto Driver Trips

Developing driver trip tables by trip purpose using auto driver percentages from pre-existing (or seed) mode choice output files and 'off-the-shelf' disaggregate curves and final trip tables from trip distribution.

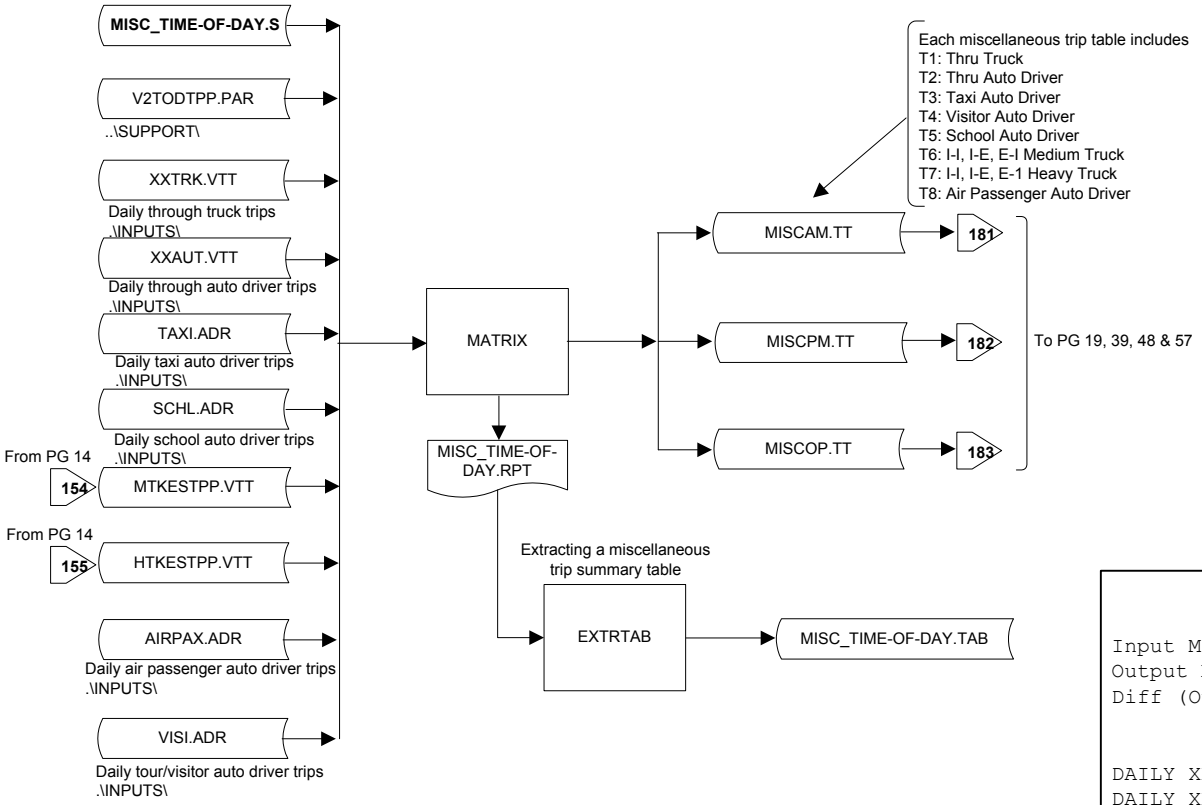


Summary
Motorized Drivers

HBW: _____
HBS: _____
HBO: _____
NHB: _____

Step08.Misc_Time-of-Day.bat

Creating miscellaneous trip tables by AM, PM and Off peak time periods by multiplying factors for each miscellaneous trip table.



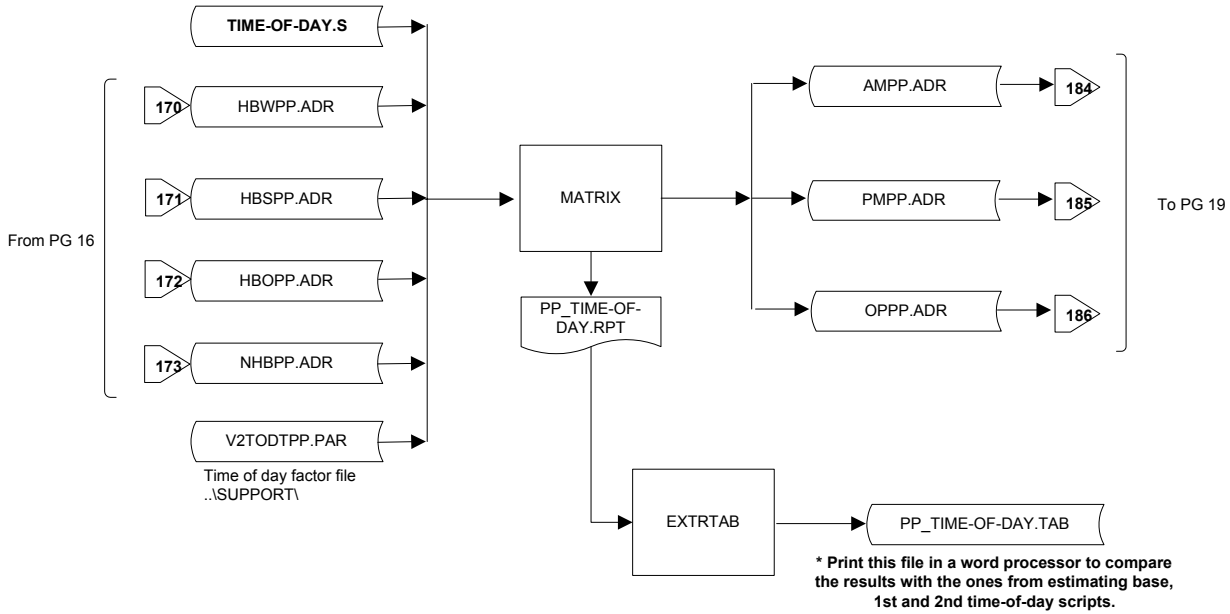
Miscellaneous Trip Summary

Input Misc/Truck Total: _____
Output Misc/Truck Total: _____
Diff (Output - Input): _____

	AM PEAK	PM PEAK	OFF PEAK	Total
DAILY XX TRUCKS:				
DAILY XX ADRS:				
DAILY TAXI ADRS:				
DAILY VISI ADRS:				
DAILY SCHO ADRS:				
DAILY MED TRKS:				
DAILY HVY TRKS:				
DAILY APX ADRS:				

Step09. PP_Time-of-Day.bat

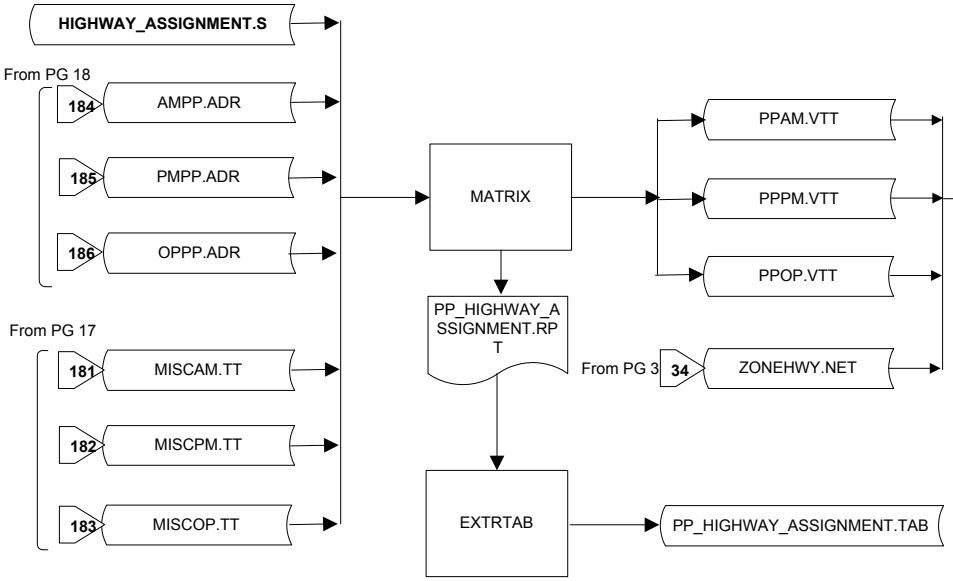
Creating time of day trip tables by multiplying time of day factors ('V2TODTPP.PAR') to HBW, HBS, HBO and NHB trip tables.



Step10. PP_Highway_Assignment.bat

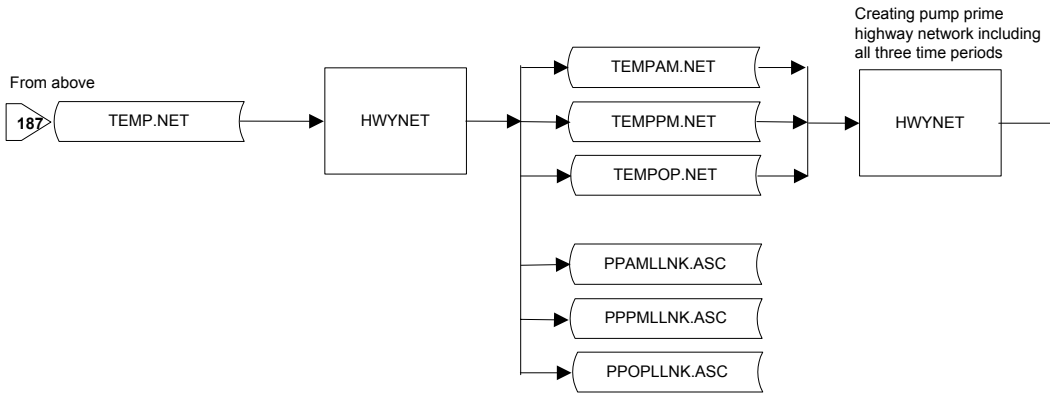
Executing pump prime highway assignment. First, the script summarizes input trip tables into three tables by time periods and then assigns them to the network. Equilibrium assignment method and 10 iterations are applied for each time period. Each trip table includes 5 trip tables (T1: 1 occ. adrs.; T2: 2 occ. adrs.; T3: 3+occ. adrs.; T4: Truck; and T5: Airport passenger adrs).

Limit Code Setup
0/1: No prohibitions
2: Prohibit 1 occupancy autos & trucks
3: Prohibit 1 & 2 occupancy autos & trucks
4: Prohibit trucks
5: Prohibit non-airport trips (Year 2000 & beyond)
6-8: Unused
9: Prohibit all traffic use



Before Assignment Summary

	AM PEAK	PM PEAK	OFF PEAK
MODELED ADRS:			
1 OCC ADRS:			
2 OCC ADRS:			
3+OCC ADRS:			
MED. TRKS:			
HVY. TRKS:			
THRU TRKS:			
THRU 1 OCC ADRS:			
THRU 2 OCC ADRS:			
THRU 3+OCC ADRS:			
TAXI:			
VISITOR:			
SCHOOL:			
AIR PASS. ADRS:			

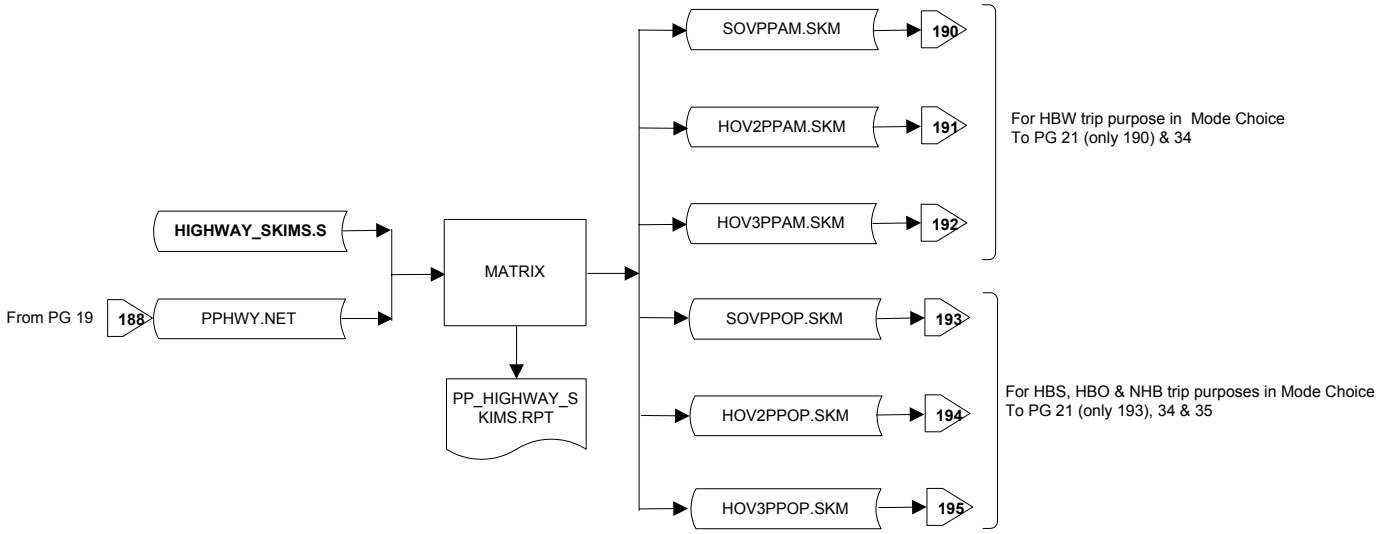


ASSIGNMENT SUMMARY

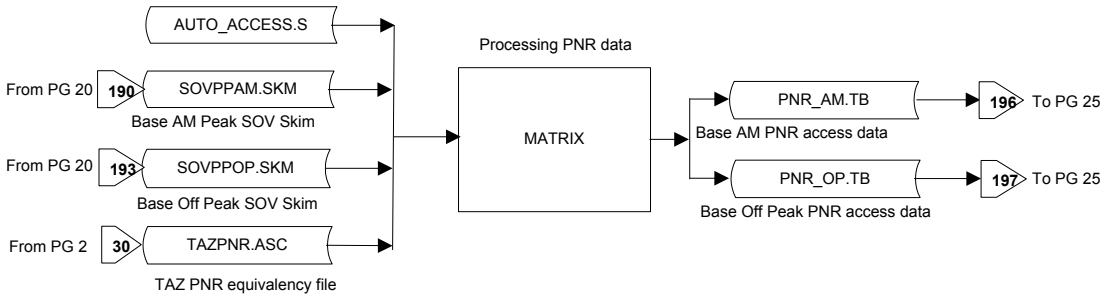
	AM PEAK	PM PEAK	OFF PEAK
1 OCC. ADRS:			
2 OCC. ADRS:			
3+OCC. ADRS:			
TRUCKS:			
AIR.PASS. ADRS:			
TOTAL:			

Step11. PP_Highway_Skims.bat

Creating highway skim files for AM and Off Peak periods by auto accupancy (1, 2, and 3+ occupancy).

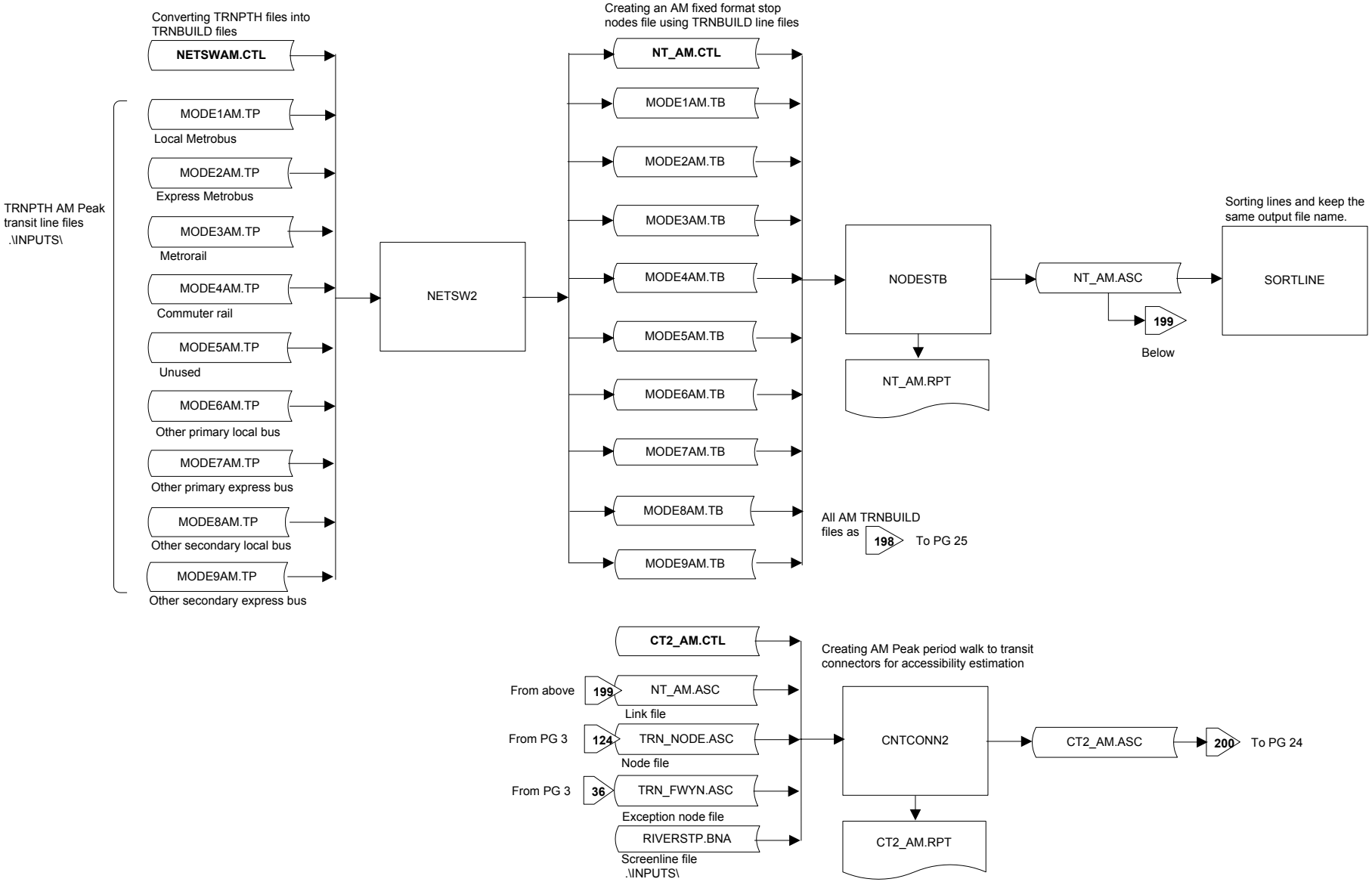


Step12.BS_Highway_PNR.bat: Base Highway Path Building



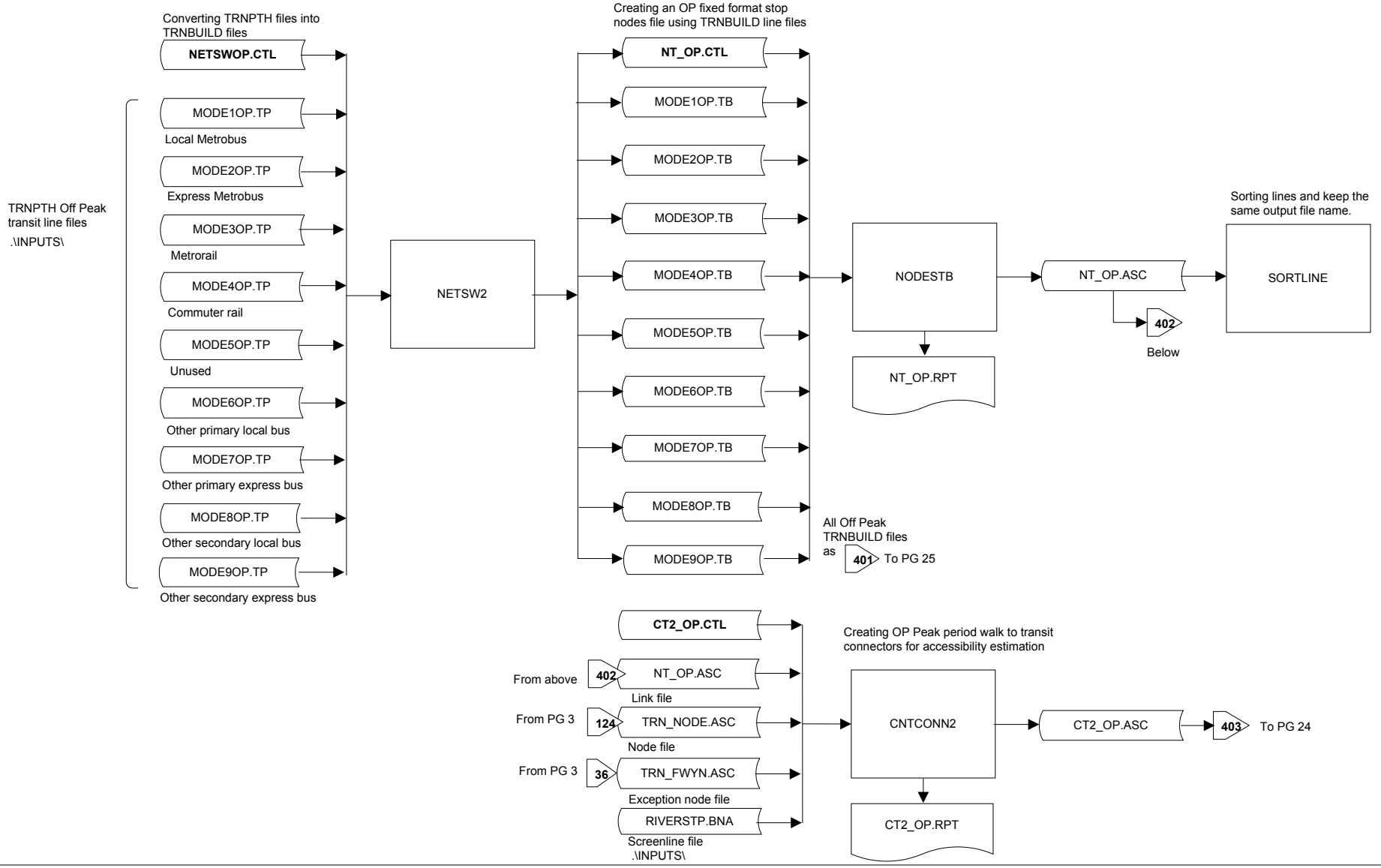
Step13.BS_Transit_Prep.bat: Transit Preparation(1/3)

Three tasks are performed: (a) Converting TRNPTH-based AM peak mode files into the TRNBUILD-based; (b) Creating an AM peak fixed format stop node files; and (c) Creating AM peak period walk to transit connectors.



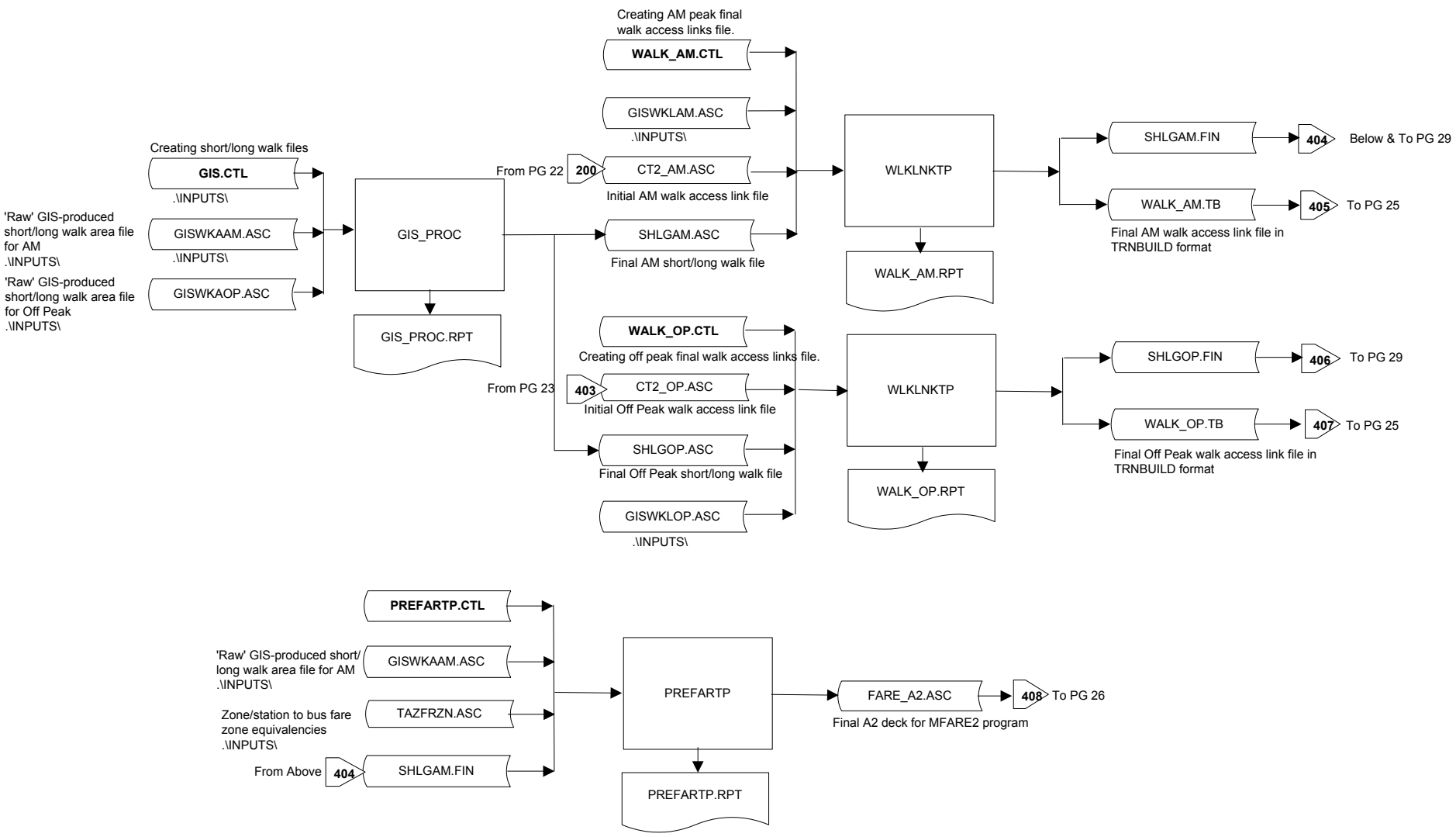
Step13.BS_Transit_Prep.bat: Transit Preparation(2/3)

Three tasks are performed: (a) Converting TRNPTH-based off peak mode files into the TRNBUILD-based; (b) Creating an off peak fixed format stop node files; and (c) Creating off peak period walk to transit connectors.



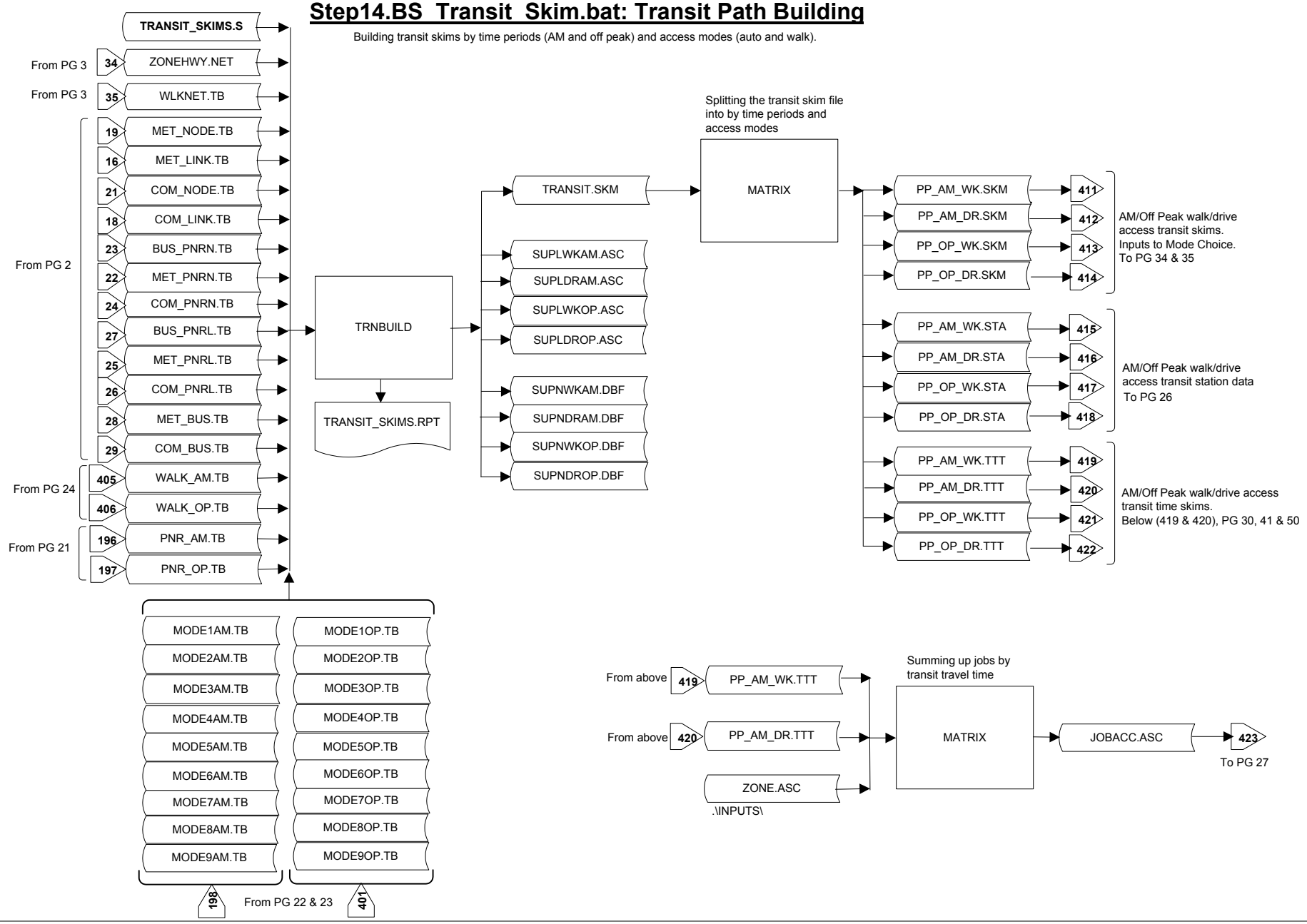
Step13.BS_Transit_Prep.bat: Transit Preparation(3/3)

Creating final auto and walk access link files for AM and off peak periods and final A2 deck for MFARE2 program.



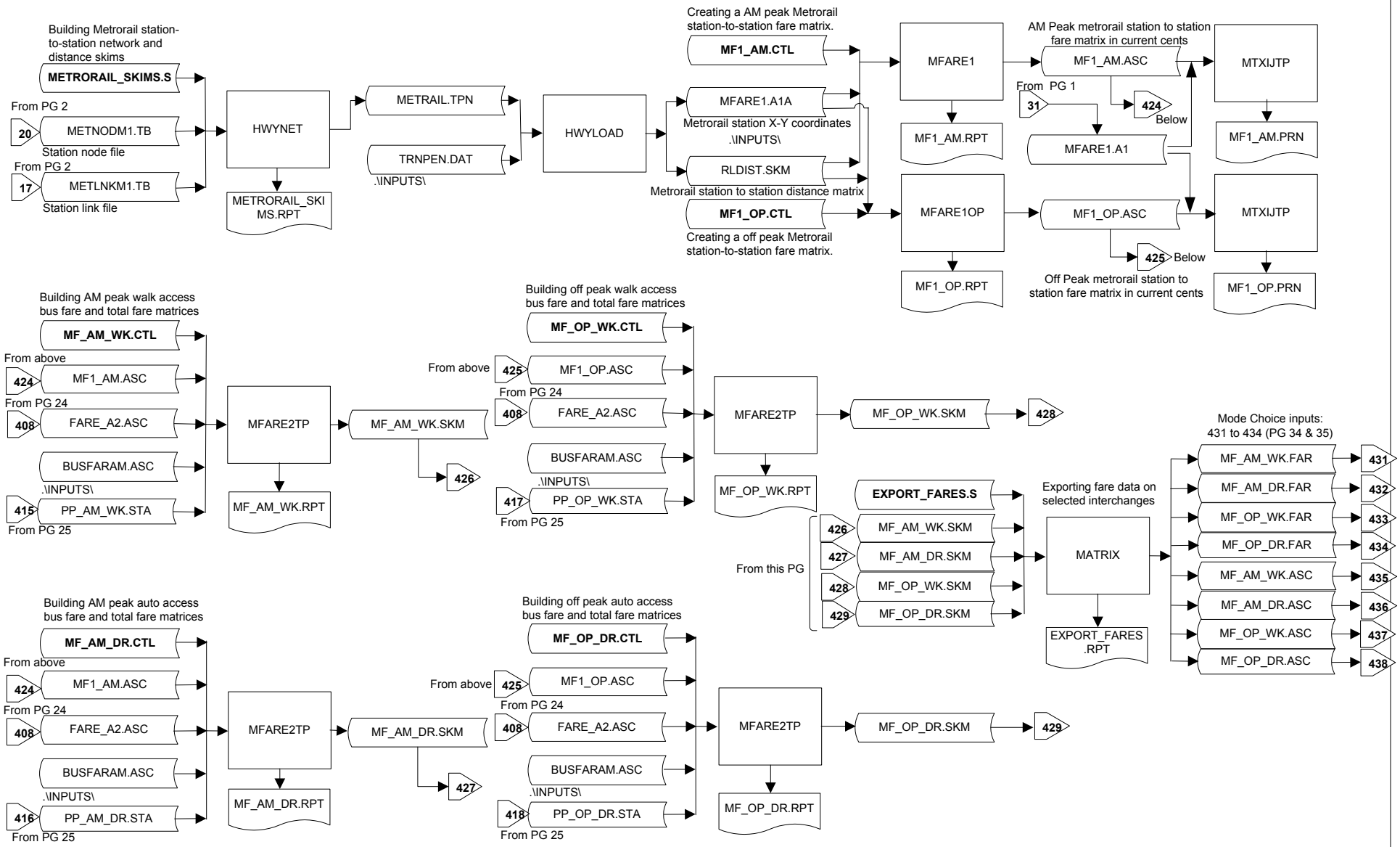
Step14.BS_Transit_Skim.bat: Transit Path Building

Building transit skims by time periods (AM and off peak) and access modes (auto and walk).



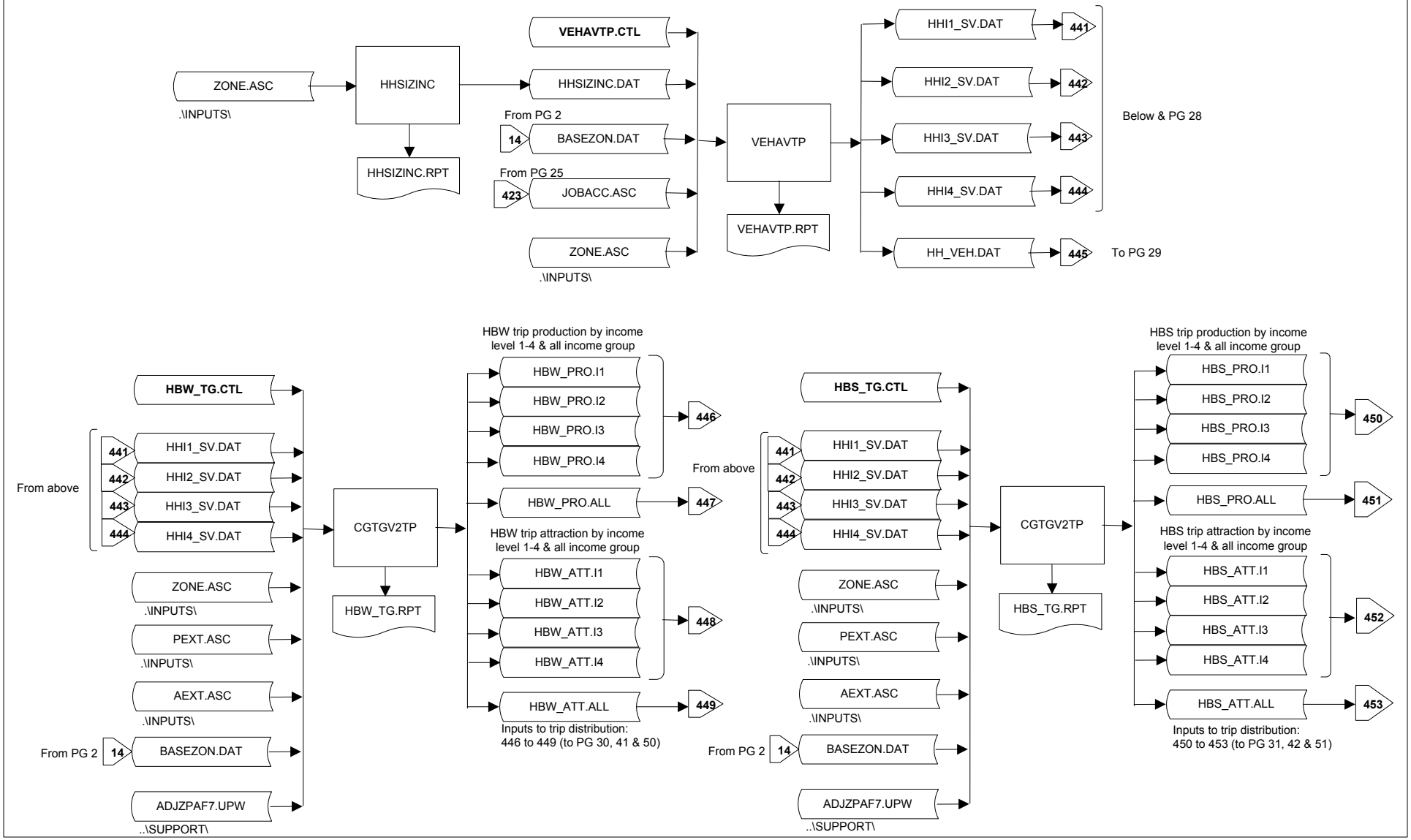
Step15.Transit_Fare.bat: Transit Fare

Creating transit fare files by time period and access mode based on WMATA Tariff 19.

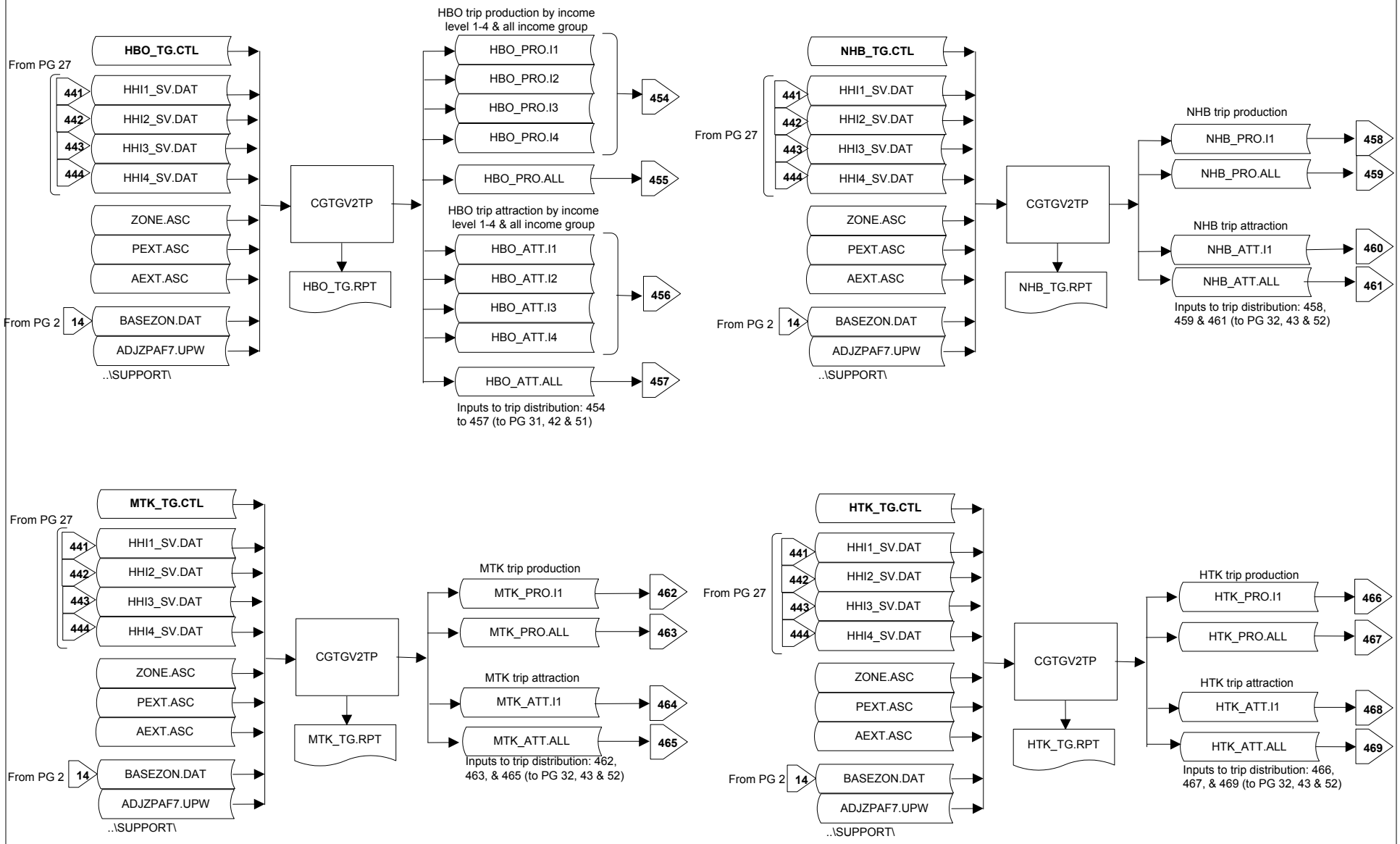


Step16.BS Trip Generation.bat: Trip Generation (1/3)

Creating trip productions/attractions by trip purpose (HBW, HBS and HBO) and income group (1 - 4) after building vehicle availability data. Only trip productions/ attractions were created for NHB purpose, medium and heavy truck trips. Outputs from trip generation by each trip purpose are fed into trip distribution.

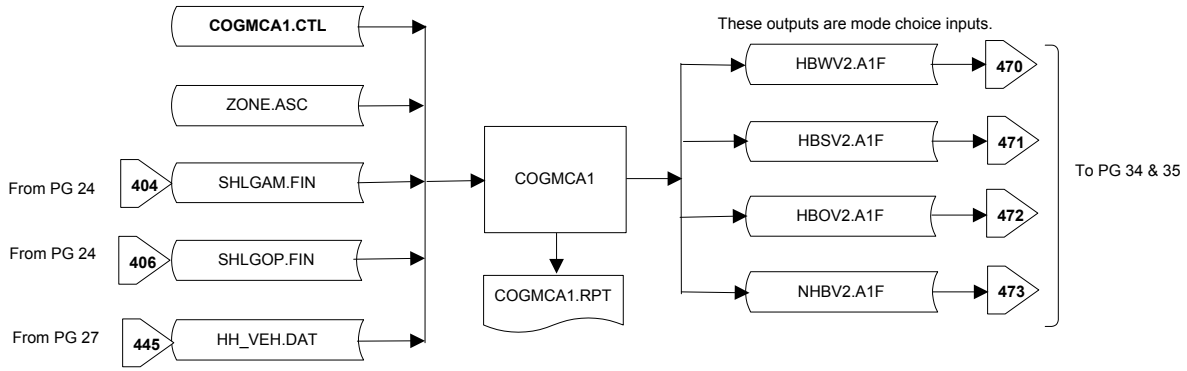


Step16.BS Trip Generation.bat: Trip Generation (2/3)



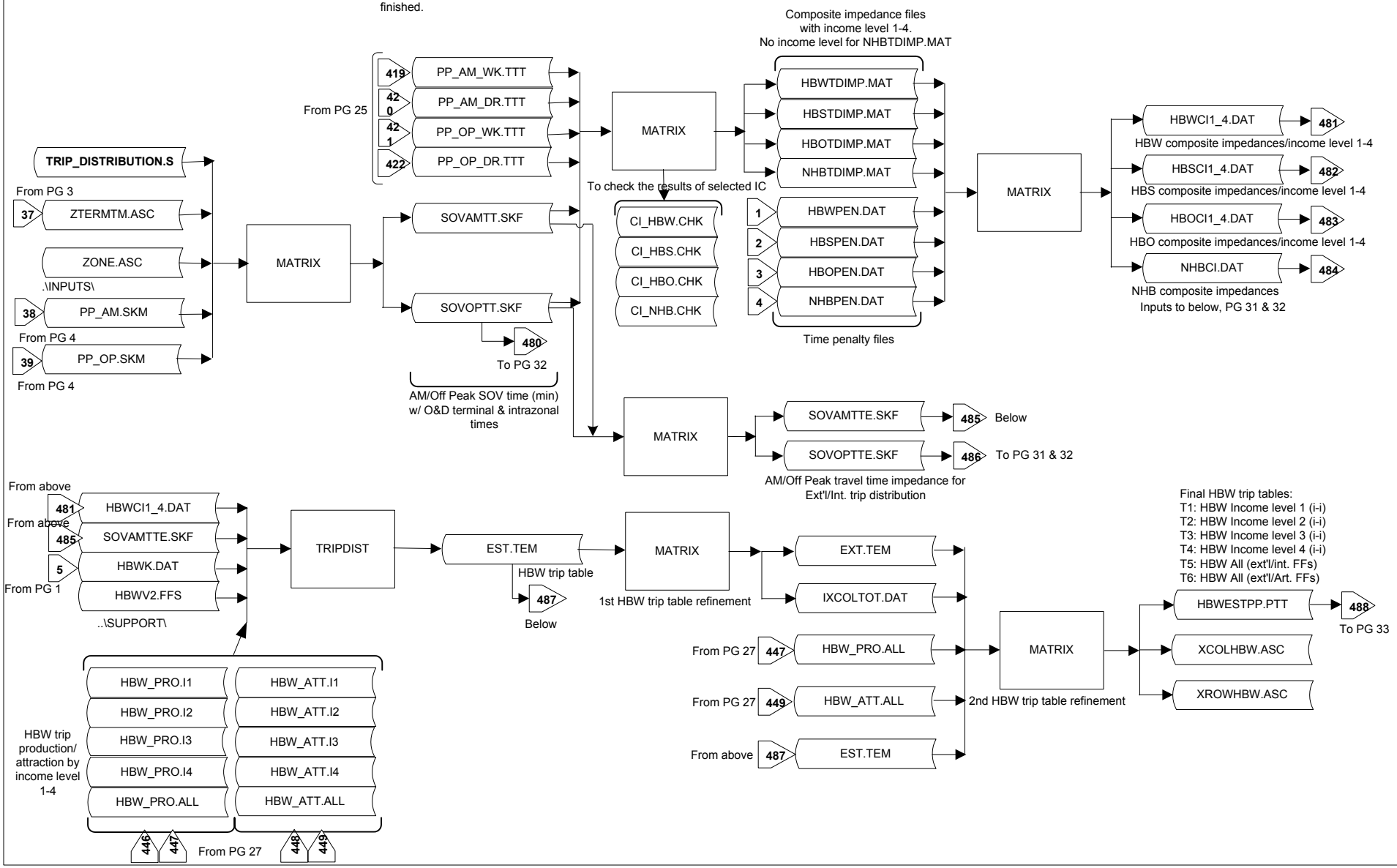
Step16.BS_Trip_Generation.bat: Trip Generation (3/3)

Creating zonal A1 deck by trip purpose.

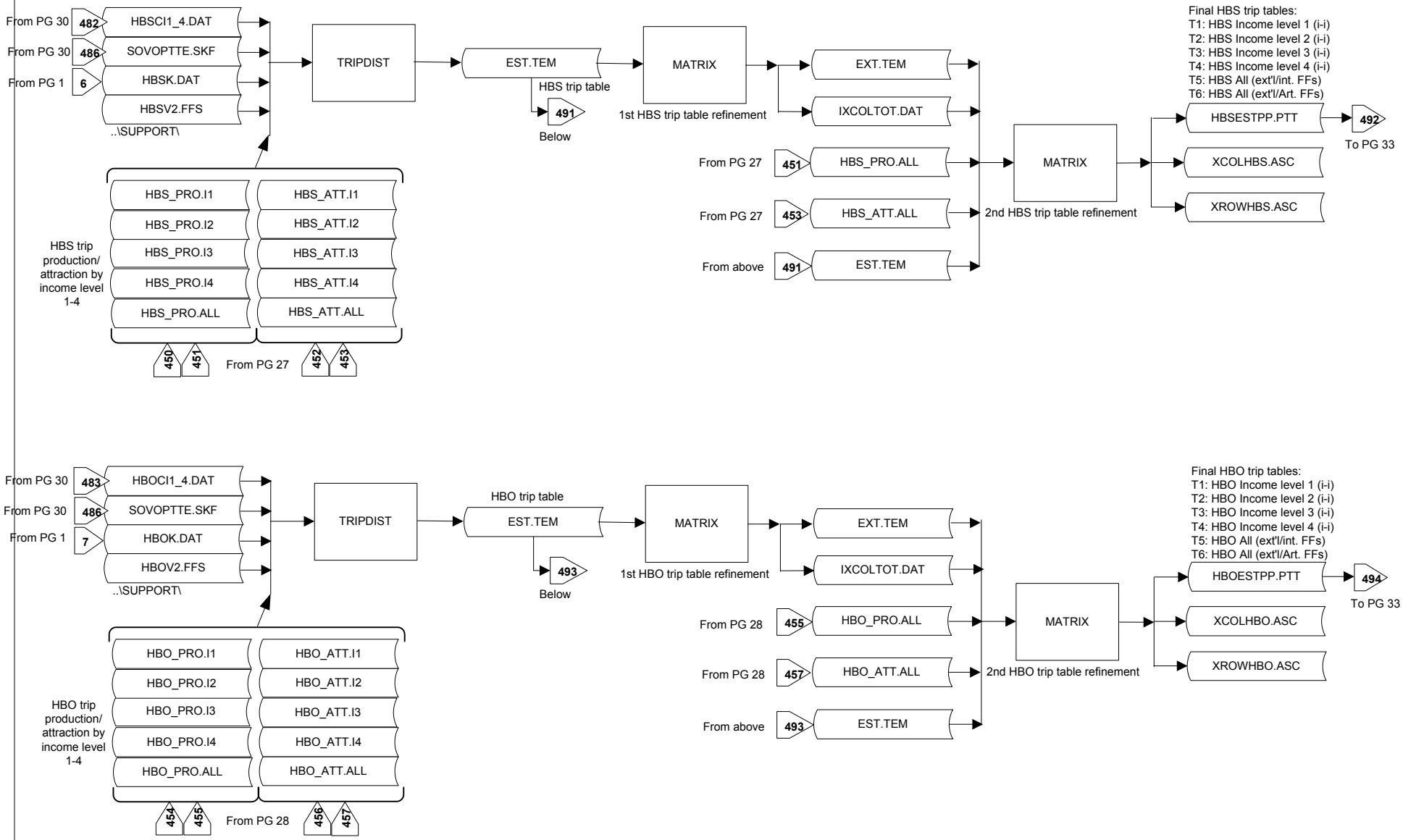


Step17.BS_Trip_Distribution.bat: Trip Distribution(1/4)

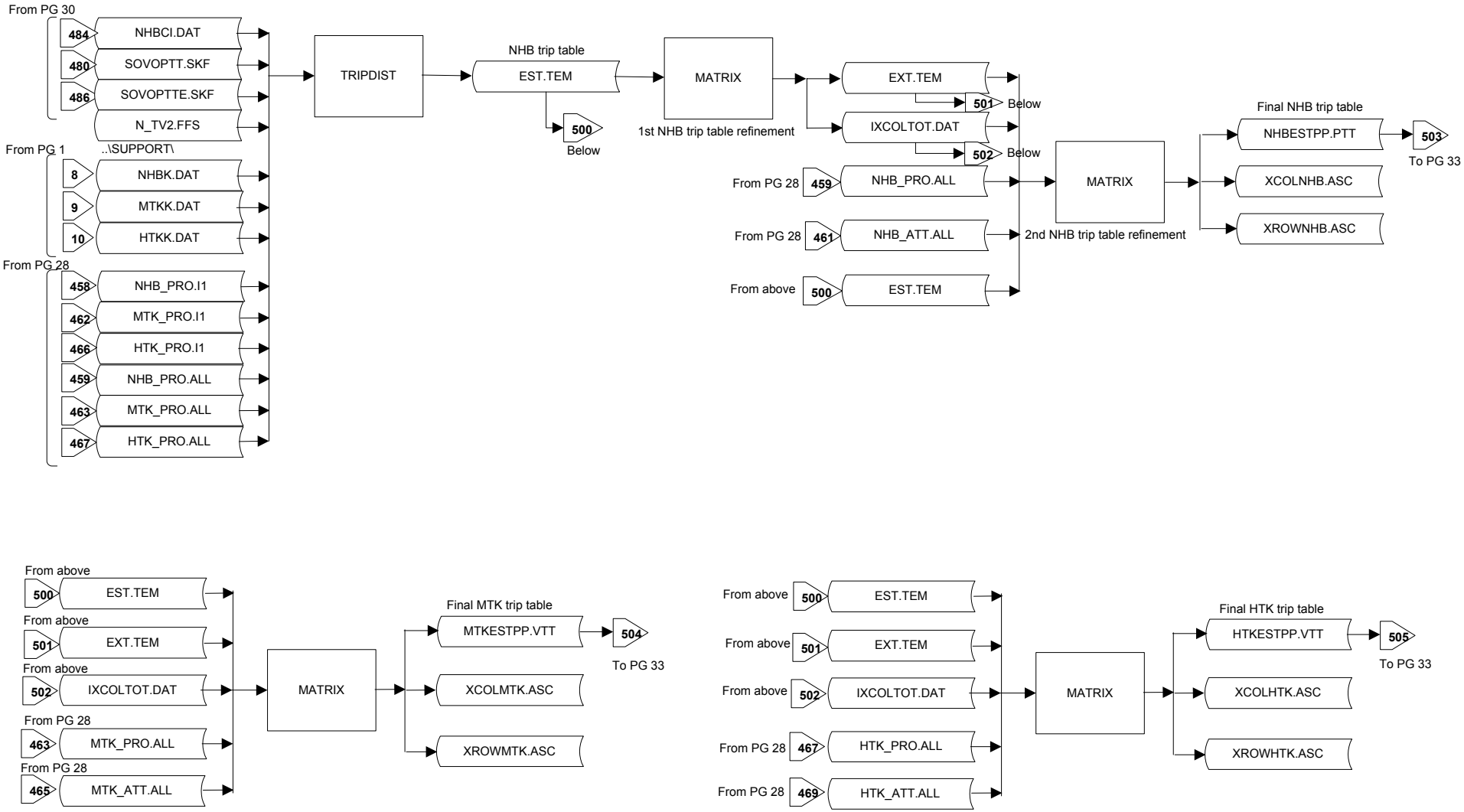
Distributing trips by trip purpose after building impedance files by income level except for NHB. No income level is available for NHB. In this process, two temp. files, 'EST.TEM' and 'EXT.TEM' are rewritten after trip distribution by each trip purpose is finished.



Step17.BS_Trip_Distribution.bat: Trip Distribution(2/4)

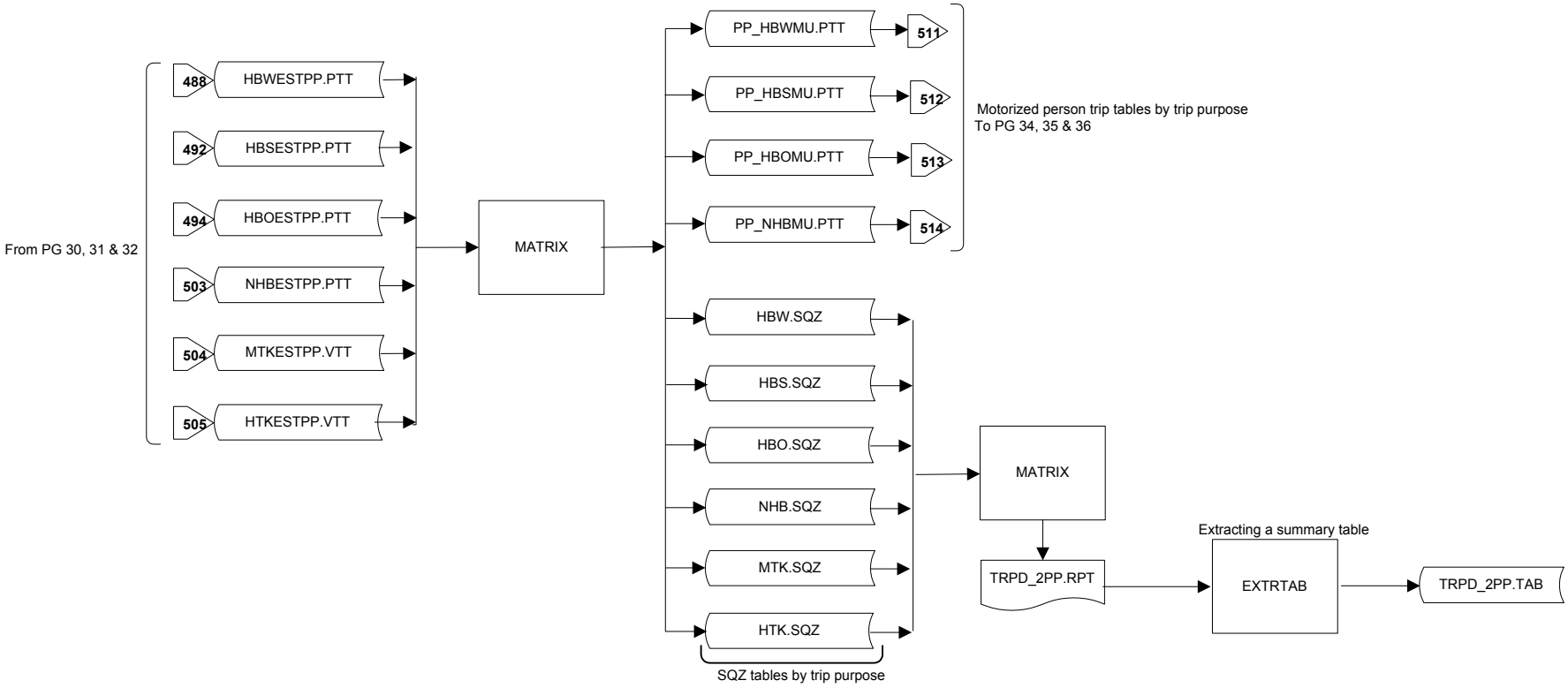


Step17.BS_Trip_Distribution.bat: Trip Distribution(3/4)



Step17.BS Trip Distribution.bat: Trip Distribution(4/4)

Output files are inputs to Mode Choice.

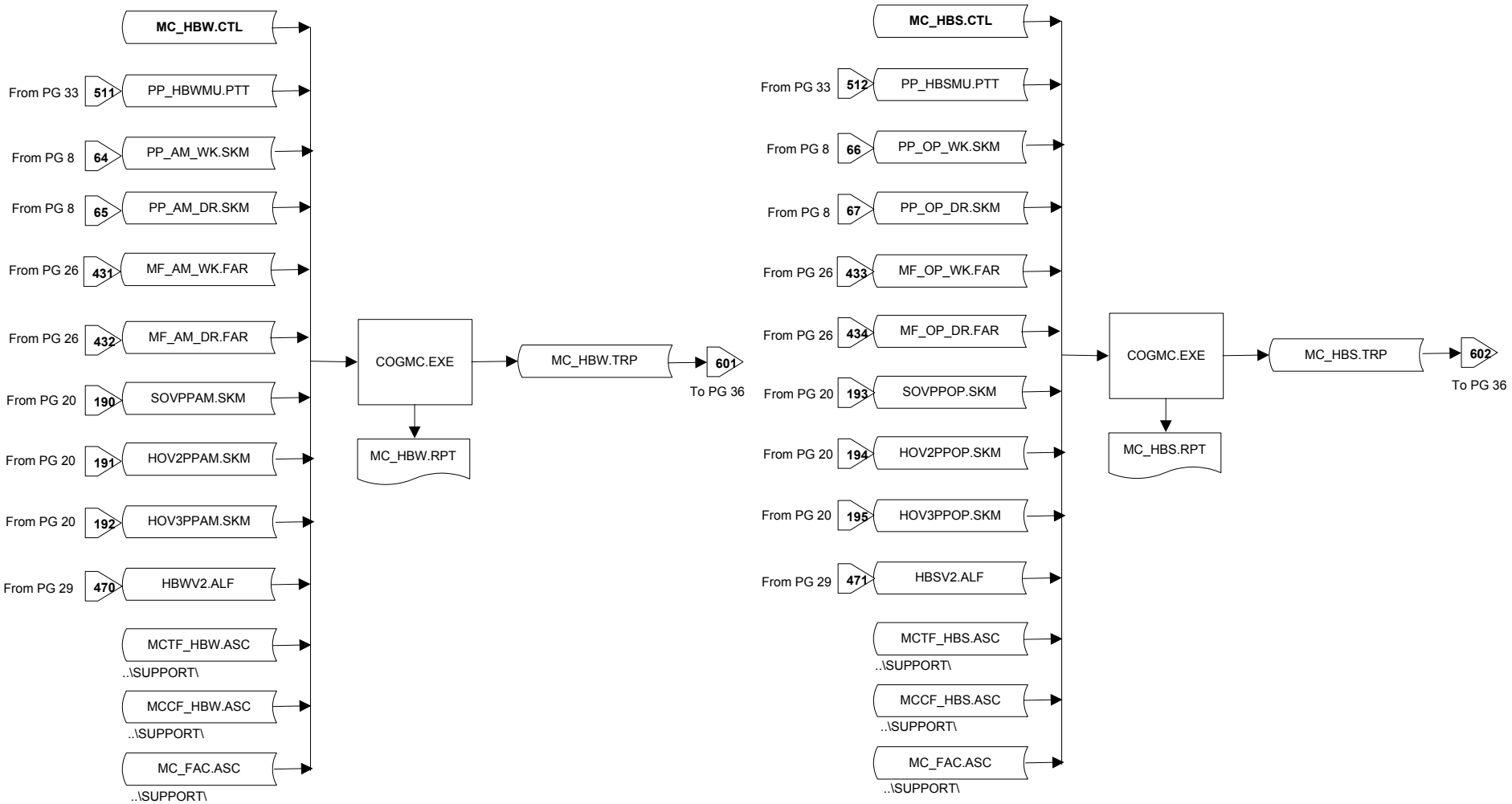


Summary
Motorized Persons/Trucks

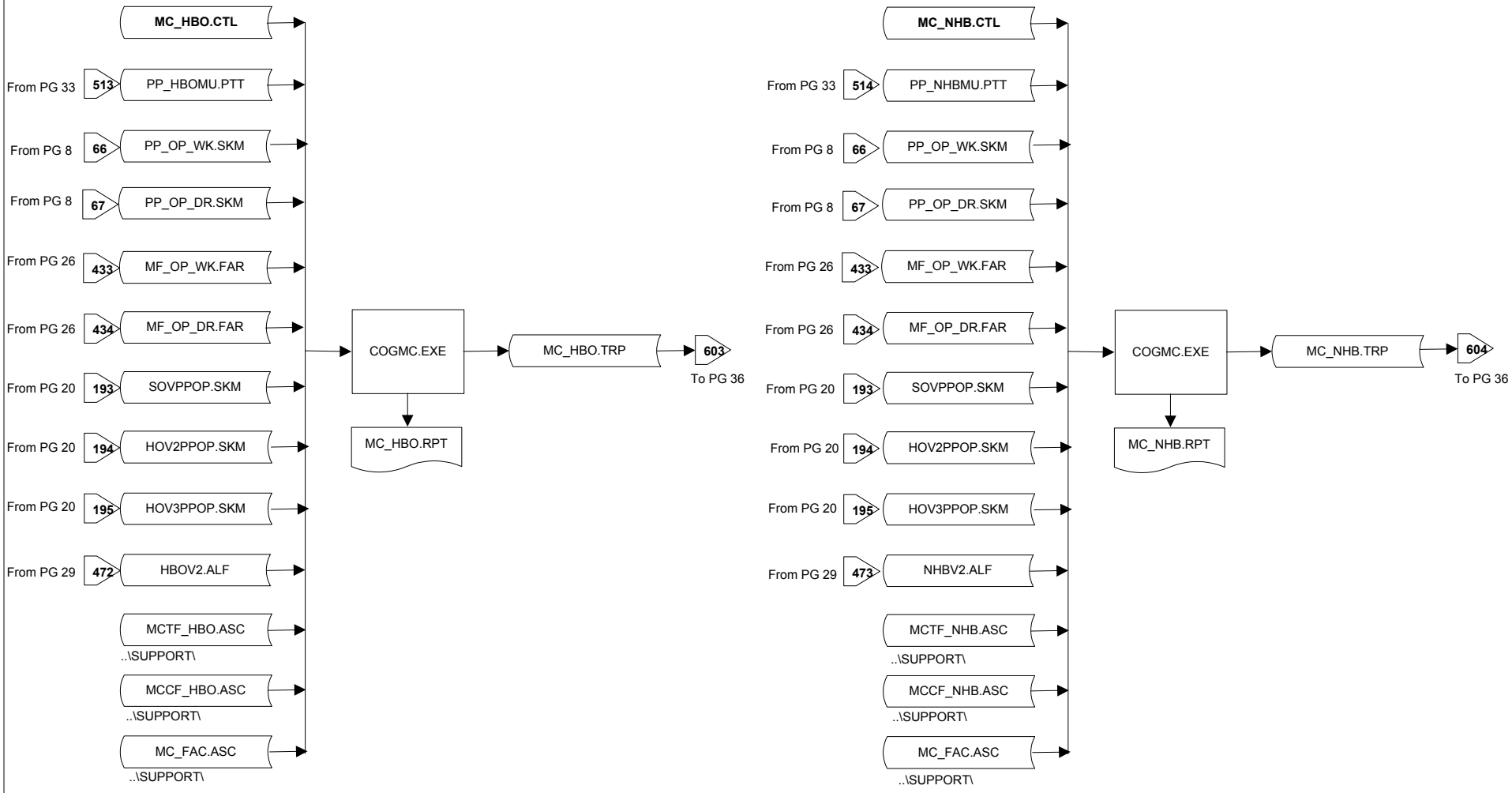
HBW: _____
HBS: _____
HBO: _____
NHB: _____
MED. TRUCK: _____
HVY. TRUCK: _____

Step18. Mode_Choice.bat(1/3)

Running mode choice setups by trip purpose.

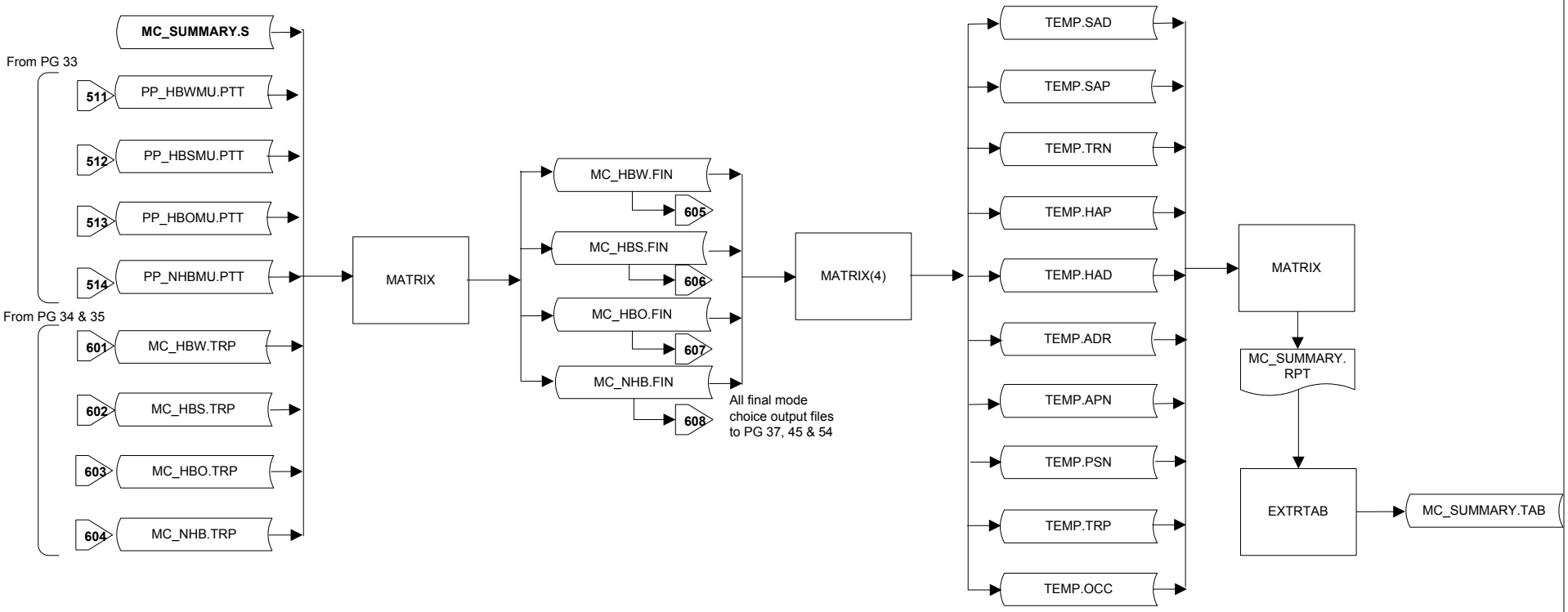


Step18. Mode_Choice.bat(2/3)



Step18. Mode_Choice.bat(3/3)

Summarizing mode choice outputs and extracting a summary table, 'MC_SUMMARY.TAB.'

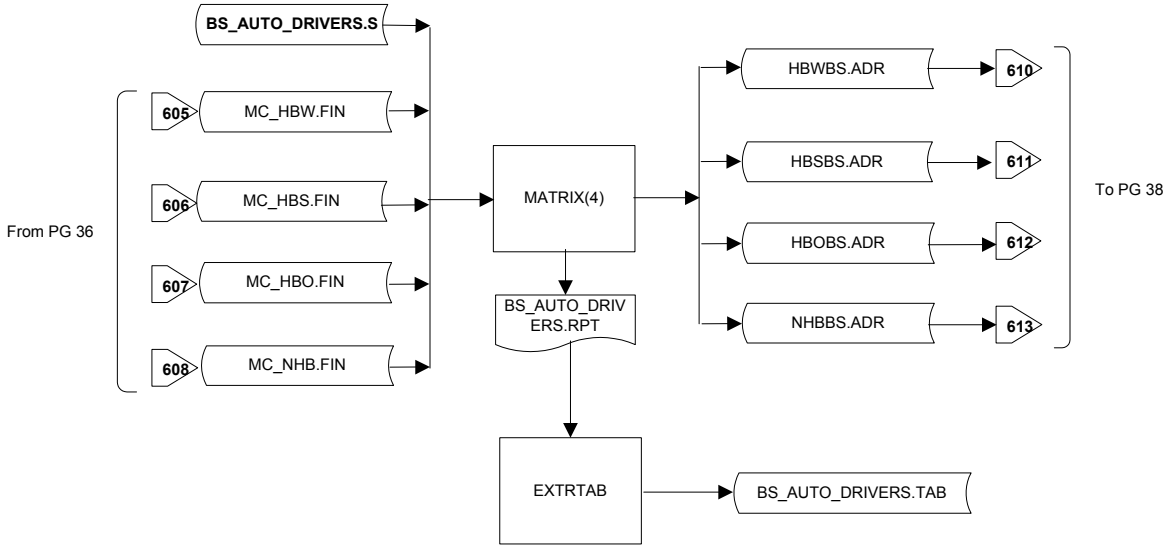


Mode Choice Summary

LOV AUTO DRVRS: _____
LOV AUTO PSNS: _____
TRANSIT: _____
HOV AUTO PSNS: _____
HOV AUTO DRVS: _____
AUTO DRVRS: _____
AUTO PSNS: _____
TOTAL MOTOR PSNS: _____
TRANSIT %: _____
AVG. AUTO OCC.: _____

Step19. BS_Auto_Driver.bat

Developing 1-occ., 2-occ. and 3+occ. auto driver trip tables by trip purpose from mode choice output files and summarizing the outputs in a table.



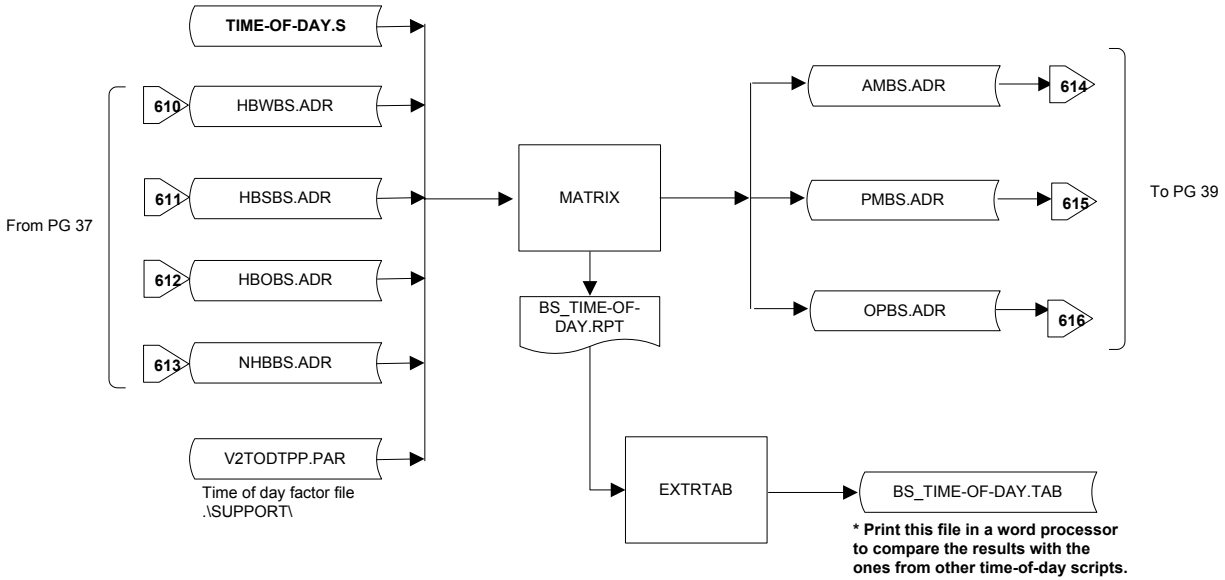
Summary

Motorized Drivers

HBW: _____
HBS: _____
HBO: _____
NHB: _____

Step20. BS_Time-of-Day.bat

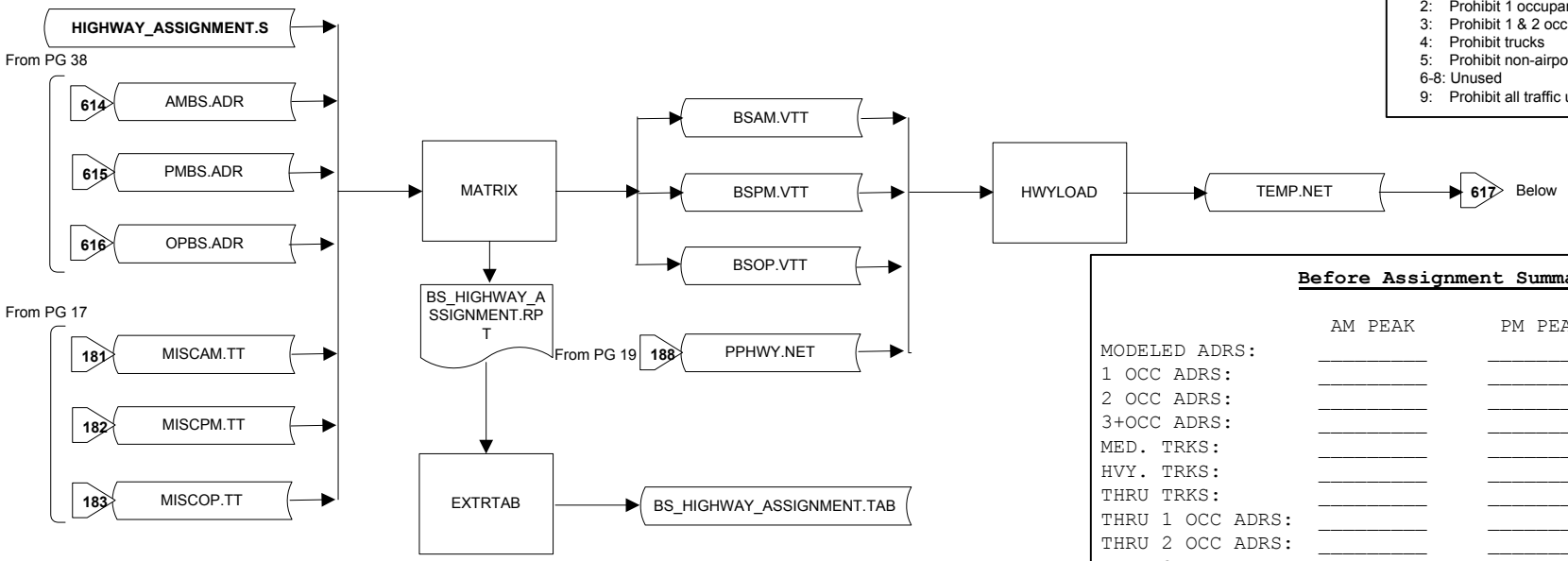
Creating time of day trip tables by multiplying time of day factors ('V2TODTPP.PAR') to HBW, HBS, HBO and NHB trip tables, which are inputs to the base assignment.



Step21. BS_Highway_Assignment.bat

Executing base highway assignment. First, the script summarizes input trip tables into three tables by time periods and then assigns them to the network. Equilibrium assignment method and 10 iterations are applied for each time period. Each trip table includes 5 trip tables (T1: 1 occ. adrs.; T2: 2 occ. adrs.; T3: 3+occ. adrs.; T4: Truck; and T5: Airport passenger adrs).

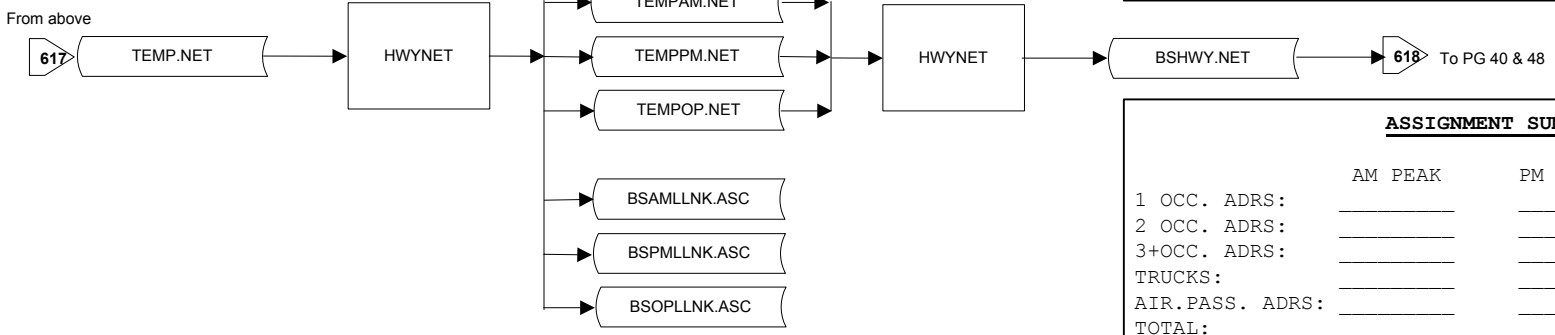
Limit Code Setup
0/1: No prohibitions
2: Prohibit 1 occupancy autos & trucks
3: Prohibit 1 & 2 occupancy autos & trucks
4: Prohibit trucks
5: Prohibit non-airport trips (Year 2000 & beyond)
6-8: Unused
9: Prohibit all traffic use



Before Assignment Summary

	AM PEAK	PM PEAK	OFF PEAK
MODELED ADRS:			
1 OCC ADRS:			
2 OCC ADRS:			
3+OCC ADRS:			
MED. TRKS:			
HVY. TRKS:			
THRU TRKS:			
THRU 1 OCC ADRS:			
THRU 2 OCC ADRS:			
THRU 3+OCC ADRS:			
TAXI:			
VISITOR:			
SCHOOL:			
AIR PASS. ADRS:			

Creating base assignment highway network including all three time periods

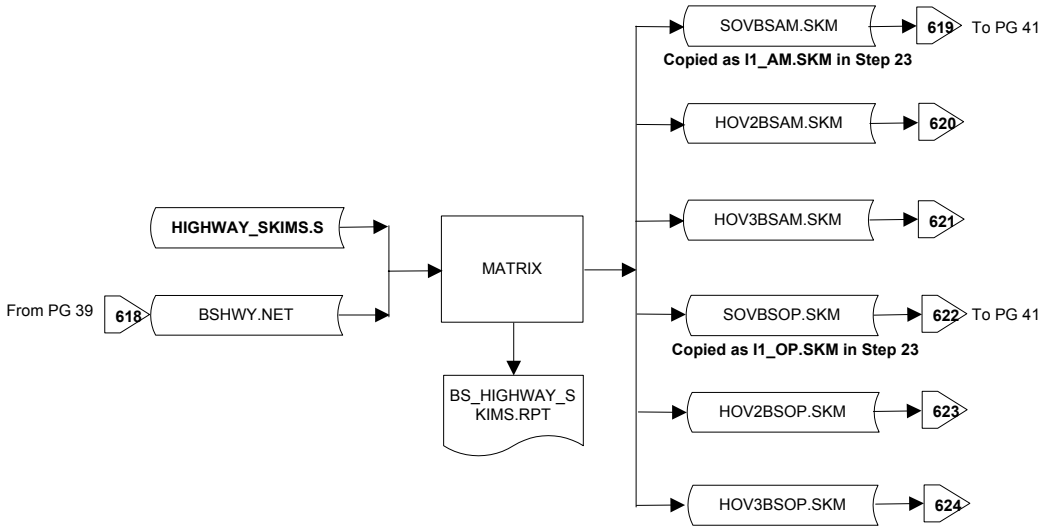


ASSIGNMENT SUMMARY

	AM PEAK	PM PEAK	OFF PEAK
1 OCC. ADRS:			
2 OCC. ADRS:			
3+OCC. ADRS:			
TRUCKS:			
AIR.PASS. ADRS:			
TOTAL:			

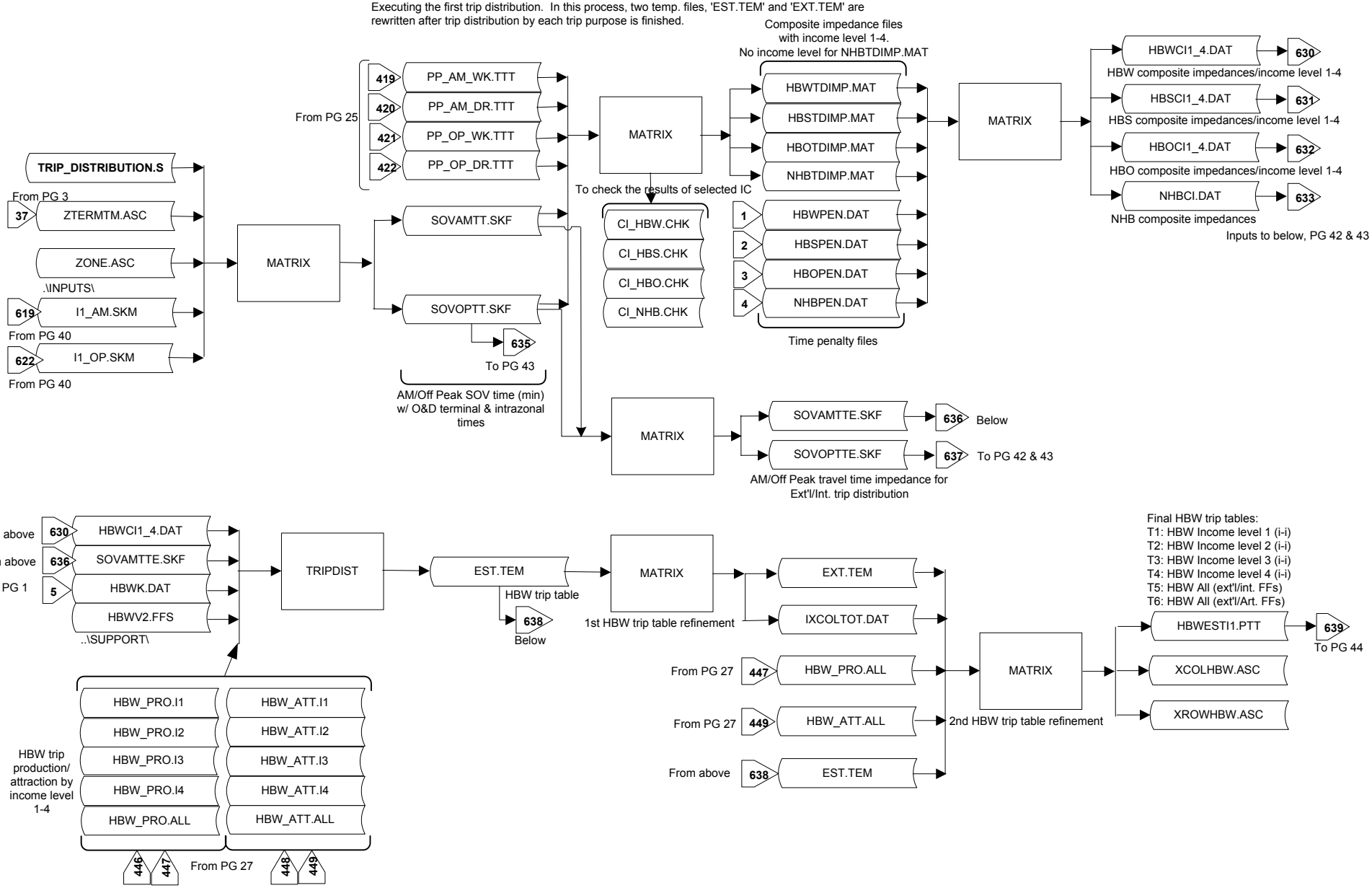
Step22. BS_Highway_Skims.bat

Creating base highway skim files for AM and Off Peak periods
by auto accupancy (1, 2, and 3+ occupancy).

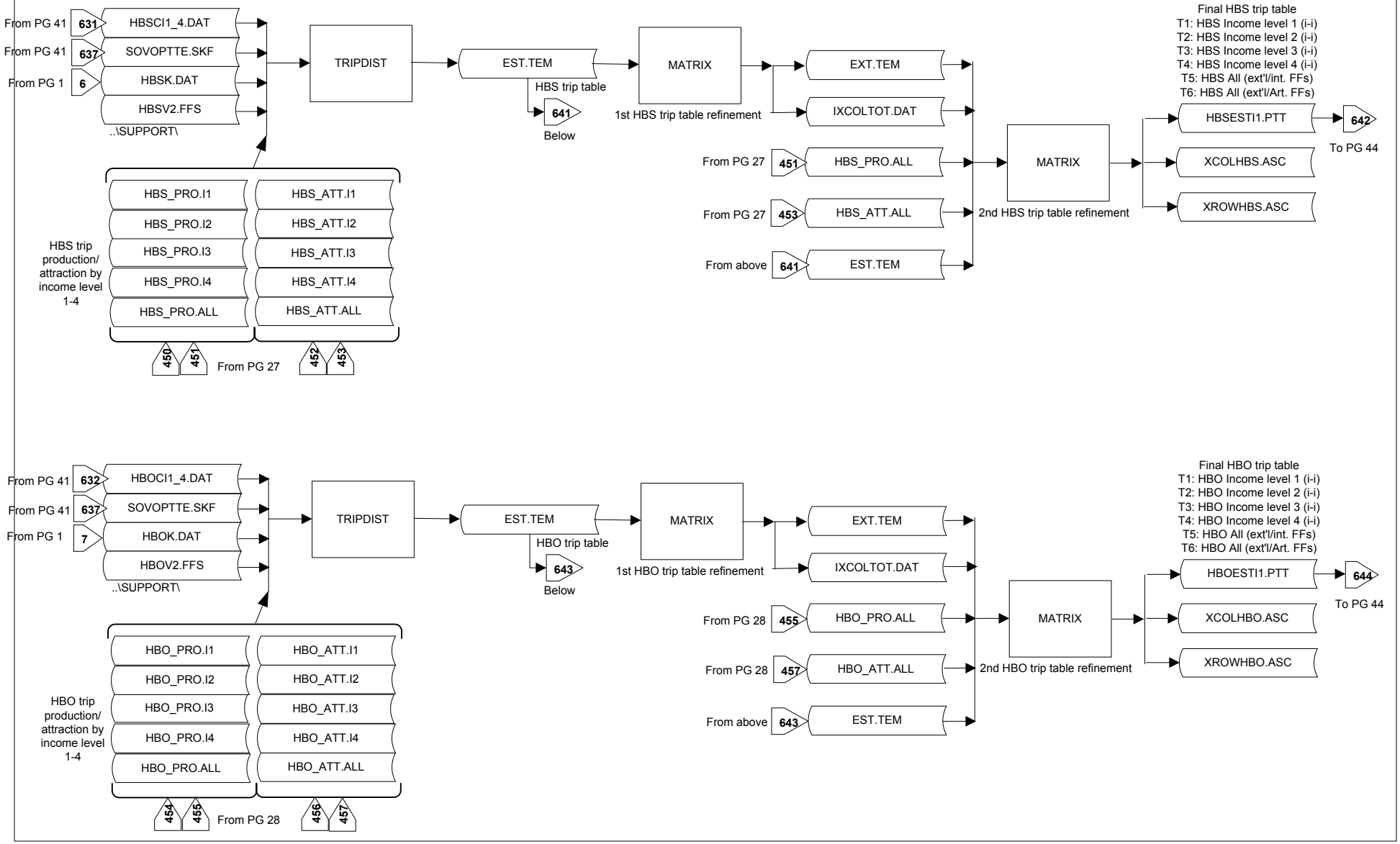


Step23.I1 Trip Distribution.bat: Trip Distribution(1/4)

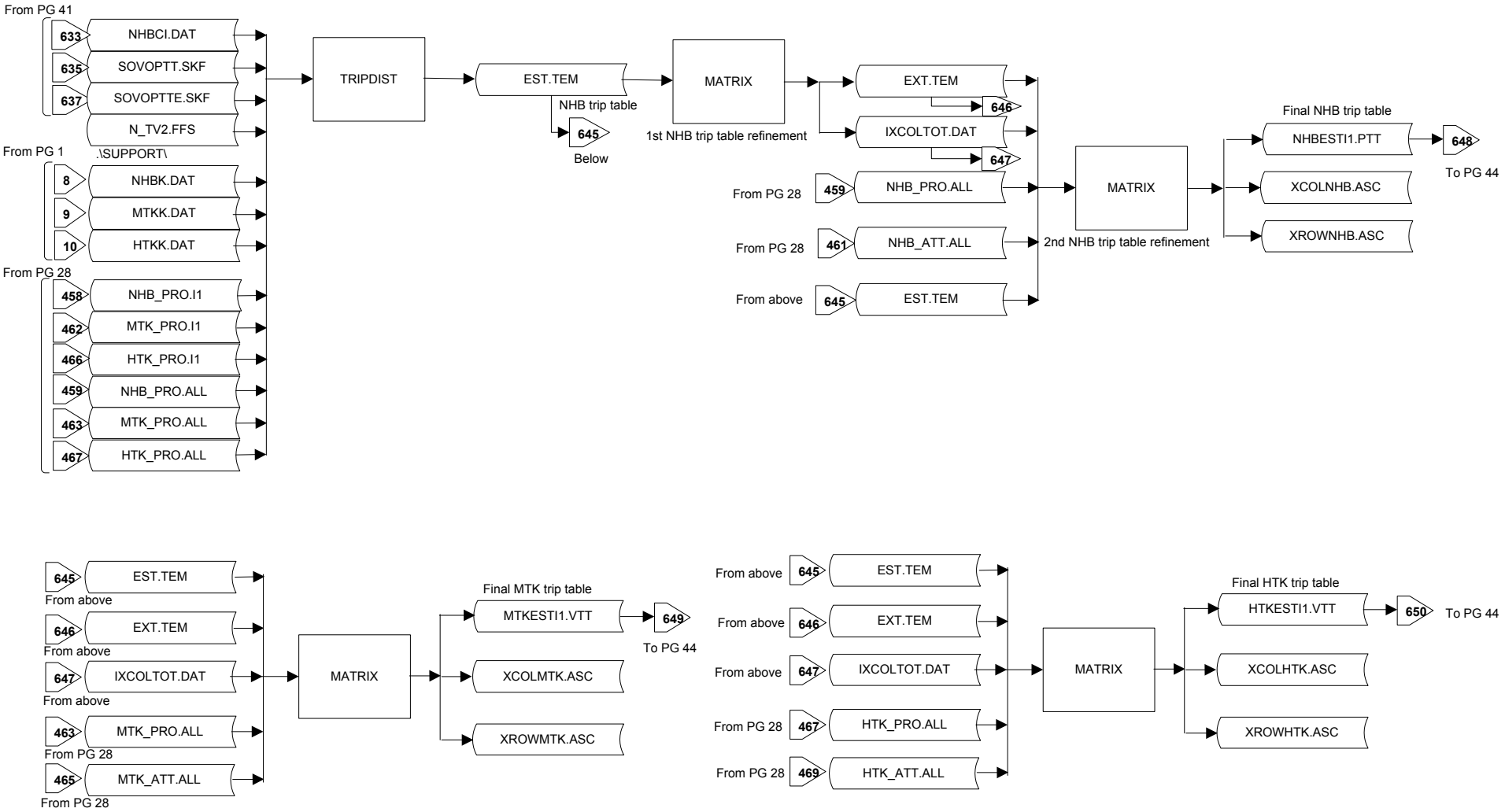
Executing the first trip distribution. In this process, two temp. files, 'EST.TEM' and 'EXT.TEM' are rewritten after trip distribution by each trip purpose is finished.



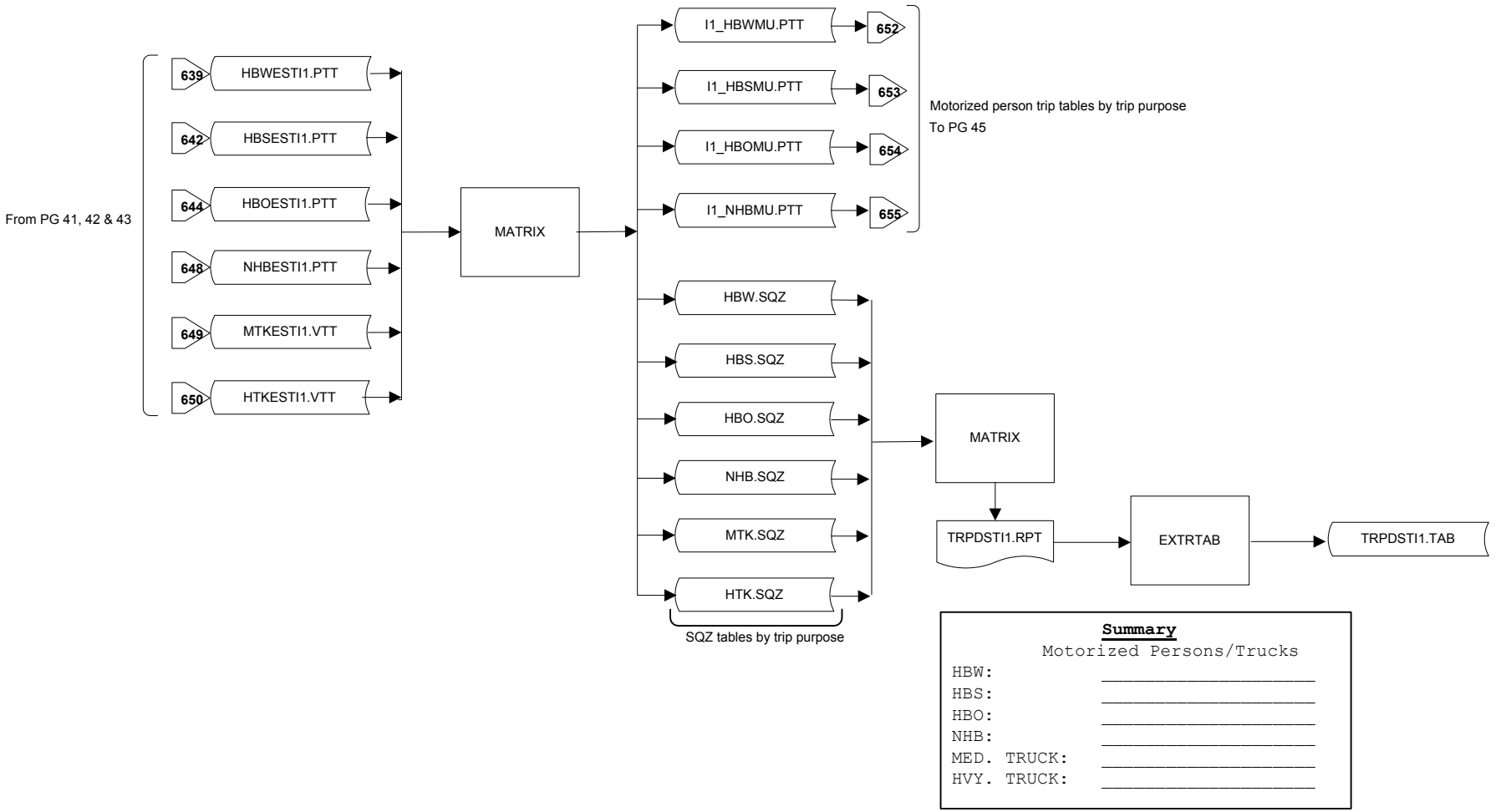
Step23.I1 Trip Distribution.bat: Trip Distribution(2/4)



Step23.I1 Trip Distribution.bat: Trip Distribution(3/4)

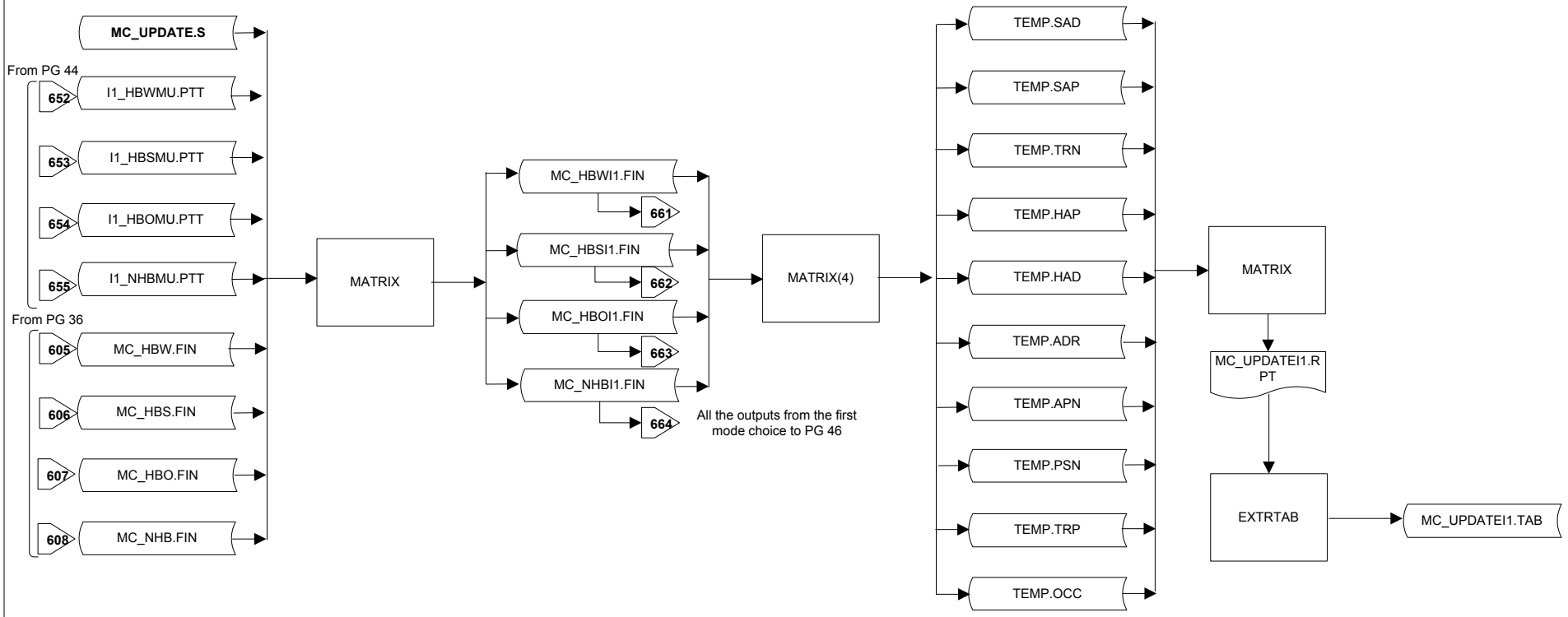


Step23.I1_Trip_Distribution.bat: Trip Distribution(4/4)



Step24. I1_Mode_Choice_Update.bat

Executing the mode choice setup to update mode choice model trips for the first speed feedback. The outputs were summarized in a table.

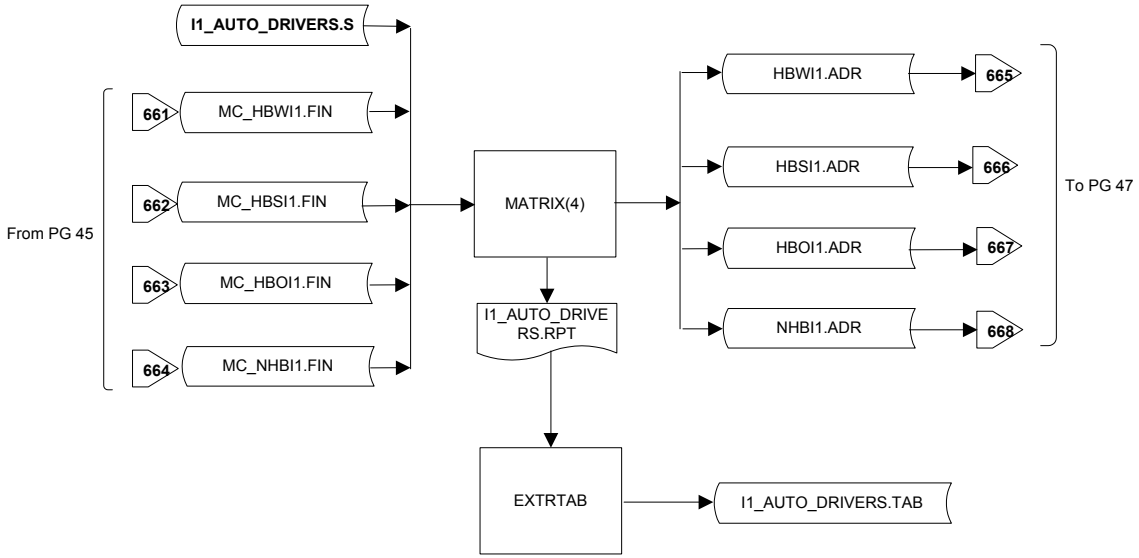


Mode Choice Summary

LOV AUTO DRVRS:	
LOV AUTO PSNS:	
TRANSIT:	
HOV AUTO PSNS:	
HOV AUTO DRVS:	
AUTO DRVRS:	
AUTO PSNS:	
TOTAL MOTOR PSNS:	
TRANSIT %:	
AVG. AUTO OCC.:	

Step25. I1_Auto_Driver.bat

Developing 1-occ., 2-occ. and 3+occ. auto driver trip tables by trip purpose from mode choice output files in the first speed feedback stage and summarizing the outputs in a table.

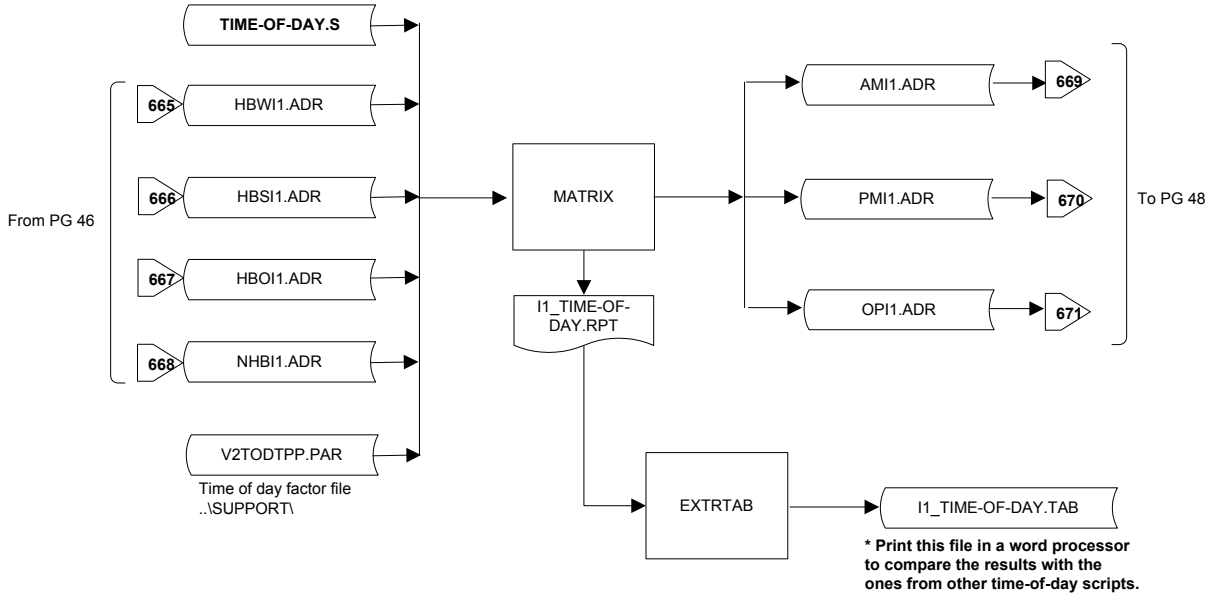


Summary
Motorized Drivers

HBW: _____
HBS: _____
HBO: _____
NHB: _____

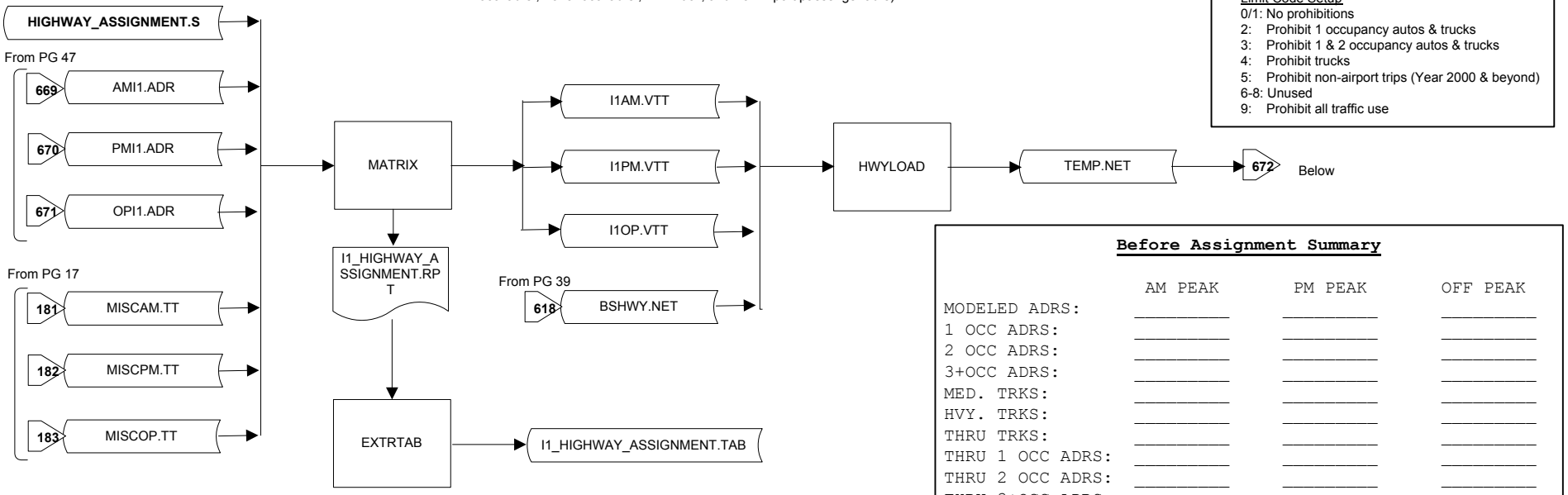
Step26. I1_Time-of-Day.bat

Creating time of day trip tables by multiplying time of day factors ('V2TODTPP.PAR') to HBW, HBS, HBO and NHB trip tables, which are inputs to the first assignment.



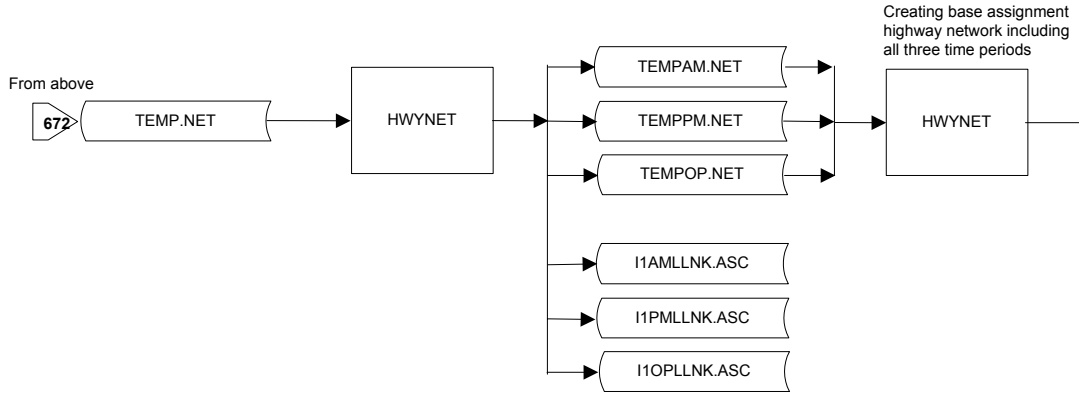
Step27. I1_Highway_Assignment.bat

Executing the first highway assignment. First, the script summarizes input trip tables into three tables by time periods and then assigns them to the network. Equilibrium assignment method and 10 iterations are applied for each time period. Each trip table includes 5 trip tables (T1: 1 occ. adrs.; T2: 2 occ. adrs.; T3: 3+occ. adrs.; T4: Truck; and T5: Airport passenger adrs).



Before Assignment Summary

	AM PEAK	PM PEAK	OFF PEAK
MODELED ADRS:			
1 OCC ADRS:			
2 OCC ADRS:			
3+OCC ADRS:			
MED. TRKS:			
HVY. TRKS:			
THRU TRKS:			
THRU 1 OCC ADRS:			
THRU 2 OCC ADRS:			
THRU 3+OCC ADRS:			
TAXI:			
VISITOR:			
SCHOOL:			
AIR PASS. ADRS:			

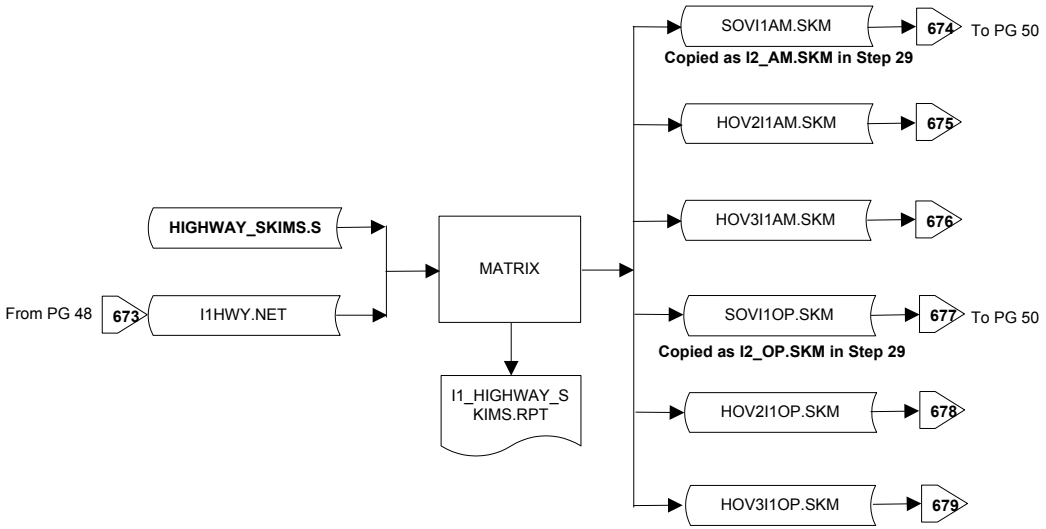


ASSIGNMENT SUMMARY

	AM PEAK	PM PEAK	OFF PEAK
1 OCC. ADRS:			
2 OCC. ADRS:			
3+OCC. ADRS:			
TRUCKS:			
AIR.PASS. ADRS:			
TOTAL:			

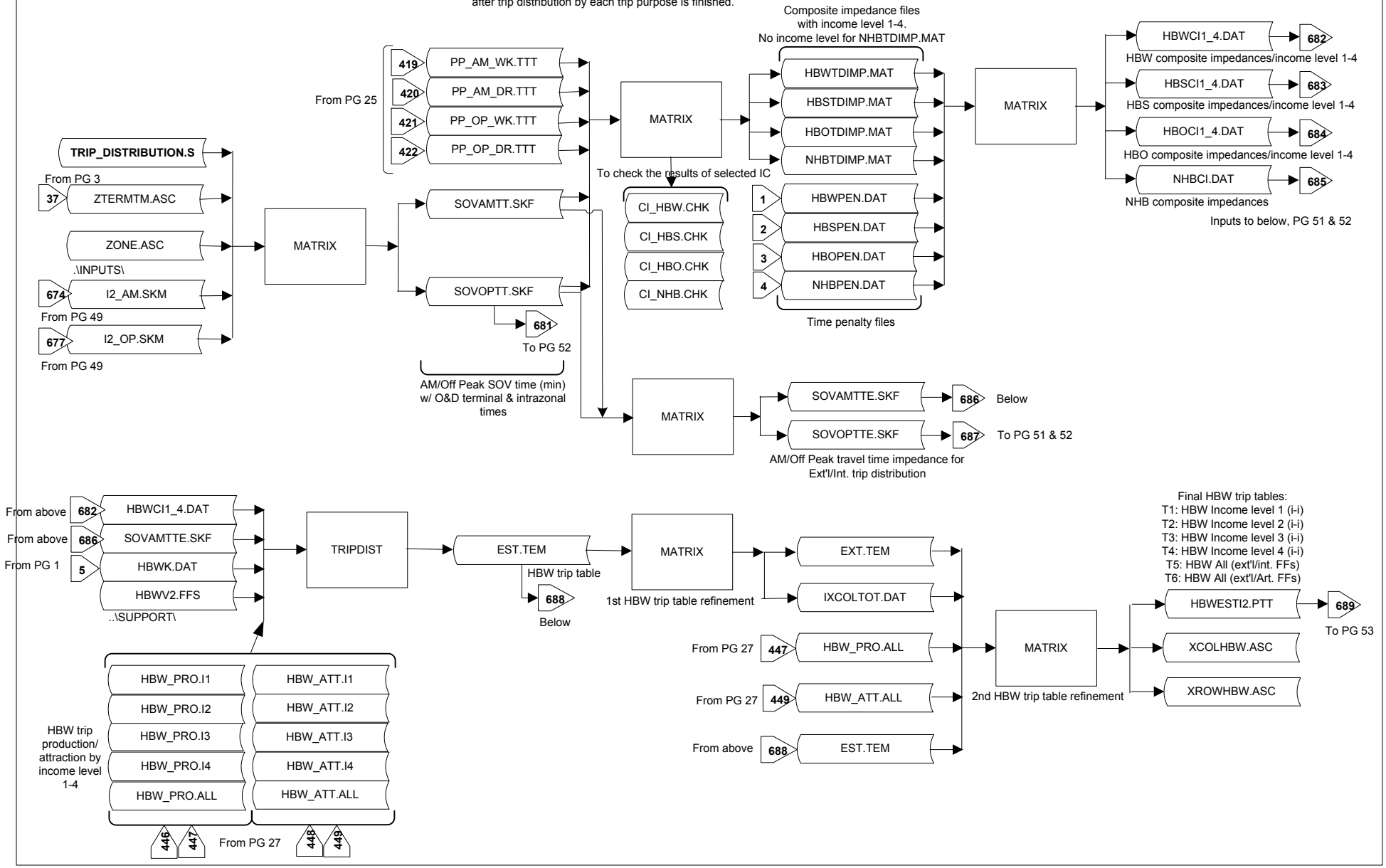
Step28. I1_Highway_Skims.bat

Creating the first highway skim files for AM and Off Peak periods by auto accupancy (1, 2, and 3+ occupancy).

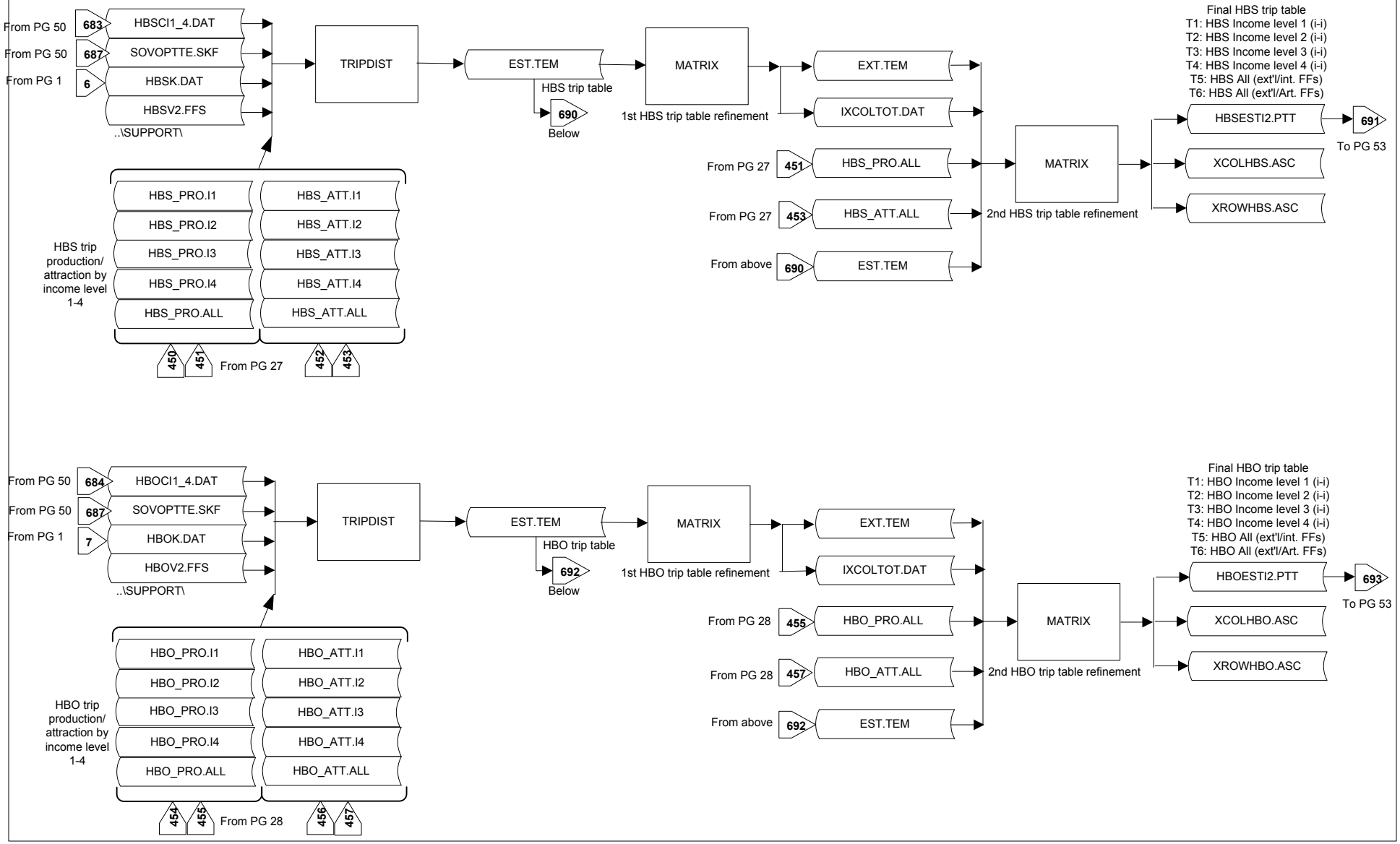


Step29.I2_Trip_Distribution.bat: Trip Distribution(1/4)

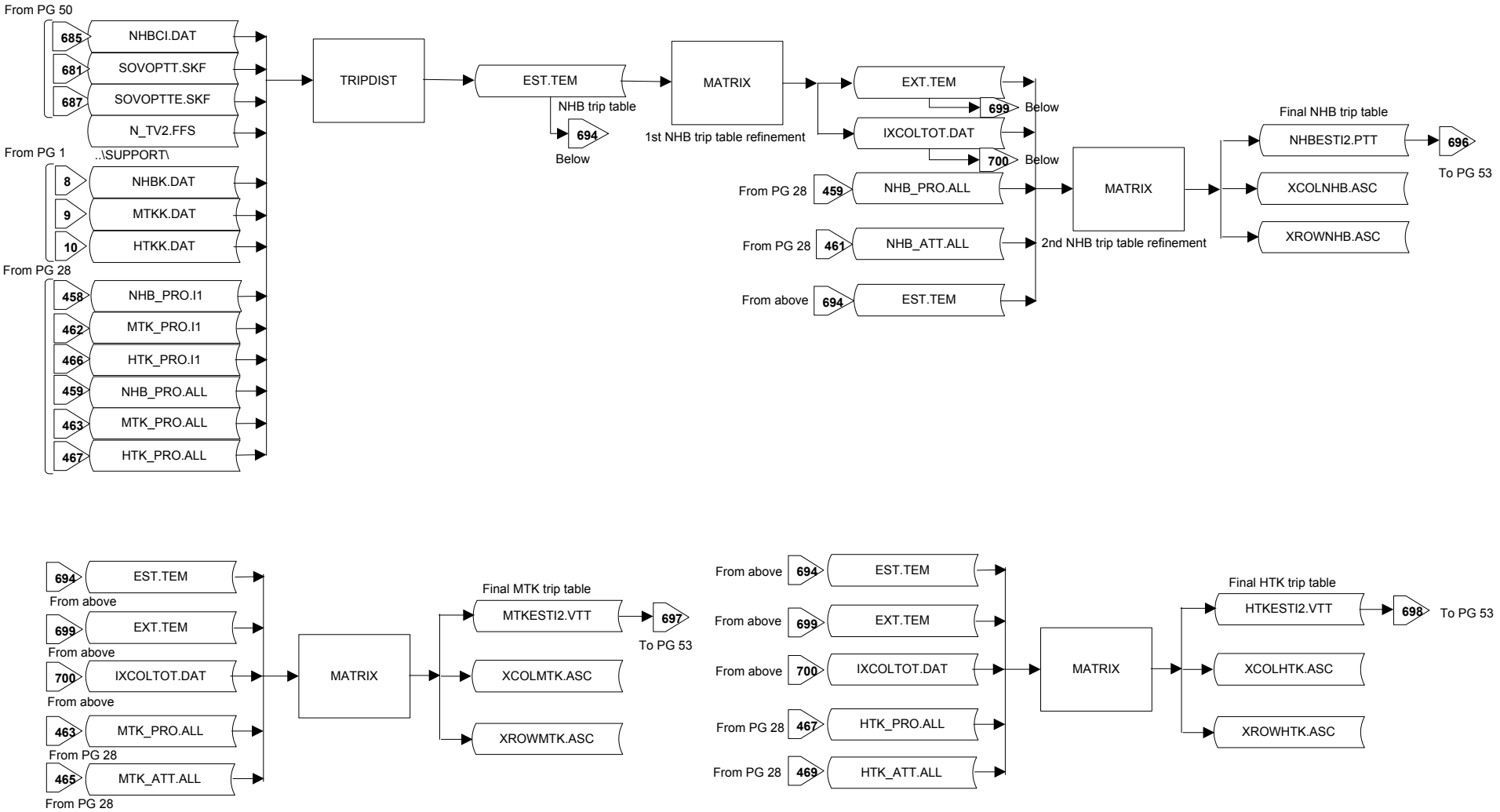
Executing the second trip distribution. In this process, two temp. files, 'EST.TEM' and 'EXT.TEM' are rewritten after trip distribution by each trip purpose is finished.



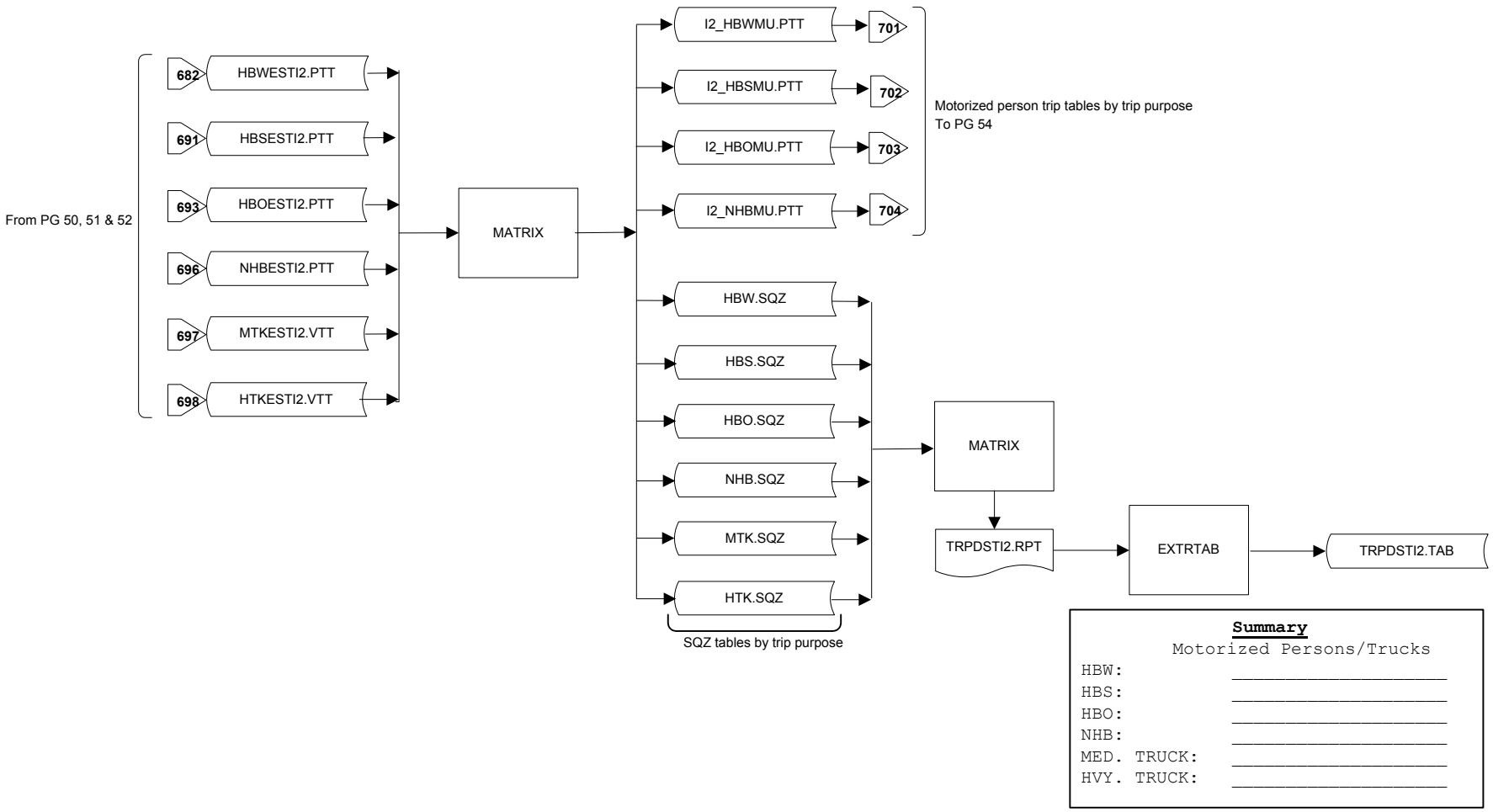
Step29.l2_Trip_Distribution.bat: Trip Distribution(2/4)



Step29.I2_Trip_Distribution.bat: Trip Distribution(3/4)

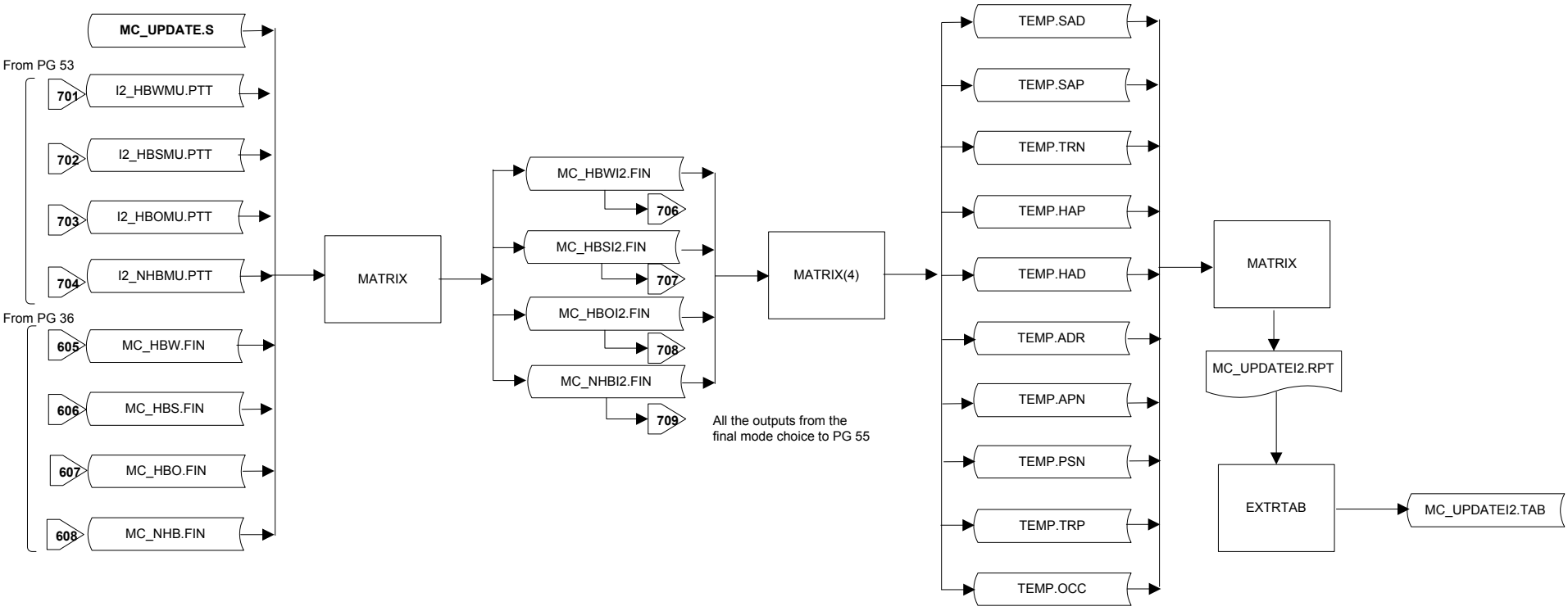


Step29.I2_Trip_Distribution.bat: Trip Distribution(4/4)



Step30. I2_Mode_Choice_Update.bat

Executing the mode choice setup to update mode choice model trips for the final speed feedback. The outputs were summarized in a table.

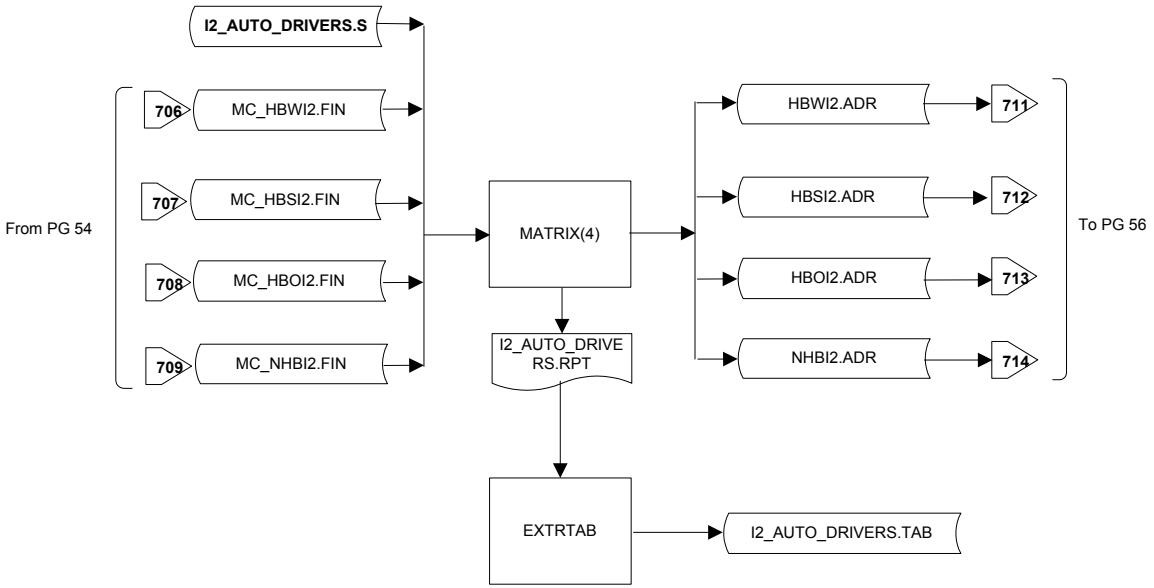


Mode Choice Summary

LOV AUTO DRVRS:	
LOV AUTO PSNS:	
TRANSIT:	
HOV AUTO PSNS:	
HOV AUTO DRVS:	
AUTO DRVRS:	
AUTO PSNS:	
TOTAL MOTOR PSNS:	
TRANSIT %:	
AVG. AUTO OCC.:	

Step31. I2_Auto_Driver.bat

Developing 1-occ., 2-occ. and 3+occ. auto driver trip tables by trip purpose from mode choice output files in the final speed feedback stage and summarizing the outputs in a table.



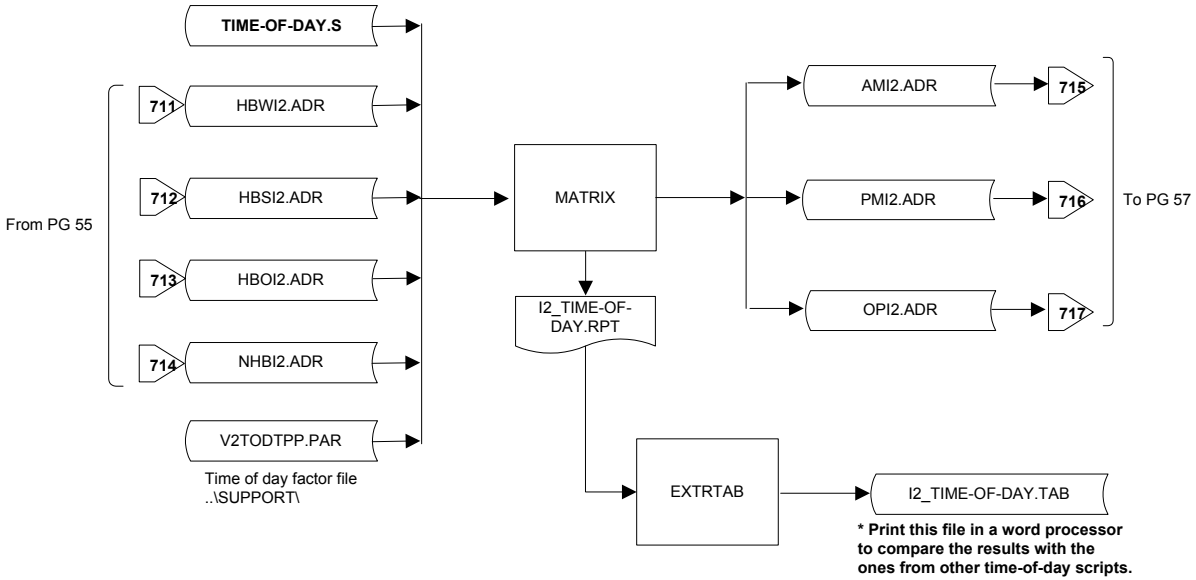
Summary

Motorized Drivers

HBW: _____
HBS: _____
HBO: _____
NHB: _____

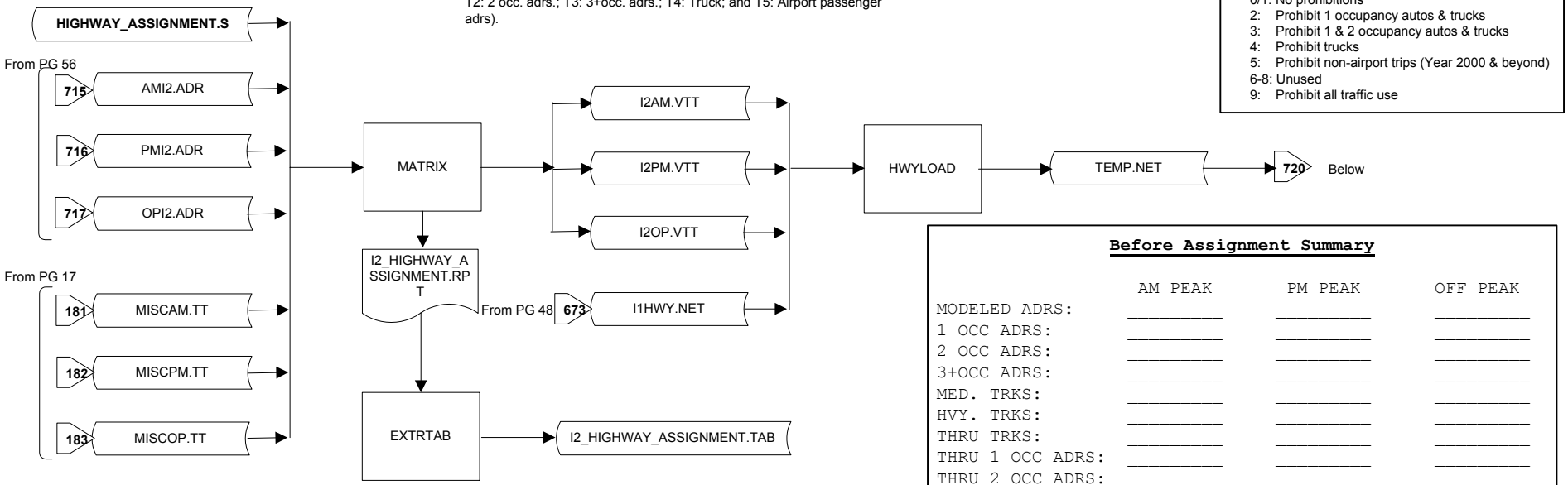
Step32. I2_Time-of-Day.bat

Creating time of day trip tables by multiplying time of day factors ('V2TODTPP.PAR') to HBW, HBS, HBO and NHB trip tables, which are inputs to the final assignment.



Step33. I2 Highway Assignment.bat

Executing the second highway assignment. First, the script summarizes input trip tables into three tables by time periods and then assigns them to the network. Equilibrium assignment method and 10 iterations are applied for each time period. Each trip table includes 5 trip tables (T1: 1 occ. adrs.; T2: 2 occ. adrs.; T3: 3+occ. adrs.; T4: Truck; and T5: Airport passenger adrs).

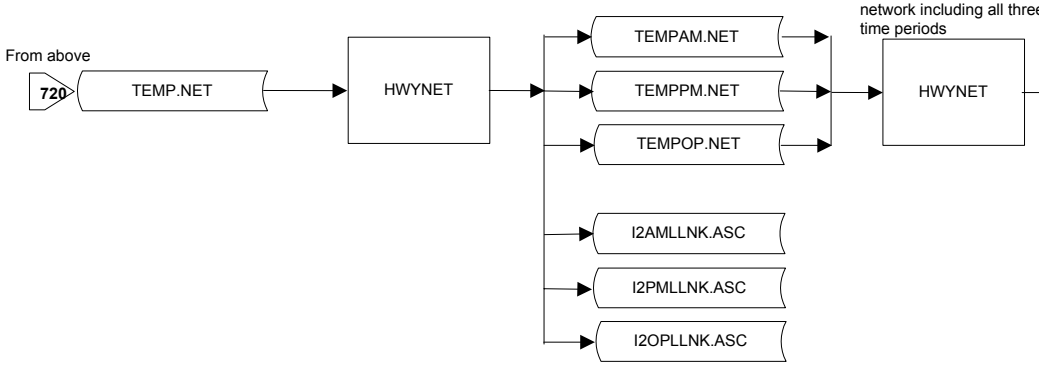


Limit Code Setup
0/1: No prohibitions
2: Prohibit 1 occupancy autos & trucks
3: Prohibit 1 & 2 occupancy autos & trucks
4: Prohibit trucks
5: Prohibit non-airport trips (Year 2000 & beyond)
6-8: Unused
9: Prohibit all traffic use

Before Assignment Summary

	AM PEAK	PM PEAK	OFF PEAK
MODELED ADRS:			
1 OCC ADRS:			
2 OCC ADRS:			
3+OCC ADRS:			
MED. TRKS:			
HVY. TRKS:			
THRU TRKS:			
THRU 1 OCC ADRS:			
THRU 2 OCC ADRS:			
THRU 3+OCC ADRS:			
TAXI:			
VISITOR:			
SCHOOL:			
AIR PASS. ADRS:			

Creating the final assignment highway network including all three time periods

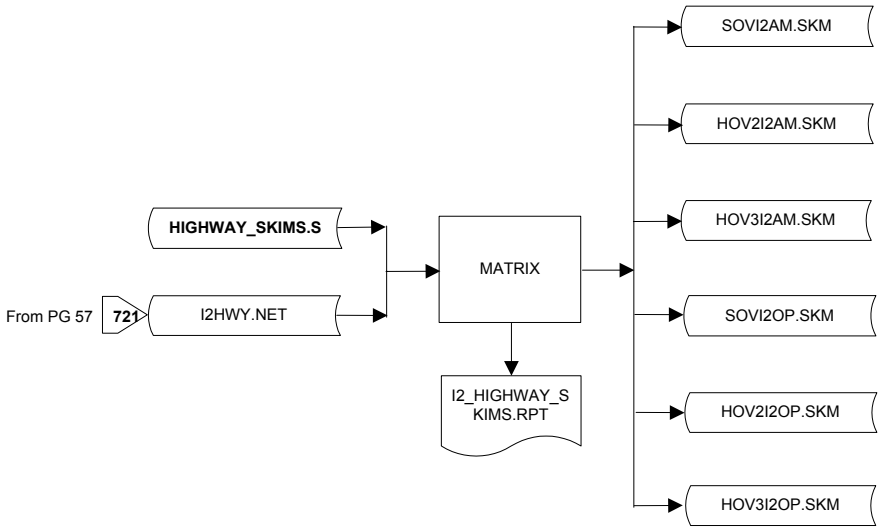


ASSIGNMENT SUMMARY

	AM PEAK	PM PEAK	OFF PEAK
1 OCC. ADRS:			
2 OCC. ADRS:			
3+OCC. ADRS:			
TRUCKS:			
AIR.PASS. ADRS:			
TOTAL:			

Step34.I2_Highway_Skims.bat

Creating the final highway skim files for AM and Off Peak periods by auto accupancy (1, 2, and 3+ occupancy).



Appendix E. Version 2.1/ TP+ fare calculation (MFARE2TP) process

MEMORANDUM

December 17, 2002

To: Files

From: Ronald Milone

Subject: Review of the Version 2.1/TP+ MFARE2TP Calculation Process

Background

This memorandum describes the general computations of the "FARE2" process, which is used to compute zone-to-zone transit fares supporting COG's model choice model. This memorandum will hopefully provide guidance for analysts wishing to check and verify the program operation. The original microcomputer-based fare programs (MFARE1/MFARE2) were documented in a June 1992 report prepared by COMSIS Corporation and William Allen. The COMSIS document should be consulted for additional information on the program.

The Version 2.1/TP+ 'FARE1/2' model is an adapted version of the microcomputer programs developed by COMSIS. The current 'FARE2' program reads a control file specifying parameters and I/O filenames, a station-to-station Metrorail fare matrix, a bus fare matrix, a zone file, and a binary zone matrix containing Metrorail station on/off numbers. The bus fare matrix indicates bus fares between the various 'fare zones' that are referenced in WMATA tariffs. Bus fare zones are typically assigned two-digit identifiers, ranging from 11..17, 21..27, and 31..37 (the current program allows for 21 such zones). TAZs are usually associated with a single bus fare zone, but the software allows for the assignment of 2 bus fair zones for cases where a given TAZ is on or near the border of adjacent bus zones. The zone file contains equivalencies between TAZ's and bus fare zones and special jurisdiction codes relevant for specifying rail-to-bus discount policies. The file also contains zonal area walk percentages, or the percentage of the zone area that is within 1 mile of a Metrorail station. The zonal file also specifies the bus fare zone associated with each Metrorail station.

COG's transit fares have traditionally been estimated using two programs applied sequentially, the first to estimate Metrorail station-to-station fares (MFARE1), and the second to estimate total transit zone-to-zone fares (MFARE2). The Metrorail fares are generally computed in current year dollars while the total zone-to-zone fares are deflated to constant 1980 dollars. The original microcomputer programs were designed to provide zone level AM peak transit fares, by path type (walk/auto access). The Version 2.1/TP+ process requires both AM peak and off-peak transit fares to support the mode choice model. Therefore, the current fare process ultimately results in 4 zonal fare matrices (2 time periods by 2 path types).

Because Metrorail fares are computed differently during peak and off-peak periods, another MFARE1-like program was developed (MFARE1OP) to more accurately compute off-peak rail fares. The MFARE1 program, however, has been maintained to compute AM peak rail fares.

The COMSIS MFARE2 program has also since been upgraded (to MFARE2TP). The upgrade reflects a small format change in the output binary file.

Checking the FARE2 Calculation.

The existing fare programs do not allow one to review input and output information on an i/j basis in a straightforward way. I have inserted a small utility in the Version 2.1/TP+ fare development process to write out a neatly formatted station-to-station fare file. The station-to-station fare files are generically named *mf1_am.prn* and *mf1_op.prn*. I have also written a TP+ script named, *CHKFARE.S* to format input and output information on an i/j basis. I recommend that the following steps be followed for general checking.

Step 1. – Print Pre-existing Input ASCII Input files

The following files should be printed. Examples of the files are attached.

- Control File: (specifes deflator and rail/bus discounts)

- Metrorail Station-to-Station Fare file (*mf1_am.prn/mf1_op.prn*)

- Bus fare zone-to-bus fare zone fare file

Step 2. – Print out Remaining Input /Output Files Using the TP+ Script *CHKFARE.S*

The CHKFARE.S script reads/merges the input zonal information (A2 file), the input binary station number-to-station number binary file, and the output binary fare file produced by the MFARE2 program. It then prints out the merged information on an i/j basis for selected interchanges to 4 files, corresponding to each time period/ path type. The program creates 4 print listings (named, *AMWK.ASC, AMDR.ASC, OPWK.ASC*, and *OPDR.ASC*), each containing untransformed data, in the following sequence:

i-TAZ, j-TAZ, i- Sta. No., j- Sta. No., Final Fare (in deflated cents), BusOnly Fare, Rail Fare, Bus Access Fare, Bus Egress Fare (all in undeflated 1/10ths of cents), origin bus fare zone(s), Origin TAZ walk pct (in 1/10ths), destination bus fare zone(s), destination TAZ walk pct (in 1/10ths), Origin Station Bus fare zone(s), Destination Station bus fare zone(s), Juris code (0-3).

Step 3. Manually Check Fare Calculations, for All Conditions

The transit fare computation is done on an i/j basis and is dependent upon, 1) whether or not Metrorail is used in the transit path, and 2) the number of relevant bus fare zones traversed by the path. If the path is non-Metrorail related, the bus fare matrix is used to formulate the final fare. Alternatively, if the path involves the use of Metrorail, the transit fare is developed using both the Metrorail fare matrix and the bus fare matrix (if bus access/egress components are appropriate). The component fares are computed in current year dollars, in 1/10ths of cents. However, the total 'final' transit fare is adjusted by the deflation factor specified as UPARMS 2 . The computations are shown below.

Non-Metrorail Related Fare Calculation (Non-Deflated) Fare Computation:

The general 'bus only' fare computation is shown below:

(1.0) Non-Metrorail Related Transit fare = Bus Fare * deflation factor

Non-Metrorail-related transit fares are based bus fares (Bf) between bus fare interchanges (bfzni/bfznj). The fare calculation is subject to the number of bus fare zones associated with the origin and destination TAZ (either 1 or 2), as detailed below:

- **Single**-bus fare zone TAZ "i" to **single**-bus fare zone TAZ "j".

The transit fare equals the bus fare from the bus fare matrix.

(1.1) Bus Fare = $Bf_{bfzni1 / bfznj1}$

- **Single**-bus fare zone TAZ "i" to **double**-bus fare zone TAZ "j".

The transit fare equals the average of the fare between the origin bus fare zone to destination bus fare zone 1 and the fare between the origin bus fare zone to destination bus fare zone 2.

(1.2) Bus Fare = $(Bf_{bfzni1 / bfznj1} + Bf_{bfzni1 / bfznj2}) / 2.0$

- **Double**-bus fare zone TAZ "i" to **single**-bus fare zone TAZ "j".

The transit fare equals the average of the fare between the origin bus fare zone 1 to destination bus fare zone and the fare between the origin bus fare zone 2 to the destination bus fare zone.

(1.3) Bus Fare = $(Bf_{bfzni1 / bfznj1} + Bf_{bfzni2 / bfznj1}) / 2.0$

- **Double**-bus fare zone TAZ "i" to **double**-bus fare zone TAZ "j".

The transit fare equals the average of all fares between the origin bus fare zones 1&2 to destination bus fare zones 1&2.

(1.4) Bus Fare = $(Bf_{bfzni1 / bfznj1} + Bf_{bfzni1 / bfznj2} + Bf_{bfzni2 / bfznj1} + Bf_{bfzni2 / bfznj2}) / 4.0$

Metrorail Related Fare Computation:

The general Metrorail-related transit fare computation is as follows:

(2.0) Transit Fare = (Bus Access Fare * (1.0 – Origin Walk Pct) + Metrorail Fare + Bus Egress Fare * (1.0 – Destin. Walk Pct)) * Deflation factor

Transit fares are based the bus access fare (Bf) from the origin bus fare zone (bfzni) to the boarding station (rfzni), the Metrorail fare, and the bus egress fare (Bf) from the alighting station (rfznj) to the destination fare zone (bfznj). The Metrorail fare component is simply taken directly from the input station-to-station fare matrix. Equation 2.0 indicates that both the access and egress bus fares are adjusted based on the Metrorail walking shed percentage associated with the origin and destination TAZs. If, for example, the Metrorail walk percentage is 100% for both the zone origin TAZ and destination TAZ, the fare calculation degenerates to equal the

Metrorail fare only. The bus fare calculations, detailed below, are subject to the number of bus fare zones associated with the origin/destination TAZ (either 1 or 2) as well as the number of bus fare zones associated with the on/off Metrorail station (either 1 or 2). Furthermore, the bus access fares and bus egress fares are both diminished by one half of the rail to bus discount (RB_disc). The discounts vary by a special jurisdiction-based code (0/DC, 1/MD 2/VA Zone 1 and 3/VA Zone 2) and are specified via UPARMS 4-7, respectively. The detailed bus access and bus egress calculations are shown below:

Bus Access Fare Calculation (Non-Deflated):

- **Single**-bus fare zone to **single**-bus fare zone Metrorail station.

(2.1) Bus Fare = $(Bf_{bfzni1\,/\,rfzni1}) - (0.5 * RB\_disc_{ijur})$

- **Single**-bus fare zone to **double**-bus fare zone Metrorail station.

(2.2) Bus Fare = $((Bf_{bfzni1\,/\,rfznj1} + Bf_{bfzni1\,/\,rfznj2}) / 2.0) - (0.5 * RB\_disc_{ijur})$

- **Double**-bus fare zone to **single**-bus fare zone Metrorail station.

(2.3) Bus Fare = $((Bf_{bfzni1\,/\,rfznj1} + Bf_{bfzni2\,/\,rfznj1}) / 2.0) - (0.5 * RB\_disc_{ijur})$

- **Double**-bus fare zone to **double**-bus fare zone Metrorail station.

(2.4) Bus Fare =
$((Bf_{bfzni1\,/\,rfznj1} + Bf_{bfzni1\,/\,rfznj2} + Bf_{bfzni2\,/\,rfznj1} + Bf_{bfzni2\,/\,rfznj2}) / 4.0) - (0.5 * RB\_disc_{ijur})$

Bus Egress Fare Calculation (Non-Deflated):

- **Single**-bus rail fare zone Metrorail Station to **single**-bus fare zone TAZ.

(3.1) Bus Fare = $((Bf_{rfznj1\,/\,bfznj1}) - (0.5 * RB\_disc_{jjur})$

- **Single**-bus fare zone Metrorail Station to **double**-bus fare zone TAZ.

(3.2) Bus Fare = $((Bf_{rfznj1\,/\,bfznj1} + Bf_{rfznj1\,/\,bfznj2}) / 2.0) - (0.5 * RB\_disc_{jjur})$

- **Double**-bus fare zone Metrorail Station to **single**-bus fare zone TAZ.

(3.3) Bus Fare = $((Bf_{rfznj1\,/\,bfznj1} + (Bf_{rfznj2\,/\,bfznj1}) / 2.0) - (0.5 * RB\_disc_{jjur})$

- **Double**-bus fare zone Metrorail Station to **double**-bus fare zone TAZ.

(3.4) Bus Fare =
$((Bf_{rfznj1\,/\,bfznj1} + Bf_{rfzni1\,/\,bfznj2} + Bf_{rfzni2\,/\,bfznj1} + Bf_{rfznj2\,/\,bfznj2}) / 4.0) - (0.5 * RB\_disc_{jjur})$

Manual Calculations Example (Assuming Step 1. and Step 2. Are Completed):

Example 1: I=8, J= 380

Time Period/ Path Type: AM/Walk Access

Interchange type: Non-Metrorail Related (the AMWK.ASC file created by CHKFARE.S indicates Metrorail Station numbers of zero). Therefore, equations 1.0 and 1.1-1.4 are pertinent.

Origin Bus Fare Zone(s): 1,1 (indicated in AMWK.ASC)
Destination Bus FrZn(s): 1,3 (indicated in AMWK.ASC)
Bus Fare Equation: This is a single bus fare zone to single bus fare zone type interchange;
bus fare = 190.0 (equation 1.1 w/ fare value from the bus fare matrix 1,1 to 1,3)
Deflated Transit fare = 190. * 0.544 (equation 1.0 and deflator param from control file)
= 103.

Example 2: I=400, J= 1

Time Period/ Path Type: AM/Walk Access

Interchange type: Metrorail Related (the AMWK.ASC file created by CHKFARE.S indicates O/D Metrorail Station numbers of 5 to 13). Therefore, equations 2.0 and 2.1-3.4 are pertinent.

Origin Bus Fare Zone(s): 1,3 (indicated in AMWK.ASC)
Destination Bus FrZn(s): 1,1 (indicated in AMWK.ASC)
Origin Sta Bus Fr Zn(s): 1,3 (indicated in AMWK.ASC)
Dest Sta Bus Fr Zn(s): 1,1 (indicated in AMWK.ASC)

Bus Fare Equation: This is a single bus fare origin zone to single bus fare access station / single bus fare zone egress station single bus fare dest.zone type interchange; Access /Egress fares computed using equations 2.1 and 3.1 w/ fare values from the bus fare matrix 1,3 to 1,3 at access end and 1,1 to 1,1 at egress end, and rail bus discounts from control cards)
Access bus fare = 100.0 - (0.5 * 0.0) = 100.0
Egress bus fare = 100.0 - (0.5 * 100)= 50.0
Rail fare = 205. (from station-to-station fare matrix listing)

Final/Deflated Transit fare based on equation 2.0, using o/d walk percentages from the AMWK.ASC listing and the deflator param from control file)
Final/Deflated Transit fare = (100. * (1.00 – 1.00)) + 205. + (50. * (1.00- 1.00)) * 0.544
= 112.

Example 3: I=1407, J= 28

Time Period/ Path Type: AM/Walk Access

Interchange type: Metrorail Related (the AMWK.ASC file created by CHKFARE.S indicates O/D Metrorail Station numbers of 55 to 37). Therefore, equations 2.0 and 2.1-3.4 are pertinent.

Origin Bus Fare Zone(s): 1,5 / 1,6 (indicated in AMWK.ASC)
Destination Bus FrZn(s): 1,1 (indicated in AMWK.ASC)
Origin Sta Bus Fr Zn(s): 1,4 (indicated in AMWK.ASC)
Dest Sta Bus Fr Zn(s): 1,1 (indicated in AMWK.ASC)

Bus Fare Equation: This is a doulble bus fare origin zone to single bus fare access station / single bus fare zone egress station single bus fare dest.zone type interchange; Access /Egress fares computed using equations 2.3 and 3.1 w/ fare values from the bus fare matrix 1,5 & 1,6 to 1,3 at access end and 1,1 to 1,1 at egress end, and rail bus discounts from control cards)
Access bus fare = (135.0 + 170) / 2.0 - (0.5 * 25.0) = 140.0
Egress bus fare = 100.0 - (0.5 * 100.)= 50.0
Rail fare = 100. (from station-to-station fare matrix listing)

Final/Deflated Transit fare based on equation 2.0, using o/d walk percentages from the AMWK.ASC listing and the deflator param from control file)
Final/Deflated Transit fare = (140. * (1.00 – 0.00)) + 100. + (50. * (1.00- 1.00)) * 0.544
= 131.

ATTACHMENTS

- Control File Example:

```
&FILES
 A1   = 'mf1_am.asc',
 A2   = 'fare_a2.asc',
 A3   = 'inputs\busfaram.asc',
 J1   = 'pp_am_dr.sta',
 J2   = 'MF_AM_DR.SKM',
 LIST = 'MF_AM_DR.RPT',  /

FILE NAME DEFINITION:
 A1       METRORAIL station to station fare matrix
 A2       Zone/Station data file (UTPS RPFARE2 A1 DECK)
 A3       Bus fare lookup table
 J1       Access/Egress station matrix, AUTO ACCESS NETWORK
 J2       OUTPUT zonal fare matrix
 List     OUTPUT listing file

SET USER-CODED PARAMETERS:
&PARAM
 zones     = 2191,
 uparms(1) = 116.0,
 uparms(2) = 0.54468,
 uparms(4) = 100.0,
 uparms(5) = 0.0,
 uparms(6) = 25.0,
 uparms(7) = 25.0,
 uparms(8) = 1.0,   /
```

- Example Portion of Station-to-Station Metrorail Fare File

```
FROM: Shady Grove         (  1)  TO: Shady Grove         (  1) / RAIL FARE: 100
FROM: Shady Grove         (  1)  TO: Rockville           (  2) / RAIL FARE: 100
FROM: Shady Grove         (  1)  TO: Twinbrook           (  3) / RAIL FARE: 130
FROM: Shady Grove         (  1)  TO: White Flint         (  4) / RAIL FARE: 150
FROM: Shady Grove         (  1)  TO: Grosvenor           (  5) / RAIL FARE: 175
FROM: Shady Grove         (  1)  TO: Medical Center      (  6) / RAIL FARE: 210
FROM: Shady Grove         (  1)  TO: Bethesda            (  7) / RAIL FARE: 225
FROM: Shady Grove         (  1)  TO: Friendship Heights  (  8) / RAIL FARE: 255
FROM: Shady Grove         (  1)  TO: Tenleytown          (  9) / RAIL FARE: 270
FROM: Shady Grove         (  1)  TO: Van Ness-UDC        ( 10) / RAIL FARE: 285
FROM: Shady Grove         (  1)  TO: Cleveland Park      ( 11) / RAIL FARE: 295
FROM: Shady Grove         (  1)  TO: Woodley Park-Zoo    ( 12) / RAIL FARE: 305
FROM: Shady Grove         (  1)  TO: Dupont Circle       ( 13) / RAIL FARE: 315
FROM: Shady Grove         (  1)  TO: Farragut North      ( 14) / RAIL FARE: 315
FROM: Shady Grove         (  1)  TO: Metro Center        ( 15) / RAIL FARE: 315
FROM: Shady Grove         (  1)  TO: Gallery Place       ( 16) / RAIL FARE: 315
FROM: Shady Grove         (  1)  TO: Judiciary Square    ( 17) / RAIL FARE: 315
FROM: Shady Grove         (  1)  TO: Union Station       ( 18) / RAIL FARE: 315
FROM: Shady Grove         (  1)  TO: Rhode Island Ave    ( 19) / RAIL FARE: 315
FROM: Shady Grove         (  1)  TO: Brookland-CUA       ( 20) / RAIL FARE: 315
FROM: Shady Grove         (  1)  TO: Fort Totten         ( 21) / RAIL FARE: 315
FROM: Shady Grove         (  1)  TO: Takoma              ( 22) / RAIL FARE: 315
FROM: Shady Grove         (  1)  TO: Silver Spring       ( 23) / RAIL FARE: 315
FROM: Shady Grove         (  1)  TO: Forest Glen         ( 24) / RAIL FARE: 315
.
.
.
```

- **Bus fare zone-to-bus fare zone fare file**

```
1   1   1100.165.190.118.153.205.240.
1   1   2205.240.345.270.245.288.250.
1   1   3373.277.275.287.322.332.339.
1   2   1165.100.100.215.190.230.255.
1   2   2230.255.345.435.245.453.415.
1   2   3373.277.185.452.487.497.504.
1   3   1190.100.100.225.265.340.375.
1   3   2340.375.345.460.245.100.440.
1   3   3373.277. 85.477.512.522.529.
1   4   1118.215.225.100.135.170.205.
1   4   2170.205.463.388.363.406.368.
1   4   3491.395.310.264.299.298.304.
1   5   1153.190.265.135.100.135.170.
1   5   2135.170.498.423.398.441.403.
1   5   3526.430.350.264.299.298.304.
1   6   1205.230.340.170.135.100.135.
1   6   2100.135.550.475.450.493.455.
1   6   3578.482.425.492.527.537.544.
1   7   1240.255.375.205.170.135.100.
1   7   2135.100.585.510.485.528.490.
1   7   3613.517.460.527.562.572.579.
2   1   1205.230.340.170.135.100.135.
2   1   2 50. 50.550.475.450.493.455.
2   1   3578.482.425. 50.158.216.240.
2   2   1240.255.375.205.170.135.100.
2   2   2 50. 50.585.510.485.528.490.
2   2   3613.517.460. 50.158.216.240.
2   3   1345.345.345.463.498.550.585.
2   3   2550.585.185.615.552.633.595.
2   3   3 85.209.370.575.610.620.627.
2   4   1270.435.460.388.423.475.510.
2   4   2475.510.615.130.515.558.520.
2   4   3643.547.373.557.592.602.609.
2   5   1245.245.245.363.398.450.485.
2   5   2450.485.552.515.185.533.495.
2   5   3675.522.520.494.529.539.546.
2   6   1288.453.100.406.441.493.528.
2   6   2493.528.633.558.533.288.538.
2   6   3661.567.563.575.610.620.627.
2   7   1250.415.440.368.403.455.490.
2   7   2455.490.595.520.495.538.250.
2   7   3623.527.525.537.572.582.589.
3   1   1373.373.373.491.526.578.613.
3   1   2578.613. 85.643.675.661.623.
3   1   3 85.294.558.660.695.705.712.
3   2   1277.277.277.395.430.482.517.
3   2   2482.517.209.547.522.565.527.
3   2   3294.185.462.514.549.559.566.
3   3   1275.185. 85.310.350.425.460.
3   3   2425.460.370.373.520.563.525.
3   3   3558.462. 85.562.597.607.614.
3   4   1287.452.477.264.264.492.527.
3   4   2 50. 50.575.557.494.575.537.
3   4   3660.514.562. 50.158.550.597.
3   5   1322.487.512.299.299.527.562.
3   5   2158.158.610.592.529.610.572.
3   5   3695.549.597.158.134.363.409.
3   6   1332.497.522.298.298.537.572.
3   6   2216.216.620.602.539.620.582.
3   6   3705.559.607.550.363.146.146.
3   7   1339.504.529.304.304.544.579.
3   7   2240.240.627.609.546.627.589.
3   7   3712.566.614.597.409.146.146.
```

- Example of CHKFARE.S Listing

```
           ORIG DEST Defl Undf Undf Undf Undf OBusFrZ Orig Orig DBusFrZ Dest Dest OStaBfz DStaBfz
    I     J STA  STA  FARE busF Rail B_ac B_eg -1- -2- Wpct Wpct -1- -2- Wpct Wpct -1- -2- -1- -2- jcode

  327     1    8   13  123     0 1250 1000  500 1 2 1 3    0     0 1 1 0 0 1000 1000 1 1 1 2 1 1 0 0    0
  327    10    8   13  123     0 1250 1000  500 1 2 1 3    0     0 1 1 0 0 1000 1000 1 1 1 2 1 1 0 0    0
  327    11    8   13  123     0 1250 1000  500 1 2 1 3    0     0 1 1 0 0 1000 1000 1 1 1 2 1 1 0 0    0
  327    29    8   15  136     0 1500 1000  500 1 2 1 3    0     0 1 1 0 0 1000 1000 1 1 1 2 1 1 0 0    0
  327    30    8   13  123     0 1250 1000  500 1 2 1 3    0     0 1 1 0 0 1000 1000 1 1 1 2 1 1 0 0    0
  327   380    0    0   54 1000     0    0    0 1 2 1 3    0     0 1 3 0 0    0    0 0 0 0 0 0 0 0 0    1
  327   381    0    0   54 1000     0    0    0 1 2 1 3    0     0 1 3 0 0    0    0 0 0 0 0 0 0 0 0    1
  327   382    0    0   54 1000     0    0    0 1 2 1 3    0     0 1 3 0 0    0    0 0 0 0 0 0 0 0 0    1
  327   383    0    0   54 1000     0    0    0 1 2 1 3    0     0 1 3 0 0    0    0 0 0 0 0 0 0 0 0    1
  327   400    8    5  128     0 1350 1000 1000 1 2 1 3    0     0 1 3 0 0 1000 1000 1 1 1 2 1 3 0 0    1
  327 1400    8   55  244     0 1900 1000 1575 1 2 1 3    0     0 1 6 0 0    0    0 1 1 1 2 1 4 0 0    2
  327 1401    8   55  244     0 1900 1000 1575 1 2 1 3    0     0 1 6 0 0    0    0 1 1 1 2 1 4 0 0    2
  327 1402    8   55  244     0 1900 1000 1575 1 2 1 3    0     0 1 6 0 0    0    0 1 1 1 2 1 4 0 0    2
.
.
.
.
```

CHKFARE.S Program Script:

```
; Chkfare.s
; Format MFARE2 output ON AN I/J BASIS
; Input files: a2 ZONAL INPUT MFARE2TP program
;                            AM/WK AM/DR, OP/WK. OP/DR MFARE2TP output files
;                            AM/WK AM/DR, OP/WK. OP/DR 'USTOS' files
; Output files:  Consolidated i/j summaries for seleted I,js
;               4 files: AMWK.ASC, AMDR.ASC, OPWK.ASC, OPDR.ASC
;------------------------------------------------------------------------
*del TPPl*.prn
Path  = 'i:\moran\cgv2_1c\cg94\'
RUN PGM=MATRIX
zdati[1] = @path@fare_a2.asc,z=1-4,bfz11= 8- 8, bfz12=12-12,
                                  bfz21=16-16, bfz22=20-20,
                                  opct =21-24, dpct =25-28,
                                  bfr11=32-32, bfr12=36-36,
                                  bfr21=40-40, bfr22=44-44,jurcd=50-50
 MATI[1]=@path@pp_am_wk.sta  ;
 MATI[2]=@path@pp_am_dr.sta  ; Input 'stos' files
 MATI[3]=@path@pp_op_wk.sta  ;
 MATI[4]=@path@pp_op_wk.sta  ;

 MATI[11]=@path@MF_AM_WK.SKM ; Output fare files
 MATI[12]=@path@MF_AM_DR.SKM ;
 MATI[13]=@path@MF_OP_WK.SKM ;
 MATI[14]=@path@MF_OP_DR.SKM ;

 JLOOP
IF (i = 8,327,400,1389,1407 & j=1,10-30,380-400,1400-1420);
IF (j=1) ; print header at top of i,j listings for each new
  PRINT LIST='           ORIG DEST Defl Undf Undf Undf Undf OBusFrZ Orig Orig DBusFrZ Dest Dest OStaBfz DStaBfz ',
        FILE=AMWK.ASC
  PRINT LIST='           ORIG DEST Defl Undf Undf Undf Undf OBusFrZ Orig Orig DBusFrZ Dest Dest OStaBfz DStaBfz ',
        FILE=AMDR.ASC
  PRINT LIST='           ORIG DEST Defl Undf Undf Undf Undf OBusFrZ Orig Orig DBusFrZ Dest Dest OStaBfz DStaBfz ',
        FILE=OPWK.ASC
  PRINT LIST='           ORIG DEST Defl Undf Undf Undf Undf OBusFrZ Orig Orig DBusFrZ Dest Dest OStaBfz DStaBfz ',
        FILE=OPDR.ASC

  PRINT LIST='    I    J STA  STA  FARE busF Rail B_ac B_eg -1- -2- Wpct Wpct -1- -2- Wpct Wpct -1- -2- -1- -2- jcode',
        FILE=AMWK.ASC
  PRINT LIST='    I    J Osta Dsta FARE busO Rail B_ac B_eg -1- -2- owpt owpt -1- -2- Wpct dwpt -1- -2- -1- -2- jcode',
        FILE=AMDR.ASC
  PRINT LIST='    I    J Osta Dsta FARE busO Rail B_ac B_eg -1- -2- owpt owpt -1- -2- Wpct dwpt -1- -2- -1- -2- jcode',
        FILE=OPWK.ASC
  PRINT LIST='    I    J Osta Dsta FARE busO Rail B_ac B_eg -1- -2- owpt owpt -1- -2- Wpct dwpt -1- -2- -1- -2- jcode',
        FILE=OPDR.ASC
ENDIF
 istaw = mi.1.1   jstaw=mi.1.2  ; get i/j station for each path type
 istad = mi.2.1   jstad=mi.2.2  ;
 istow = mi.3.1   jstow=mi.3.2  ;
 istod = mi.4.1   jstod=mi.4.2  ;
;
if (istaw = 0)  istaw=151
if (istad = 0)  istad=151
if (istow = 0)  istow=151
```

```
if (istod = 0)  istod=151

if (jstaw = 0)  jstaw=151
if (jstad = 0)  jstad=151
if (jstow = 0)  jstow=151
if (jstod = 0)  jstod=151
  PRINT FILE=AMWK.ASC FORM=5.,LIST= I,j,
        MI.1.1,MI.1.2,
        MI.11.1,MI.11.2,MI.11.3,MI.11.4,MI.11.5,
        bfz11[i](2),bfz12[i](2),bfz21[i](2),bfz22[i](2),opct[i],dpct[i],
        bfz11[j](2),bfz12[j](2),bfz21[j](2),bfz22[j](2),opct[j],dpct[j],
        bfr11[istaw](2),bfr12[istaw](2),bfr21[istaw](2),bfr22[istaw](2),
        bfr11[jstaw](2),bfr12[jstaw](2),bfr21[jstaw](2),bfr22[jstaw](2),jurcd[j](4)
  PRINT FILE=AMDR.ASC FORM=5.,LIST= I,j,
        MI.2.1,MI.2.2,
        MI.12.1,MI.12.2,MI.12.3,MI.12.4,MI.12.5,
        bfz11[i](2),bfz12[i](2),bfz21[i](2),bfz22[i](2),opct[i],dpct[i],
        bfz11[j](2),bfz12[j](2),bfz21[j](2),bfz22[j](2),opct[j],dpct[j],
        bfr11[istad](2),bfr12[istad](2),bfr21[istad](2),bfr22[istad](2),
        bfr11[jstad](2),bfr12[jstad](2),bfr21[jstad](2),bfr22[jstad](2),jurcd[j](4)

  PRINT FILE=OPWK.ASC FORM=5.,LIST= I,j,
        MI.3.1,MI.3.2,
        MI.13.1,MI.13.2,MI.13.3,MI.13.4,MI.13.5,
        bfz11[i](2),bfz12[i](2),bfz21[i](2),bfz22[i](2),opct[i],dpct[i],
        bfz11[j](2),bfz12[j](2),bfz21[j](2),bfz22[j](2),opct[j],dpct[j],
        bfr11[istow](2),bfr12[istow](2),bfr21[istow](2),bfr22[istow](2),
        bfr11[jstow](2),bfr12[jstow](2),bfr21[jstow](2),bfr22[jstow](2),jurcd[j](4)
  PRINT FILE=OPDR.ASC FORM=5.,LIST= I,j,
        MI.4.1,MI.4.2,
        MI.14.1,MI.14.2,MI.14.3,MI.14.4,MI.14.5,
        bfz11[i](2),bfz12[i](2),bfz21[i](2),bfz22[i](2),opct[i],dpct[i],
        bfz11[j](2),bfz12[j](2),bfz21[j](2),bfz22[j](2),opct[j],dpct[j],
        bfr11[istod](2),bfr12[istod](2),bfr21[istod](2),bfr22[istod](2),
        bfr11[jstod](2),bfr12[jstod](2),bfr21[jstod](2),bfr22[jstod](2),jurcd[j](4)

 ENDIF

 ENDJLOOP
ENDRUN
*copy TPPl*.prn  chkfare.rpt
```